GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

SPECIFICATION AND BID DOCUMENTS FOR THE REPLACEMENT OF 115 KV TRANSMISSION STRUCTURES ALONG CIRCUIT 18, 15, AND 11

ISSUED FOR BIDS

ADVERTISEMENT FOR BIDS

Sealed proposals will be received in the Office of the Procurement Coordinator, Greenville Utilities Commission, 401 S. Greene Street, Greenville, North Carolina 27834 until 2:00 PM (EDST) on July 18, 2019, and immediately thereafter publicly opened and read for the replacement of 115 kV transmission structures along Circuit 18, 15, and 11.

Instructions for submitting bids and complete specifications will be available in the Office of the Procurement Coordinator, Greenville Utilities Commission, 401 S. Greene Street, Greenville, North Carolina during regular office hours, which are 8:30AM – 5:00PM Monday through Friday.

Greenville Utilities Commission reserves the right to reject any or all bids. **Late bids will not be considered.**

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

SPECIFICATION AND BID DOCUMENTS
FOR THE REPLACEMENT OF
115 KV TRANSMISSION STRUCTURES
ALONG CIRCUIT 18, 15, AND 11

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SECTION I

GENERAL INSTRUCTIONS FOR FORMAL BIDS

RELATED TO THE REPLACEMENT OF 115 TRANSMISSION

STRUCTURES ALONG CIRCUIT 18, 15, AND 11 CONTRACT

1. NOTICE TO BIDDERS

Sealed bids, subject to the conditions made a part hereof, will be received in the Office of the Procurement Coordinator, Greenville Utilities Commission, 401 S. Greene Street, Greenville, North Carolina 27834 until 2:00 PM (EDST) on July 18, 2019, the day of opening. Bids submitted in a fax or e-mail in response to this Invitation for Bids **will not be acceptable.**

2. STANDARD FORMS REQUIRED

Each bidder must submit a proposal on the enclosed bid forms. **The bid must be signed by an authorized official of the firm. Return only the attached Proposal Form. Do not return the Advertisement for Bids, Instructions to Bidders or Specifications.**

3. PREPARATION OF BID

Bids must be in sealed envelopes clearly marked on the outside with the name of the bid and the bid opening date and time. Bid shall be addressed to PROCUREMENT COORDINATOR, GREENVILLE UTILITIES COMMISSION, 401 S. GREENE STREET, GREENVILLE, NORTH CAROLINA 27834.

4. TIME FOR OPENING BIDS

Bids will be opened promptly and read at the hour and on the date set forth in the advertisement in the Office of the Procurement Coordinator, Greenville Utilities Main Office, 401 S. Greene Street, Greenville, North Carolina. Bidders or their authorized agents are invited to be present.

5. BID SECURITY

5.1. Each Proposal shall be accompanied by a cashier's check, or certified check drawn on a bank or trust company insured by the Federal Deposit Insurance Corporation, or the Savings Association Insurance Fund, or an original signed/sealed Bid Bond in an amount equal to not less than five percent (5%) of the total amount of the Proposal; said deposit to be retained by the Owner as liquidated damages in event of failure of the Successful Bidder to execute the Contract within ten (10) days after the award.

5.2. Bid Bond shall be conditioned that the Surety will upon demand forthwith make payment to the Obligee upon said Bond if the Bidder fails to execute the Contract in accordance with the Bid Bond, and upon failure to immediately make payment, the Surety shall pay to the Obligee an amount equal to double the amount of said Bond. Standard Form of Bid Bond is included in these Specifications.

5.3. Only one (1) bid Surety is required, the amount of which shall be based on the total amount of all bid schedules.

6. BULLETINS AND ADDENDA

Any bulletins issued during the time of bidding or addenda to Specifications are to be considered covered in the Proposal, and in executing a Contract will become a part thereof. Receipt of addenda shall be acknowledged by the bidder in the *Form of Proposal*.

7. NC SALES TAX

Do not include NC sales taxes in bid figure; however, Greenville Utilities Commission (GUC) does pay sales tax. Sales tax should be added to the invoice as a separate item.

8. FEDERAL EXCISE TAX

GUC is exempt from Federal Excise Tax and will issue a Federal Exemption Certificate upon request to the successful bidder.

9. FORM OF EXCEPTIONS

Proposals shall include a *Form of Exceptions* utilizing forms provided which shall itemize each exception from the Specifications. The Form of Exceptions shall state the section, subsection, and paragraph designations from the part of the Specifications to which exception is taken and explain in detail the nature of the exception. A copy of this *Form of Exceptions* is included in the Form of Proposals. Exceptions will not necessarily eliminate a Bidder from consideration, even if bids without exceptions are received from others. The treatment of exceptions will be based entirely on the overall best interests of the Owner.

10. DISCREPANCY

Should the Bidder find discrepancies in or omissions from the Drawings or Documents or should he be in doubt as to their meaning, he shall at once notify the Engineer who will send written instructions to all Bidders. Neither the Owner nor the Engineer will be responsible for any oral instructions. If Plans and Specifications are found to disagree after Contract is awarded, the Engineer shall be the judge as to what was intended. The Successful Bidder is hereby made responsible for the furnishing of the necessary labor, tools and equipment reasonably inferred or evidently necessary for the proper execution and completion of the

work; for any additional work involved in the correction of apparent errors or inconsistencies, and in executing the true intent and meaning of the Drawings and Specifications as interpreted by the Engineer and all such labor and equipment shall be provided at the Contractor's expense, and under no condition will any such labor and equipment be allowed as an extra.

11. EVALUATION AND AWARD OF BIDS

11.1. The award of the Contract will be made to the lowest responsible, responsive Bidder as soon as practicable. The bid shall be awarded to the Bidder who, in the judgment of the Owner, offers the best value to the Owner. Factors to be considered by the Owner are specified in Paragraph 11.3. The Owner reserves the right to reject any and all bids.

11.2. The Owner reserves the right to waive minor irregularities or minor errors in any Proposal if it appears to the Owner that such irregularities or errors were made through inadvertence. Any such irregularities or errors so waived must be corrected on the Proposal prior to its acceptance by the Owner.

11.3. In estimating the lowest cost to the Owner as one of the factors in deciding the award of the Contract, the Owner will consider, in addition to the prices quoted in the Proposal, the following:

11.3.1. Completion date

11.3.2. Adherence to the Plans and Specifications

11.3.3. Contractor capabilities, crew experience, and past performance

11.3.4. Conditional quotations (Only firm fixed prices in U.S. dollars)

11.3.5. Any additional factors deemed appropriate by the Owner.

11.4. In the event the Bidder proposes any change or deviation from the Engineer's Plans and Specifications, such proposed changes or deviations must be submitted at the time bids are opened on the *Form of Exceptions* included. The Owner reserves the right to reject any proposed changes or deviations. All exceptions must be stated on the *Form of Exceptions*. Failure to provide a *Form of Exceptions* with the Proposal shall imply strict adherence to all details of the Plans and Specifications.

11.5. The Contract, when awarded, shall be deemed to include the Specifications for the equipment, and the Bidder shall not claim any modification thereof resulting from any representative or promise made at any time by any officer, agent, or employee of the Owner or by any other person.

12. PROMPT PAYMENT DISCOUNTS

Bidders are urged to compute all discounts into the price offered. If a prompt payment discount is offered, it may be considered in the award of the contract.

13. NUMERICAL ERRORS

In the case of a discrepancy between a unit price and the extension (the unit price multiplied by the number of units) the unit price governs. In the case where numerical bids are stated both in numbers and in words, the words govern.

14. BID WITHDRAWAL

If, within 24 hours after bids are opened, any Bidder files a duly signed written notice with the Owner and promptly thereafter demonstrates to the reasonable satisfaction of the Owner that there was a substantial mistake in the preparation of its bid, that Bidder will not be permitted to modify its bid, but may withdraw its bid in its entirety, and the Bid Security will be returned. Thereafter, the bidder will be disqualified from further bidding on the installation of the project herein specified.

15. MINORITY BUSINESS PARTICIPATION PROGRAM

GUC has adopted an Affirmative Action and Minority and Women Business Enterprise Plan (M/WBE) Program. Firms submitting a proposal are attesting that they also have taken affirmative action to ensure equality of opportunity in all aspects of employment, and to utilize M/WBE suppliers of materials and/or labor.

16. PERFORMANCE AND PAYMENT BONDS

16.1. The Successful Bidder shall be required to furnish separate Performance and Payment Bonds executed on the forms bound herein in amounts at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and as security for the payment of all persons performing labor and furnishing materials and equipment in connection with this Contract.

16.2. Performance and Payment Bonds shall be with a Surety company authorized and licensed to do business in the State of North Carolina and shall be for the full Contract sum.

17. EXAMINATION OF CONDITIONS

Prior to the submission of the Proposal, the Bidder shall make and shall be deemed to have made a careful examination of the Plans and Specifications on file with the Owner and with the Engineer, and all other matters that may affect the cost and the time of completion of the work.

18. SUBCONTRACTORS

The Bidder shall include in the Proposal a listing of all subcontractors (if any) and their respective support services to be utilized during the project. All subcontractors will be subject to approval by the Owner and Engineer.

19. COMPLETION

19.1. The award of this Contract shall be issued as soon as possible, subsequent to the bid opening, by issuance of written contract to the Contractor by the Engineer or notification from the Owner. Work on the projects shall begin after award of Contract and no later than September 1, 2019.

19.2. The completion date for the projects' on-site activities shall be March 1, 2020.

19.3. Time for completion shall be extended for delays due to bad weather days or other special cases with the written consent of the Owner and/or Engineer.

19.4. The Contractor shall include in the Proposal a project construction schedule using the completion date above, indicating each major construction activity with duration and the total number of calendar days of construction time he proposes to perform his work based on the above completion date.

20. LIQUIDATED DAMAGES

Time is of the essence, and it is critical that the work be performed on schedule and time is allowed for the completion of the work in the Contract Agreement included herewith. Damages for delay shall be at the rate of five-hundred dollars ($500.00) per calendar day for failure of the Contractor to complete the work within the Construction Schedule. No credit shall be given for early completion of the work.

21. BIDS TO BE RETAINED

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty (60) days pending the execution of a Contract by the Successful Bidder. Should the Successful Bidder default and not execute a Contract, the Contract will be offered to the next lowest responsible, responsive Bidder.

22. DELIVERY LOCATION

The prices quoted shall include delivery of any Contractor-furnished materials and equipment to the project site, and complete installation of said materials and equipment and installation of the Owner- furnished materials. The location of the station is shown on the Vicinity Map in the Appendices.

23. FORM OF PROPOSAL

Those bids not received on the Form of Proposal contained herein will be considered unresponsive. The forms shall be filled out completely. Any omissions may cause the entire Proposal to be rejected

24. CONTRACTOR'S INSURANCE

24.1. General Liability: Commercial General Liability Insurance, (with coverage consistent with ISO Form CG 00 01 12 07 or its equivalent) with a limit of not less than One Million Dollars ($1,000,000) per occurrence and Two Million Dollars ($2,000,000) per project or per location general aggregate, and a deductible or self-insured retention not to exceed Twenty-five Thousand Dollars ($25,000) per occurrence, covering liability for bodily injury and property damage, arising from premises, operations, independent contractors, personal injury/advertising injury, contractual liability, and products/completed operations for not less than two (2) years from the Substantial Completion Date.

24.2. Automobile Liability: Commercial Automobile Liability Insurance, including coverage for liability arising out of the use of owned (if any), non-owned, leased or hired automobiles, for both bodily injury and property damage in accordance with Applicable Legal Requirements, with a limit of not less than One Million Dollars ($1,000,000) combined single limit per occurrence.

24.3. Workers Compensation: Worker's Compensation Insurance, with statutory limits, covering all of Subcontractor's employees, on terms and conditions as required by applicable Law and imposed by worker's compensation, occupational disease or similar laws, including the Longshore and Harbor Workers' Act, the Federal Employers' Liability and the Jones Act, if applicable.

24.4. Employers Liability: Employers' Liability Insurance with limits of not less than One Million Dollars ($1,000,000) each accident for bodily injury by accident, One Million Dollars ($1,000,000) each employee for bodily injury by disease, and One Million Dollars ($1,000,000) policy limit.

24.5. Umbrella Liability: Subcontractor must provide an Umbrella form (not Excess Liability form) that provides additional liability for underlying General Liability, Auto Liability, and Employer Liability.

24.5.1. Level 1 Contracts (Contract Value $200,000 to $499,999) - $1,000,000

24.5.2. Level 2 Contracts (Contract Value $500,000 to $999,999) - $3,000,000

24.5.3. Level 3 Contracts (Contract Value $1,000,000 & up) - $5,000,000

25. CONTRACTOR'S LICENSE

In accordance with the State of North Carolina General Statues, Contractors performing work of this caliber in the State must be licensed to do so. A current copy of the Contractor's State of North Carolina Board for General Contractor's License must be submitted with this Proposal in the Form of Proposal. Additionally, a valid license must be maintained during the course of the work.

Contractor represents and warrants that it is fully experienced in projects of the nature, scope and magnitude of the Work, properly qualified, registered, licensed, equipped, organized and financed to perform the Work.

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GENERAL CONDITIONS

1. DRAWINGS AND SPECIFICATIONS

The Drawings and Specifications are complementary, one to the other. That which is shown on the Drawings or called for in the Specifications shall be as binding as if it were both called for and shown. The intention of the Drawings and Specifications is to include all labor, materials, transportation, equipment and any and all other items necessary to do a complete job which may include manufactured items and field service assistance. In case of discrepancy or disagreement in the Contract, the order of precedence shall be: Contract, Specifications, Drawings.

2. CLARIFICATIONS AND DETAILED DRAWINGS

In such cases where the nature of the work requires clarification by the Engineer, such clarification shall be furnished by the Engineer with reasonable promptness by means of written instructions or Detail Drawings or both. Clarifications and Drawings shall be consistent with the intent of Contract Documents and shall become a part thereof.

3. CHANGE OF DRAWINGS AND/OR SPECIFICATIONS

3.1. The Owner, or the Engineer on behalf of the Owner, may make changes to Drawings and/or Specifications after award of the Contract or while construction is in progress. The compensation for such changes shall be agreed upon in writing between the Contractor and the Owner prior to commencement of work involving the change. No payment shall be made to the Contractor for correcting work not in compliance with Specifications. Once the change of work has been agreed upon between all parties, the Engineer will initiate a change order.

3.2. Records of conditions above and below ground, water records or other observations which may have been made by or for Owner shall be made available to Contractor for its information, upon request. Site sub-surface conditions which differ materially from the results reasonably indicated in any reports furnished by Owner or undertaken by Contractor shall be deemed to be changed work.

3.3. Except as otherwise set forth in the Contract, all loss or damage to Contractor arising out of the Work or from the action of the elements, or from any unforeseen circumstance in the prosecution of the Work including inefficiencies or claims of inefficiencies, shall be sustained and borne by Contractor at its own cost and expense.

4. COPIES OF BID DOCUMENTS

The Engineer will furnish free of charge to each pre-qualified Bidder one (1) copy of bid documents. Additional sets of these Specifications for approved Bidders and sets for Bidders seeking approval may be obtained upon request for a non-refundable payment of Fifty Dollars ($50) per set.

5. WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

Contractor shall maintain, in readable condition at his office, one (1) complete set of as-built working Drawings and Specifications for his work. Such Drawings and Specifications shall be available for use by the Engineer or Owner. During construction, the Contractor will work diligently to keep the Owner abreast of electric system conditions, so as not to interfere with normal or emergency operations.

6. OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

All Drawings and Specifications are instruments of service and remain the property of the Engineer whose name appears thereon. The use of these instruments on work other than this Contract without permission is prohibited. All copies of Drawings and Specifications other than Contract copies shall be returned to the Engineer upon request after completion of the work.

7. MATERIALS, EQUIPMENT, AND EMPLOYEES

7.1. The Contractor shall, unless otherwise specified, supply and pay for all labor, equipment, transportation, tools, apparatus, lights, heat, sanitary facilities, water, and incidentals necessary for the entire proper and substantial completion of his work. The Contractor shall install, maintain, and remove all equipment of the construction and be responsible for the safe, proper, and lawful construction, maintenance, and use of same. The Contractor shall construct, in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the Plans, stated in the Specifications, or reasonably implied there from, all in accordance with the Contract Documents. Some of the major material items required for the work will be furnished by the Owner as outlined in the Technical Specifications. All other necessary materials are to be furnished by the Contractor as outlined in the Technical Specifications.

7.2. The Contractor shall not re- use any "removed" materials in the completion of this project unless indicated as a transfer unit on the construction drawings. Materials damaged or lost during construction of the work due to carelessness of the Contractor's personnel, shall be replaced in kind by the Contractor at no cost to the Owner.

7.3. If at any time during the construction and completion of the work covered by these Specifications, the conduct of any workman of the various crafts is

adjudged ungentlemanly and a nuisance to the Owner or the Engineer, or if any workman is considered incompetent or detrimental to the work, the Contractor shall order such parties to be immediately removed from the grounds.

7.4. Any superintendent or foreman of the Contractor who ignores or refuses to follow written instructions of the Owner or the Engineer or his representative at the site shall be immediately removed and replaced.

7.5. The Contractor shall always ensure that he has sufficient crew compliments, both in terms of numbers and experience of personnel to perform work tasks safely. both for workers and the general public. Any instance noted to the contrary of this requirement may result in the complete shutdown of work on the project.

8. ROYALTIES, LICENSE, AND PATENTS

It is the intention of the Contract Documents that the work covered herein will not constitute in any way on an infringement on any patent whatsoever. The Contractor shall protect and save harmless the Owner against suit on account of alleged or actual infringement. The Contractor shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

9. INDEMNIFICATION

Bidder agrees to indemnity and save GUC of the City of Greenville, Pitt County, North Carolina, and the City of Greenville, North Carolina, its co-owners, joint-venturers, agents, employees, and insurance carriers harmless from any and all Third Party claims, actions, costs, expenses, including reasonable attorney fees, judgments, or other damages resulting from injury to any person (including injury resulting in death), or damage (including loss or destruction) to third party tangible property arising out of the negligent performance of the terms of this Contract by Bidder; including, but not limited to, Bidder's employees, agents, subcontractors, and others designated by Bidder to perform work or services in, about, or attendant to, the work and services under the terms of this Contract. Bidder shall not be held responsible for any losses, expenses, claims, subrogation, actions, costs, judgments, or other damages, directly and proximately caused by the negligence of Greenville Utilities Commission of the City of Greenville, Pitt County, North Carolina. Insurance covering this indemnity agreement by Bidder in favor of Greenville Utilities Commission of the City of Greenville, Pitt County, North Carolina, and the City of Greenville, North Carolina, shall be provided by the Bidder.

10. SURVEYS

Unless otherwise specified, the Owner, will furnish all surveys and locations for locating the principal component parts of the work. Stakes missing at the time of construction will be replaced within a reasonable amount of time after notification by the Contractor.

11. UNCORRECTED FAULTY WORK

The Contractor shall be notified of faulty or damaged work and shall have the option to respond in a reasonable period. Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the Owner or the Engineer, the Owner shall be reimbursed by the Contractor for the same by a deduction in the Contract prices arrived at by a fair estimate of the probable cost of correction, approved by the Engineer.

12. DELAYS AND EXTENSION OF TIME

12.1. The time to be allowed for construction of these facilities is stated in the Instructions to Bidders. The Contractor, upon notice of award of Contract, shall prepare a construction schedule based on the allowed time, and submit such schedule to the Engineer for approval. A Pre-Construction Conference will be scheduled for all parties concerned.

12.2. If the Contractor is delayed at any time in the progress of the work by any act of negligence by the Owner or the Engineer, or by any separate Contractor employed by the Owner or by changes ordered in the work, then the time of completion shall be extended for such reasonable time as the Engineer may decide.

12.3. No extension of time for completion will be made for ordinary delays and accidents. Extensions may be granted for delays ordered by the Owner or the Engineer if the request has been made in writing within forty-eight (48) hours after the order to cease work has been given.

13. LIQUIDATED DAMAGES

Time is of the essence, and it is critical that the work be performed on schedule and time is allowed for the completion of the work in the Contract Agreement included herewith. Damages for delay shall be at the rate of five-hundred dollars ($500.00) per calendar day for failure of the Contractor to complete the work within the Construction Schedule. No credit shall be given for early completion of the work.

14. CORRECTION OF WORK BEFORE FINAL PAYMENT

14.1. Any work, materials, or other parts of the work which have been condemned or declared not in accordance with the Contract by the Owner or the Engineer shall be removed from the work site by the Contractor and shall be immediately replaced by new work in accordance with the Contract at no additional cost to the Owner. Work or property of others or the Owner damaged or destroyed by virtue of such faulty work shall be made good at the expense of the Contractor whose work is faulty.

14.2. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the Owner or the Engineer and shall be pursued to completion.

14.3. Final payment will not be made until certificates of the engineer have been duly issued

15. CORRECTION OF WORK AFTER FINAL PAYMENT

Neither the final certificate, final payment, acceptance of the premises by the Owner, nor any provision of the Contract, nor any other act or instrument of the Owner or Engineer shall relieve the Contractor from responsibility for negligence, or faulty materials or workmanship, or failure to comply with the Drawings and Specifications. He shall correct or make good any defects due thereto and repair any damage resulting there from which may appear during the period of the guarantee following final acceptance of the work by the Owner. The Owner will report any defects as they may appear to the Engineer who will give the instructions for a time limit for completion of corrections to the Contractor.

16. THE OWNER'S RIGHT TO PERFORM WORK

16.1. The Owner may perform or have performed by others work which is described in the Specifications to be performed by the Contractor, due to early delivery of equipment prior to the execution of this Contract. Upon the execution of the contract, the work performed will be deducted from the Contractor's price by the unit price set forth in the *Form of Proposal.*

16.2. If during the progress of the work or during the period of guarantee, the Contractor fails to execute the work properly or to perform any provision of the Contract, the Owner, after five (5) days' written notice to the Contractor from

the Engineer or the Owner, may perform or have performed that portion of the work and may deduct the cost thereof from any amounts due or to become due the Contractor, such action and cost of same having been first approved by the Engineer. Should the cost of such action of the Owner exceed the amount due or to become due the Contractor, then the Contractor or his surety, or both, shall be liable for and shall pay to the Owner the amount of said excess.

17. CONTRACTOR'S AFFIDAVIT

The final payment of retained amount due the Contractor on account of the Contract shall not become due until the Contractor has furnished to the Owner, with a copy to the Engineer, an affidavit signed, sworn and notarized to the effect that all payments for materials, services, or any other reason in connection with his Contract have been satisfied and that no claims or liens exist against the Contractor in connection with this Contract. In the event that the Contractor cannot obtain similar affidavits from Subcontractors to protect the Contractor and the Owner from possible liens or claims against the Subcontractor, the Contractor shall state in his affidavit that no claims or liens exist against any Subcontractor to the best of his (the Contractor's) knowledge and if any appear afterwards, the Contractor shall save the Owner harmless on account thereof.

18. ASSIGNMENTS

The Contractor shall not assign any portion of this Contract nor subcontract it in its entirety. Except as may be required under terms of the Payment and/or Performance Bond, no funds or sums of money due or to become due the Contractor under this Contract may be assigned.

19. GUARANTEE

The Contractor shall guarantee his work against defect due to faulty workmanship or negligence for a period of two (2) years following final acceptance of the work. He shall make good such defective workmanship and any damage resulting therefrom without cost to the Owner.

20. ENGINEER'S STATUS

The Engineer shall, within a reasonable time after their presentation to him, make decisions on all claims of the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the Contract Documents. All such decisions by the Engineer shall be final.

21. ENGINEER'S DECISIONS

The Engineer shall, within a reasonable time after their presentation to him, make decisions on all claims of the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the Contract Documents. All such decisions by the Engineer shall be final.

22. RIGHT-OF-WAY

The Owner will obtain all easements and/or rights-of-way required for the project.

23. ACCIDENTS

The Contractor shall provide at the site such equipment and medical facilities as are necessary to supply first-aid service to anyone who may be injured in connection with the work. The Contractor will provide a written report to the Owner of all accidents within twenty-four (24) hours of the event.

24. EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this Contract, the Contractor agrees as follows:

24.1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or physical handicap. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or physical handicap. Such action shall include but not be limited to the following employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices setting forth the provisions of the nondiscrimination clause.

24.2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or physical handicap.

24.3. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or other understanding, a notice advertising the labor union or workers' representative of the Contractor's commitments under the Equal Employment Opportunity Section of this Contract and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

24.4. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Owner contracts.

24.5. The owner has adopted an Affirmative Action & Minority & Women Business Enterprise Plan (M/WBE) Program. Contractors submitting a proposal are attesting that they also have taken affirmative action to ensure equality of opportunity in all aspects of employment, and to utilize M/WBE supplies of material and/or labor.

25. MEDIATION/BINDING ARBITRATION

25.1. In the event of any dispute between the Parties, the Parties agree to submit any dispute to non-binding mediation before a mutually agreeable Mediator prior to initiating litigation. If the Parties are unable to agree upon a Mediator within thirty (30) days after demand therefore, either Party may petition a Court of competent jurisdiction for the designation of a qualified Mediator for these purposes. Each Party shall bear its own costs and expenses of participating in the mediation (including, without limitation, reasonable attorneys' fees), and each Party shall bear one-half (1/2) of the costs and expenses of the Mediator. Unless otherwise agreed, the Parties will hold the mediation in Greenville, North Carolina. The matters discussed or revealed in the mediation session shall not be disclosed in any subsequent litigation.

25.2. In the event the matter is not resolved in mediation, either Party may request arbitration. The parties shall jointly select an Arbitrator and shall be bound by the decision of the Arbitrator with respect to any dispute between the parties with respect to this Agreement. If the parties are unable to mutually agree upon an Arbitrator, the Parties shall each select an Arbitrator, and the two Arbitrators so selected shall select a third Arbitrator, and the decision of the majority of the Arbitrators shall be conclusive and binding upon the Parties. The Parties at all times agree to equally split the costs of any Arbitrator(s) selected in an effort to

resolve the dispute between the Parties. Any party desiring to resolve a dispute under the terms of this Agreement shall notify the other Party in writing, and the Parties shall seek to agree upon a mutually agreed-upon Arbitrator within a period of ten (10) days from the date of such written demand. If the Parties are unable to agree within such ten (10) day period, the Parties shall each select an Arbitrator, and the two (2) Arbitrators so selected shall select a third Arbitrator within fifteen (15) days from the date of the written demand for arbitration, and a decision shall be rendered by the Arbitrator(s) so selected within five (5) days after such Arbitrator(s) is selected.

26. GOVERNMENT RESTRICTIONS

In the event any Governmental restrictions may be imposed which would necessitate alteration of the material, quality, workmanship, or performance of the items offered on this bid prior to their delivery, it shall be the responsibility of the successful Bidder to notify the GUC Procurement Coordinator, at once, indicating in its letter the specific regulation which required such alterations. GUC reserves the right to accept any such alterations, including any price adjustments occasioned thereby, or, in the sole discretion of GUC, to cancel the contract.

27. PATENTS AND COPYRIGHTS

The Bidder shall hold and save GUC, its officers, agents, and employees, harmless from liability of any kind, including costs and expenses, including reasonable attorney fees, on account of any copyrighted articles or any patented or unpatented invention, device or appliance manufactured or used in the performance of this contract.

28. PATENT AND COPYRIGHT INDEMNITY

The Bidder will defend or settle, at its own expense, any action brought against GUC to the extent that it is based on a claim that the product(s) provided pursuant to this agreement infringe any U.S. copyright or patent; and will pay those costs, damages, and attorney fees finally awarded against GUC in any such action attributable to any such claim, but such defense, settlements, and payments are conditioned on the following: (1) that Bidder shall be notified promptly in writing by GUC of any such claim; (2) that Bidder shall have sole control of the defense of any action on such claim and of all negotiations for its settlement or compromise; (3) that GUC shall cooperate with Bidder in a reasonable way to facilitate the settlement of defense of such claim; (4) that such claim does not arise from GUC modifications not authorized by the Bidder or from the use of combination of products provided by the Bidder with products provided by GUC or by others; and (5) should such

product(s) become, or in the Bidder's opinion likely to become, the subject of such claim of infringement, then GUC shall permit Bidder, at Bidder's option and expense, either to procure for GUC the right to continue using the product(s), or replace or modify the same so that it becomes non-infringing and performs in a substantially similar manner to the original product.

29. EXCEPTIONS

All proposals are subject to the terms and conditions outlined herein. All responses will be controlled by such terms and conditions and the submission of other terms and conditions, price catalogs, and other documents as part of a Bidder's response will be waived and have no effect on this Request for Proposal or any other contract that may be awarded resulting from this solicitation. The submission of any other terms and conditions by a Bidder may be grounds for rejection of the Bidder's proposal. The Bidder specifically agrees to the terms and conditions set forth in this set of Terms and Conditions by affixing its name on the signatory page contained herein.

30. CONFIDENTIAL INFORMTATION

GUC will keep trade secrets which the Bidder does not wish to be disclosed, except as provided by statute and rule of law. Each page shall be identified in boldface at the top and bottom as "CONFIDENTIAL" by the Bidder. Cost information shall not be deemed confidential. The determination of whether a matter is confidential will be determined by North Carolina law.

31. ASSIGNMENT

No assignment of the Bidder's obligations or the Bidder's right to receive payment hereunder shall be permitted without the express written consent of GUC, provided however, upon written request approved by the GUC Procurement Coordinator, solely as a convenience to the Bidder, GUC may:

31.1. Forward the Bidder's payment check directly to any person or entity designated by the Bidder, and

31.2. Include any person or entity designated by Bidder as a joint payee on the Bidder’s payment check.

31.3. In no event shall such approval and action obligate GUC to anyone other than the Bidder, and the Bidder shall remain responsible for fulfillment of all contract obligations.

32. AVAILABILITY OF FUNDS

Any and all payments of compensation of this specific transaction and any continuation or any renewal or extension are dependent upon and subject to the allocation of GUC funds for the purpose set forth in this Agreement.

33. GOVERNING LAWS

All contracts, transactions, agreements, etc., are made under and shall be governed by and construed in accordance with the laws of the State of North Carolina.

34. ADMINISTRATIVE CODE

Bids, proposals, and awards are subject to applicable provisions of the North Carolina Administrative Code.

35. EXECUTION

In the discretion of GUC, failure of a duly authorized official of Bidder to sign the Signatory Page may render the bid invalid.

36. CLARIFICATIONS/INTERPRETATIONS

Any and all questions regarding these Terms and Conditions must be addressed to the GUC Procurement Coordinator. Do not contact the user directly. **These Terms and Conditions are a complete statement of the parties' agreement and may only be modified in writing signed by Bidder and the GUC Procurement Coordinator.**

37. SITUS

The place of all contracts, transactions, agreements, their situs and forum, shall be North Carolina, where all matters, whether in contract or tort, relating to the validity, construction, interpretation, and enforcement shall be determined.

38. TERMINATION OF AGREEMENT

GUC or Bidder may terminate this Agreement for just cause at any time. Bidder will be paid for all time and expenses incurred as of the termination date. Termination for just cause by either party shall be by certified letter and shall be effective thirty (30) days after signed and acknowledged receipt of said letter. Just cause shall be based on reasonable grounds, and there must be a fair and honest cause or reason for such action. The causes for termination, include, but are not limited to:

38.1. Bidder's persistent failure to perform in accordance with the Terms and Conditions.

38.2. Bidder's disregard of laws and regulations related to this transaction

38.3. Bidder's substantial violation of the provisions of the Terms and Conditions.

39. FORCE MAJEURE

Neither party shall be considered in default in the performance of its obligations hereunder to the extent that the performance of any such obligation is prevented or delayed by any cause, existing or future, which is beyond the reasonable control of such party. In any such event of force majeure, the parties shall advise each other of such event, and the parties shall negotiate an equitable adjustment to their respective obligations under this Agreement.

40. INTEGRATED CONTRACT

These Terms and Conditions, Instructions to Bidders, Specifications, and the selected Bidder's bid represents the entire contract between the Parties. No verbal or other written agreement(s) shall be held to vary the provisions of this Agreement.

41. CONTRACT PROVISIONS

Each of the provisions of these Terms and Conditions shall apply to the full extent permitted by law, and the invalidity in whole or in part of any provision shall not affect the remainder of such provision or any other provisions.

42. E-VERIFY

E-Verify- I understand 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 NCGS §64-25 et seq. I am aware of and in compliance with the requirements of E- Verify and Article 2 of Chapter 64 of the North Carolina General Statutes. To the best of my knowledge, any subcontractors employed by me as a part of this contract are in compliance with the requirements of E-Verify and Article 2 of Chapter 64 of the North Carolina General Statutes.

43. IRAN DIVESTMENT ACT CERTIFICATION

By acceptance of this purchase order, Vendor/Contractor certifies that, as of the date of the purchase order or contract, it is not on the Final Divestment List as created by the State Treasurer pursuant to N.C.G.S. § 143-6A-4. In compliance with the requirements of the Iran Divestment Act and N.C.G.S. § 143C-6A-5(b), Vendor/Contractor shall not utilize in the performance of the contract any subcontractor that is identified on the Final Divestment List.

44. NOTICES

Notices to the Parties should be sent to the names and addresses specified below:

Mr. Cleve Haddock, CLGPO
Procurement Coordinator
Greenville Utilities Commission
P.O. Box 1847
Greenville, NC 27835-1847

SPECIAL CONDITIONS

1. DEFECTIVE WORKMANSHIP

The acceptance of any workmanship by the Owner shall not preclude the subsequent rejection thereof if such workmanship shall be found to be defective after installation, and any such workmanship found defective before final acceptance of the work or within two (2) years after completion shall be remedied or replaced, as the case may be, by and at the expense of the Contractor. In the event of failure by the Contractor to do so, the Owner may remedy such defective workmanship and in such event the Contractor shall pay to the Owner the cost and expense thereof. The Contractor shall not be entitled to any payment hereunder so long as any defective workmanship, of which the Contractor shall have had notice, shall not have been remedied or replaced, as the case may be.

2. MATERIALS

2.1. At or prior to the commencement of construction, the Owner shall make available to the Contractor all materials which the Owner has on hand, and from time to time as such additional deliveries of materials, if any, are received by the Owner, the Owner shall make such materials available to the Contractor; Provided, however, that the Contractor or his authorized representative shall give to the Owner a receipt in such form as the Owner shall approve for all materials furnished to the Contractor by the Owner. Upon completion of the project, the Contractor shall return all materials furnished by the Owner which are in excess of those required for the construction. Excess will be determined by comparison of Contractor's material receipts with final inventory as approved by the Owner. The Contractor shall also return to the Owner all material, usable and scrap, removed during construction. The Contractor will reimburse the Owner, at the current invoice cost to the Owner, for loss and/or breakage resulting from Contractor's negligence, of materials furnished to the Contractor by the Owner.

2.2. The winning Bidder will use the material package supplied by the Owner. The structures and equipment lists are located in the Appendices.

2.3. The project foundation details (as applicable) will be provided to the Contractor prior to start of construction.

3. DEFECTIVE MATERIALS (SUPPLIED BY CONTRACTOR)

3.1. All materials supplied by the Contractor shall be subject to the inspection, tests and approval of the Owner. The Contractor shall furnish all information required concerning the nature or source of any materials and provide adequate facilities for testing and inspecting the materials at the plant of the Contractor.

3.2. The materials furnished hereunder shall become the property of the Owner when delivered at the point to which shipment is to be made. The Owner may, however, reject any materials and/or warranties of the Contractor and manufacturers. Recognition and subsequent rejection of any defective materials may occur either before or after incorporation of such materials into the work, provided such rejection is made within one (1) year of date of delivery of the materials. Upon any such rejection, the Contractor shall replace the rejected materials with materials complying with the Specification for Materials and warranties at the substation site. The Owner shall return the rejected materials F.O.B. truck at the same destination. In the event of the failure of the Contractor to so replace rejected materials, the Owner shall make such replacement and the cost and expense thereof shall be paid by and recoverable from the Contractor.

4. STORAGE OF MATERIALS

The pole line structures for this construction will be delivered and stored in the vicinity of G230 Substation site, shown on the Vicinity Map in the Appendices. All other materials furnished by Owner shall be issued from the Owner's warehouse located at 801 Mumford Road, Greenville, North Carolina. All driveways and public roadways must be kept clear. No parking, storage or staging of materials shall be placed in a driveway or roadway, causing said roadway impassable any time.

5. PROTECTION TO PERSONS AND PROPERTY

The Contractor shall always take all reasonable precautions for the safety of employees on the work and of the public, and shall comply with all applicable provisions of Federal, State, and Municipal safety laws and building and construction codes, as well as the safety rules and regulations of the Owner. All machinery and equipment and other physical hazards shall be guarded in accordance with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America unless such instructions are incompatible with Federal, State, or Municipal laws or regulations.

The following provisions shall not limit the generality of the above requirements:

5.1. The Contractor shall so conduct the construction as to cause the least possible obstruction of public highways or streets.

5.2. The Contractor shall provide and maintain all such guard lights and other protection for the public as may be required by applicable statutes, ordinances, and regulations or by local conditions.

5.3. The Contractor shall do all things necessary or expedient to protect properly any and all parallel, converging, and intersecting lines, joint line poles, highways, railways and any and all property of others from damage, and in the event that any such parallel, converging and intersecting lines, joint line poles, highways, railways or other property are damaged in the course of the construction of the line, the Contractor shall at his own expense immediately restore any or all of such damaged property to as good a state as before such damage occurred.

5.4. The Contractor shall enter and exit the right-of-way at those locations specified by Owner or the Engineer.

It shall be the responsibility of the Contractor to maintain safe and unobstructed control of traffic along all state roads, highways, and all other streets within the project area. The Contractor shall obtain sufficient and suitable traffic cones, barriers, warning signs, and other devices necessary to maintain a safe work environment for crews and the general public. Traffic control must be provided for in accordance with the Manual of Uniform Traffic Control Devices (MUTCD), the North Carolina Department of Transportation (NC D.O.T.) Supplement to the MUTCD, all local ordinances, and as approved by local and state authorities.

5.5. All ditches and access ways disturbed shall be returned to their pre-existing condition at the end of construction.

5.6. Any and all excess earth, rock, debris, underbrush, and other useless material shall be removed by the Contractor from the site of the work as rapidly as practicable as the work progresses.

5.7. Before beginning work in or around any areas where underground facilities are known to exist, the Contractor shall locate all such facilities including water, sewer, gas, telephone and electrical lines.

5.8. Upon violation by the Contractor of any provisions of this section, after written notice of such violation given to the Contractor by the Owner, the Contractor shall immediately correct such violation. Upon failure of the Contractor to do so, the Owner may correct such violation at the Contractor's expense.

5.9. The Contractor shall submit to the Owner monthly reports in duplicate of all accidents, giving such data as may be prescribed by the Owner.

6. SUPERVISION AND INSPECTION

6.1. The Contractor shall cause the construction work to receive constant supervision by a competent superintendent (hereinafter called the "Superintendent") who shall be present at all times during working hours where construction is being carried on. The Contractor shall also employ, in connection with the construction of the substation capable, experienced, and reliable foremen and such skilled workmen as may be required for the various classes of work to be performed. Directions and instructions given to the Superintendent by the Owner shall be binding upon the Contractor.

6.2. The Owner reserves the right to require the removal from the project of any employee of the Contractor if, in the judgment of the Owner, such removal shall be necessary in order to protect the interest of the Owner. The Owner shall have the right to require the Contractor to increase the number of his employees and to increase or change the amount or kind of tools and equipment if at any time the progress of the work shall be unsatisfactory to the Owner; the failure of the Owner to give any such directions shall not relieve the Contractor of his obligations to complete the work within the time and in the manner specified in this Proposal.

6.3. The manner of performance of the work, and all equipment used therein, shall be subject to the inspection, tests and approval of the Owner. The Contractor shall have an authorized agent accompany the Owner when final inspection is made and, if requested by the Owner, when any other inspection is made.

6.4. In the event that the Owner shall determine that the construction contains or may contain numerous defects, it shall be the duty of the Contractor, if requested by the Owner to have an inspection made by the Engineer for the purpose of determining the exact nature, extent, and location of such defects.

7. TEMPORARY CONSTRUCTION

All temporary construction required to accomplish the work covered in these Specifications shall be the sole responsibility of the Contractor. The Contractor shall furnish all labor and materials necessary for temporary construction including the installation and removal of structures, poles, insulators, hardware, guys, anchors, etc. All materials used for temporary construction shall be removed from the site as soon as practicable and the site restored to as good a state as before such construction. All temporary materials supplied by the Contractor will remain the property of the Contractor. All temporary construction shall be performed and shall adhere to the same safety and code requirements as the proposed work and shall be covered by all requirements of these Plans, Specifications, and Contract Documents.

No extra pay item will be issued for temporary construction, or for subsequent removal of same.

8. NORMAL WORK WEEK

8.1. The Contractor shall provide the Owner quoted prices on a per-hour basis, for various personnel and equipment, assuming a normal work week as being forty (40) hours.

8.2. The Contractor shall state in the Proposal his normal work week for the project.

8.3. Work on weekends or generally accepted holidays will only be allowed if specific outage arrangements are required or the Contractor falls behind in meeting the project's scheduled completion date.

8.4. The Contractor will not be paid for inclement weather days or for travel time to and from the job site, unless expressly requested by the Contractor as a written stipulation to his original Proposal.

9. JOB-SITE OBLIGATIONS

9.1. Except as otherwise provided in the Contract, necessary sanitary conveniences for use by the Contractor's employees and Subcontractors at the Jobsite shall be furnished and maintained by the Contractor in such manner and at such locations as shall be approved by the Company Representative and their use shall be strictly enforced.

9.2. The Contractor shall, at all times, keep its work areas in a neat, clean, and safe condition. The Contractor shall be responsible for continuous clean up and removal of its trash, debris, waste materials and scrap and disposal of same off the Jobsite. Upon completion of any portion of the Work, the Contractor shall immediately remove all its equipment, construction plant, temporary structures and surplus materials not to be used at or near the same location during later stages of the Work. Upon completion of the Work and before final payment is made, the Contractor shall, at its expense, satisfactorily dispose of all plant, buildings, rubbish, unused materials, and other equipment and materials belonging to it or used in the performance of the Work, including return to the Owner's warehouse or designated lay down area(s), at the Owner's option of any salvageable materials for which the Owner has reimbursed the Contractor or that has been supplied by the Owner for incorporation into the Work but not used; and the Contractor shall leave the premises in a neat, clean and safe condition acceptable to the Company Representative. In the event of the Contractor's failure to comply with the foregoing, the same may be accomplished by the Owner at the Contractor's expense.

9.3. The Owner reserves the right to authorize its agents or designees to enter the jobsite as it may elect for the purpose of inspecting the work or constructing or installing such collateral work as it may desire, or testing, boring or surveying, or any other purpose.

9.4. The Contractor understands and agrees that duly authorized representatives of government agencies having appropriate jurisdiction may enter the Jobsite at any time and from time to time.

9.5. If any Work or part thereof shall be covered contrary to the requirements of the Contract or the request of the Owner or Engineer, it must, if required by the Company Representative, be uncovered for observation and inspection and covered again at the Contractor's sole expense.

9.6. If any other Work that the Company Representative has not specifically requested to observe and inspect prior to being covered has been covered, the Owner or Engineer may request to see such Work or part thereof and it shall be uncovered by the Contractor. If such Work or part thereof is found to be in accordance with the Contract, the cost of uncovering and covering again shall, by appropriate Change Form, be charged to the Owner. If such Work or part thereof fails to meet the requirements of the Contract, the Contractor shall pay

all costs of uncovering, correcting, and covering again and any additional costs resulting there from.

9.7. The Contractor shall conduct daily and weekly on-site safety meetings at the beginning of each work period. These meetings should not preclude the Contractor from conducting tailgate safety meetings before each new work period, after break, different work assignments, etc. as determined by OSHA and other applicable safety laws and regulations. In addition, the Contractor shall be required to attend onsite safety meetings with the Owner.

9.8. All personnel / visitors / individuals shall have a safety briefing by the Contractor prior to entering the energized substation area.

9.9. The Contractor shall facilitate a formal safety program for all individuals entering the site.

9.10. The Contractor shall provide the Owner a copy of the Contractor's Safety Manual, outlining policies, procedures, documentation and training. The Owner will provide the Contractor with a copy of the Owner's Safety Manual. The Contractor shall perform the work using the more stringent of the two policies.

CONTRACT AGREEMENT

THIS CONTRACT made this _____ day of _____, 2019, by _____, hereinafter called Bidder, and GREENVILLE UTILITIES COMMISSION (GUC) OF THE CITY OF GREENVILLE, PITT COUNTY, NORTH CAROLINA, a corporation, hereinafter called the Owner.

WITNESSETH

THAT WHEREAS, a Contract for

GREEVILLE UTILITIES COMMISSION
REPLACEMENT OF 115 KV TRANSMISSION
STRUCTURES ALONG CIRCUIT 18, 15, AND 11

has recently been awarded to Bidder by the Owner at and for a total price of _____ AND 00/100 ($_____) named in the Bidder's Proposal attached hereto;

AND WHEREAS, it was provided in said award that a formal Contract would be executed by and between Bidder and Owner, evidencing the terms of said award, and that Bidder would commence the work to be performed under this agreement on a date to be specified in a written order of Owner, and would fully complete all work thereunder no later than 150 days from the date of contract.

NOW, THEREFORE, Bidder doth hereby covenant and agree with Owner that it will well and faithfully perform and execute such work and furnish such work and furnish such materials and equipment in accordance with each and every one of the conditions, covenants, stipulations, terms, and provisions contained in said Specifications in accordance with the Plans, at the total price named therefore in the Bidder's Proposal attached hereto, and will well and faithfully comply with and perform each and every obligation imposed upon it by said Plans and Specifications and the terms of said award.

Bidder shall promptly make payments to all laborers and others employed thereon.

Bidder shall be responsible for all damages to the property of the owner that may be consequent upon the normal procedure of its work or that may be caused by or result from the negligence of Bidder, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. Bidder must restore all property so injured to a condition as good as it was when Bidder entered upon the work.

By execution of this Contract, both parties acknowledge the following conditions as a part of their respective obligations:

a) Governing Law – This Contract shall be construed and enforced in accordance with the laws of the State of North Carolina. All parties agree to the jurisdiction of the Courts of North Carolina with respect to an action or dispute arising between the parties.

b) Further Assurances – The parties hereto agree to execute and deliver any and all papers and documents which may be necessary to carry out the terms of this Contract.

c) Entire Contract – This Contract (including materials incorporated herein by reference) constitutes the entire agreement between the parties hereto and there are no agreements, representations, or warranties which are not set forth herein. All prior negotiations, agreements, and understandings are superseded hereby. This Contract may not be amended or revised except by a writing signed by all parties hereto. This Contract shall be construed and interpreted without any presumption either for or against the party who caused its preparation.

d) Binding Effect – This Contract shall be binding upon an inure to the benefit of the heirs, legal representatives, successors and assigns of the respective parties hereto, provided that this Contract and all rights hereunder may not be assigned by any party hereto without the written consent of the other party.

e) Time of Performance – Time is of the essence with regard to the performance of this Contract.

f) Survivability – The terms of this Contract shall survive execution and delivery of any deeds or bills of sale called for hereunder.

g) Headings – The headings in the paragraphs of this Contract are inserted for convenience only and do not constitute a part hereof.

Bidder shall furthermore be responsible for and required to make good at its expense any and all damages of whatever nature to persons or property arising during the period of the Contract caused by carelessness, neglect, or want of due precaution on the part of Bidder, its agents, employees, or workmen. Bidder shall also indemnify and save harmless the Owner, and the officers and agents thereof, from all third party claims, suits, and proceedings of every name and description which may be brought against the Owner, or the officers and agents thereof, for or on account of any injuries or damages to persons or property received or sustained by any person or persons, firm, or corporation, by or in consequence of any materials used in said work, to the extent caused by the negligence of Bidder, its agents, employees, servants, or workmen.

It is agreed and understood that the Notice to Prospective Bidders, Definitions, Instructions to Bidders, and Technical Specifications, the accepted Bidder's Proposal, and the enumerated addenda are incorporated in this Contract by reference and are an integral part thereof as set forth herein.

And the Owner doth hereby covenant and agree with Bidder that it will pay to Bidder, when due and payable under the terms of said Specifications and said award, the above-mentioned sum;

and that it will well and faithfully comply with and perform each and every obligation imposed upon it by said Specifications and the terms of said award.

Bidder shall, upon completion of all work awarded under this Contract, furnish to the Owner invoices or copies of invoices for all materials purchased for said work; and such invoices shall state the amount of North Carolina sales tax paid for said materials. Bidder shall also furnish the Owner and affidavit certifying the total costs of materials purchased for all work performed under the Contract and the total amount of state sales tax paid for said materials.

Whenever used herein, the singular shall include the plural, the plural the singular, and the use of any genders shall be applicable to all genders as the context may require.

[Balance of page left blank intentionally.]

PROVIDE CURRENT LIABILITY INSURANCE CERTIFICATE(S)
Section I General Instructions, 24. Contractor's Insurance

COVERAGES:

1. Workmen's Compensation Insurance shall include all of the Bidder's employees employed at the site of the project under his contract. In case any class of employees engaged in hazardous work under this Contract at the site of the project is not protected under the Workmen's Compensation Statute, the Bidder shall provide adequate coverage for the protection of his employees not otherwise protected.

2. Public Liability and Property damage Insurance shall be in such amounts as to adequately protect the Owner and the Bidder from claims for damages for personal injury, including accidental death, as well as from claims for property damages which may arise from operations under this Contract, whether such operations be by himself or by anyone directly or indirectly employed by him. The amount of such insurance shall be for the following:

2.1. Public Liability Insurance for bodily injury or death $1,000,000 got one person, and $2,000,000 for each accident.

2.2. Property Damage Insurance $2,000,000 for each accident and $2,000,000 aggregate for accidents during the policy period.

3. Motor Vehicle Liability Insurance shall be for the following amounts:

3.1. Bodily injury or death $1,000,000 for one person and $2,000,000 for each accident.

3.2. Property damage is $2,000,000 for each accident.

Copies of Certificates of Insurance for all aforementioned policies shall be furnished by the Bidder and shall be attached to the respective pages of the Contract Agreement at the time of signing.

It shall be understood that the above required insurance shall not be canceled or changed until thirty (30) days after written notice of such termination or alteration has been sent by registered mail to the certificate holder. Each certificate must not terminate before the contract completion date.

CERTIFICATE HOLDER:

Greenville Utilities Commission
401 South Green Street
Greenville, NC 27835-1847
Contact: Mr. Cleve Haddock, CLGPO
Phone: 252-551-1533

IN TESTIMONE WHEREOF, Bidder and Owner have duly signed and sealed this Contract.

BIDDER:

(Imprint Corporate Seal
Below this line)

_____(SEAL)

By _____(SEAL)

Title _____

ATTEST:

By: _____

Title: _____

GREENVILLE UTILITIES COMMISSION (GUC) OF THE CITY OF GREENVILLE, PITT COUNTY, NORTH CAROLINA

By _____
Anthony C. Cannon

Title General Manager/CEO

ATTEST:

By: _____
Amy Wade

Title: Executive Secretary

APPROVED AS TO FORM AND LEGALITY:

By: _____
Phillip R. Dixon

Title: General Counsel

CERTIFICATE OF ATTORNEY

GREENVILLE UTILITIES COMMISSION (GUC)
OF THE CITY OF GREENVILLE,
PITT COUNTY, NORTH CAROLINA

This is to certify I have examined the attached Contract Documents, and after such examination I am of the opinion that such Documents conform to the laws of the State of North Carolina, the execution of the Contract is in due and proper form, the representatives of the respective contracting parties have full power and authority to execute such contract on behalf of the respective contracting parties, and the foregoing agreements constitute valid and binding obligations on such parties.

By: _____
Phillip R. Dixon

Title: General Counsel

Date: _____

This instrument has been pre-audited in the manner required by the local Government Budget and Fiscal Control Act.

By: Jeff W. McCauley

Title: Chief Financial Officer

Date: _____

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

TRANSMISSION STRUCTURE REPLACEMENT
CONTRACT FOR 115 KV CIRCUIT 18, 15, AND 11
TRANSMISSION LINE

FORM OF PROPOSAL
(*Provide two (2) copies)*

Respectfully submitted this _____day of _____, 2019.

<table>
<tr><td>OWNER:</td><td>BIDDER</td></tr>
<tr><td rowspan="8">Greenville Utilities Commission
401 South Greene Street
Greenville, North Carolina 27834
P.O. Box 1847
Greenville, North Carolina 27835

Mr. Cleve Haddock, CLGPO
Procurement Coordinator
Office: 252-551-1533
Cell: 252-551-3302</td><td></td></tr>
<tr><td>NAME TITLE</td></tr>
<tr><td>STREET ADDRESS</td></tr>
<tr><td>CITY/STATE/ZIP</td></tr>
<tr><td>PHONE:</td></tr>
<tr><td>FAX:</td></tr>
<tr><td>EMAIL:</td></tr>
<tr><td>SIGNATURE</td></tr>
<tr><td>MANUFACTURER OF
PROPOSED EQUIPMENT</td><td rowspan="5"></td></tr>
<tr><td></td></tr>
<tr><td>MANUFACTURER</td></tr>
<tr><td>STREET ADDRESS</td></tr>
<tr><td>CITY/STATE/ZIP</td></tr>
</table>

TERMS AND CONDITIONS

1. The undersigned, hereafter called the Contractor, hereby declares that the only person or persons interested in this Proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a bid or Proposal; and that it is in all respects fair and in good faith without collusion or fraud.

2. The Contractor further declares that he has examined the site of the work and informed himself fully in regard to all conditions pertaining to the locations where the work is to be done; that he has examined the Technical Specifications for the work and Contract Documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed.

3. The Contractor proposes and agrees, if this Proposal is accepted, to contract with the Owner in the form of Contract specified, to furnish all necessary labor, equipment, and materials, except materials and equipment specified to be furnished by the Owner, required for the installation of the station, complete in accordance with the Plans, Specifications and Contract Documents, to the full and entire satisfaction of the Owner with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and Contract Documents, as filed on Change Order forms. No changes in work shall begin without prior written approval by the Owner or its representative Engineer.

4. The Bid Schedule is subject to the following terms and conditions which, by reference, are made a part of this Proposal.

5. The prices of materials set forth herein do not include any sums which are or may be payable by the Contractor on account of North Carolina Sales Tax upon the sale, purchase, or use of the materials hereunder, the amount thereof shall be added to the purchase price and paid by the Owner after the Contractor has ascertained the actual sales tax to be included in the Contract price.

6. The prices quoted in the Proposal shall be firm unless otherwise clearly noted in the Proposal.

7. The price quoted includes delivery FOB substation site of any equipment and materials and complete installation at substation site. The prices of the equipment and installation set forth herein shall include the cost of delivery at the Contractor's risk to the site.

8. The Contractor shall provide the Owner quoted prices on a per-hour basis, for various personnel and equipment, assuming a normal work week as being forty (40) hours.

9. The Contractor shall state his normal work week for the project:

_____ Five (5), eight (8) hour days (Monday through Friday)

_____ Four (4), ten (10) hour days (Monday through Thursday)

_____Other, _____

10. Work on weekends or generally accepted holidays will only be allowed if specific outage arrangements are required, or if the Contractor falls behind in meeting the project's scheduled completion date. If the Contractor deems this necessary, he must receive the Owner's written approval five (5) business days prior to beginning the revised work scheme.

11. The time of completion for this project is of the essence.

12. The Contractor shall submit a proposed project construction schedule with the Proposal for review and approval by the Owner and Engineer. The targeted date for completion is March 1, 2020. If this date is not possible, please present an alternate date.

13. The time for delivery and installation shall be extended for the period of any reasonable delay due exclusively to causes beyond the control and without fault of the Contractor, including acts of God, fires, floods, strikes, and delay in transportation.

14. The Contractor will not be paid for inclement weather days or for travel time to and from the job site, unless expressly requested by the Contractor as a written stipulation to his original Proposal.

15. The Contractor-furnished materials shall conform to the "Technical Specifications" attached hereto and made a part hereof.

16. Title to the materials furnished by the Contractor shall pass to the Owner upon completion of the installation at the point above specified.

17. This Proposal is made pursuant to the provisions of the Notice and Instructions to Bidders, the Specifications, and the Contractor agrees to the terms and conditions thereof.

18. The Contractor warrants the accuracy of all statements contained in the Bidders Qualifications, if any shall be submitted, and agrees that the Owner shall rely upon such accuracy as a condition of the Contract if this Proposal is accepted.

19. The Contractor warrants that the Contractor-furnished Materials will conform to the performance data and guarantees attached which, by this reference, are made a part of this Proposal. Any exceptions or deviations from the Plans and Specifications must be clearly stated in the Proposal to warrant consideration.

20. The Contractor assumes liability for the proper care, handling, storage, and security of all materials furnished to the Contractor by the Owner for the project.

21. The undersigned further agrees that in case of failure on his part to execute said Contract within ten (10) consecutive calendar days after written notice has been given of the Award of the Contract, bid security accompanying this bid, and the monies payable thereon, shall be paid into the funds of the Owner's account set aside for this project, as liquidated damages for such failure, otherwise, the check, cash, or Bid Bond accompanying the Proposal shall be returned to the undersigned.

22. The Contractor shall maintain during the project and shall provide the Owner/Engineer one (1) complete set of "as-constructed" drawings upon the completion of the project.

23. The Contractor warrants that it possesses Electric Utility Contractor's License for the State of North Carolina. A copy of the license shall be included in this *Form of Proposal*.

24. The Contractor shall submit, in the *Form of Proposal*, the proposed project management staff, i.e., project manager, site superintendent, general foreman, etc. The qualifications / work experience level of the Bidder's proposed work force shall be included as well. The Contractor shall provide evidence of a minimum of 60% of the proposed work force having five (5) years or more tenure with the Bidder's firm. If other personnel are assigned to the project, similar information will be required prior to construction assignment.

25. The Contractor shall provide a list of recent projects of similar voltage class and complexity, along with the Owner and contact information of the representative who was reported to directly.

26. If the proposed staff along with their qualifications is not provided, the bid may be subject to non-compliance, thus, making it unacceptable.

27. The Contractor shall provide a list of subcontractors (if any) in the proposal and their respective support services which will be used by the Contractor when undertaking this project. All subcontractors will be subject to review and approval by the Owner.

28. **A mandatory pre-construction meeting will be scheduled at a later time based on the construction schedule.**

29. Uniform Guidance: Contracts funded with federal grant or loan funds must be procured in a manner that conforms with all applicable federal laws, policies, and standards, including those under the Uniform Guidance (2 C.F.R. Part 200).

INSERT

ADDENDA / CLARIFICATIONS / BULLETINS

Section I General Instructions, 6. Bulletins and Addenda

PROPOSAL PAGES

TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Definitions:

POLE UNITS

A pole unit consists of one pole in place. It does not include pole-top construction assembly unit or other parts attached to the pole. The first two digits of the unit number column indicate the length of the pole; the following digits specify the RUS Class.

Pole Plan Under Which the Poles are to be Furnished: (Check one)

1. *Insured Warranted* ☐ 2. *Independently Inspected* ☒
3. *Quality Assured* ☐
4. *Either Insured Warranted, Independently Inspected, or quality Assured* ☐

POLE TOP CONSTUCTION ASSEMBLY UNITS

A pole top construction assembly unit generally consists of the insulator(s), crossarm(s), braces, and hardware, except tie wire, required to support the power conductors and overhead ground wire, as indicated on the applicable drawing. It does not include the pole, the downlead, and butt coil, which are separate units.

GUY CONSTRUCTION ASSEMBLY UNITS (TG UNITS)

A guy construction assembly unit consists of the hardware and wire. Guy guards are designated separately.

ANCHOR CONSTRUCTION ASSEMBLY UNITS

An anchor construction assembly unit consists of the anchor with rod or rods, complete, ready for attaching the guy wire.

STEEL POLE TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Part 1a - Ckt 18 Pole Units - Galvanized Steel Direct Embedded				Unit Price			Extended Price
Stucture Number	Unit Number	Embedment Depth (ft)	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
1	50/S-04.2	7.0	3	$	$	$	$
2	70/S-04.2	9.0	1	$	$	$	$
3	75/S-04.2	9.5	1	$	$	$	$
4	70/S-04.2	9.0	1	$	$	$	$
5	70/S-04.2	9.0	1	$	$	$	$
6	55/S-04.2	7.5	2	$	$	$	$
8A	65/S-04.2	12.0	3	$	$	$	$
8B	65/S-04.2	12.0	3	$	$	$	$
8C	65/S-04.2	12.0	3	$	$	$	$
9	65/S-04.2	12.0	2	$	$	$	$
10	65/S-04.2	12.0	2	$	$	$	$
11	65/S-04.2	12.0	2	$	$	$	$
12	65/S-04.2	12.0	2	$	$	$	$
13	65/S-04.2	12.0	2	$	$	$	$
14	65/S-04.2	12.0	2	$	$	$	$
15	65/S-04.2	12.0	2	$	$	$	$
16	65/S-04.2	12.0	3	$	$	$	$
17	65/S-04.2	12.0	3	$	$	$	$
18	65/S-04.2	12.0	2	$	$	$	$
19	65/S-04.2	12.0	2	$	$	$	$
23	65/S-04.2	12.0	2	$	$	$	$
24	65/S-04.2	12.0	2	$	$	$	$
25	65/S-04.2	12.0	2	$	$	$	$
26	65/S-04.2	12.0	2	$	$	$	$
27	65/S-04.2	12.0	2	$	$	$	$
28	65/S-04.2	12.0	2	$	$	$	$
29	65/S-04.2	12.0	2	$	$	$	$
30	65/S-04.2	12.0	2	$	$	$	$
31	65/S-04.2	12.0	2	$	$	$	$
32	65/S-04.2	12.0	2	$	$	$	$
33	65/S-04.2	12.0	2	$	$	$	$
34	65/S-04.2	12.0	2	$	$	$	$
35	65/S-04.2	12.0	3	$	$	$	$
36	65/S-04.2	12.0	3	$	$	$	$
37	65/S-04.2	12.0	2	$	$	$	$
38	65/S-04.2	12.0	2	$	$	$	$
39	65/S-04.2	12.0	2	$	$	$	$
40	65/S-04.2	12.0	2	$	$	$	$

STEEL POLE TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Part 1a - Ckt 18 Pole Units - Galvanized Steel Direct Embedded				Unit Price			Extended Price
Stucture Number	Unit Number	Embedment Depth (ft)	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
41	65/S-04.2	12.0	2	$	$	$	$
42	65/S-04.2	12.0	2	$	$	$	$
43	80/S-04.2	10.0	1	$	$	$	$
44	75/S-04.2	9.5	1	$	$	$	$
45	75/S-04.2	9.5	1	$	$	$	$
46	75/S-04.2	9.5	1	$	$	$	$
47	75/S-04.2	9.5	1	$	$	$	$
48	80/S-04.2	10.0	1	$	$	$	$
49	75/S-04.2	9.5	1	$	$	$	$
50	75/S-04.2	9.5	1	$	$	$	$
52	75/S-04.2	9.5	1	$	$	$	$
53	75/S-04.9	9.5	2	$	$	$	$
54	75/S-04.9	9.5	2	$	$	$	$
55	75/S-04.2	9.5	1	$	$	$	$
56	75/S-04.2	9.5	1	$	$	$	$
57	75/S-04.2	9.5	1	$	$	$	$
58	75/S-04.2	9.5	1	$	$	$	$
60	45/S-04.2	6.5	3	$	$	$	$

Part 1b - Ckt 15 Pole Units - Galvanized Steel Direct Embedded				Unit Price			Extended Price
Stucture Number	Unit Number	Embedment Depth (ft)	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
1	80/S-04.2	10.0	1	$	$	$	$
2	75/S-04.2	9.5	1	$	$	$	$
3	75/S-04.2	9.5	1	$	$	$	$
4	75/S-04.2	9.5	1	$	$	$	$
6	75/S-04.2	9.5	1	$	$	$	$
7	70/S-04.2	9.0	1	$	$	$	$
8	70/S-04.2	9.0	1	$	$	$	$
9	70/S-04.2	9.0	1	$	$	$	$
10	80/S-04.2	10.0	1	$	$	$	$

STEEL POLE TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Part 1c - Ckt 11 Pole Units - Galvanized Steel Direct Embedded				Unit Price			Extended Price
Stucture Number	Unit Number	Embedment Depth (ft)	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
1	80/S-04.2	10.0	1	$	$	$	$
2	80/S-04.2	10.0	1	$	$	$	$
3	80/S-04.2	10.0	1	$	$	$	$
4	85/S-04.2	10.5	1	$	$	$	$
5	80/S-04.2	10.0	1	$	$	$	$
6	80/S-04.2	10.0	1	$	$	$	$
7	80/S-04.2	10.0	1	$	$	$	$
8	80/S-04.2	10.0	1	$	$	$	$
9	80/S-04.2	10.0	1	$	$	$	$
10	80/S-04.2	10.0	1	$	$	$	$
11	80/S-04.2	10.0	1	$	$	$	$
12	80/S-04.2	10.0	1	$	$	$	$
13	80/S-04.2	10.0	1	$	$	$	$

Part 2a - Ckt 18 Pole Top Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TST4	1	$	$	$	$
TPZ1.1	3	$	$	$	$
TPV2.1	1	$	$	$	$
TSH1.1	28	$	$	$	$
TST4.2	4	$	$	$	$
TST3.2	2	$	$	$	$
TST6.2	2	$	$	$	$
TSVD4.C1.3	1	$	$	$	$
TPZD1.C1.3	11	$	$	$	$
TSVD3.V3	1	$	$	$	$
TSTD6.C6.5	2	$	$	$	$

STEEL POLE TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Part 2b - Ckt 15 Pole Top Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TSV4.2	1	$	$	$	$
TPZ1	4	$	$	$	$
TPZD1.V1.2	1	$	$	$	$
TSV4	2	$	$	$	$
TSV3	1	$	$	$	$

Part 2c - Ckt 11 Pole Top Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TPZD1.C1.3	12	$	$	$	$
TSVD4.V4	1	$	$	$	$

Part 3a - Ckt 18 Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TG-21A	97	$	$	$	$

Part 3b - Ckt 15 Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TG-21A	28	$	$	$	$

Part 3c - Ckt 11 Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TG-21A	16	$	$	$	$

STEEL POLE TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Part 4a - Ckt 18 Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TA-2H	97	$	$	$	$

Part 4b - Ckt 15 Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TA-2H	28	$	$	$	$

Part 4c - Ckt 11 Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TA-2H	16	$	$	$	$

PROPOSAL SUMMARY

TRANSMISSION CONSTRUCTION ASSEMBLY UNITS	
Wood Pole Transmission Line	
Removal	$
Steel Pole Transmission Line	
New	$
TOTAL TRANSMISSION CONSTRUCTION ASSEMBLY UNITS	$
SUBSTATION CONSTRUCTION ASSEMBLY UNITS	
_____Substation	N/A
_____Substation	N/A
_____.....	N/A
TOTAL SUBSTATION CONSTRUCTION ASSEMBLY UNITS	N/A
DISTRIBUTION CONSTRUCTION ASSEMBLY UNITS	
NEW CONSTRUCTION	
Overhead	
Part 1, A to Y	N/A
Total Overhead	N/A
Underground	
Part UD	N/A
Part UG	N/A
Part UK	N/A
Part UM	N/A
Part UR	N/A
Total Underground	N/A
Total New Distribution Line Construction	N/A
Line Changes	
Part LCC	N/A
Part LCP	N/A
Part LCN	N/A
Total Line Changes	N/A
TOTAL DISTRIBUTION CONSTRUCTION ASSEMBLY UNITS	N/A
Transmission Construction Assembly Units	$
Substation Construction Assembly Units	N/A
Distribution Construction Assembly Units	N/A
TOTAL	$

INSERT

PROPOSED CONSTRUCTION SCHEDULE

General Instructions, 19. Completion
Terms and Conditions – Item 12

INSERT

CERTIFICATE(S) OF INSURANCE

General Instructions, 24. Contractor's Insurance

INSERT

CONTRACTOR'S LICENSE

General Instructions, 25. Contractor's License
Terms and Conditions – Item 23

FORM OF EXCEPTIONS

General Instructions, 9. Form of Exceptions,
General Instructions, 11. Evaluation and Award of Bids

BIDDER: _____

OWNER: GREENVILLE UTILITIES COMMISSION, NORTH CAROLINA

PROJECT DESCRIPTION: REPLACEMENT OF 115 KV TRANSMISSION STRUCTURES ALONG CIRCUITS 18, 15, AND 11

INSTRUCTIONS: The following is a list of exceptions to the Bidding Documents and/or Technical Specifications pertaining to the furnishing of the subject materials. Bidders shall identify each exception by Specification page and paragraph number on this form. The omission of exception implies complete compliance with Plans and Specifications.

BID DOCUMENT/ SPECIFICATION PAGE NO. AND PARAGRAPH	**EXCEPTION/VARIATION**

EQUAL EMPLOYMENT OPPORTUNITY AFFIDAVIT
General Conditions, 24. Equal Employment Opportunity

The Contractor shall include the provisions of the Equal Employment Opportunity, as found in General Conditions section, in every Subcontract unless exempted by rules, regulations, or orders of the Owner so that such provisions will be binding upon each Subcontractor.

Bidder: _____

By: _____

Date: _____

Special Instructions to Bidders

City of Greenville/Greenville Utilities Commission
Minority and/or Women Business Enterprise (M/WBE) Program

GUC
Construction Guidelines and Affidavits
$100,000 and above

These instructions shall be included with each bid solicitation.

City of Greenville/Greenville Utilities Commission
Minority and/or Women Business Enterprise Program

$100,000 and Construction Guidelines for M/WBE Participants

Policy Statement
It is the policy of the City of Greenville and Greenville Utilities Commission to provide minorities and women equal opportunity for participating in all aspects of the City's and Utilities' contracting and procurement programs, including but not limited to, construction projects, supplies and materials purchases, and professional and personal service contracts.

Goals and Good Faith Efforts
Bidders responding to this solicitation shall comply with the M/WBE program by making Good Faith Efforts to achieve the following aspiration goals for participation.

	GUC	
	MBE	**WBE**
Construction This Goal includes Construction Manager at Risk	7%	4%

Bidders shall submit M/WBE information with their bids on the forms provided. This information will be subject to verification by GUC prior to contract award. **As of July 1, 2009, contractors, subcontractors, suppliers, service providers, or M/WBE members of joint ventures intended to satisfy GUC M/WBE goals shall be certified by the NC Office of Historically Underutilized Businesses (NC HUB) only**. Firms qualifying as "WBE" for GUC's goals must be designated as a "women-owned business" by the HUB Office. Firms qualifying as "MBE" for GUC's goals must be certified in one of the other categories (i.e.: Black, Hispanic, Asian American, American Indian, Disabled, or Socially and Economically Disadvantaged). Those firms who are certified as both a "WBE" and "MBE" may only satisfy the "MBE" requirement. A complete database of NC HUB certified firms may be found at http://www.doa.nc.gov/hun/. An internal database of firms who have expressed interest to do business with the City and GUC is available at www.greenvillencmwbe.org. However, the HUB status of these firms must be verified by the HUB database. GUC shall accept NCDOT certified firms on federally funded projects only. Please note: A contractor may utilize any firm desired. However, for participation purposes, all M/WBE vendors who wish to do business as a minority, or a female must be certified by NC HUB.

The Bidder shall make good faith efforts to encourage participation of M/WBEs prior to submission of bids in order to be considered as a responsive bidder. Bidders are cautioned that even though their submittal indicates they will meet the M/WBE goal, they should document their good faith efforts and be prepared to submit this information, if requested.

The M/WBE's listed by the Contractor on the **Identification of Minority/Women Business Participation** which are determined by the GUC to be certified shall perform the work and supply the materials for which they are listed unless the Contractors receive prior authorization

from the GUC to perform the work with other forces or to obtain materials from other sources. If a contractor is proposing to perform all elements of the work with his own forces, he must be prepared to document evidence satisfactory to the owner of similar government contracts where he has self-performed.

The Contractor shall enter into and supply copies of fully executed subcontracts with each M/WBE or supply signed Letter(s) of Intent to the Project Manager after award of contract and prior to Notice to Proceed. Any amendments to subcontracts shall be submitted to the Project Manager prior to execution.

Instructions

The Bidders Shall Provide with the bid the following documentation:

☐ Identification of Minority/Women Business Participation
(if participation is zero, please mark zero – Blank forms will be considered nonresponsive)

☐ Affidavit A (if subcontracting)

OR

☐ Identification of Minority/Women Business Participation
(if participation is zero, please mark zero – Blank forms will be considered nonresponsive)

☐ Affidavit B (if self-performing; must attest that bidder does not customarily subcontract work on this type of project – includes supplies and materials)

Within 72 hours or 3 business days after notification of being the apparent low bidder who is subcontracting anything must provide the following information:

☐ Affidavit C (if aspirational goals are met or are exceeded)

OR

☐ Affidavit D (if aspirational goals are not met)

After award of contract and prior to issuance of notice to proceed:

☐ Letter(s) of Intent or Executed Contracts

****With each pay request, the prime contractors will submit the Proof of Payment Certification, listing payments made to M/WBE subcontractors.**

*****If a change is needed in M/WBE Participation, submit a Request to Change M/WBE Participation Form. Good Faith Efforts to substitute with another M/WBE contractor must be demonstrated.**

Minimum Compliance Requirements:

All written statements, affidavits, or intentions made by the Bidder shall become a part of the agreement between the Contractor and the GUC for performance of contracts. Failure to comply with any of these statements, affidavits or intentions or with the minority business guidelines shall constitute a breach of the contract. A finding by the GUC that any information submitted (either prior to award of the contract or during the performance of the contract) is inaccurate, false, or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the GUC whether to terminate the contract for breach or not. In determining whether a contractor has made Good Faith Efforts, the GUC will evaluate all efforts made by the Contractor and will determine compliance regarding quantity, intensity, and results of these efforts.

Identification of Minority/Women Business Participation

I, _____,
(Name of Bidder)
do hereby certify that on this project, we will use the following minority/women business enterprises as construction subcontractors, vendors, suppliers, or providers of professional services

Firm Name, Address and Phone #	Work Type	M/WBE Category

*****M/WBE categories: Black, African American (**B**), Hispanic, Latino (**L**), Asian American (**A**), American Indian (**I**), Female (**F**), Socially and Economically Disadvantaged (**S**), Disabled (**D**)

If you will not be utilizing M/WBE contractors, please certify by entering "0"

The total value of MBE business contracting will be ($) _____.

The total value of WBE business contracting will be ($) _____.

Greenville Utilities Commission AFFIDAVIT A – Listing of Good Faith Efforts

County of _____

(Name of Bidder)

Affidavit of _____

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

☐ **1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government-maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.

☐ **2 – (10 pts)** Made the construction plans, specifications and requirements available for review for review by prospective minority businesses or providing these documents to them at least 10 days before the bids are due.

☐ **3 – (15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.

☐ **4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.

☐ **5 – (10 pts)** Attended Prebid meetings scheduled by the public owner.

☐ **6 – (20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.

☐ **7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.

☐ **8 – (25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.

☐ **9 – (20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.

☐ **10 – (20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the identification of Minority/Women Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d). Failure to abide by this statutory provision will constitute a breach of the contract.
The undersigned hereby certifies that he or she has read the terms of the minority/women business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer: _____

Signature:_____

Title:_____

SEAL

State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____20___

Notary Public _____

My Commission expires _____

Greenville Utilities Commission - AFFIDAVIT B - Intent to Perform Contract with Own Workforce

County of _____

Affidavit of _____
(Name of Bidder)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type of project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____

SEAL

State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20 _____

Notary Public _____

My commission expires _____

Greenville Utilities Commission – AFFIDAVIT C – Portion of the Work to be Performed by M/WBE Firms

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)
If the portion of the work to be executed by M/WBE businesses as defined in GS143-128.2(g) and the COG/GUC M/WBE Plan sec. III is equal to or greater than 11% of the bidder's total contract price, then the bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification.

Affidavit of _____I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)
Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises and a minimum of _____% of the total dollar amount of the contract with women business enterprises. Minority/women businesses will be employed a construction subcontractors, vendors, suppliers, or providers of professional services. Such work will be subcontracted to the following firms listed below.

Name and Phone Number	*M/WBE Category	Work Description	Dollar Value

*M/WBE categories: Black, African American (**B**), Hispanic, Latino (**L**), Asian American (**A**), American Indian (**I**), Female (**F**), Socially and Economically Disadvantaged (**S**), Disabled (**D**)

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

State of _____, County of _____

Subscribed and sworn to before me this_____ day of _____20___

Notary Public _____

My commission expires _____

Greenville Utilities Commission – AFFIDAVIT D – Good Faith Efforts

County of _____
(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder)

If the goal of 11% participation by minority/women business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)
Project ID# _____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises and a minimum of _% of the total dollar amount of the contract with women business enterprises. Minority/women businesses will be employed a construction subcontractors, vendors, suppliers, or providers of professional services. Such work will be subcontracted to the following firms listed below.

Name and Phone Number	*M/WBE Category	Work Description	Dollar Value

*M/WBE categories: Black, African American (**B**), Hispanic, Latino (**L**), Asian American (**A**), American Indian (**I**), Female (**F**), Socially and Economically Disadvantaged (**S**), Disabled (**D**)

Examples of documentation required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.

B. Copies of quotes or responses received from each firm responding to the solicitation.

C. A telephone log of follow-up calls to each firm sent a solicitation.

D. For subcontracts where a minority business firm is not considered the lowest responsible, responsive sub-bidder, copies of quotes received from all firms submitting quotes for that subcontract.

E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.

F. Copy of pre-bid roster.

G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

H. Letter detailing reasons for rejection of minority business due to lack of qualification.

I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of _____

Subscribed and sworn to before me this_____ day of _____20___

Notary Public _____

My commission expires _____

LETTER OF INTENT
M/WBE Subcontractor Performance

Please submit this form or executed subcontracts with M/WBE firms after award of contract and prior to issuance of notice to proceed.

PROJECT:_____
(Project Name)

TO: _____
(Name of Prime Bidder/Architect)

The undersigned intends to perform work in connection with the above project as a:

_____ Minority Business Enterprise _____ Women Business Enterprise

The M/WBE status of the undersigned is certified by the NC Office of Historically Underutilized Businesses (required). _____ Yes _____ No

The Undersigned is prepared to perform the following described work or provide materials or services in connection with the above project at the following dollar amount:

Work/Materials/Service Provided	Dollar Amount of Contract	Projected Start Date	Projected End Date

_____
(Date)

_____ _____
(Address) (Name & Phone No. of M/WBE Firm)

_____ _____
(Name & Title of Authorized Representative of M/WBE) (Signature of Authorized Representative of M/WBE)

REQUEST TO CHANGE M/WBE PARTICIPATION

Submit changes only if notified as apparent lowest bidder, continuing through project completion)

Project: _____

Bidder or Prime Contractor: _____

Name & Title of Authorized Representative: _____

Address: _____ **Phone #:** _____

_____ **Email Address:**_____

Total Contract Amount (including approved change orders or amendments): $ _____

Name of Subcontractor: _____

Good or service provided: _____

Proposed Action:

_____ Replace subcontractor
_____ Perform work with own forces

For the above actions, you must provide one of the following reasons (Please check applicable reason):

_____ The listed MBE/WBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract.

_____ The listed MBE/WBE is bankrupt or insolvent.

_____ The listed MBW/WBE fails or refuses to perform his/her subcontract or furnish the listed materials.

_____ The work performed by the listed subcontractor is unsatisfactory according to industry standards and is not in accordance with the plans and specifications; or the subcontractor is substantially delaying or disrupting the progress of the work.

If replacing subcontractor:

Name of replacement subcontractor: _____

The M/WBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). _____ Yes _____ No

Dollar amount of original contract $_____

Dollar amount of amended contract $_____

Other Proposed Action:

____ Increase total dollar amount of work
____ Decrease total dollar amount of work
____ Add additional subcontractor
____ Other

Please describe reason for requested action: _____

If adding additional subcontractor*

The M/WBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). ___ Yes ___ No

Please attach Letter of Intent or executed contract document

Dollar amount of original contract $_____

Dollar amount of amended contract $_____

Interoffice Use Only:

Approval __ Y __ N

Date_____

Signature_____

Proof of Payment Certification
M/WBE Contractors, Suppliers, Service Providers

Project Name: _____ Pay Application No._____

Prime Contractor: _____ Purchase Order No. _____

Current Contract Amount (including change orders): $_____

Requested Payment Amount for this Period: $_____

Is this the final payment? ___ Yes ___ No

Firm Name	*M/WBE Category	Total Amount Paid from this Pay Request	Total Contract Amount (including changes)	Total Amount Remaining

*M/WBE categories: Black, African American (**B**), Hispanic, Latino (**L**), Asian American (**A**), American Indian (**I**), Female (**F**), Socially and Economically Disadvantaged (**S**), Disabled (**D**)

Date: _____ Certified By: _____
Name

_____
Title

_____
Signature

PROPOSED PROJECT MANAGEMENT STAFF

Terms and Conditions – Item 24

Title/Function	**Name**	**Years with Firm**	**Total Years Experience**
Project Manager			
Site Superintendent			
General Foreman - Foundations			

CONTRACTOR HAS ☐ DOES NOT HAVE ☐ SIXTY PERCENT (60%) OF PROPOSED WORK FORCE WITH FIVE (5) YEARS CONTINUOUS SERVICE WITH BIDDER'S FIRM

REFERENCES

Terms and Conditions – Item 25

CONTACT INFORMATION FOR RECENT SIMILAR PROJECTS

Owner Name	**Project Description**	**Contact Name and Phone Number**

LIST OF SUBCONTRACTORS

Terms and Conditions – Item 27

SUBCONTRACTOR	PROPOSED WORK TO BE PERFORMED

Letter of Compliance to E-Verify for Greenville Utilities Commission

1. I have submitted a bid for contract or desire to enter into a contract with the Greenville Utilities Commission;

2. As part of my duties and responsibilities pursuant to said bid and/or contract, I affirm that I am aware of and in compliance with the requirements of E-Verify, Article 2 of Chapter 64 of the North Carolina General Statutes, to include (mark which applies):

   a. ____ After hiring an employee to work in the United States I verify the work authorization of said employee through E-Verify and retain the record of the verification of work authorization while the employee is employed and for one year thereafter; or

   b. ___I employee less than fifteen (15) employees in the State of North Carolina.

3. As part of my duties and responsibilities pursuant to said bid and/or contract, I affirm that to the best of my knowledge and subcontractors employed as a part of this bid and/or contract, are in compliance with the requirements of E-Verify, Article 2 of Chapter 64 of the North Carolina General Statutes, to include (mark which applies):

   a. ____ After hiring an employee to work in the United States the subcontractor verifies the work authorization of said employee through E-Verify and retains the record of the verification of work authorization while the employee is employed and for one year thereafter; or

   b. ___Employ less than fifteen (15) employees in the State of North Carolina.

Specify subcontractor:_____

_____(Company Name)

By: _____(Typed Name)

_____(Authorized Signatory)

_____(Title)

_____(Date)

LETTER OF COMPLIANCE TO THE
IRAN DIVESTMENT ACT CERTIFICATION

Name of Vendor or Bidder: _____

_____

IRAN DIVESTMENT ACT CERTIFICATION
REQUIRED BY N.C.G.S. 143C-6A-5(a)

As of the date listed below, the vendor or bidder listed above is not listed on the Final Divestment List created by the State Treasurer pursuant to N.C.G.S. 143-6A-4.

The undersigned hereby certifies that he or she is authorized by the vendor or bidder listed above to make the foregoing statement.

_____

Signature Date

_____

Printed Name Title

BID BOND

KNOW ALL MEN BY THESE PRESENT, THAT WE _____

_____

as Principal, and _____

as Surety, who is duly licensed to act as Surety in North Carolina, are held and firmly bound unto the Greenville Utilities Commission, Greenville, NC, as Obligee, in the penal sum of _____ _____ DOLLARS ($_____) (5% Bid Bond), lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves, our heirs, administrators, successors and assigns, jointly and severally, firmly by these present.

SIGNED, Sealed and dated this _____day of _____, 2019.

WHEREAS, the said Principal is herewith submitting a Proposal for

TRANSMISSION STRUCTURE REPLACEMENT
OF CIRCUIT 18, 15, AND 11

and the Principal desires to file this Bid Bond in Lieu of making the cash deposit as required by the bidding documents contained herein;

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such that if the principal shall be awarded the Purchase Order for which the bid is submitted and shall accept the Purchase Order within ten (10) days after the award of same to the principal, then this obligation shall be null and void; but if the principal fails to so accept such purchase order as required by the bidding documents contained herein, the Surety shall, upon demand, forthwith pay to the Obligee the amount set forth in the first paragraph hereof, and upon failure to forthwith make such payment, the Surety shall pay the Obligee an amount equal to double the amount of this Bid Bond as set forth in the first paragraph hereof. Power of Attorney from the surety to is Attorney-in-Fact is attached hereto.

_____
Principal

By _____(SEAL)

_____
Corporate Surety

By _____(SEAL)

PERFORMANCE BOND/PAYMENT BOND

Date of Execution: _____

Name of Principal: _____

(Contractor) _____

Name of Surety: _____

Name of Contracting Body: _____

Amount of Bond: _____

Project: _____

KNOW ALL THESE MEN BY THESE PRESENT, That We, the Principal and Surety above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these present.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal entered into a certain Contract with the Contracting Body, identified as shown above and hereto attached.

NOW, THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions there of that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under the several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed, and these present duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in five (5) counterparts.

Witness:

_____
(Proprietorship or Partnership)

ATTEST:

By: _____

Title: _____
(Corporate Secretary or
Assistant Secretary Only)

CONTRACTOR:

_____
(Trade or Corporate Name)

By: _____

Title: _____

(CORPORATE SEAL)

Witness:

_____

Countersigned:

_____

_____
N.C. Licensed Resident Agent

_____

_____
(Name and Address – Surety Agent)

_____

_____
Surety Company Name and N.C.
Regional or Branch Office Address

SURETY COMPANY:

_____

By: _____

Title: _____
(Attorney-in-Fact)

(SURETY SEAL)

SPACE FOR ATTACHING POWER OF ATTORNEY
(Performance Bond)

SECTION II

GREENVILLE UTILITIES COMMISSION

TECHNICAL SPECIFICATIONS INSTALLATION SPECIFICATIONS

July 18, 2019

1. SCOPE

This Specification covers the removal, installation, and materials of 56 transmission structures along Greenville Utilities' Circuit 18, 115kV transmission line, 10 transmission structures along Circuit 15, 115 kV transmission line, and 13 transmission structures along Circuit 11, 115 kV transmission line. The existing wooden transmission structures will be replaced with new steel structures. The existing conductors will not be replaced. All hardware and insulators will be replaced. The proposal submitted by the contractor shall include all labor, equipment, and all other necessary items to complete this project.

The Circuit 18 115 kV transmission line consists of approximately 3.5 miles of 795 AAC with 7 #9 Alumoweld OHGW. Approximately 0.87 miles of the transmission line has 12.47 kV distribution under build consisting of 556 ACSR for all phases and a 4/0 ACSR neutral. The Circuit 15 115 kV transmission line consists of approximately 0.5 miles of 795 AAC. The Circuit 11 115 kV transmission line consists of approximately 0.93 miles of 1272 AAC with 7 #9 Alumoweld OHGW. This section of transmission line also has 12.47 kV distribution under build consisting of 556 ACSR for all phases and a 336 ACSR neutral.

2. GENERAL

2.1. The new construction, rearrangements, relocations, modifications, and removals shall be complete in accordance with the Plans, Specifications, stringing charts, and Assembly Drawings. All work shall be done in a thorough and workmanlike manner.

2.2. The latest edition of the National Electrical Safety Code shall be followed. All construction shall conform to that required for a medium loading district. Deviations from the Plans, Specifications, and Construction Drawings will not be permitted except upon written permission from the Engineer.

2.3. All work shall be done in a thorough and workmanlike manner to produce a complete and functional system with minimal interruption to customers served by existing facilities.

3. CODES AND STANDARDS

Codes, standards, or other documents referred to in this specification shall be considered as part of this specification. The following codes and standards are referenced:

3.1. American Institute of Steel Construction (AISC), *Specification for the Design, Fabrication and Erection of Structural Steel for Buildings,* latest edition.

3.2. American Society of Civil Engineers (ASCE) Standard, *Design of Steel Transmission Pole Structures,* Manual 48, latest edition.

3.3. American Society for Testing and Materials (ASTM), various standards, latest version.

3.4. American Concrete Institute (ACI), *Building Code Requirements for Reinforced Concrete,* ACI 318, latest edition.

3.5. American Welding Society (AWS), *Structural Welding Code,* AWS D1.1, latest edition.

3.6. American National Standards Institute (ANSI), *National Electrical Safety Code*, ANSI C2, latest edition.

3.7. Society for Protective Coatings (SSPC, formerly Steel Structure Painting Council), *Surface Preparation Specification,* SSPC SP6/NACE NO.3, latest edition.

4. REMOVALS

4.1. Removals shall consist of removing each and every item designated on the drawings, the disassembling of structures into material items, and the transportation of the items from the site of the work to the storage area designated by the Commission.

4.2. Conductor removal shall include the coiling or reeling of the conductor removed in a workmanlike manner.

4.3. Anchor assemblies shall be removed by removing the anchor rod only. If the anchor rod cannot be unscrewed, the rod must be cut or bent down so as to be a minimum of eighteen inches (18") below the ground line. Screw-type anchors shall be completely removed.

4.4. The removal shall include any necessary handling, re-sagging, and retying of conductors in those cases where an existing assembly unit will be removed and replaced by a new assembly unit and where any existing conductor is to be retained. Removal will also include any holding or handling of main line or tap conductors at tap lines, angles, and deadends where such is involved and the reinstalling of such conductor, including re-sagging and reconnection. It shall also include reinstalling any conductors temporarily detached.

4.5. The Contractor shall reinstall, at his own expense, any other items removed by him for his own convenience.

4.6. All materials removed as part of the work and not specified to be reused will remain the property of the Commission.

5. TRANSFERRING

5.1. Transferring shall consist of disconnecting existing material and reinstalling this material in a different location on the same structure or a new structure, provided the new structure is adjacent to the existing structure.

5.2. The transfer shall include any necessary handling, re-sagging, and retying of all conductors in those cases where an existing assembly unit will be removed and replaced by a new assembly unit and where any existing conductor is to be retained. Transfer will also include any holding or handling of all conductors at tap lines, angles, and deadends where such is involved and the reinstalling of such conductor, including re-sagging and reconnection. It shall also include reinstalling any conductors temporarily detached.

6. POLES-WOOD AND/OR TUBULAR STEEL

6.1. Inspection

6.1.1. All main-line transmission poles will be steel.

6.1.2. The Contractor shall not install a pole that, in his opinion, or the opinion of the Commission or Engineer, has been damaged or is otherwise unsafe. The Contractor shall promptly report any damaged or questionable pole or other component to the Commission and Engineer and confirm the report in writing.

6.2. Handling and Storage

6.2.1. The Contractor will be responsible for any damage to the poles and arms resulting from his handling, transporting, or storing procedures.

6.2.2. Steel shall be lifted and supported during manufacturing, stockpiling, transporting, and erection operations only at the points shown on the Contract and Shop Drawings. Nylon slings shall be used to avoid damage to pole finish. Transportation, site handling, and erection shall be performed with appropriate equipment and methods and by qualified personnel.

6.2.3. Poles shall not be dragged along the ground. Nylon slings of adequate strength rating shall be used for handling all steel poles. Pole tongs,

cant hooks, and other pointed tools capable of producing indentations more than one inch (1") in depth shall not be used in handling wood poles. No tools shall be applied to the ground line section of any pole.

Poles and structural members' arms shall not be stored directly on the ground. Stored poles and arms shall be elevated from the ground using wood or other suitable non-abrasive blocking. Poles are to be stored with identification marks clearly visible.

6.3. Repair or Alteration

6.3.1. Repair: Bent, twisted, or otherwise damaged structural members shall not be repaired or installed except at the written direction of the Engineer. Repair methods shall be approved by the manufacturer. Damaged base plates or butt splice plates shall not be repaired or installed. Pole wall sections shall not be repaired in the area of slip joints or lap splices.

6.3.2. Touch-Up: It will be the responsibility of the Contractor to touch up all galvanized steel pole and bolt surfaces or Ameron Dimetcote painted surfaces that are damaged by the Contractor during handling, transporting, storing, or erecting. Galvon or similar touch-up material for galvanized surfaces or Ameron Dimetcote for painted surfaces will be furnished by the Commission and will be applied in accordance with the manufacturer's recommendations. Areas of the pole to be below the ground line shall be repaired prior to pole installation with materials designated by the manufacturer to inhibit corrosion

6.4. Lifting and Setting

6.4.1. All poles shall be lifted in accordance with such precaution required to eliminate the possibility of bending or overstressing any section. Nylon slings shall be used to avoid damage to pole finish. During lifting, all flexible components shall be restrained to prevent any damage to insulators or pole finish.

6.4.2. Before setting surface mounted poles, the bottom anchor bolt nuts shall be leveled unless otherwise directed by the Engineer. After setting, if the pole is not to be raked it shall be plumbed to within one-half of one percent (0.5%) or 0.005 times the pole length. Such plumbing shall take into account any built-in camber.

6.4.3. No surface mounted pole shall be set on a foundation before it has been established by ASTM testing methods that the concrete meets the minimum compressive strength specified.

6.4.4. The minimum setting depths shall be as follows:

Pole Length (Feet)	Setting Depth (Feet)
30	5.5
35	6.0
40	6.0
45	6.5
50	7.0
55	7.5
60	8.0
65	8.5
70	9.0
75	9.5
80	10.0
85	10.5
90	11.0
95	11.5

Additional embedment may be required for some construction units (See Appendix A, B, C, and Drawings for more details regarding embedment).

6.4.5. On sloping ground, the depth of the hole shall always be measured from the low side of the hole.

6.4.6. Holes shall be approximately eight inches (8”) larger than the butt diameter of the pole unless noted otherwise and shall be at least as large at the bottom as at the top.

6.4.7. All poles shall be set plumb and in alignment except at line angle points. At line angles where horizontal post insulators are stacked on one side of the pole or suspension insulator construction is used, poles shall be offset on the bisector of the angle so that conductors will hang directly over the point of intersection in line with the tangent in both directions. All poles shall be plumb after conductors are strung. Where poles are set along the edge of cuts or embankments, or where the soil is liable to be washed out, special precautions shall be taken to ensure durable foundations and the setting depth shall be measured from the lower side of the hole.

6.4.8. All replacement poles shall be set in the same hole as the existing wood pole being removed.

6.5. Excavation and Backfill

6.5.1. Unsuitable Material: The Contractor shall excavate for the foundation to the dimensions and outline shown on the Drawings. Excavated material which conforms to the Specifications for backfill material may be used for this purpose. Materials which are not suitable for backfill and excess material shall be disposed of as directed by the Commission or Engineer.

6.5.2. Excavation Classification: All excavation will be classified as "common excavation." All excavation including soft shale, gravel, or other material which can be removed by hand or machine is defined as common excavation.

6.5.3. Excavation Preparation: Excavation in earth shall be to clean level surfaces of undisturbed material of adequate bearing value. Over-excavation shall be backfilled with well compacted six-inch (6") layers of aggregate base course (ABC) gravel. If the over-excavation is unnecessary, the cost of the backfill shall be borne by the Contractor. The quality of the soil and the adequacy of its bearing value shall be decided by the Engineer before backfill material is placed in any excavation. Where water is encountered, the excavation shall be kept dry by pumping during the installation of the structure and during the backfilling process. If unsuitable material is encountered at the proposed bearing surface, the Engineer may require further excavation to reach sound bearing. Backfill labor and material for this type of required over-excavation will be supplied at the Contractor's expense and should be included in the Unit Price for "M-2 (Stone Backfill)" in the Proposal Section. The Contractor will be paid on a per cubic yard unit basis.

6.5.4. Gravel Base: The stone or gravel base cited in Section 6.5.3 shall consist of a mixture of graded aggregate, coarse and fine, together with soil binder. The coarse aggregate shall consist of sound, tough, durable particles or fragments of gravel or stone. The material shall be placed in six-inch (6") layers and thoroughly compacted. A gravel base shall be formed before pole is placed in the excavated hole.

6.5.5. Excavation Maintenance: The excavation shall be maintained in a safe, clean and sound condition up to the time of placement of pole. The excavation shall be suitably protected when not attended. Whenever necessary, the Contractor shall re-excavate materials which have accumulated in the previously prepared excavation. Any muck or other unsatisfactory bearing material resulting from frost action or entrance of water into excavation previously prepared to the required

depth for sound bearing shall be removed and replaced with well compacted ABC gravel backfill at the Contractor's expense.

6.5.6. Sheeting and Shoring: The Contractor shall do all bracing, sheeting, and shoring necessary to support and protect all excavations as required for safety and to conform to laws and regulations of all governmental bodies having jurisdiction. When sheeting is used, it shall be removed during or upon completion of backfilling.

6.5.7. Backfill: Backfill around the pole base shall be aggregate base course (ABC) gravel. All backfill around the pole base shall be compacted in six-inch (6") layers by means of mechanical tampers. Excavated material is not suitable for backfill, the Contractor shall at his expense spread and aerate the material around the structure after the excavation has been completely backfilled with the specified material. The surplus earth shall be placed around the pole in a conical shape and packed tightly in order that water will drain away from the pole. The degree of compaction to be attained for all backfill shall be the equivalent density of adjacent undisturbed earth. Large stones, muck, frozen material, roots, or other undesirable material shall not be used for backfilling. This material, furnished by the Contractor, shall be locally available and when placed and compacted in six-inch (6") layers will bind and compact around the foundation. Sources of this material shall be approved by the Engineer.

6.6. Vibratory Pole Base – *Not Applicable to this Project*

6.6.1. Vibratory pole bases shall be installed by use of a vibratory hammer. The Contractor shall include the cost of the vibratory hammer in the pole labor installation unit.

6.6.2. Vibratory pole bases shall be installed in accordance with the construction assembly drawings. (See TMF-VPB)

6.6.3. Vibratory pole bases shall be installed with a frequency between 400 and 1600 vibrations per minute and a stroke amplitude between one-half inch (1/2") and one and one-half inches (1-1/2") maximum.

6.6.4. The Contractor is responsible for any damages incurred during vibratory pole base installation. The Contractor is responsible for obtaining the services of a geotechnical engineering firm to provide vibration monitoring.

6.6.5. Peak Particle Velocity shall be limited to two inches (2") per second maximum for residences.

6.6.6. Ground vibrations shall be limited to 40 Hz minimum and should be monitored in areas in close proximity to building, walls, driveways, underground utilities, etc. to prevent damage.

6.7. Holes in Pole

6.7.1. Transmission and distribution under-build pole top assembly attachment point holes will be predrilled at the factory. However, the Contractor will be responsible for field drilling transmission attachments on Circuit 18 structures 8A, 8B, 8C, 16, 17, 35, 36, 60, and all other holes required for construction (see drawings for details). Cost for drilling these holes shall be part of the pole top assembly unit. In no instances will additional charges be paid for drilling holes. The contractor shall touch up the finish of all other holes with cold galvanizing.

6.7.2. Mismatched Bolts and/or Holes: The Engineer shall be promptly notified of the discovery of mismatched bolts and holes, misaligned connections, or misaligned foundation bolts. The Engineer will decide upon the corrective action to be taken.

6.7.3. Any unused holes are to be plugged and sealed using galvanized steel plugs or caulk and plastic plugs.

7. CONCRETE FOUNDATIONS FOR STEEL POLES – *Not Applicable for this Project*

7.1. Subsurface Conditions:

Results of soil test borings taken along the proposed line are provided with these Specifications (See Book II, Exhibit No. 5). The Contractor shall familiarize himself with the subsurface conditions as shown on the boring logs and exercise his own judgment as to the nature and difficulty of the proposed work. It should be noted in particular that the ground water level may change from the level existing at the time of the test borings.

7.2. Line and Grade:

The Engineer will set a hub at the pole center and provide a benchmark and reference hubs on the longitudinal and transverse center lines. The Contractor shall perform all subsequent layout work necessary to ensure that the foundation is constructed to the correct dimensions and in the locations specified on the Drawings. If the Contractor finds that the hubs have been disturbed, are missing or are in error, he shall stop work immediately and notify the Engineer who will replace the hubs as soon as practicable. The Contractor shall carefully protect all reference hubs and shall give such assistance as may be required when it is found necessary to replace or move the same.

7.3. Site Grading:

In general, the natural earth at the pole site shall be disturbed as little as possible during construction. The ground surface shall be graded to provide drainage away from the pole and shall be reasonably smooth and compact. The Contractor shall comply with all Federal, State, and local regulations governing soil erosion and sediment control.

7.4. Drilled Cylindrical Foundation Excavation:

7.4.1. General: The drilled cylindrical foundation diameter and depth shall be as shown on the Drawings. The hole shall be drilled with drilling equipment which will produce the excavation shown on the Drawings. Drill rigs which do not run true will not be acceptable.

7.4.2. Depth/Diameter Required: The depth/diameter noted on the Drawings is to be considered minimum. If in the opinion of the Engineer, unsuitable soils are encountered, the excavation shall be continued to whatever depth/diameter is necessary to obtain suitable bearing. If depth/diameter required by the Engineer is greater than depth/diameter shown on the Drawings, the additional excavation and volume of reinforced concrete to fill it will be paid for by the Commission.

7.4.3. Depth/Diameter Required: The depth/diameter noted on the Drawings is to be considered minimum. If in the opinion of the Engineer, unsuitable soils are encountered, the excavation shall be continued to whatever depth/diameter is necessary to obtain suitable bearing. If depth/diameter required by the Engineer is greater than depth/diameter shown on the Drawings, the additional excavation and volume of reinforced concrete to fill it will be paid for by the Commission.

7.4.4. Temporary Casings: Temporary casing will be required in the excavation if it becomes necessary for workmen to do hand excavation, remove obstructions, or clean out the lower sections prior to the placement of concrete. Temporary casings will also be required if soil characteristics or the infiltration of ground water make excavation walls unstable. The Contractor shall have immediately available for use on the job an ample supply of casing in the event it is needed to stabilize the excavation. Casing may be assembled using short pieces if jointing devices are of sufficient strength to allow assembled sections of casing to be pulled as a unit as concrete is being placed or immediately thereafter. The casing shall also be of such strength and rigidity as to maintain the required excavation lines against the pressure of material sloughing from the sides of the excavation. All temporary casing shall be removed from excavations

as concrete is placed or immediately thereafter, and in such a manner as to prevent sloughing material from dropping to the bottom of the excavation, falling on top of freshly placed concrete or intruding into the concrete mass.

7.4.5. Dimensional Tolerances: The location and dimensions of the foundation shall be as close as possible to those shown on the Drawings and staked in the field. The maximum allowable tolerance will be as follows:

7.4.5.1. Top of the foundation shall be set to the elevation shown on Drawings, except where otherwise directed by the Engineer.

7.4.5.2. The variation in elevation of the bottom of the drilled caisson from the specified depth shall be from zero to plus six inches (6”), except where required to be deeper due to soil conditions.

7.4.5.3. Maximum deviation of the axis of the hole from the vertical shall be no more than one inch (1”) in eight feet (8’-0”).

7.4.5.4. The diameter of the drilled caisson shall not be less than specified or more than four inches (4”) greater than specified.

7.5. Concrete For Surface Mounted Pole

7.5.1. Strength: The Contractor shall supply ready mixed concrete prepared in accordance with ASTM C94. It shall have a minimum compressive strength of 4,000 PSI at twenty-eight (28) days for surface mounted structures.

7.5.2. Slump Test: Consistency will be determined in the field by the slump test, in accordance with ASTM Cl43. The specified slump for all concrete shall be three to four inches (3” to 4”). A minimum of one (1) slump test shall be made for each load of concrete used on the job site. If water is added at the job site to increase the slump, the recorded slump shall be that tested after the final addition of water.

7.5.3. Air Entrainment: Air entrained concrete shall be used in all applications where concrete will be exposed to moisture and cycles of freezing and thawing. The air content shall be between four percent and six percent (4% and 6%).

7.5.4. Concrete Testing: The Contractor shall be required to make four (4) test cylinders from each truck load of concrete used in pouring the foundation for the surface mounted structure in accordance with standard ASTM sampling procedures. Cylinders are to be cured and tested prior to the surface mounted pole erection. The test cylinders shall be broken as follows: one (1) cylinder at seven (7) days; two (2) cylinders at twenty-eight (28) days; one (1) cylinder at fifty-six (56) days if 4,000 psi is not achieved by twenty-eight (28) days. It will be the Contractor's responsibility to arrange for onsite and laboratory testing by a qualified testing laboratory approved by the Engineer. The cost of testing will be borne by the Contractor. The Contractor will require the laboratory to send two (2) sets of compressive test reports to the Commission and Engineer, in addition to those copies furnished to the Contractor.

Testing will be in accordance with ASTM C31 and will cover compressive strength, slump, and quality of aggregates. In cases where the strength of the test cylinders for any portion of the work falls below the requirements specified herein, the Engineer may require the Contractor to secure test specimens of the hardened concrete represented by these cylinders. Specimens shall be secured and tested in accordance with ASTM C-42 and shall have a minimum diameter of three inches (3"). If the specimen test further substantiates that the concrete represented by the cylinders and specimens are below the strength requirements specified herein, the Engineer may order such concrete removed and replaced at the expense of the Contractor.

Dependent upon the location of the concrete section in question, the Engineer may approve low frequency ultrasonic testing or other non-destructive techniques as an alternate to core drilling and testing.

7.6. Concrete Placement

7.6.1. Dry Hole: Concrete shall be placed as soon as possible after excavation. Immediately prior to the placement of concrete, the excavation shall be cleaned of water, debris, ice, clods and piles of loose earth, and any other material which should be excluded from the concrete. Surfaces against which concrete is to be placed shall be free of frost, and in cold weather shall be enclosed or heated, if necessary, prior to placing concrete to ensure this requirement is met. Water in the bottom of the excavation must be removed or absorbed. Equipment for placing concrete shall include a pump and two (2) vibrators in good working condition, hoppers and elephant trunks for directing the flow of concrete and an ample supply of sacked cement for use in drying the bottom of the excavation. The Contractor shall not place any concrete until the excavation, reinforcing steel and anchor bolts are

checked and approved by the Engineer. In a drilled caisson where the contractor can free fall the concrete down the center of the caisson without having the concrete come in contact with the embedded items, which will cause segregation of the aggregate, the Contractor may place the concrete with the use of an elephant trunk or drop chutes and shall use vibrators. The maximum free fall distance shall be no more than five feet (5'-0"). If the Engineer sees the above method cannot be implemented, then the Contractor shall place the concrete for the first lift using hoppers and sections of elephant trunk or drop chutes. The normal procedure expected to be followed by the Contractor will be to place the concrete to an elevation approximately five feet (5'-0") above the bottom of the caisson and vibrate this deposit with one (1) pass of the vibrator down to the bottom of the caisson and back to the top of concrete. Following this, the remainder of the concrete may be poured in two (2) or more lifts of equal height with one (1) pass of the vibrator down to the bottom of the lift and back up on each lift. In placing concrete, internally operated vibrators of a minimum diameter of two and one-quarter inches (2-1/4") and having a speed of 5,000 rpm or more, are to be used. On the upper lifts of concrete, elephant trunks will not be required, but the placing of the concrete shall be done in such a manner as to prevent segregation of the aggregates.

7.6.2. Wet Hole: Immediately prior to the start of the concrete placement, water shall be pumped from the excavation to expose the bottom or, if a sump is used, leaving a depth of water not exceeding four inches (4") in the sump. The use of cement to dry up the water left in the sump will then be permissible provided the rate of inflow is sufficiently slow to permit placement of concrete without increasing the water- cement ratio. To meet this requirement, the Contractor must have cement ready to place into the excavation immediately after pumping, and also have adequate concrete at the site. If in the opinion of the Engineer, the influx of ground water is too great to obtain concrete of acceptable quality, it will be necessary for the Contractor to place concrete by tremie.

7.6.3. Tremie Method: If the inflow of water into the excavation is too rapid to permit placement of concrete in the dry, the Contractor shall place the concrete under water by the tremie method. In such cases, a special mix of concrete will be required with coarse aggregate (gravel), three-fourth inch (3/4") maximum size, and a minimum of seven (7) bags of cement per yard. A retarding agent may be used if approved by the Engineer. The slump of the concrete, when being placed, shall be between five inches (5") and seven and one-half inches (7-1/2"). Minimum mix strength of 4,000 PSI shall be maintained. No vibration of the tremie concrete will be required or permitted, but it will be permissible to vibrate the tremie pipe under

certain conditions when the flow of concrete becomes sluggish. It will also be permissible to vibrate the casing, if used, when the excavation is filled with concrete at the time the casing pull is started. The tremie pipe shall have a minimum diameter of eight inches (8") and shall be equipped with a watertight foot valve or gate at the discharge end which can be positively controlled from the ground surface. If joints are required in the tremie pipe, they shall be watertight. The entire assembly shall be watertight, and under no circumstances will concrete be permitted to flow through water in the tremie. In placing concrete, the discharge end of the tremie shall be placed no more than six inches (6") above the bottom of the excavation and shall not be raised until the pipe has become submerged in the concrete to a depth which establishes a seal between the tremie pipe and the concrete sufficient to prevent entry of water into the tremie. The discharge end of the tremie shall be kept submerged in the concrete a sufficient depth to maintain, at all times, an adequate seal during underwater placement. Once started, the underwater placement shall proceed without interruption until this seal has been well established. At that point, the Contractor shall start removing the water being displaced by the concrete. The placing of concrete by tremie shall not be started until a supply of concrete is at the site sufficient to complete placing up to the ground surface. Concrete may be placed by tremie only when authorized by the Engineer.

7.6.4. Placement Temperature: The temperature of concrete when being placed shall be:

7.6.4.1. Not less than 40°F in moderate weather.

7.6.4.2. Not less than 50°F in weather during which the mean daily temperature drops below 40°F.

7.6.4.3. Not greater than 90°F during hot weather.

7.7. Protection

The Contractor shall protect all concrete against injury until final acceptance by the Commission. The Contractor shall be prepared to protect all concrete in accordance with the requirements of this paragraph. Temperature of concrete being poured shall be controlled by controlling the temperature of aggregate and mixing water. Mixing time and elapsed time between mixing and placing shall be kept at a minimum. The interior surfaces of forms and ground upon which concrete is to be placed shall be thoroughly wetted before concrete is poured. After the first frost and until the mean daily temperature in the vicinity of the work rises above 40°F for more than one (1) day, the concrete shall be protected against freezing for not less than forty-eight (48) hours after it is placed.

7.8. Finishing

Smooth, solid concrete surfaces are required throughout the work. The top surface of the concrete foundation shall be finished to conform to the detail shown on the Drawings. In general, steel trowel finish on the concrete is required. Care shall be taken in the steel troweling not to bring excessive fine material to the surface. Finishing of concrete surfaces shall be performed only by skilled workmen.

7.9. Surface Treatment

All exposed concrete shall be properly cured for seven (7) days by moist curing using a wetted burlap covering with craft paper or polyethylene sheets or by spray application of a liquid membrane-forming compound conforming to ASTM Designation C309-89 to prevent evaporation. The membrane shall be applied according to the manufacturer's recommendations. Surface defects shall be filled prior to application of the curing compound. All concrete surfaces on which curing compound has been applied, shall be adequately protected for the duration of the curing period from any cause which will destroy the continuity of the curing membrane. No curing compound shall be used on surfaces requiring subsequent bonding.

7.10. Reinforcing Steel

7.10.1. Grade: Reinforcing bars shall conform to the latest revision of ASTM Standard Specifications for Deformed Billet Steel Bars for Concrete Reinforcement, Designation A615 or A617, Grade 60.

7.10.2. Placement: Steel reinforcing bars shall be placed in the concrete wherever shown on the Drawings. Unless otherwise shown on the Drawings or directed, measurements made in placing the bars shall be to the center lines of the bars. Before the reinforcing bars are placed, the surfaces of the bars and the surfaces of any metal bar supports shall be cleaned of heavy flaky rust, loose mill scale, dirt, grease, or other foreign substances. After being placed, the reinforcing bars shall be maintained in a clean condition until they are completely embedded in the concrete. Main reinforcement shall have a minimum clear protective cover to the face of concrete as shown on the Drawings. Reinforcing bars shall be accurately placed and secured in position so that they will not be displaced during the placing of the concrete. Special care shall be exercised to prevent any disturbance of the reinforcing bars in concrete which has already been placed. Rust-proof metal chairs, metal hangars, metal spacers or other satisfactory

metal supports may be used for supporting reinforcing bars. Precast concrete blocks may be used for supporting reinforcing bars.

7.11. Anchor Bolts

7.11.1. Material Assemblies: All anchor bolt assemblies furnished by the Commission and required for permanent installation in the foundations will be installed by the Contractor. Any anchor bolts damaged during installation shall be replaced by the Contractor to the original Specifications at no cost to the Commission. All pre-clustered anchor bolt assemblies shall be checked against the Drawings by the Contractor before pouring concrete to ensure the cluster has not been damaged and complies with the Specifications and Drawings.

7.11.2. Bolt Protection: Prior to setting, the threads on the upper end of each anchor bolt shall be given a light coat of oil or grease to prevent the adherence of concrete. When installed, the bolts shall be clean and the portions to be embedded in concrete shall be free of heavy scale, oil or other deleterious substances which would adversely affect the bond between the bolts and concrete. During the concrete finish and clean-up, the Contractor shall remove concrete adhering to the portions of anchor bolts extending above finished concrete grade. No pipe sleeves are to be installed with the anchor bolts. The bolts shall be accurately positioned. It will be the Contractor's responsibility to accurately set the bolts initially and to maintain the required accuracy of their positioning until final acceptance by the Engineer.

7.11.3. Assembly Tolerance: Deviations from specified positions of anchor bolts, after concrete has set, shall not exceed the following:

7.11.3.1. Horizontal distance between centers of adjacent anchor bolts shall be within one-sixteenth inch (1/16") of the specified distance, measured at the top of concrete.

7.11.3.2. The elevation of the top of the lowest anchor bolt in a set shall not be less than specified, and that of the highest bolt shall not exceed the specified elevation by more than one-quarter inch (1/4").

7.11.3.3. Angular deviation from specified alignment of the installed anchor bolt set relative to the vertical center line shall not exceed one degree (IE).

7.11.3.4. The foundation must comply with the specified requirements for line and grade in order to be accepted. No payment shall be made for any defective foundations until the Contractor has completed the necessary corrective work to the satisfaction of the Engineer. The Contractor shall bear the full expense of all such corrective work.

8. ROCK ENCOUNTERED DURING EXCAVATIONS

8.1. The Contractor shall be responsible for the removal and disposition of solid rock when encountered in holes for wood poles and tubular steel poles. Solid rock shall be defined as solid, naturally occurring mineral formations that cannot be effectively removed by conventional trenchers, backhoes, or pressure augers on line-trucks. Loose rock or limestone in intermittent layers that result in "difficult digging" shall not be defined as solid rock excavations. "Solid rock" shall require the use of air hammers, blasting or other specialized equipment. (Note: Blasting must be approved by the Commission in accordance with local ordinances.)

8.2. An adder (M-1 (Rockhole)) will be quoted by the Bidder in the Proposal Section to establish a labor cost for rock excavations, including disposition to the Commission's landfill, on a per- cubic-yard basis. Quantities will be agreed upon jointly by the Contractor and the Commission (or Engineer) as the excavations occur. Over excavation to remove rock will not be counted in the quantity of rock excavations. The volume of rock excavation adder will be computed based on the normal pole hole diameter and depth, as if no rock were encountered. Rock adders will not apply to man-made surface treatments, such as asphalt, concrete or gravel.

9. DAVIT ARMS – *Not Applicable for this Project*

Davit arms are being used on some structures for this project. The arms and all attachment hardware are being supplied by the steel pole manufacturer. It will be the Contractor's responsibility to install the davit arms and ensure proper orientation of the arms.

10. GUYS AND ANCHORS

10.1. Guys shall be attachment type utilizing preformed guy grips. Guys shall be installed in locations specified by the Engineer. Points of attachment to poles shall be as shown on Construction Drawings. Guys shall be installed before conductors or overhead ground wires are strung.

10.2. All anchors and rods shall be in line with the strain. All anchors are to be single or multiple helix screw type or expanding rock type and shall be located as staked by the Engineer. Anchor rods shall be so installed that approximately six inches (6") of the rod shall remain out of the ground or extend more than twelve

inches (12”) out of the ground in cultivated fields. The setting of each anchor in regard to depth, torque, and position shall be inspected by the Commission’s Construction representative and his approval given in writing. The Contractor shall fill out anchor installation reports, furnished by the Engineer, as each anchor is installed. No anchor installations shall be invoiced without copies of the installation reports properly filled out and attached.

10.3. All anchors shall be installed using a Hydraulic Torque Indicator control tool. Expanding rock type anchors shall be installed and torqued per manufacturer’s recommendations.

10.4. Anchor locations shall be checked and verified by the Contractor prior to installation to assure that guys do not conflict with phase conductors. This is especially critical when transmission guying passes through distribution phase positions. Where fiberglass guy strain insulators are installed in guys, a minimum of ten inches (10”) must be maintained to any under-build phase conductors.

10.5. Where multiple fiberglass guy strain insulators are to be installed, in one (1) guy strand, they shall be connected using a chain link of the appropriate size.

11. HARDWARE

11.1. Hardware shall be installed as indicated on the Drawings. All bolts shall be installed with nuts and locknuts. Bolts shall be long enough to accommodate the necessary nuts, washers, etc. without projecting more than one and one-half inches (1-1/2”) or less than one-half inch (1/2”) at the free end. They shall not project more than one-fourth inch (1/4”) into an eye-nut installed.

11.2. All bolts and nuts shall be installed to torques specified by the pole manufacturer or the Engineer. Wrenches used in assembly of anchor bolts shall not deform nuts nor damage factory finish.

11.3. Upon completion of pole setting, conductor sagging and pole plumbing, all top and bottom anchor bolt nuts shall be secured by tack welding to the pole base plate. The weld area shall be cleaned, primed and painted in accordance with the manufacturers’ recommendations.

11.4. Care should be exercised during all phases of construction to protect all bolt threads. Nuts should operate on bolt threads without forcing. In case of anchor bolt thread damage during pole installation, repairs shall be made as directed by the Engineer.

11.5. Any unused holes are to be plugged and sealed using galvanized steel plugs or caulk and plastic plugs. No holes or voids are to be left unsealed when installation is complete.

12. INSULATORS

12.1. Care shall be exercised in handling and erecting insulators.

12.2. All insulators shall be handled with utmost care during storage, transportation, assembly, and installation. Care shall be taken to avoid bending stresses in insulator strings during handling. Insulators shall not be dropped. Insulators subjected to these or any other abuses or damage shall be permanently marked, rejected from the job and charged to the Contractor.

12.3. All insulators shall be protected from the accumulation of all foreign materials insofar as is possible. Mud, grease, and other foreign materials shall be cleaned from insulators using clean rags. Wire brushes may not be used for the cleaning of any insulator parts. Upon installation, all insulators shall be clean on all surfaces. Workmen shall not climb on insulators at any time.

13. GROUNDING ASSEMBLY

13.1. Wood Poles

13.1.1. Butt plates (M2-12) or driven ground rods (M2-11) shall be installed on all wood distribution poles as indicated on the Staking Sheets.

13.1.2. Refer to the following drawings for the grounding of wood distribution poles: M2-11, M2-12

13.2. Direct Embedded and Vibratory Base Steel Poles

13.2.1. Driven pole grounds (TM-9SP) shall be installed on all steel transmission poles.

13.2.2. Steel transmission poles with distribution under-build shall share a common ground rod (TM-9SP).

13.2.3. Refer to the following drawings for the grounding of direct embedded steel transmission poles:

TM-9SP
TM-9R
TM-9X(S)

13.2.4. Installation cost of ground rods to include testing of ground resistance and generating a report of test results.

The following is the minimum information to be included in the test report:

13.2.4.1. Ambient Air Temperature

13.2.4.2. Relative soil moisture content (i.e. Dry, Moist, Wet)

13.2.4.3. Total number of rods installed to achieve 25 ohms

13.2.4.4. Ground Resistance Reading after installation of each ground rod section

13.2.4.5. Type of meter used

13.2.4.6. Date and time of test

13.2.4.7. Person or persons performing test

All measurements are to be made without connection to steel pole or neutrals.

Ground Resistance Test reports to be submitted to Owner and Engineer for all installed structures.

13.3. Surface Mounted Steel Poles

13.3.1. Driven pole grounds (TM-9SP) shall be installed on the surface mounted steel pole as indicated on the Plan & Profile sheets.

13.3.2. Steel transmission poles with distribution under-build shall share a common ground rod (TM-9SP).

13.4. Where transmission and distribution assemblies are joint use structures, a common ground shall be shared. For wood poles, the common ground will be a ground wire. For steel poles, the common ground will be the pole itself.

13.5. Guys and overhead ground wires shall be attached to the common ground.

13.6. The distribution neutral shall be attached to the common ground.

13.7. Ground rods shall be driven to their full length into undisturbed earth according to the unit assembly drawings. The top of the ground rod shall be located a minimum of one foot (1'-0") below grade or as indicated otherwise on the Assembly Drawings.

13.8. Ground rods shall be 5/8" x 10'-0" galvanized steel for transmission. Extensions (TM-9R) shall be added if necessary, to obtain a verifiable ground resistance of twenty-five (25) ohms or less.

13.9. Ground wire for transmission poles shall be No.4 AWG soft drawn tinned copper wire.

14. CONDUCTORS

14.1. Distribution Conductors-

14.1.1. Care shall be exercised to avoid kinking, twisting, or abrading the conductor in any manner. Conductors shall not be trampled on, run over by vehicles, or dragged over sharp rocks. The wire on each reel shall be inspected for cuts, kinks, or other injuries. Injured portions or crooked or imperfect splices in the conductor shall be cut out and the wire respliced.

14.1.2. Conductors shall be pulled over suitable rollers or stringing blocks properly mounted on the pole or crossarm to prevent binding while stringing.

14.1.3. Installation of conductors and accessories shall be done in accordance with manufacturer's recommendations.

14.1.4. With post- and pin-type insulators, the conductors shall be tied in the top groove of the insulator on tangent poles and on the side of the insulator away from the strain at angles greater than ten degrees (10°). Post- and pin-type insulators shall be tight on the pins and on tangent construction the top groove must be in line with the conductor after tying in

14.1.5. There shall not be more than one splice per conductor in any span and no splice shall be located within ten feet (10'-0") of the conductor support. Splices will not be permitted in road or street crossing spans. Automatic splices are not permitted on primary, neutral, or secondary conductors.

14.1.6. Utmost care shall be exercised in installing parallel groove clamps. The contact surface of the conductor shall be clean and bright. A steel brush shall be the principal cleaning medium; contact compound shall be used for all connections to aluminum conductors. Those same precautions for cleaning shall also apply to the conductor before splicing.

14.1.7. Conductors shall be sagged in accordance with sag and tension charts or tables furnished by the Engineer. Under no circumstances will a decrease in the specified sag be allowed. Sagging by sighting between targets or dynamometer is recommended.

14.1.8. The conductor temperature at the time and place of stringing shall be determined by a certified, thermometer inserted in a short section of conductor. The temperature at which the conductor is sagged and the spans in which sags are measured shall be recorded and the information given to the Engineer.

14.2. Transmission Conductors

14.2.1. The Contractor shall install all phase conductors and shield wires by the tension stringing method. This method shall always result in the conductor having sufficient tension to clear all obstructions by an amount adequate to provide safety to personnel and the public. The conductor shall not be allowed to touch or drag across the surface of the ground, any obstruction or guard structure.

14.2.2. If at any time during the construction of the line the conductor should come into contact with the ground or should suffer any other form of damage the conductor shall be lowered and inspected by the Commission's designated Construction Representative. The Commission's Construction Representative shall judge the method of repair or cleaning to be exercised by and at the expense of the Contractor. Forms of repair may include but will not be limited to cleaning of foreign matter, smoothing with suitable abrasives (emery cloth or equal), cutting and splicing, or replacing.

14.2.3. The Contractor shall install guard structures at crossings of all other overhead utilities, all railroads, public roads, and navigable waterways. Other guard structures may be installed for the protection of the conductor. Guard structures shall be of such construction as to prevent the conductor from dragging on the structure surface since such contact would require conductor repair. Upon completion of conductor stringing in a line section, all guard structures shall be immediately removed in their entirety and all pole holes shall be backfilled and properly compacted to original grade. The Contractor shall be responsible for obtaining the required local, state, and/or federal permits for erection of guard structures on public rights-of-way.

The Contractor shall submit to the Commission a sketch of the guard pole installations with dimensions locating and outlining the number of guard poles and their placement on public rights-of-way. The

Contractor shall supply this information two weeks in advance of the guard pole use. Once this sketch has been approved by the state, no changes regarding number and placement of guard structures will be allowed without proper written approval.

14.2.4. The Contractor shall notify the Commission's designated construction representative at least five (5) days in advance of the intended date of conductor pulling across any transmission or distribution line, any highway, stream, or environmentally sensitive area (wetlands, etc.). The Contractor shall also directly notify any public authorities of such operations as may be required in permits, which the Commission or Contractor has obtained.

14.2.5. OHGWs will deadend at structure prior to crossing under DEP transmission lines and will begin at the structure immediately following the DEP crossing.

14.2.6. The Contractor shall make himself aware of potential sources of electrical contact, induction, or static charge buildup which may be encountered during construction of the line. The Contractor shall be responsible for conducting operations in such a manner as to avoid hazards of this type. Measures shall be taken by the Contractor to prevent dangerous voltages between various pieces of equipment and between equipment and ground in cases of accidental contact with foreign electric sources. Such measures shall include but not be limited to bonding of pulling equipment and installation of adequate conductor and equipment grounds during all phases of construction. The Contractor shall be responsible for the evaluation of hazards and the determination of protective methods. The Contractor's methods must be in compliance with OSHA Safety Regulations and are subject to review by the Commission's Engineer and the Commission's Construction Representative.

14.2.7. All equipment used by the Contractor shall be of such type and condition as to ensure installation of conductor without damage. Such damage would include strand overstress, birdcaging, marring of the surface, or the accumulation of foreign material. Tensioning and pulling equipment shall be operated in such a manner as to avoid overstressing of conductors or structures.

14.2.7.1. The tensioner shall be of a double bullwheel design with an offset of approximately one-half (1/2) groove width between the tandem bullwheels. Bullwheels shall be arranged so that conductor enters the system on the left and exits on the right side of the system (facing direction of

pull). These directions shall be reversed for left-handed lay conductors.

Single V-groove bullwheels will not be allowed. Bullwheel grooves shall be of a polished smooth finish or may be elastomer lined. However, polished smooth bullwheel grooves will not be allowed where the pulling line passes in the same grooves as the conductor. The tensioner shall have a braking system capable of continuously holding a desired tension. Heat from the braking system shall not be transmitted to the conductor. Conductor reels shall be located behind the tensioner with a maximum recommended angle of two degrees (2°) for entry of conductor into the bullwheel. A constant back tension of approximately 1,000 pounds should be maintained on the conductor to minimize birdcaging in the tensioner and conductor over-running. The tensioner and puller shall be located so that under no condition is the average slope of the top conductor less than four (4) horizontal to one (1) vertical. If sagging temperature is 60°F or greater, the Commission's Construction Representative may allow a slope of as low as 3:1 to be used.

14.2.7.2. Stringing blocks (stringing sheaves or travelers) shall be of such a design as to minimize conductor deformation during pulling and to enhance good sagging practice through low friction. Blocks shall be equipped with ball or roller bearings and shall be maintained in accordance with the manufacturer's recommendations. It is recommended that block grooves be elastomer lined. Unlined smooth polished grooves may be used for conductor stringing if the block material is aluminum or magnesium alloy. However, in no case shall unlined grooves be used if steel pulling line is used.

14.2.8. Pulling and sagging of conductor shall be accomplished as specified below.

14.2.8.1. Pulling tensions shall be limited to seventy percent (70%) of the sag tension for the temperature at time of pulling, or 2,900 pounds, whichever is less. The Contractor is instructed to select pulling sites such that maximum sags near the tensioner position will not result in inadequate ground clearances. Block efficiency and pulling tension

limits may preclude pulls of the maximum dimension noted above.

14.2.8.2. Conductor shall not be left in stringing blocks for more than twenty-four (24) hours before pulling to initial sags specified by the Commission's Engineer. If so directed by the Commission's Construction Representative, sag tables corrected for creep time shall be used. After being sagged, the conductor shall remain in the stringing blocks for twelve (12) hours prior to being clipped in. However, the total time in stringing blocks shall not exceed four (4) days, ninety-six (96) hours prior to clipping in.

14.2.8.3. Conductor sagging shall be accomplished by use of a combination of dynamometer and sag boards. Sags will be checked at a minimum of three (3) locations for each mile of sag distance. No sag distance shall have less than two (2) spans checked before acceptance. Sags shall be checked in each unusually long span and on each side of unusual horizontal or vertical angles. The Contractor and the Commission's Construction Representative will mutually agree on which spans are to be used as sag checks at least two (2) days prior to the commencement of a pulling operation. The Contractor shall make available to the Commission's Engineer for sag checking such instruments and setups as are being used to sag the conductor. Sag tolerances shall be minus zero (0) plus six inches (6") from those furnished by the Engineer. Temperatures used in establishing sags shall be established by a certified etched- glass thermometer inserted in a sample conductor section exposed to sunlight and air temperatures the same as those to which the tensioned conductor is exposed.

14.2.8.4. If emergency conditions or inclement weather require the pulling- sagging sequence to be interrupted before the completion of clipping in, it shall be the responsibility of the Contractor to make sure that adequate clearances exist under the conductor at all points and that the conductor is secure. The conductor tension shall not exceed seventy percent (70%) of the sag tension for the average temperature of the period. The Commission's Engineer will notify the Contractor of any adjustments required to the standard sag tables.

14.2.9. Utmost care shall be exercised in installing parallel groove clamps. The contact surface of the conductor shall be clean and bright. A steel brush shall be the principal cleaning medium; contact compound shall be used for all connections to aluminum conductors. Those same precautions for cleaning shall also apply to the conductor before splicing.

14.2.10. Jumpers and other leads connected to line conductors shall have sufficient slack to allow free movement of the conductors. Slack will be provided at least two (2) bends in a vertical plane, one in a horizontal plane or the equivalent.

15. RIGHT OF WAY GENERAL

15.1. Access to right-of-way areas shall be from existing public or private roads or along existing Commission rights-of-way. Where private roads or trails are used, the Contractor shall obtain permission in writing from the property owner for their use with copies to be furnished to the Commission's Engineer.

15.2. All right-of-way clearing shall be completed for a section of the line before pole setting may begin. No poles shall be set with right-of-way not completely cleared.

15.3. All right-of-way clearing will be by the Commission.

15.4. At the completion of construction and clean-up the Contractor shall regrade all disturbed right-of-way areas to their preconstruction contours where practicable. All cuts or fills shall maintain a maximum slope of 3:1 in order to insure as little run off as possible. Any soil erosion and sedimentation devices required to stabilize and/or reduce further erosion shall be installed. All devices installed during construction and no longer required shall be removed. All disturbed or denuded areas shall be covered with topsoil, if required, fertilized, limed, seeded, strawed, and tacked as necessary. Fertilizer, lime, and seed rates and mixes shall be as specified by the local soil conservation service for the time of year applied. All cost for right-of-way clean-up and restoration shall be included in the overall price of the project.

15.5. Maintenance of Existing Rights-of-Way

Existing rights-of-way, both public and private, must be maintained during construction in such a manner so as not to create a hazard. Deep ruts shall be backfilled and graded out. Denuded grass and vegetation areas shall be replanted with a suitable seed mixture. At the end of the construction, the right-of-way should be left in as good or better condition than it was before construction began. All cost of maintaining existing right- of-way and/or reseeding shall be borne by the Contractor.

15.6. Temporary Service or Access Roads

15.6.1. If, during the course of construction it should become necessary for the Contractor to construct, modify, widen, grade, or perform any other earth work in order to provide access to or work areas around any facilities covered in this Contract, he shall do so at his own cost.

15.6.2. The Contractor shall be responsible for all permits required for such construction. He shall also be responsible for the installation and maintenance of any soil erosion and sediment control devices required by local, county, or state agencies.

15.6.3. All cost associated with the construction, maintenance, removal, and rehabilitation of any area associated with the rights-of-way, access roads, service roads, etc., shall be included in the Contractor's overall price. A separate cost item will not be billed for this work.

15.7. Poles & Foundations in Wetlands

15.7.1. Any excavation for poles and/or foundations in wetland areas shall utilize extra precaution to avoid disturbing the root mat around the excavated area. Tree stumps and root mats must be left intact in forested wetlands.

15.7.2. Any excess excavated soil in wetland areas must be removed from the wetland area and deposited (spread evenly) on higher ground.

15.7.3. No concrete may be poured directly in wetland areas. The use of steel vibratory casings/forms must be used to prevent contact of concrete with surface waters. The cost of the casing/form must be included in the foundation unit.

15.7.4. No mechanized clearing (bulldozers) in jurisdictional wetlands.

15.7.5. Minimize soil disturbance in jurisdictional wetlands (use mats where possible).

15.7.6. Maintain preconstruction contours in jurisdictional wetlands.

SECTION III

GREENVILLE UTILITIES COMMISSION

TECHNICAL SPECIFICATIONS-MATERIALS SPECIFICATIONS

July 18, 2019

1. SCOPE

All hardware and insulators needed to complete each transmission structure will be replaced. Conductors will not be replaced. Greenville Utilities Commission will furnish all transmission and distribution materials required for the construction unless otherwise noted in this specification. The proposal submitted by the contractor shall include all labor, equipment, and all other necessary items to complete this project. Steel poles are expected to be delivered mid-August.

2. GENERAL

2.1. All materials shall be new, except items specified for reuse, and will be furnished by the Commission and the Contractor as outlined in this specification.

2.2. All materials issued to the Contractor must be acknowledged by a material receipt.

2.3. Materials removed and salvaged must be returned to the Commission's warehouse and a receipt will be issued to the Contractor for materials returned.

2.4. The Contractor will be charged for all materials removed which are neither reused nor returned to the Commission's warehouse. Current stock item prices will be used to determine the removed material charge.

2.5. A brief description of the materials is furnished hereinafter for the Contractor's information.

2.6. Reference to ASTM, NEMA, AWS, SSPC, or ACI Standard implies reference to the latest revision or to its replacement if it has been discontinued.

3. POLES-WOOD-*Not Applicable for this Project*

3.1. All poles shall meet the requirements of ANSI Standard "Specifications and Dimensions for Wood Poles 05.1," the latest revision thereof.

3.2. Poles shall be framed as indicated on the Drawings. All holes shall be field drilled and treated with a two percent (2%) solution of Copper Napthenate or other EPA approved preservative before framing.

3.3. New poles shall be Southern Yellow Pine or Douglas Fir and shall meet the requirements set forth in ANSI Specification and Dimensions for Wood Poles 05.1. Treatment shall be AWPA Standard C4 for the Preservative Treatment of Poles by Waterborne Process. The preservative shall be Chromated Copper Arsenate, CCA, conforming to AWPA Specification P5, or the latest revisions thereof.

4. POLES-TUBULAR STEEL-*Furnished by Owner*

4.1. All poles will meet the requirements of the Tubular Steel Structures Specifications pertaining to this project.

4.2. Transmission and distribution under-build pole-top assembly attachment point holes will be predrilled at the factory, unless otherwise specified. The contractor will be responsible for field drilling any other holes required for construction. Cost for drilling these holes shall be part of the pole top assembly unit. In no instance will additional charges be paid for drilling holes. The Contractor shall touch up the finish of all field drilled holes using high zinc content paint (Galvon) supplied by the pole manufacturer.

4.3. Poles may be delivered in two (2) or three (3) pieces. The Contractor is responsible for all field assembly required for these poles. Additionally, the Contractor is responsible for providing any equipment (i.e., jacks) required to join pieces.

4.4. Any unused holes are to be plugged and sealed using galvanized steel plugs or caulk and plastic plugs.

5. HARDWARE-*Furnished by Owner*

Hardware shall be hot dip galvanized.

5.1. Bolts and nuts shall conform to ANSI Standards as follows:

5.1.1. C135.1 for machine, carriage, and double-arming bolts

5.1.2. C135.4 for eye bolts

5.1.3. Cl35.3 for lag screws

5.2. Steel parts shall conform to ASTM Specifications A36.

5.3. Malleable iron shall conform to ASTM Specifications A47.

5.4. Galvanizing shall conform to ASTM Specifications A153.

6. GUY WIRE-*Furnished by Owner*

6.1. Guy wire shall be 7/16" Extra High Strength Steel rated 20,800 pounds ultimate strength and supplied by the Owner.

6.2. All transmission guys shall be attached to steel poles via pole eye plates or pre-manufactured vangs built into the steel pole as shown on the drawings.

7. OVERHEAD GROUND WIRE-*Furnished by Owner*

A 7 No. 9 Alumoweld overhead ground wire shall be installed.

8. ANCHORS-*Furnished by Owner*

8.1. Transmission anchors shall be double helix (8" and 10"), with one and one-half inch (1- 1/2") square shaft rod and a twin eye, rated 23,000 lbs. in Class 6 soil. Combined with a twelve-inch (12") Helix-extension, the anchor is rated at 32,000 lbs. in Class 6 soil.

8.2. The anchors shall be installed per the manufacturer's recommendations.

8.3. The ultimate holding capacity of these anchors is dependent upon the soil properties. Holding capacity for Class 6 soil is 23,000 lbs. (32,000 lbs. when combined with a twelve-inch (12") Helix-extension).

8.4. The holding capacity of the anchors is dependent upon the torque values achieved while setting the anchors. Additionally, it will be necessary for the eye of the anchor to be installed a specific distance out of the ground in accordance with the construction drawings.

In order for the Contractor to meet the specification criteria for both torque and depth, it will be necessary to use multiple shaft length extensions in increments of three and one- half feet (3'-6"), and six feet (6'-0").

9. INSULATORS-*Furnished by Owner*

9.1. <u>Suspension</u>

9.1.1. Insulators shall be polymer and shall conform to ANSI, IEEE, ASTM, and AEIC Standards for insulators. All suspension insulators shall be gray.

9.1.2.

Insulator Type	Flashover (kV)		Leakage (in.)	Suggested Manufacturer	Catalog Number
	Dry	Wet			
Polymer Suspension	530	470	139.0	NGK Locke	251-SS410-YJ

9.1.3. Suspension insulators shall be attached via shoulder eye through bolts, transmission guy plates, or pre-manufactured vangs built into the steel pole.

9.2. Horizontal Post

9.2.1. Polymer horizontal mounting line post insulators for 115 kV shall be Ohio Brass or NGK Locke for steel pole mounting.

9.2.2.

Insulator Type	Flashover (kV)		Leakage (in.)	Suggested Manufacturer	Catalog Number
	Dry	Wet			
Polymer Horizontal Post	475	420	119.9	NGK Locke	L2-SN291-13

9.2.3. Mechanical strength 7.4 kN, design cantilever load.

10. FIBERGLASS STRAIN INSULATOR-*Furnished by Owner*

Fiberglass strain insulator for use in guys shall have an ultimate strength of 30,000 pounds; shall have an insulating distance of seventy-eight inches (78") and shall be equipped with clevis ends and the number of rollers required.

11. CONNECTORS AND SPLICES-*Furnished by Owner*

All connectors and splices for 1272 AAC, 795 AAC, 556 ACSR, 336 ACSR, 4/0 ACSR, and 7 No. 9 Alumoweld OHGW conductors shall be the compression type. Full tension compression splices shall develop strength equal to not less than ninety-five percent (95%) of the ASTM rated strength of the conductor. See Total Transmission Material List and Cross Reference pages provided by Greenville Utilities Commission for preferred manufacturer and catalog numbers.

12. ARMOR RODS-*Furnished by Owner*

Where armor rods are installed on phase conductors or OHGW, they shall be of a type specifically designed for the conductor being protected and shall be manufactured with aluminum alloy, aluminized acceptable. Armor rods shall be installed with the midpoint within two inches (2") of the center of the suspension clamp. The maximum distance between the ends of any two (2) individual rods within a bundle shall not exceed one-half inch (1/2").

13. CONDUCTOR CLAMPS-*Furnished by Owner*

13.1. Trunnion Clamps and Suspension Clamps

Suspension clamps and connecting pieces, material items on tangent and light/medium angle type pole top assemblies for 1272 AAC, 795 AAC, 556 ACSR, 336 ACSR, 4/0 ACSR, and 7 No. 9 Alumoweld OHGW conductors shall be sized to fit conductor with Armor Rod as manufactured by Preformed or approved equal. See Total Transmission Material List and Cross Reference pages provided by Greenville Utilities Commission for preferred manufacturer and catalog numbers.

13.2. Cushion Grip Supports

Cushion grip supports on tangent and light/medium angle type pole top assemblies shall be sized to fit 1272 AAC, 795 AAC, 556 ACSR, 336 ACSR, 4/0 ACSR, and 7 No. 9 Alumoweld OHGW conductors . See Total Transmission Material List and Cross Reference pages provided by Greenville Utilities Commission for preferred manufacturer and catalog numbers.

14. DEADENDS-*Furnished by Owner*

All deadends for 1272 AAC, 795 AAC, 556 ACSR, 336 ACSR, 4/0 ACSR, and 7 No. 9 Alumoweld OHGW conductors shall be bolted, quadrant type. See Total Transmission Material List and Cross Reference pages provided by Greenville Utilities Commission for preferred manufacturer and catalog numbers.

15. GROUNDING-*Furnished by Owner*

15.1. All steel poles shall have driven grounds (transmission and distribution) as indicated on the Drawings. Guys and overhead ground wire shall be attached to the common ground which is the pole itself in the case of steel poles.

15.2. Ground rods shall be 5/8" x 10' galvanized steel. Extensions shall be added if necessary to obtain a verifiable ground resistance of 25 ohms or less. Ground rods shall be installed at the direction of the Engineer. Threaded ground rod couplings shall be used to secure each ground rod section as it is installed.

15.3. Ground wire for steel poles shall be No. 4 AWG soft drawn tinned copper wire unless otherwise specified.

15.4. Installation cost of ground rods to include testing of ground resistance and generating a report of test results.

The following is the minimum information to be included in the test report:

15.4.1. Ambient Air Temperature.

15.4.2. Relative soil moisture content (i.e. Dry, Moist, Wet).

15.4.3. Total number of rods installed to achieve 25 ohms.

15.4.4. Ground Resistance Reading after installation of each ground rod section.

15.4.5. Type of meter used.

15.4.6. Date and time of test.

15.4.7. Person or persons performing test.

All measurements to be made without connection to steel pole or neutrals.

Ground Resistance Test reports to be submitted to Owner and Engineer for all installed structures.

16. STATIC GROUND BRACKETS-*Furnished by Owner*

The ground wire cable supports shall be Hughes Brothers 2855 series or approved equal for tangent and light angle structures.

17. CONDUCTOR-*Existing Conductor to be used*

17.1. Overhead conductor for the Circuit 18, 115kV Transmission Line is 795 kcmil AAC and will be reused. Overhead conductor for Circuit 18, 12.47 kV distribution under build is 556 kcmil ACSR and will be reused.

17.2. Overhead conductor for the Circuit 15, 115 kV Transmission Line is 795 kcmil AAC and will be reused.

17.3. Overhead conductor for the Circuit 11, 115 kV Transmission Line is 1272 kcmil AAC and will be reused. Overhead conductor for Circuit 11, 12.47 distribution under build is 556 kcmil ACSR and will be reused.

18. OWNER–FURNISHED MATERIAL STANDARDS-*Furnished by Owner*

The successful bidder will be provided a list of Owner-furnished material pages as a "Standard" for reference. The Commission may substitute other manufacturer's products of equal or better quality.

[Balance of page left blank intentionally.]

Appendix A: **Circuit 18 Pole Replacement Schedule**

Structure #	Pole Height (ft.)	RUS Class	Embedment (ft.)	Structure Type	Drawing #
1	50	S-04.2	7.0	Three pole angle	
2, 4, 5	70	S-04.2	9.0	Single pole tangent	
3	75	S-04.2	9.5	Single pole angle	
6	55	S-04.2	7.5	Two pole tangent H-frame	
8A, 8B, 8C, 16, 17, 35, 36	65	S-04.2	12.0	Three pole angle	
9, 10, 11, 12,13, 14, 15, 18, 19, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42	65	S-04.2	12.0	Two pole tangent H-frame	
43	80	S-04.2	10.0	Single pole angle	
44, 45, 46, 47, 49, 50, 52, 55, 56, 57, 58	75	S-04.2	9.5	Single pole tangent	
48	80	S-04.2	10.0	Single pole angle	
53,54	75	S-04.9	9.5	Three pole tangent H-frame	
60	45	S-04.2	6.5	Three pole angle	

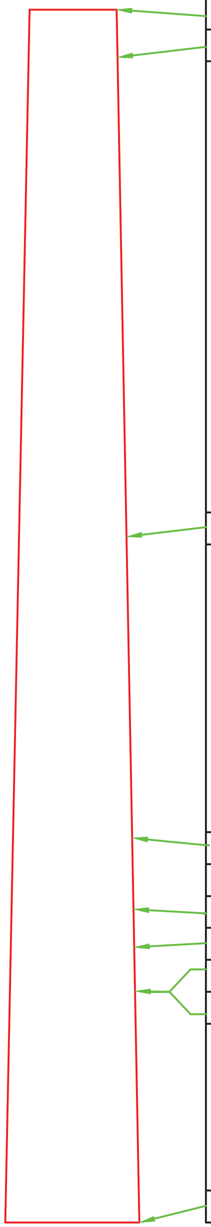
Appendix B: Circuit 15 Pole Replacement Schedule

Structure #	Pole Height (ft.)	RUS Class	Embedment (ft.)	Structure Type	Drawing #
1	80	S-03.5	10	Single Pole Angle	TSV4.2
2	75	S-03.5	9.5	Single Pole Tangent	TPZ1
3	75	S-03.5	9.5	Single Pole Tangent	TPZD1.V1.2
4	75	S-03.5	9.5	Single Pole Angle	TSV4
6	75	S-03.5	9.5	Single Pole Angle	TSV3
7, 8, 9	70	S-04.2	9.0	Single Pole Tangent	TPZ1
10	80	S-03.5	10.0	Single Pole Angle	TSV4

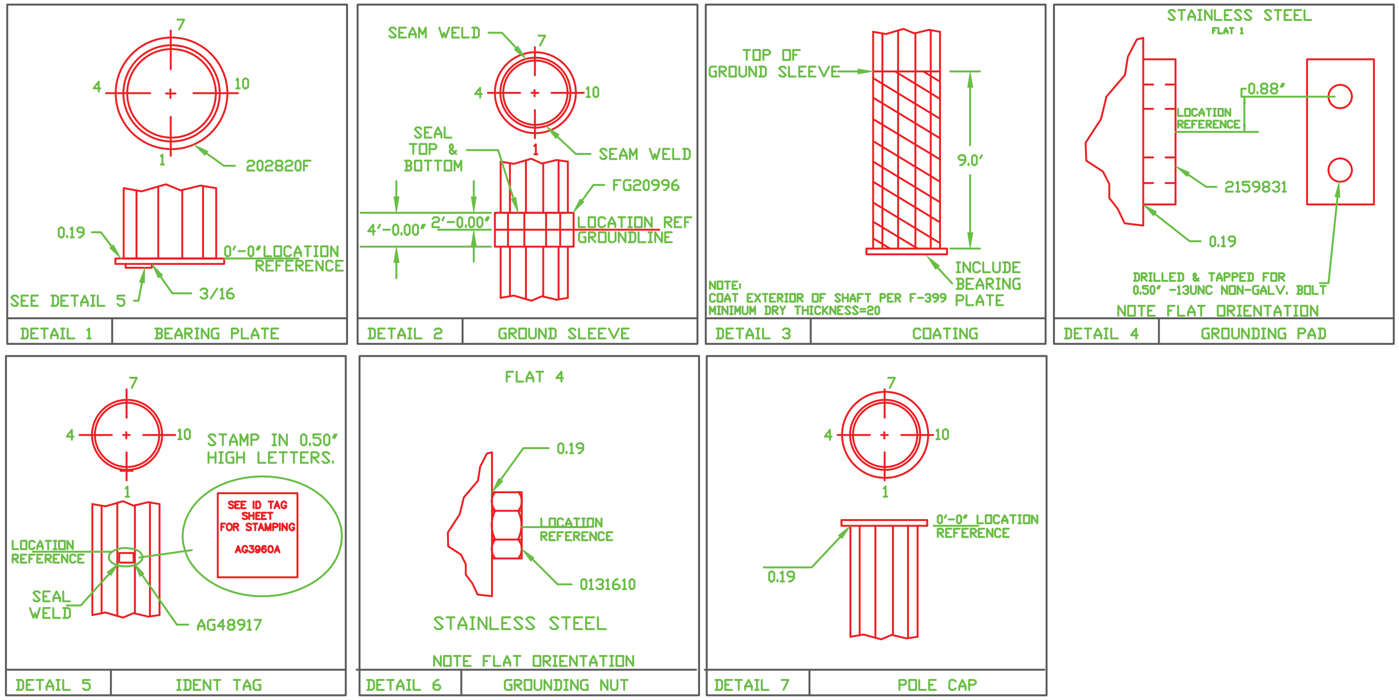
Appendix C: Circuit 11 Pole Replacement Schedule

Structure #	Pole Height (ft.)	RUS Class	Embedment (ft.)	Structure Type	Drawing #
1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13	80	S-07.4	10.0	Single Pole Tangent	TPZD1.C1.3
4	85	S-05.7	10.5	Single Pole Angle	TSVD4.V4

Appendix D: Detail Construction Drawings



LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
33'-0.00"			4
12.0'			5
10.0'			4
9.0'			3
7.0'			2
7.0'			GL
0'-00"			1



NOTE: DIMENSIONS IN THE DRAWING
ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF   MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
50'			

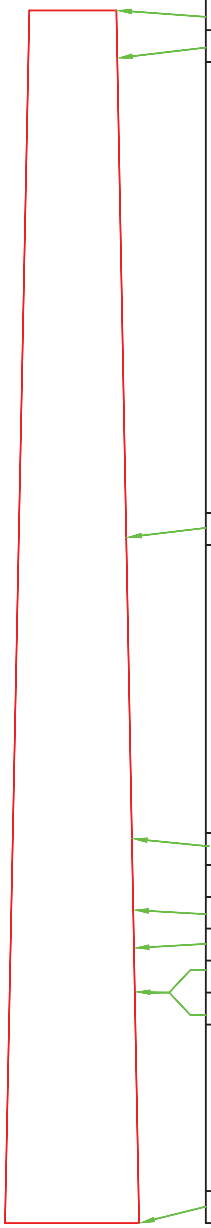
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

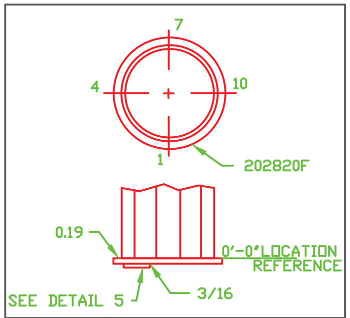
Greenville Utilities

STRUCTURE 1
GROUNDING AND COATINGS DETAIL

DWN. JLS	DATE: 04/01/19			DWG. NO.
CKD. KW	APPD. KW			1G
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	



LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
33'-0.00"			4
14.0'			5
12.0'			4
11.0'			3
9.0'			2
9.0'			GL
0'-00"			1



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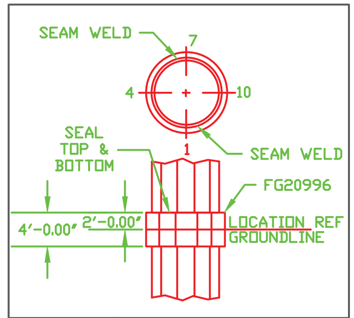
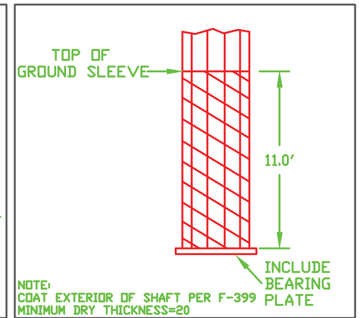
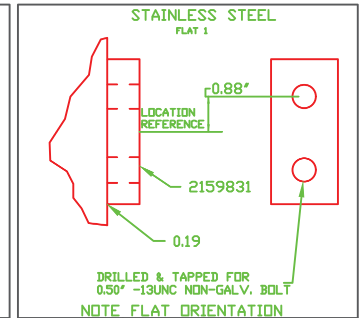


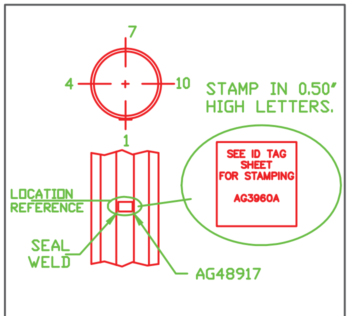
DETAIL 2 GROUND SLEEVE



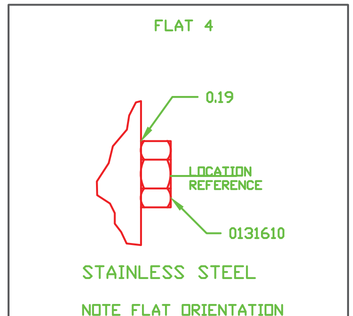
DETAIL 3 COATING



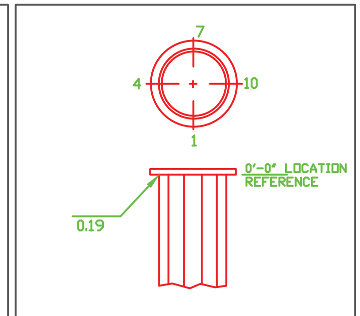
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING
ARE NOT TRUE TO PROPORTION.

NOTES:
1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF   MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	SMALL	THICKNESS (IN)
70'			

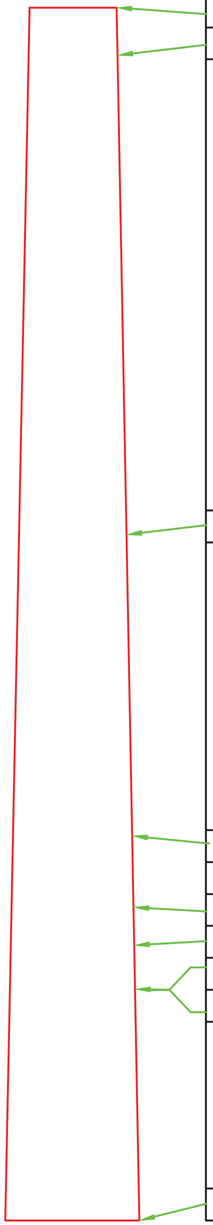
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

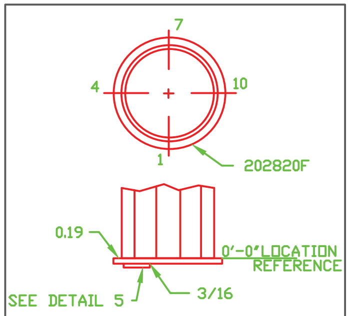
Greenville Utilities

STRUCTURE 2, 4, 5
GROUNDING AND COATINGS DETAIL

DWN. JLS		DATE: 04/01/19		DWG. NO.
CKD. KW		APPD. KW		2G
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	



LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	1'–6.00"		4
33'–0.00"			4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'–00"			1



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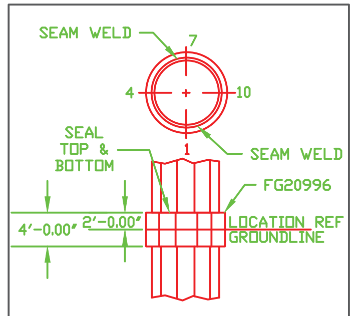
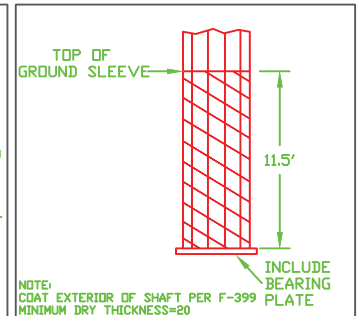
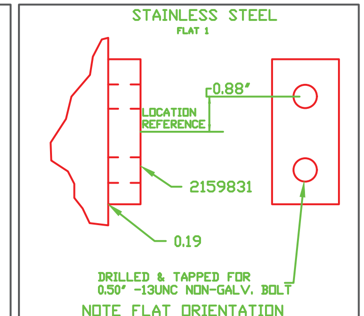


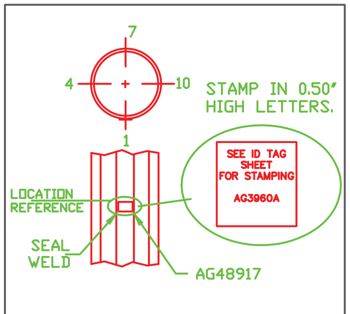
DETAIL 2 GROUND SLEEVE



DETAIL 3 COATING



DETAIL 4 GROUNDING PAD



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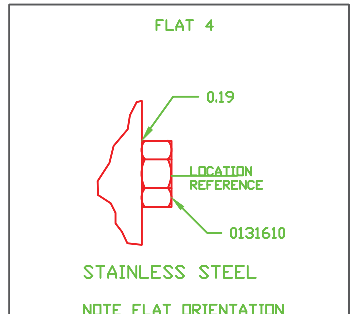
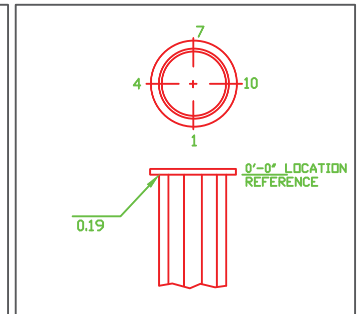


DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

TUBE LENGTH	END OD (IN) LARGE	SMALL	THICKNESS (IN)
75'			

TUBE DIAMETERS MEASURED ACROSS FLATS

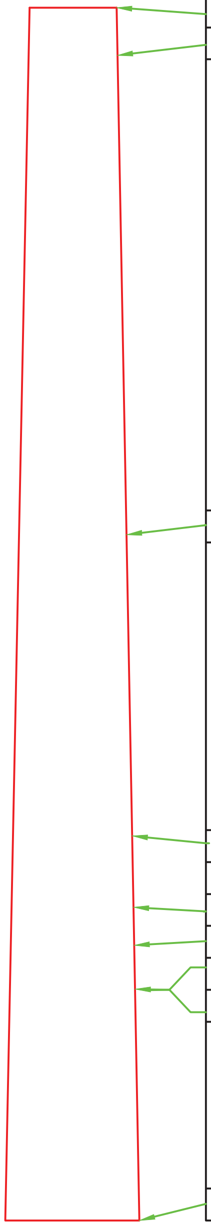
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 3
GROUNDING AND COATINGS DETAIL

DWN. JLS		DATE: 04/01/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
3G



LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
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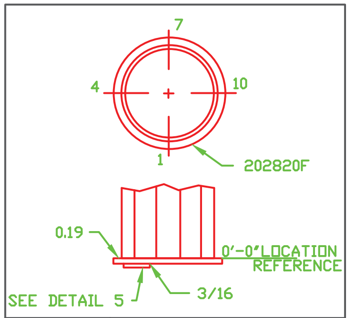
	1'-6.00"		4
33'-0.00"			4
12.5'			5
10.5'			4
9.5'			3
7.5'			2
7.5'			GL
0'-00"			1



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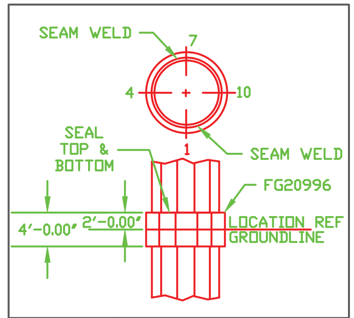
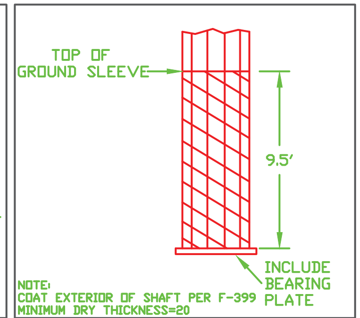
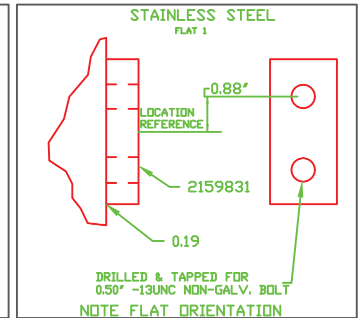


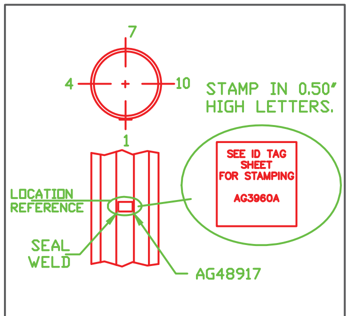
DETAIL 2 GROUND SLEEVE



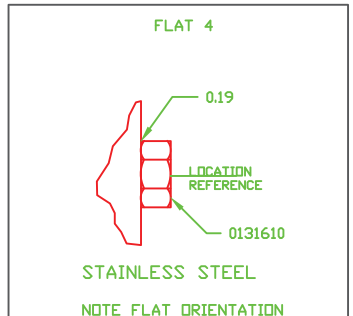
DETAIL 3 COATING



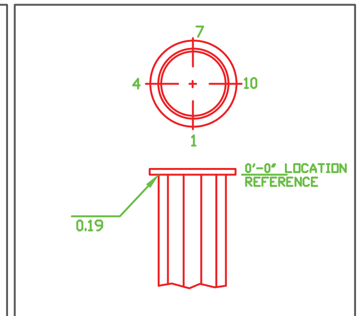
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
55'			

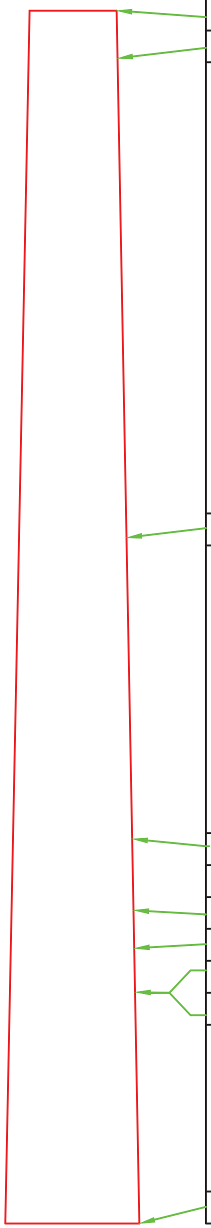
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

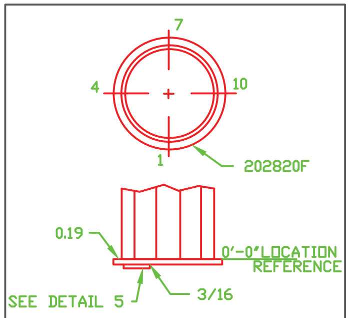
Greenville Utilities

STRUCTURE 6
GROUNDING AND COATINGS DETAIL

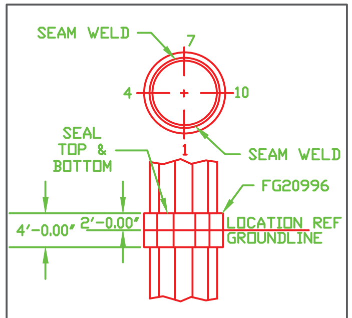
DWN. JLS		DATE: 04/01/19		DWG. NO.
CKD. KW		APPD. KW		6G
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	



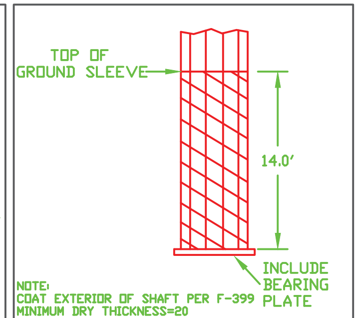
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
33'-0.00"			4
17.0'			5
15.0'			4
14.0'			3
12.0'			2
12.0'			GL
0'-00"			1



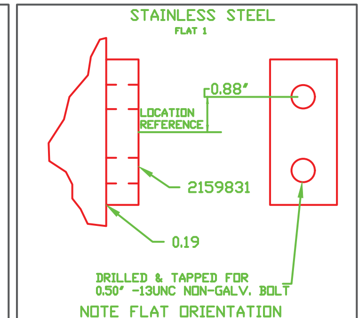
DETAIL 1 BEARING PLATE



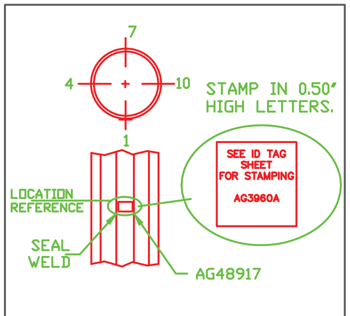
DETAIL 2 GROUND SLEEVE



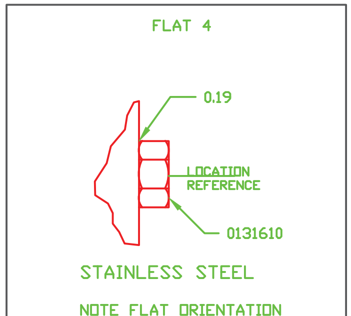
DETAIL 3 COATING



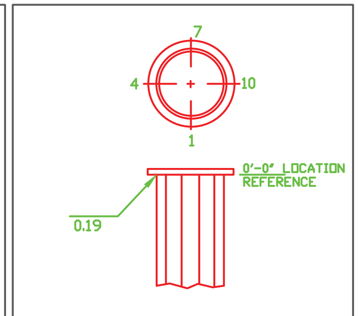
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:
1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
65'			

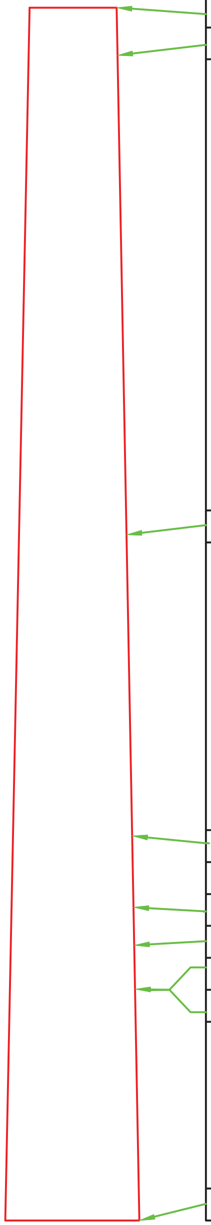
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

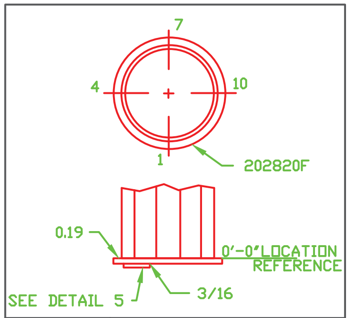
Greenville Utilities

STRUCTURE 8A, 8B, 8C, 16, 17, 35, 36
GROUNDING AND COATINGS DETAIL

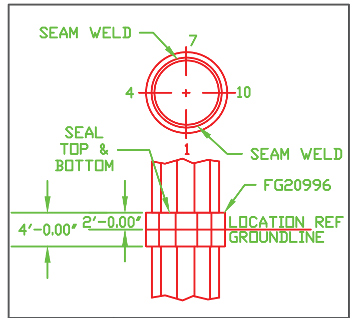
DWN. JLS	DATE: 04/01/19			DWG. NO.
CKD. KW	APPD. KW			8G
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	



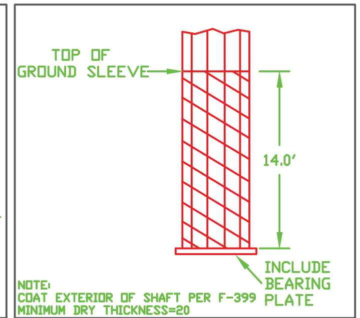
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	1'–6.00"		4
33'–0.00"			4
17.0'			5
15.0'			4
14.0'			3
12.0'			2
12.0'			GL
0'–00"			1



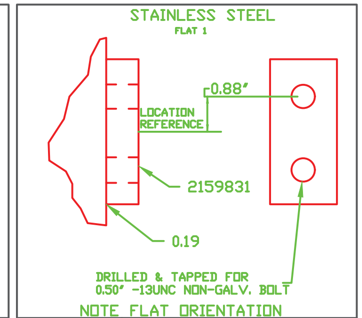
DETAIL 1 BEARING PLATE



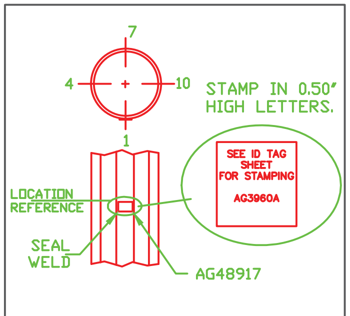
DETAIL 2 GROUND SLEEVE



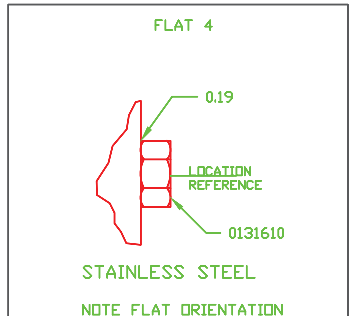
DETAIL 3 COATING



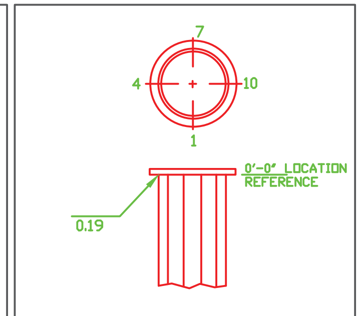
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:
1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
65'			

TUBE DIAMETERS MEASURED ACROSS FLATS

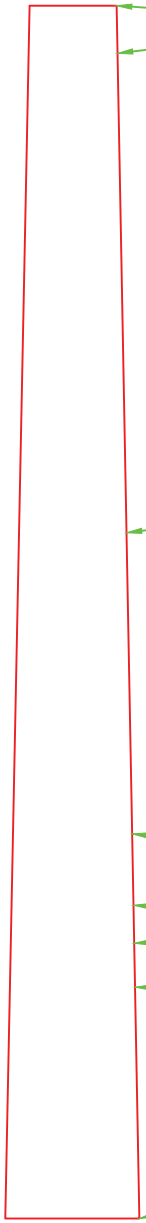
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

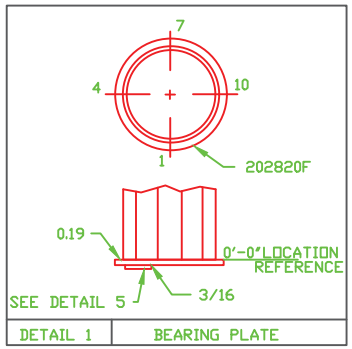
STRUCTURE 9, 10, 11, 12, 13, 14, 15, 18, 19, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42
GROUNDING AND COATINGS DETAIL

DWN. JLS	DATE: 04/01/19	DWG. NO.
CKD. KW	APPD. KW	9G
SCALE: N.T.S.		

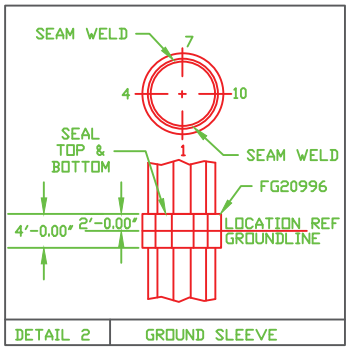
DATE	REVISION	DATE	REVISION



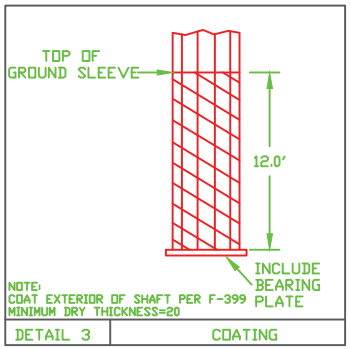
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
	37'-2.00"		4
15.0'			5
13.0'			4
12.0'			3
10.0'			2
10.0'			GL
0'-00"			1



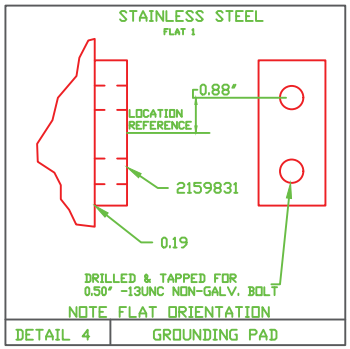
DETAIL 1 | BEARING PLATE



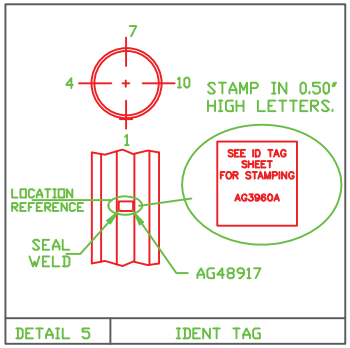
DETAIL 2 | GROUND SLEEVE



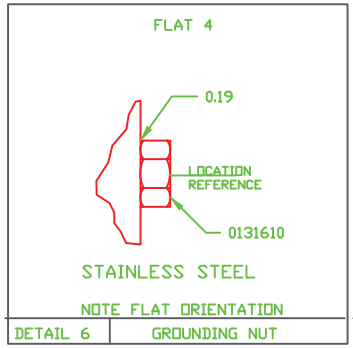
DETAIL 3 | COATING



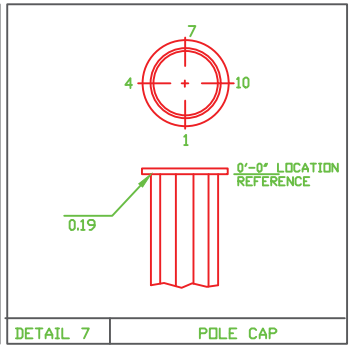
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
80'			

TUBE DIAMETERS MEASURED ACROSS FLATS

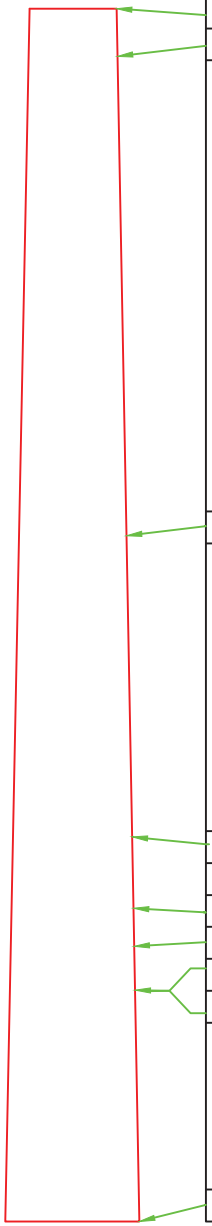
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

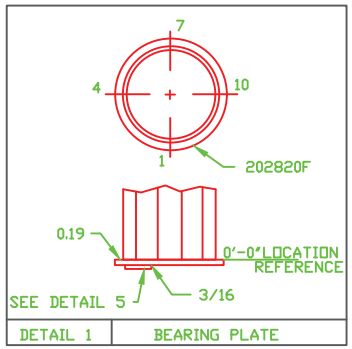
STRUCTURE 43
GROUNDING AND COATINGS DETAIL

DWN. JLS		DATE: 04/01/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

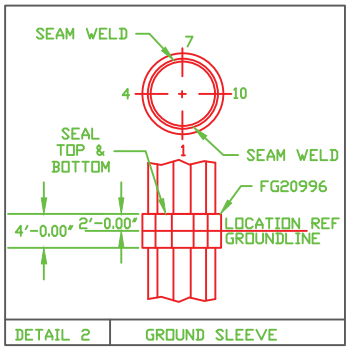
DWG. NO.
43G



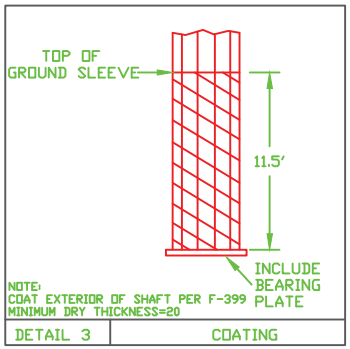
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	1'–6.00"		4
	33'–8.00"		4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'–00"			1



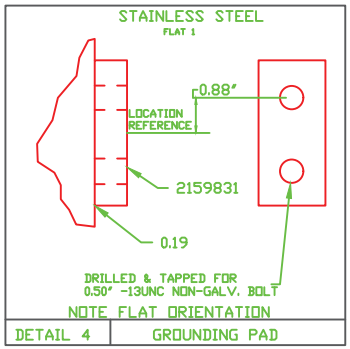
DETAIL 1 | BEARING PLATE



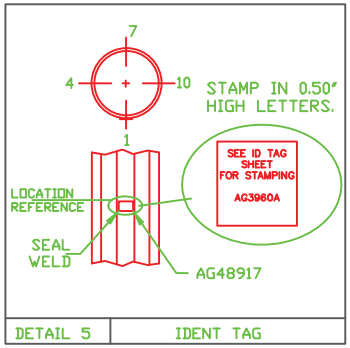
DETAIL 2 | GROUND SLEEVE



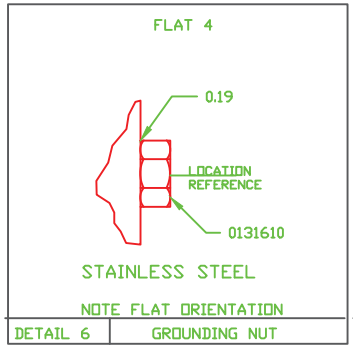
DETAIL 3 | COATING



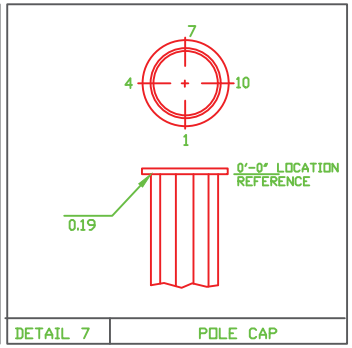
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
75'			

TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

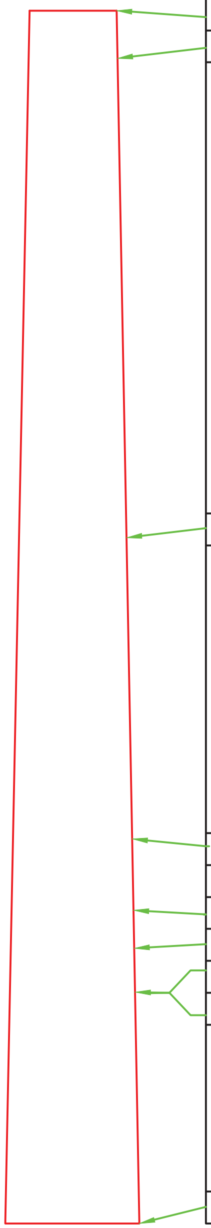
Greenville Utilities

STRUCTURE 44, 45, 46, 47, 49, 50, 52, 55, 56, 57, 58 GROUNDING AND COATINGS DETAIL

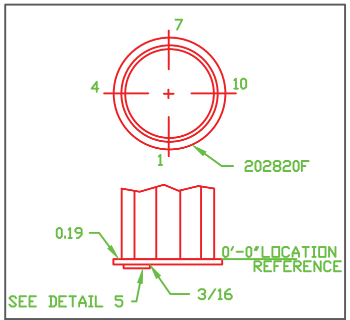
DWN. JLS		DATE: 04/01/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

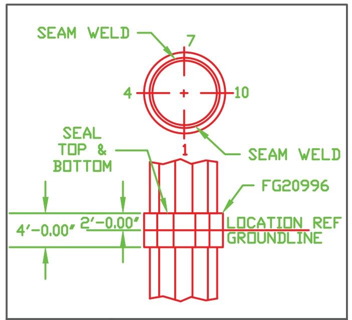
44G



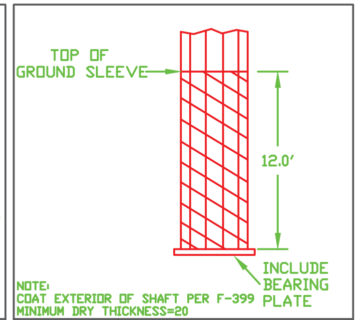
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	1'–6.00"		4
	48'–0.00"		4
15.0'			5
13.0'			4
12.0'			3
10.0'			2
10.0'			GL
0'–00"			1



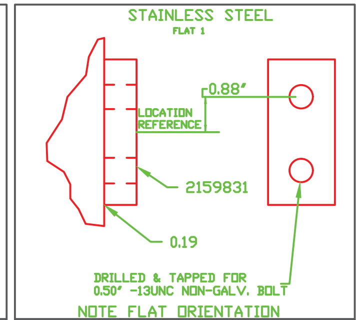
DETAIL 1 BEARING PLATE



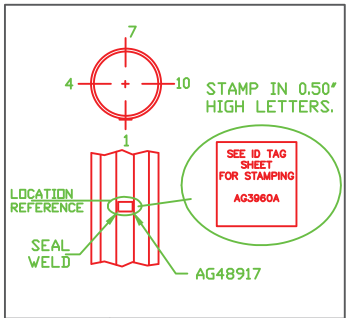
DETAIL 2 GROUND SLEEVE



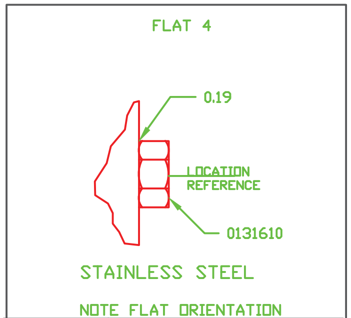
DETAIL 3 COATING



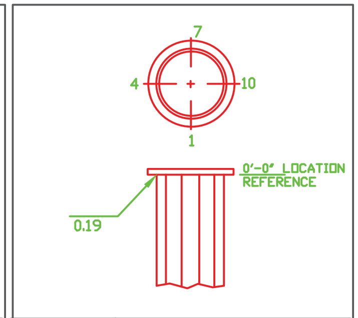
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

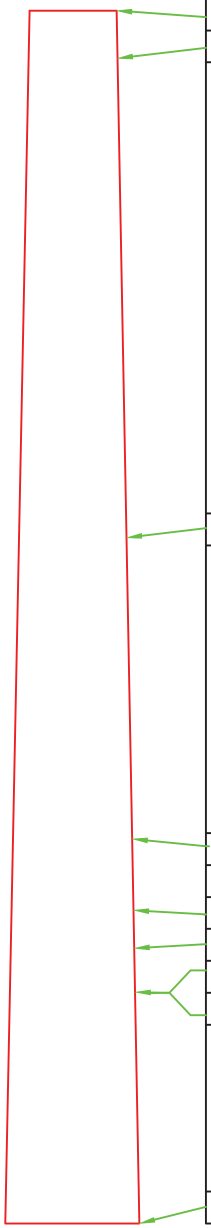
NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

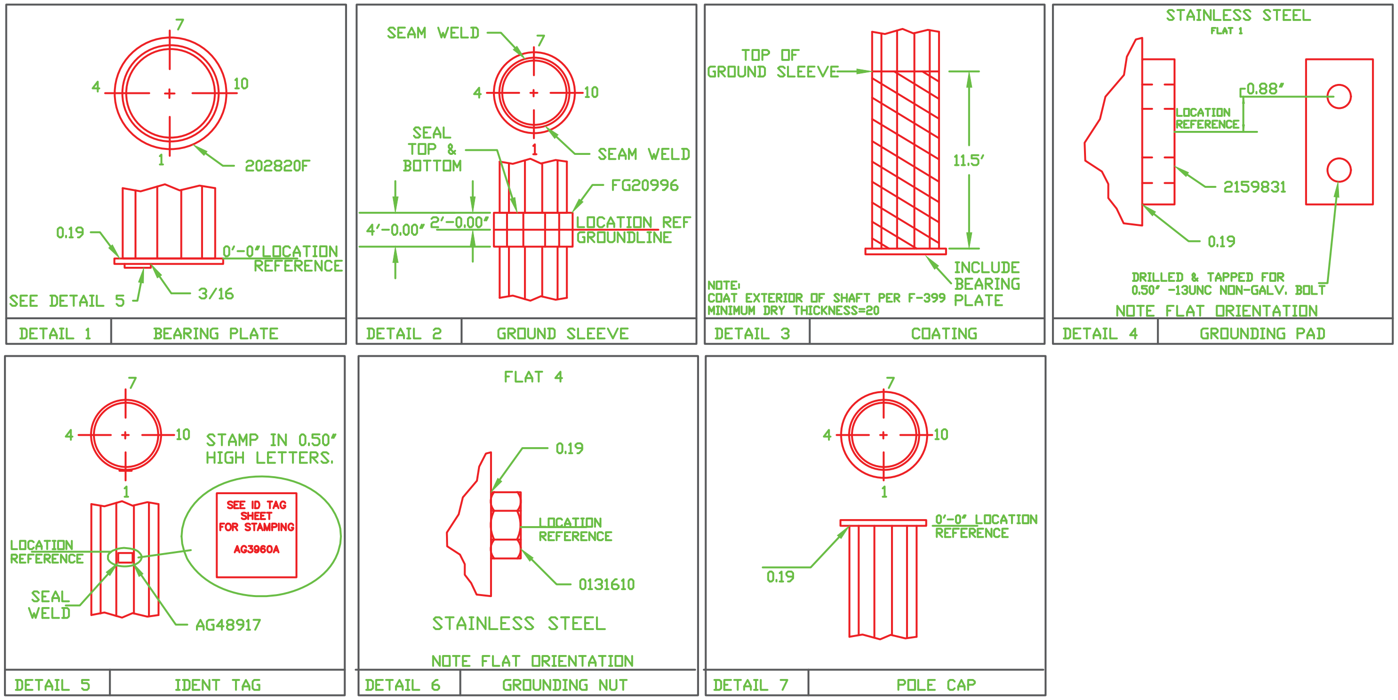
TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
80'			

TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION GREENVILLE, NORTH CAROLINA			
Greenville Utilities	STRUCTURE 48 GROUNDING AND COATINGS DETAIL		
DWN. JLS	DATE: 04/01/19		DWG. NO.
CKD. KW	APPD. KW		48G
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION



LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
	22'-0.00"		4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'-00"			1



NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	SMALL	THICKNESS (IN)
75'			

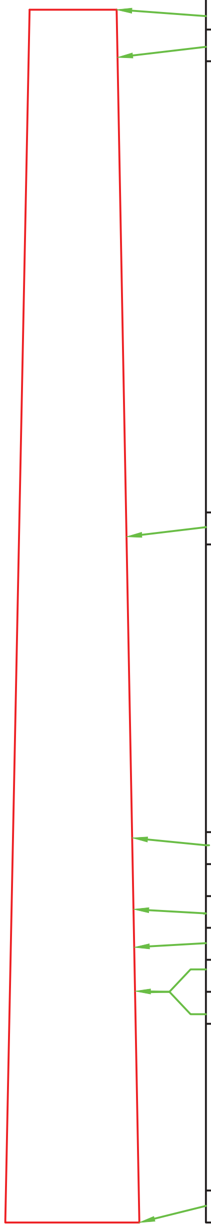
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

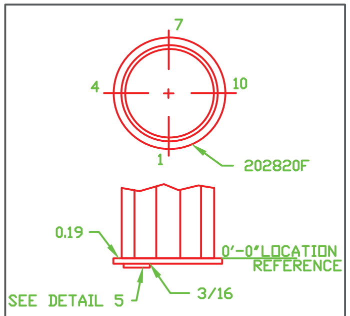
Greenville Utilities

STRUCTURE 53, 54
GROUNDING AND COATINGS DETAIL

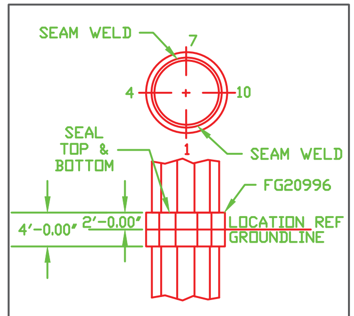
DWN. JLS	DATE: 04/01/19			DWG. NO.
CKD. KW	APPD. KW			
SCALE: N.T.S.				53G
DATE	REVISION	DATE	REVISION	



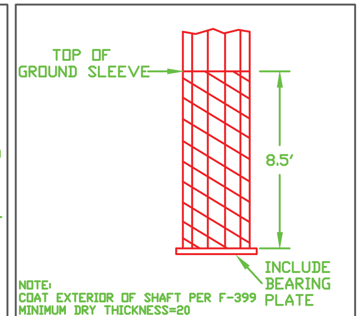
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
33'-0.00"			4
11.5'			5
9.5'			4
8.5'			3
6.5'			2
6.5'			GL
0'-00"			1



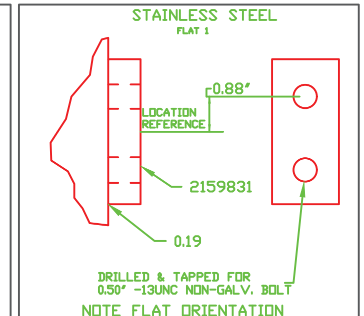
DETAIL 1 BEARING PLATE



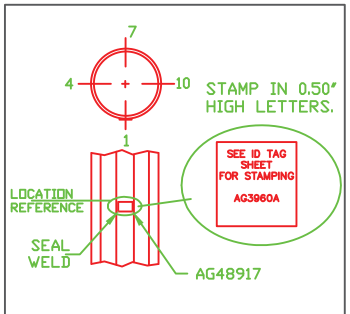
DETAIL 2 GROUND SLEEVE



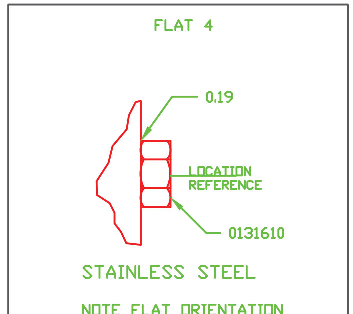
DETAIL 3 COATING



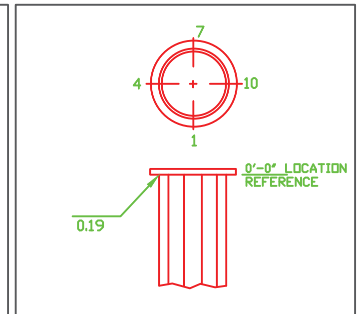
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING
ARE NOT TRUE TO PROPORTION.

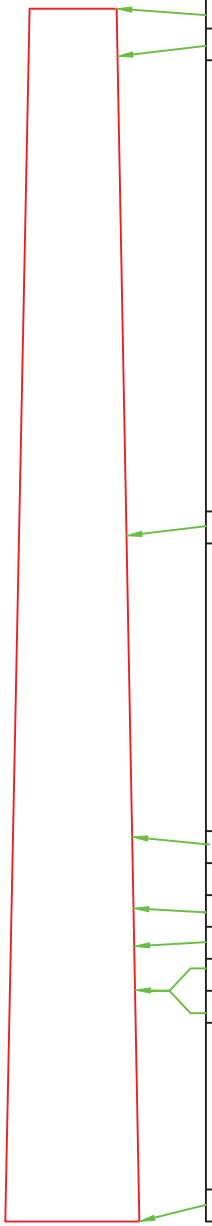
NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

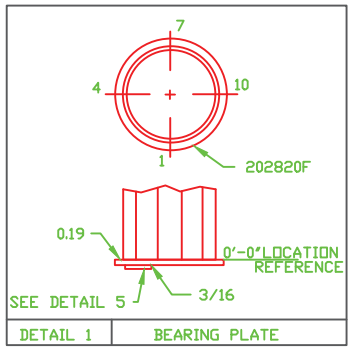
TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
45'			

TUBE DIAMETERS MEASURED ACROSS FLATS

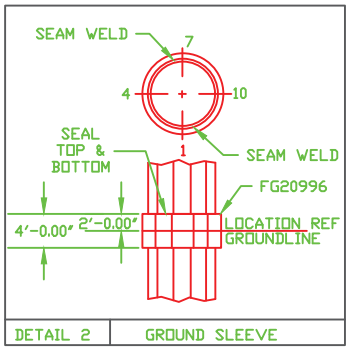
GREENVILLE UTILITIES COMMISSION GREENVILLE, NORTH CAROLINA				
Greenville Utilities	STRUCTURE 60 GROUNDING AND COATINGS DETAIL			
DWN. JLS		DATE: 04/01/19		DWG. NO. 60G
CKD. KW		APPD. KW		
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	



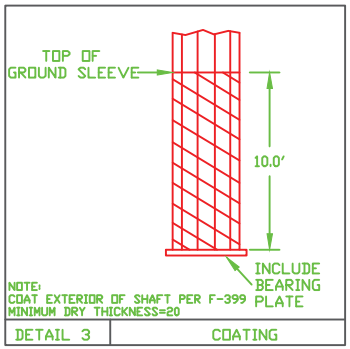
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
	0'-0.00"		7
	2'-0.00"		4
	34'-6.00"		4
15.0'			5
13.0'			4
12.0'			3
10.0'			2
10.0'			GL
0'-00"			1



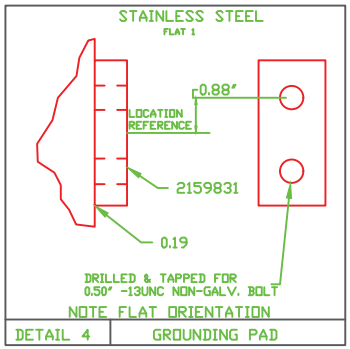
DETAIL 1 | BEARING PLATE



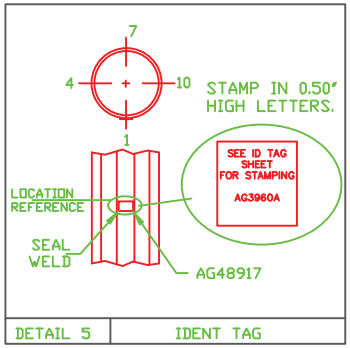
DETAIL 2 | GROUND SLEEVE



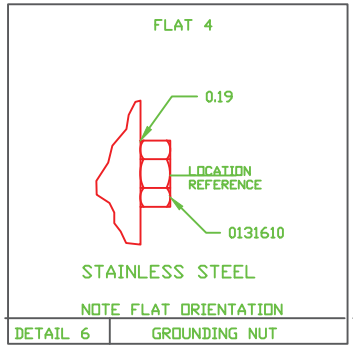
DETAIL 3 | COATING



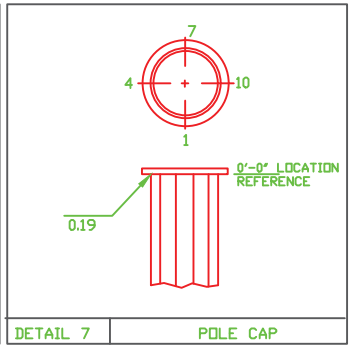
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
80'			

TUBE DIAMETERS MEASURED ACROSS FLATS

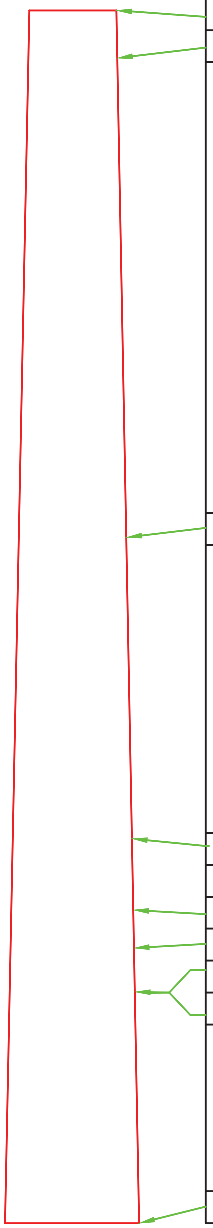
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

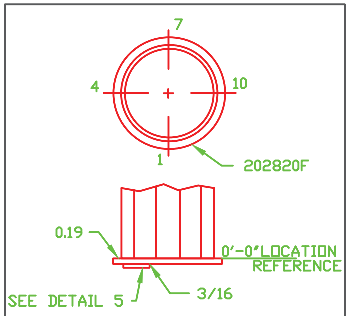
CKT 15 STRUCTURE 1
GROUNDING AND COATINGS DETAIL

DWN. JLS		DATE: 05/08/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

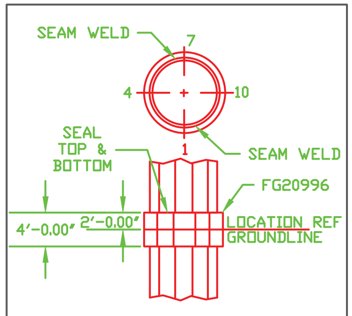
DWG. NO.
CKT15-1G



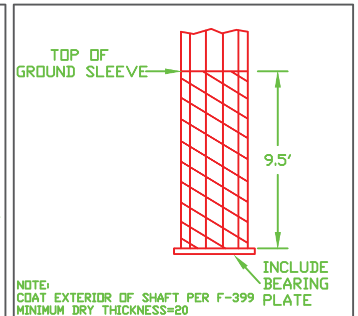
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	1'–6.00"		4
	34'–6.00"		4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'–00"			1



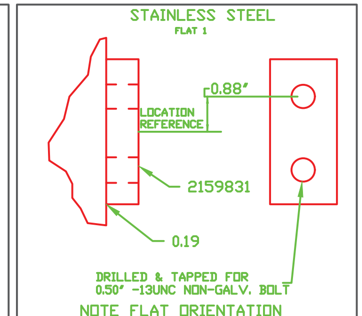
DETAIL 1 BEARING PLATE



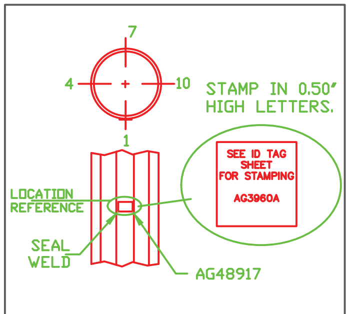
DETAIL 2 GROUND SLEEVE



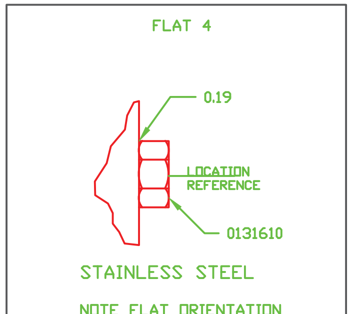
DETAIL 3 COATING



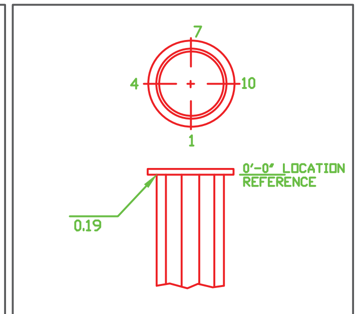
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
75'			

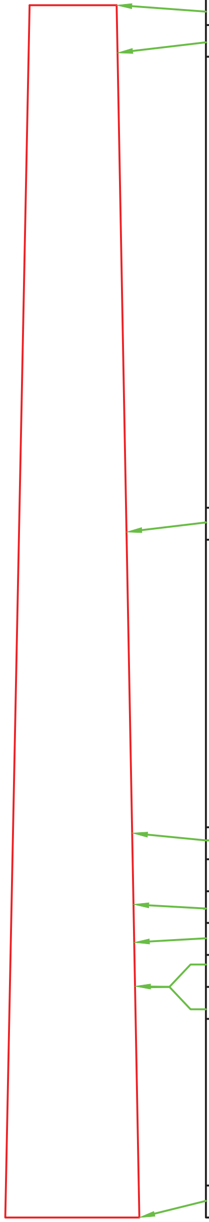
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

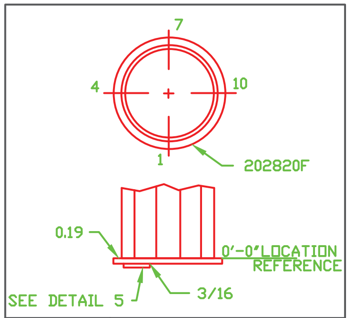
Greenville Utilities

CKT 15 STRUCTURE 2
GROUNDING AND COATINGS DETAIL

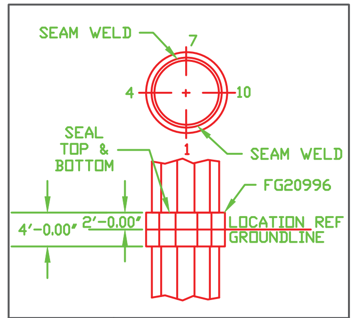
DWN. JLS		DATE: 05/08/19		DWG. NO.
CKD. KW		APPD. KW		
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	CKT15–2G



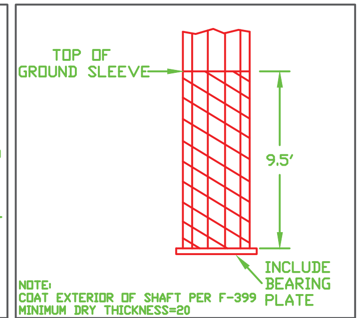
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	1'–6.00"		4
	41'–6.00"		4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'–00"			1



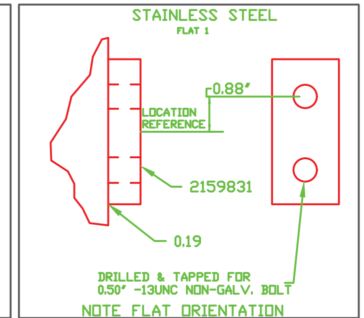
DETAIL 1 BEARING PLATE



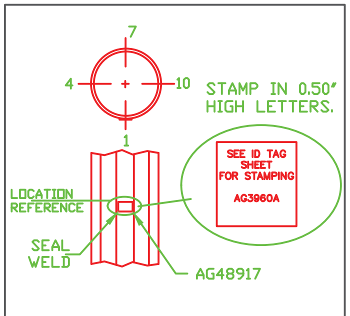
DETAIL 2 GROUND SLEEVE



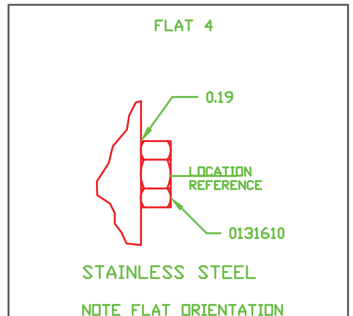
DETAIL 3 COATING



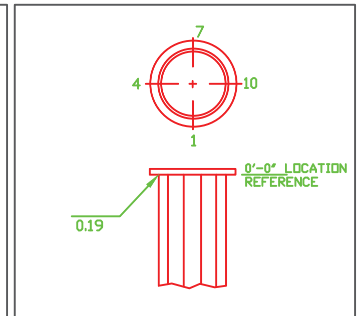
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

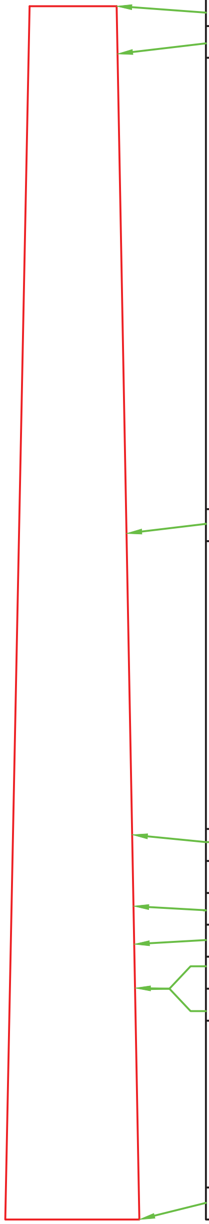
NOTE: DIMENSIONS IN THE DRAWING
ARE NOT TRUE TO PROPORTION.

NOTES:
1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

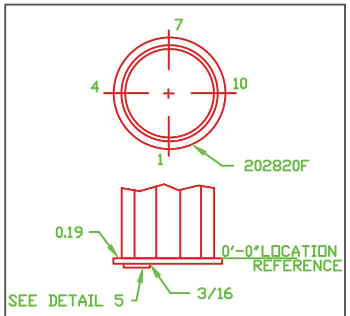
TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
75'			

TUBE DIAMETERS MEASURED ACROSS FLATS

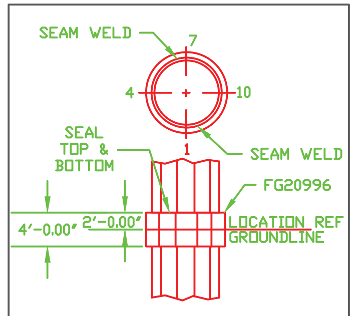
GREENVILLE UTILITIES COMMISSION GREENVILLE, NORTH CAROLINA				
Greenville Utilities	CKT 15 STRUCTURE 3 GROUNDING AND COATINGS DETAIL			
DWN. JLS		DATE: 05/08/19		DWG. NO.
CKD. KW		APPD. KW		
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	CKT15–3G



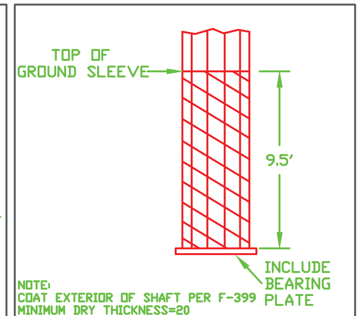
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	2'-0.00"		4
	37'-6.00"		4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'-00"			1



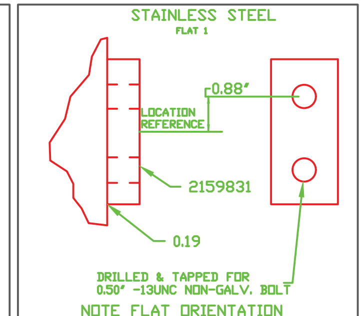
DETAIL 1 BEARING PLATE



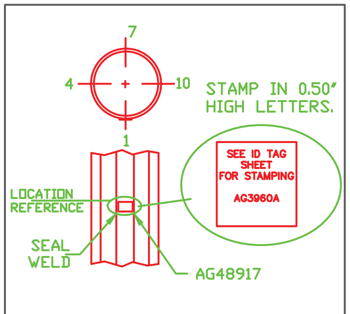
DETAIL 2 GROUND SLEEVE



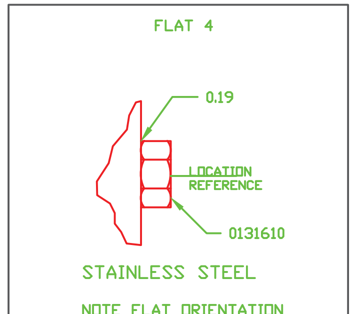
DETAIL 3 COATING



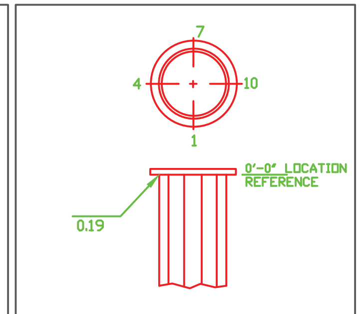
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
75'			

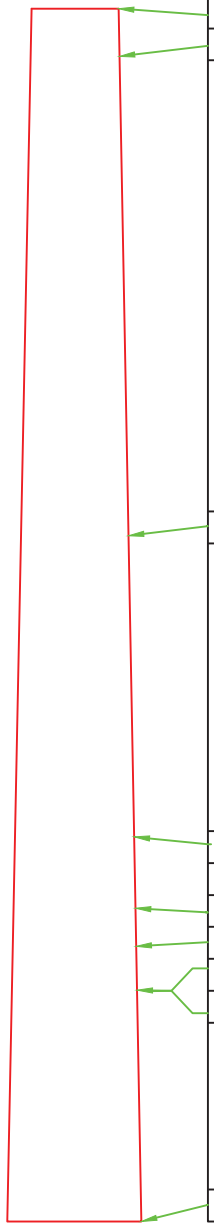
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

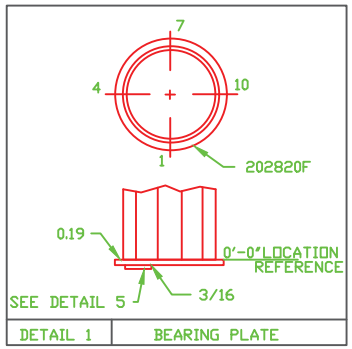
Greenville Utilities

CKT 15 STRUCTURE 4
GROUNDING AND COATINGS DETAIL

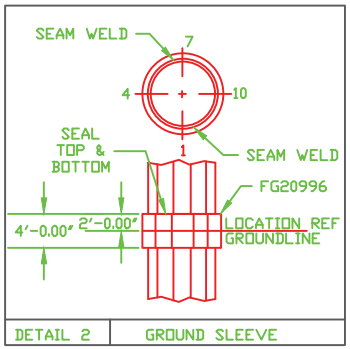
DWN. JLS		DATE: 05/08/19		DWG. NO.
CKD. KW		APPD. KW		
SCALE: N.T.S.				CKT15-4G
DATE	REVISION	DATE	REVISION	



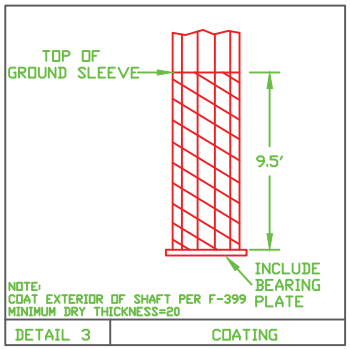
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
	37'-6.00"		4
14.5'			5
12.5'			4
11.5'			3
9.5'			2
9.5'			GL
0'-00"			1



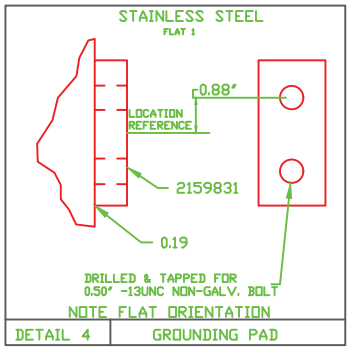
DETAIL 1 | BEARING PLATE



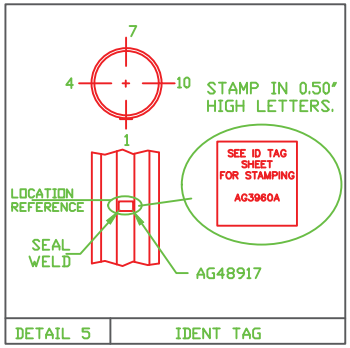
DETAIL 2 | GROUND SLEEVE



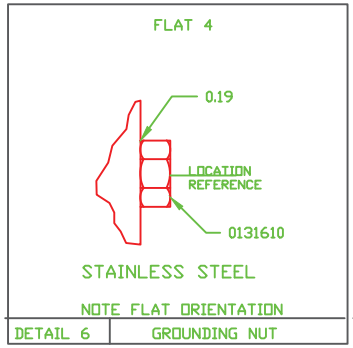
DETAIL 3 | COATING



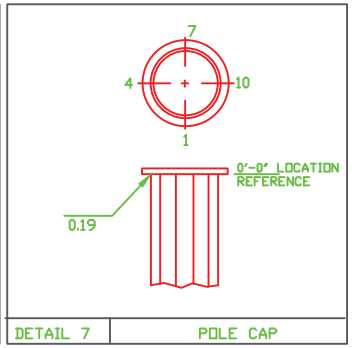
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
75'			

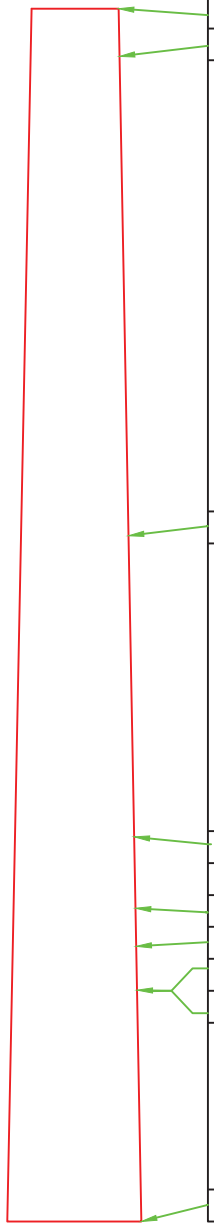
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

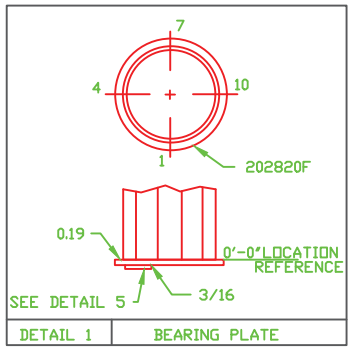
Greenville Utilities

CKT 15 STRUCTURE 6
GROUNDING AND COATINGS DETAIL

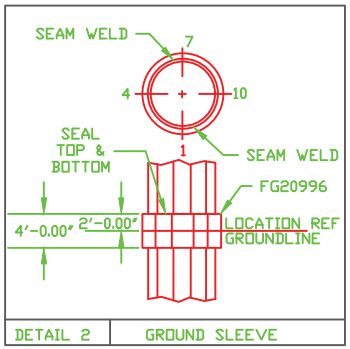
DWN. JLS		DATE: 05/08/19		DWG. NO.
CKD. KW		APPD. KW		
SCALE: N.T.S.				CKT15-6G
DATE	REVISION	DATE	REVISION	



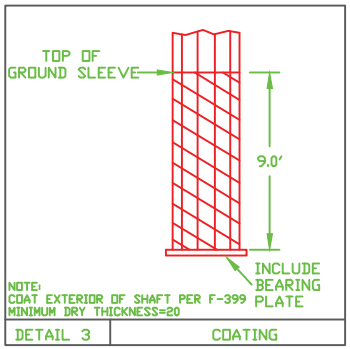
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
	37'-6.00"		4
14.0'			5
12.0'			4
11.0'			3
9.0'			2
9.0'			GL
0'-00"			1



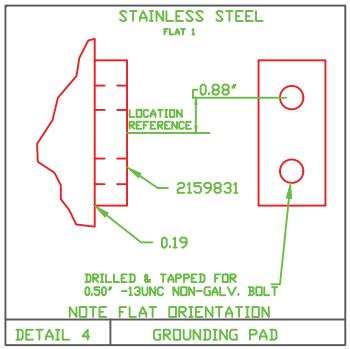
DETAIL 1 | BEARING PLATE



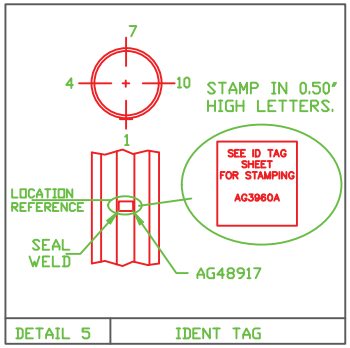
DETAIL 2 | GROUND SLEEVE



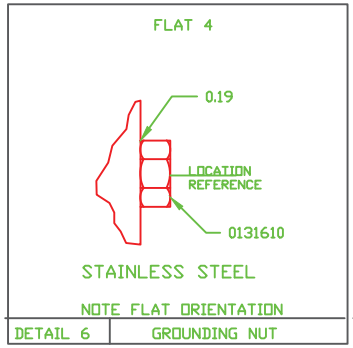
DETAIL 3 | COATING



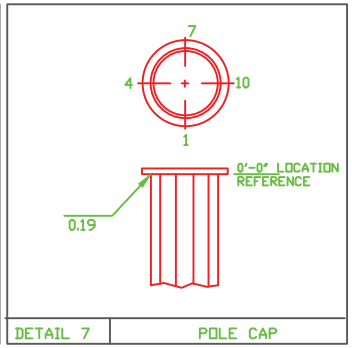
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
70'			

TUBE DIAMETERS MEASURED ACROSS FLATS

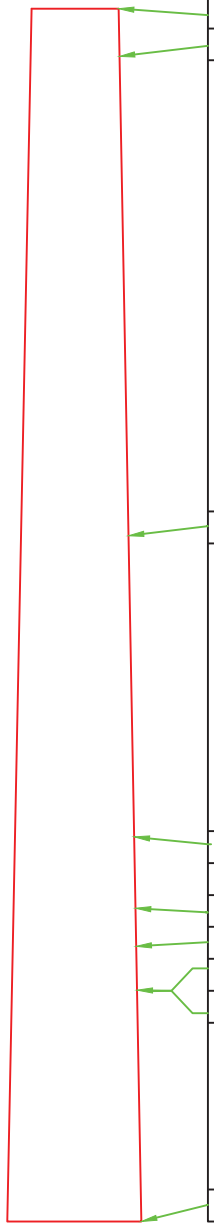
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

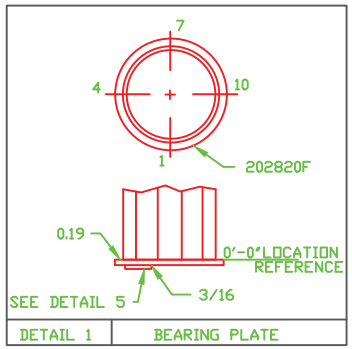
CKT 15 STRUCTURE 7, 8, 9
GROUNDING AND COATINGS DETAIL

DWN. JLS		DATE: 05/08/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

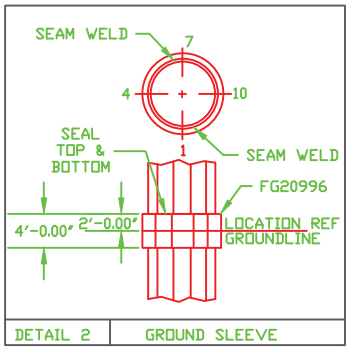
DWG. NO.
CKT15-7G



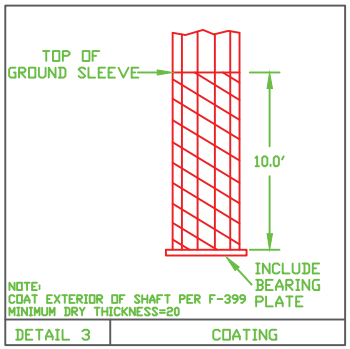
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
	0'-0.00"		7
	2'-0.00"		4
	37'-6.00"		4
15.0'			5
13.0'			4
12.0'			3
10.0'			2
10.0'			GL
0'-00"			1



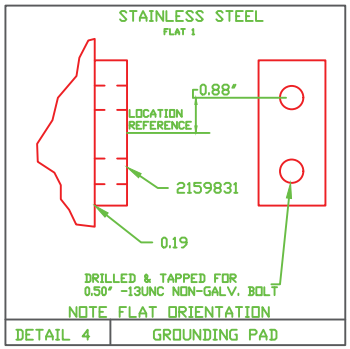
DETAIL 1 | BEARING PLATE



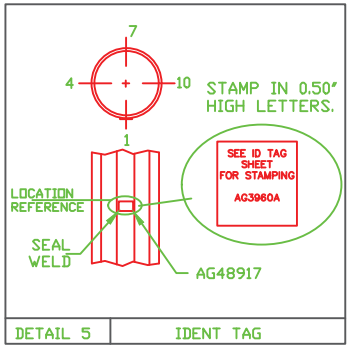
DETAIL 2 | GROUND SLEEVE



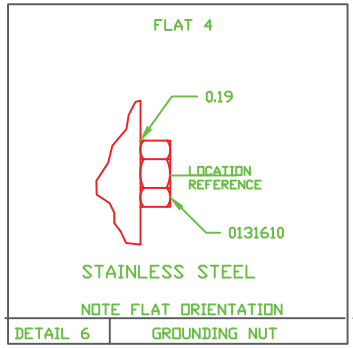
DETAIL 3 | COATING



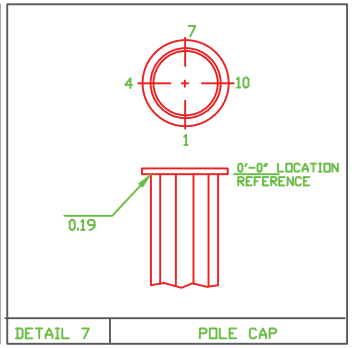
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
80'			

TUBE DIAMETERS MEASURED ACROSS FLATS

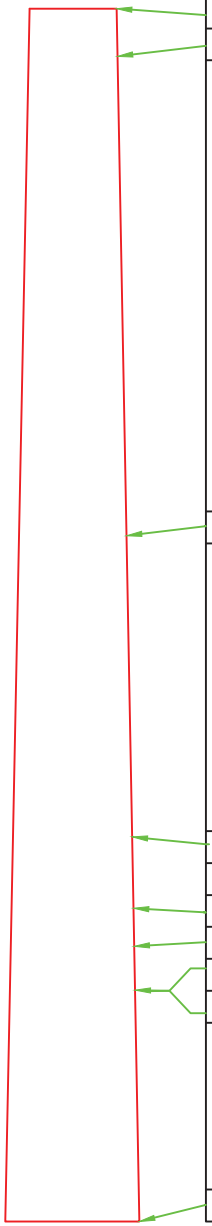
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

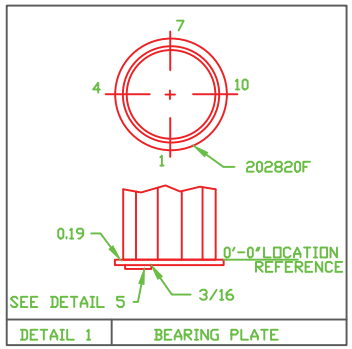
CKT 15 STRUCTURE 10
GROUNDING AND COATINGS DETAIL

DWN. JLS		DATE: 05/08/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

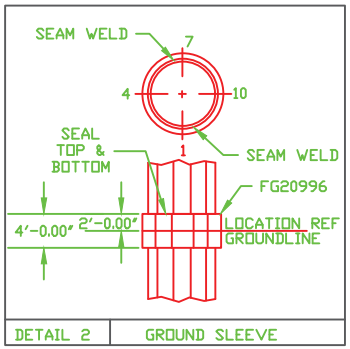
DWG. NO.
CKT15-10G



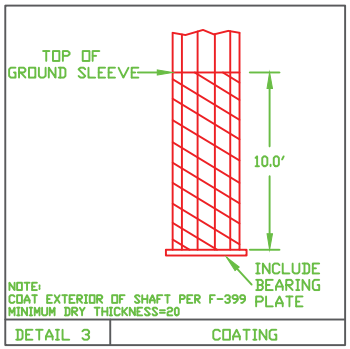
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
	45'-6.00"		4
15.0'			5
13.0'			4
12.0'			3
10.0'			2
10.0'			GL
0'-00"			1



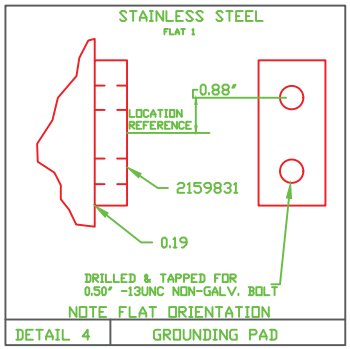
DETAIL 1 | BEARING PLATE



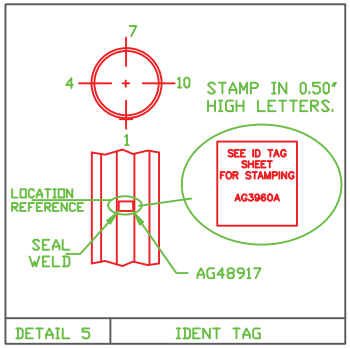
DETAIL 2 | GROUND SLEEVE



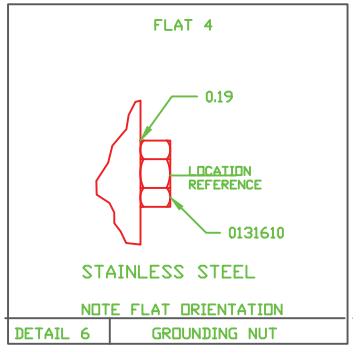
DETAIL 3 | COATING



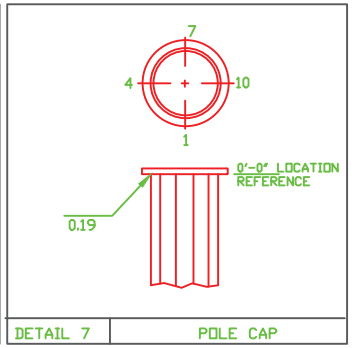
DETAIL 4 | GROUNDING PAD



DETAIL 5 | IDENT TAG



DETAIL 6 | GROUNDING NUT



DETAIL 7 | POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
80'			

TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

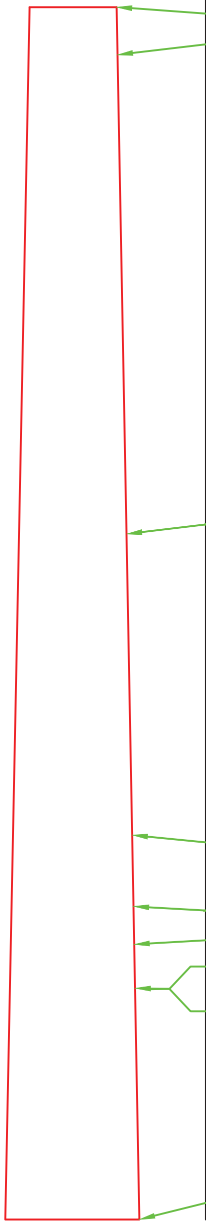
Greenville Utilities

CKT 11 STRUCTURES 1-3 & 5-13
GROUNDING AND COATINGS DETAIL

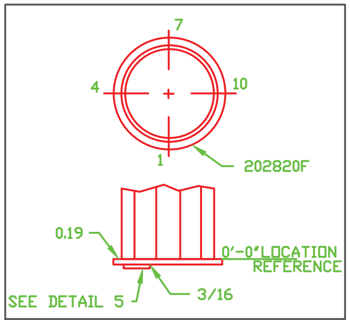
DWN. JLS		DATE: 05/07/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

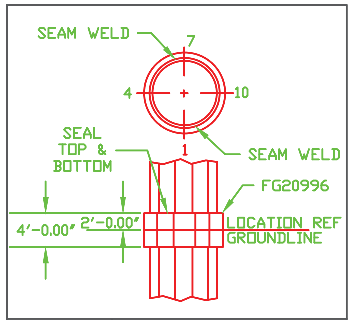
CKT11-1G



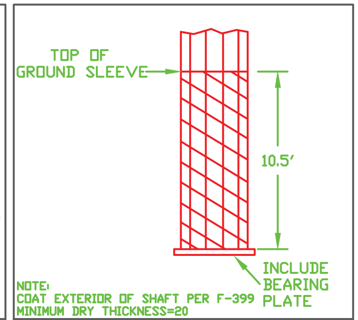
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK–M–1	DETAIL
	0'–0.00"		7
	2'–0.00"		4
	50'–6.00"		4
15.5'			5
13.5'			4
12.5'			3
10.5'			2
10.5'			GL
0'–00"			1



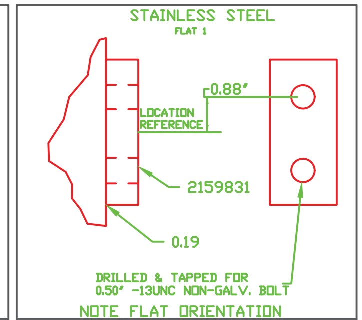
DETAIL 1 BEARING PLATE



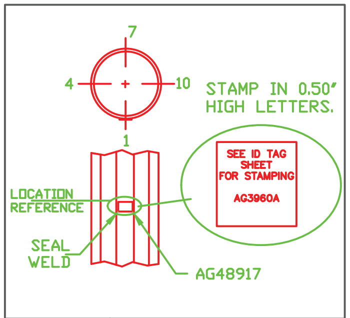
DETAIL 2 GROUND SLEEVE



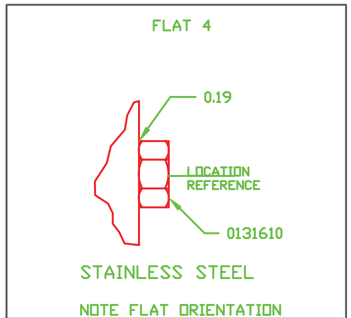
DETAIL 3 COATING



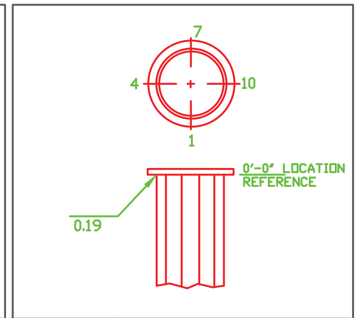
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:
1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S–99

TUBE LENGTH	END OD (IN) LARGE	SMALL	THICKNESS (IN)
85'			

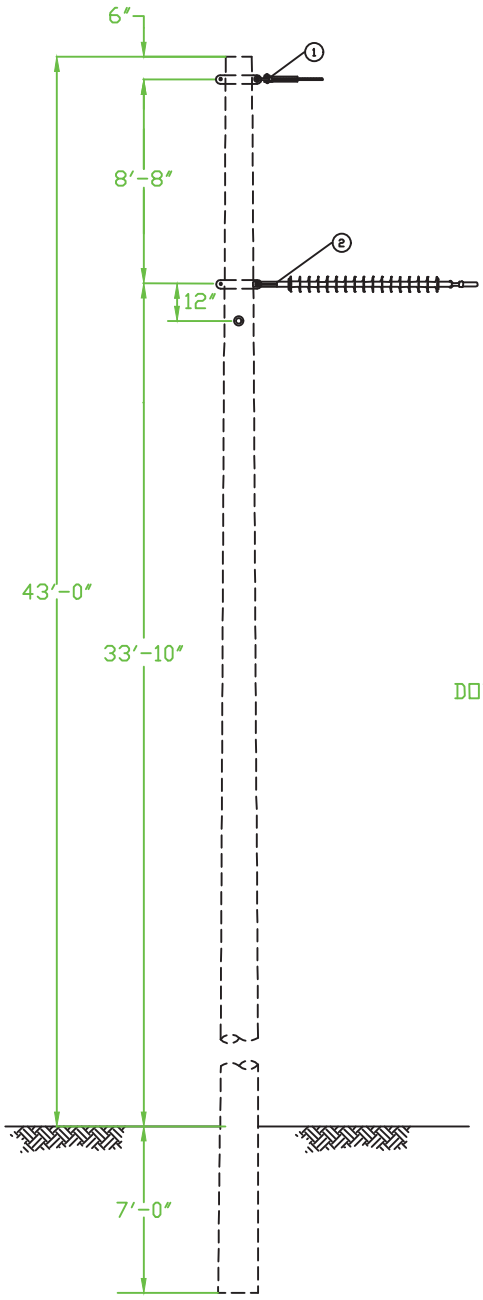
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

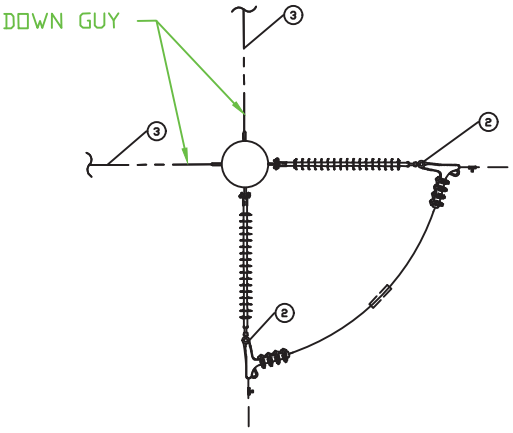
Greenville Utilities

CKT 11 STRUCTURE 4
GROUNDING AND COATINGS DETAIL

DWN. JLS	DATE: 05/07/19			DWG. NO.
CKD. KW	APPD. KW			
SCALE: N.T.S.				
DATE	REVISION	DATE	REVISION	CKT11–4G



NOTE: DRAWING IS NOT TO SCALE



OVERHEAD VIEW OF
STRUCTURE 1

NOTE: DOWN GUYS OPPOSITE OF
STATIC AND EACH DEADEND

50′ STRUCTURE

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, DEADEND	–	TM-4
2	2	DEAD END ASSEMBLY, PRIMARY	–	TM-1EM
3	3	SINGLE DOWN GUY	–	TG-21A
	3	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

LIST OF MATERIALS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

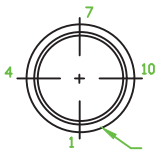
Greenville Utilities

STRUCTURE 1
115 KV 3 PHASE 3 POLE STRUCTURE
LARGE ANGLE, DEADEND

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

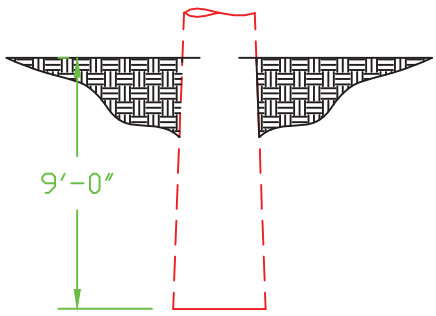
DWG. NO.

TST4

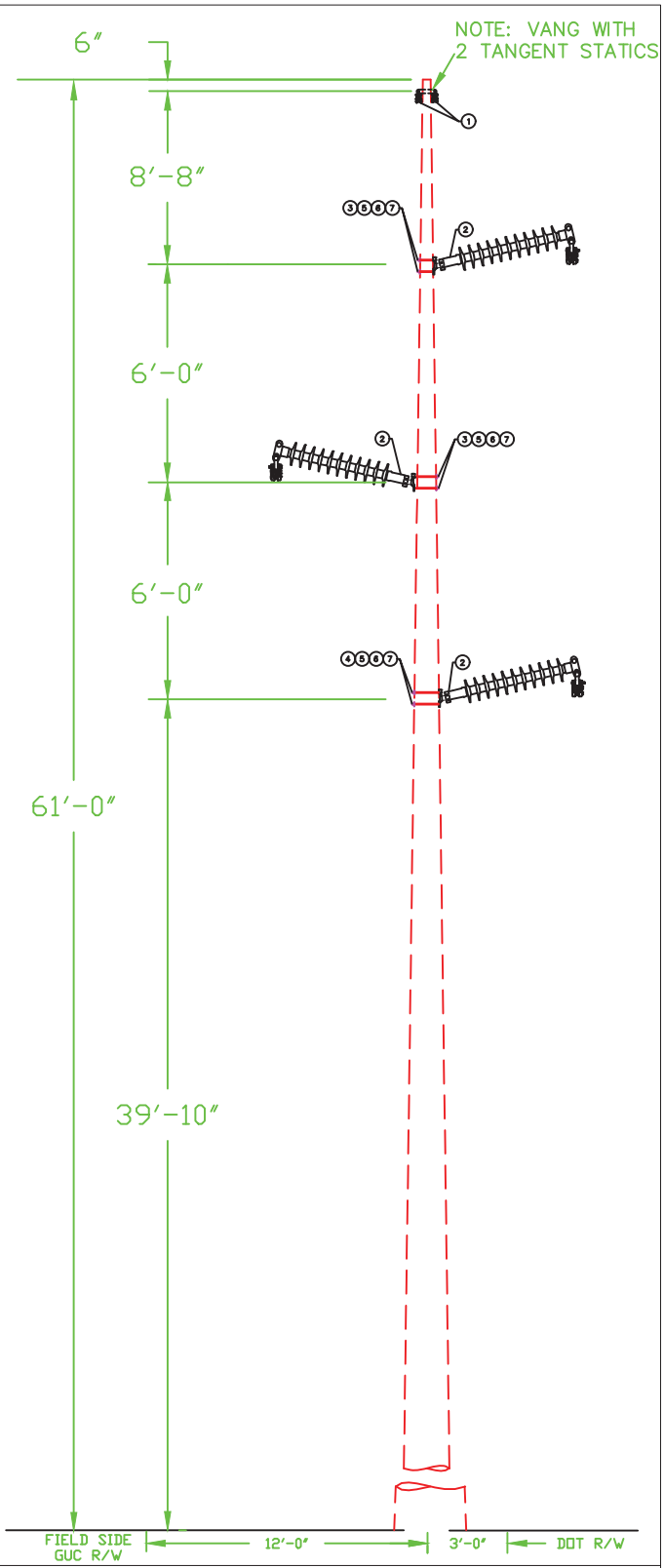


THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	8'–8.00"	4
1.25"	9'–8.00"	4
1.25"	14'–8.00"	4
1.25"	15'–8.00"	4
1.25"	20'–8.00"	4
1.25"	21'–8.00"	4

NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.



70' STRUCTURE EMBEDMENT



DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
3	4	BOLT, MACHINE, 3/4" x 14"	–	
4	2	BOLT, MACHINE, 3/4" x 16"	–	
5	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	
6	6	SPRING LOCK WASHER, 3/4"	–	
7	6	NUT, 3/4"	–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

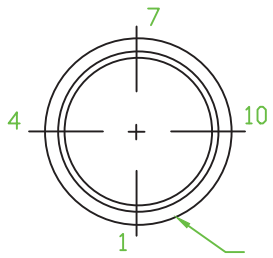
Greenville Utilities

STRUCTURES 2,4,5
115 KV 3 PHASE, Z–FRAME STRUCTURE,
TANGENT, POST INSULATORS

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

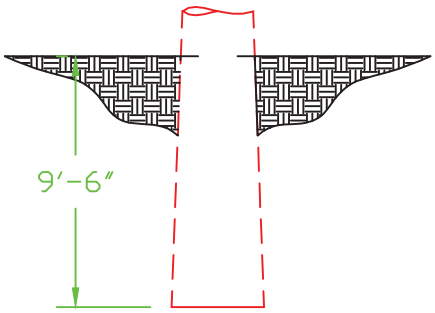
DWG. NO.

TPZ1.1

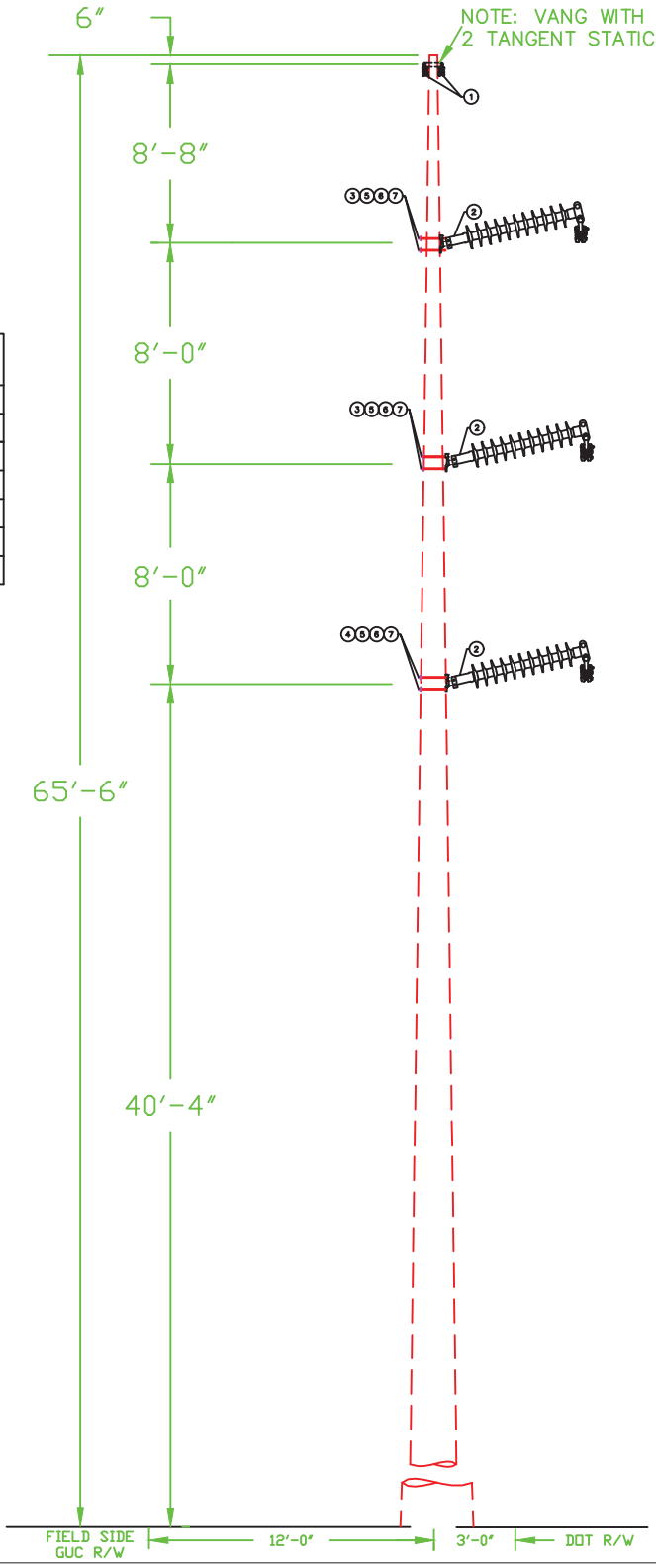


THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	8'-8.00"	10
1.25"	9'-8.00"	10
1.25"	16'-8.00"	10
1.25"	17'-8.00"	10
1.25"	24'-8.00"	10
1.25"	25'-8.00"	10

NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.



75' STRUCTURE EMBEDMENT



DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, TANGENT	–	TM-4A
2	3	115 KV POST INSULATOR, SMALL ANGLE	–	TM-3DM
3	4	BOLT, MACHINE, 3/4" x 14"	–	
4	2	BOLT, MACHINE, 3/4" x 16"	–	
5	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	
6	6	SPRING LOCK WASHER, 3/4"	–	
7	6	NUT, 3/4"	–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

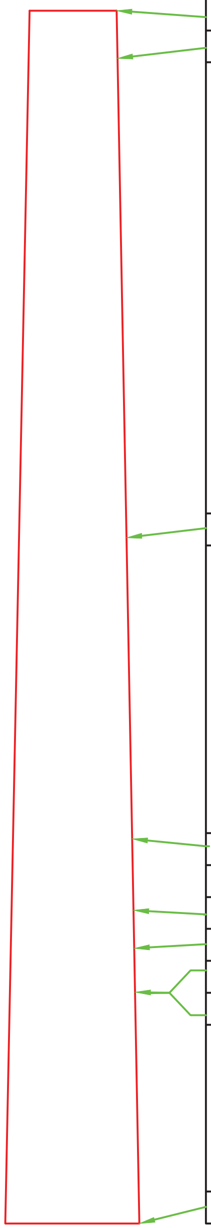
Greenville Utilities

STRUCTURE 3
115 KV 3 PHASE, VERTICAL STRUCTURE,
SMALL ANGLE, POST INSULATORS

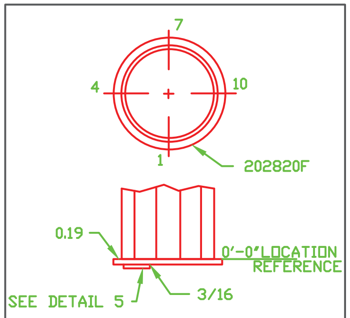
DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

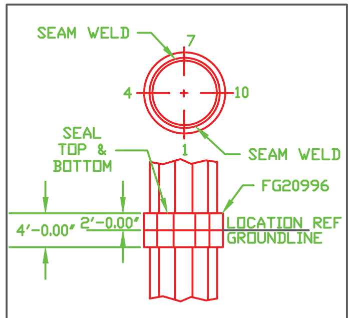
TPV2.1



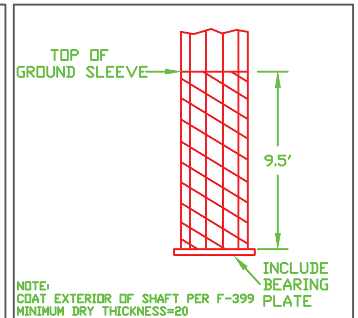
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
33'-0.00"			4
12.5'			5
10.5'			4
9.5'			3
7.5'			2
7.5'			GL
0'-00"			1



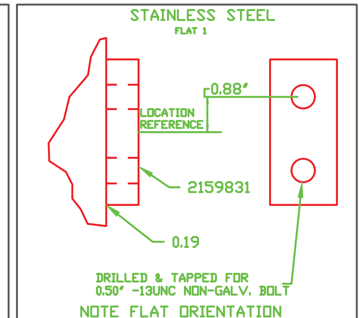
DETAIL 1 BEARING PLATE



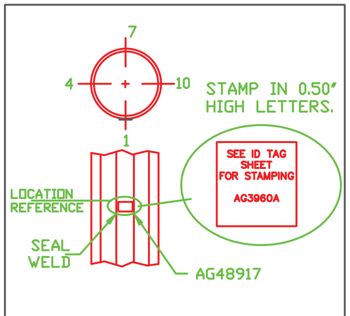
DETAIL 2 GROUND SLEEVE



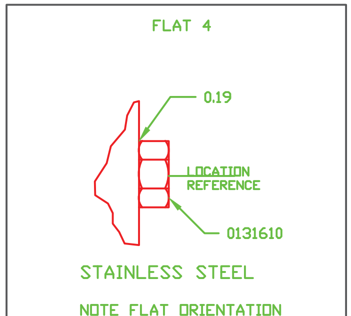
DETAIL 3 COATING



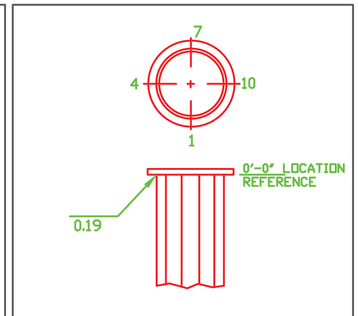
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
0.75"	0'-5.00"	4
0.75"	0'-9.00"	4
1.25"	2'-3.00"	1
1.25"	3'-6.00"	1

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:

1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	END OD (IN) SMALL	THICKNESS (IN)
55'			

TUBE DIAMETERS MEASURED ACROSS FLATS

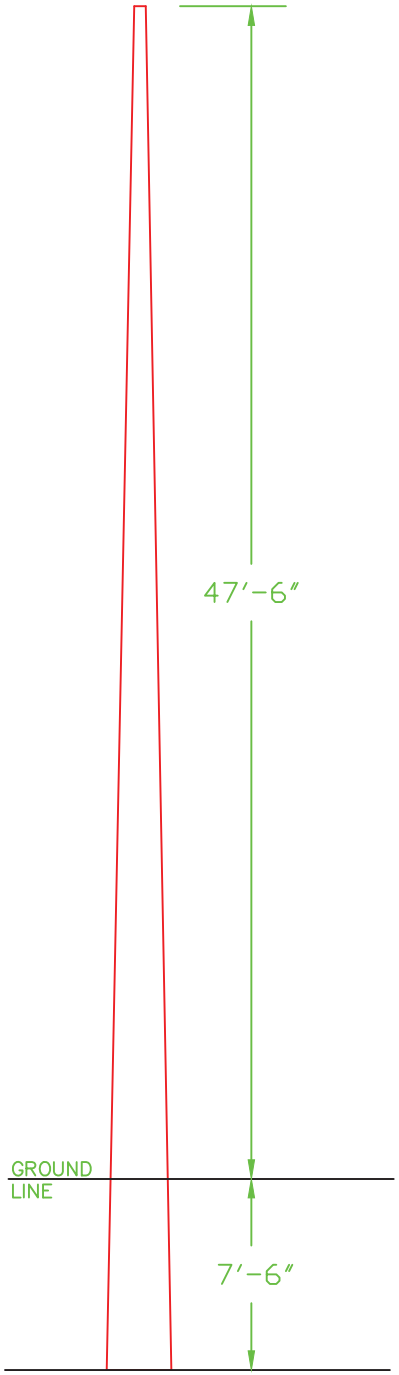
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 6
115 KV 3 PHASE, H-FRAME STRUCTURE, TANGENT

DWN. JLS	DATE: 11/01/18	DWG. NO.
CKD. KW	APPD. KW	
SCALE: N.T.S.	PAGE: 1 OF 4	TSH1.1

DATE	REVISION	DATE	REVISION



ELEVATION VIEW
SEE FABRICATION DRAWINGS
FOR ADDITIONAL DETAIL

NOTE: DIMENSIONS IN THE DRAWING
ARE NOT TRUE TO PROPORTION.

55' WEATHERING STEEL POLE

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
	2	DOUBLE BOLT OHGW SUPPORT	–	TM–6B(S)
	2	OHGW ASSEMBLY, DEADEND	–	TM–4
	3	TANGENT ASSEMBLY, PRIMARY	–	TM–1AM

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 6
115 KV 3 PHASE, H–FRAME STRUCTURE,
TANGENT

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE: 2 OF 4	
DATE	REVISION	DATE	REVISION

DWG. NO.

TSH1.1

AG3967Z

TOTAL HARDWARE QUANTITIES TO INCLUDE AN EXTRA 5% OVERAGE

BILL OF MATERIAL
(SHIPPING SEQ. = 1 FOR ALL)

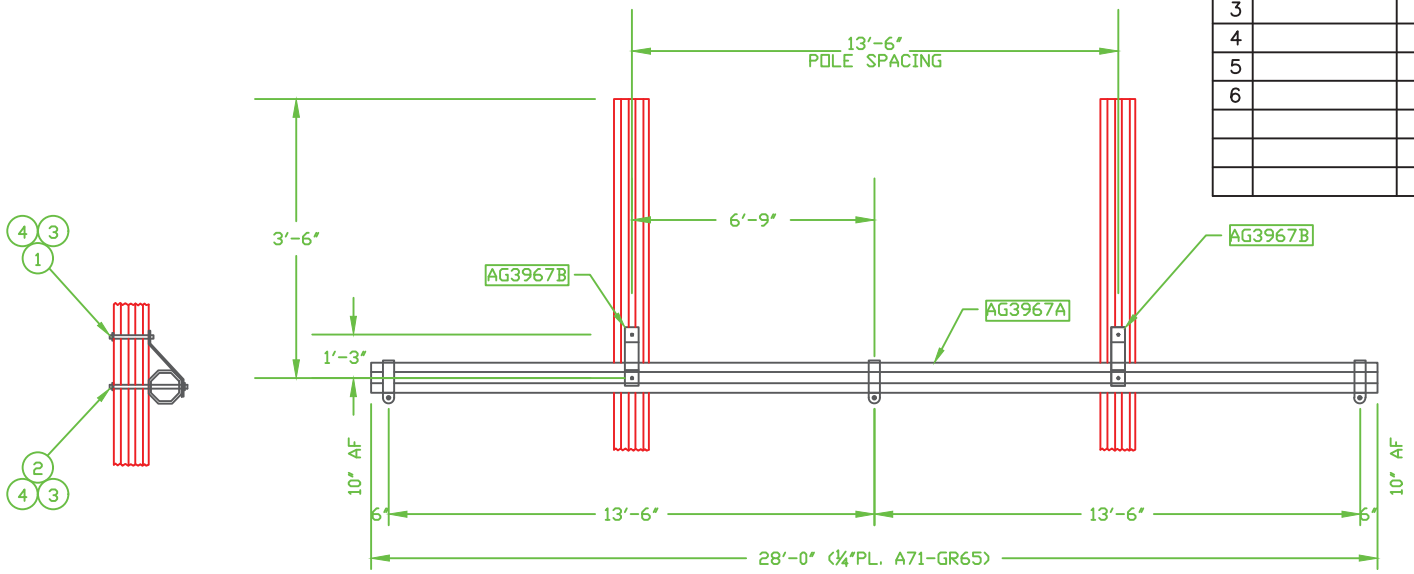
PART #	DESCRIPTION	UNIT WEIGHT	QTY PER STR.
AG3967A	CROSSARM	790	1
	GALVANIZED STEEL MOUNTING STRAP	20	2
AG99267	HARDWARE KIT		1

DESCRIPTION

LINE	PART NUMBER	HARDWARE SIZE				GEN.	FINISH	ASTM SPEC.	QTY PER STR.
		BOLT		NUT	WASHER				
		DIA.	LENGTH						
1		1				TYPE3	BARE	A325	2
2		1				TYPE3	BARE	A325	2
3				1		ANCO	BARE	A563	8
4					1	FLT	BARE	F436	16
5									
6									

MANUFACTURER NOTE:

MANUFACTURER IS RESPONSIBLE FOR MOUNTING BOLTS BEING LONG ENOUGH TO FIT POLE CLASSES SPECIFIED.



115 kV H-FRAME 28' CROSSARM

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 6
115 KV 3 PHASE, H-FRAME STRUCTURE, TANGENT

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE: 3 OF 4	
DATE	REVISION	DATE	REVISION

DWG. NO.

TSH1.1

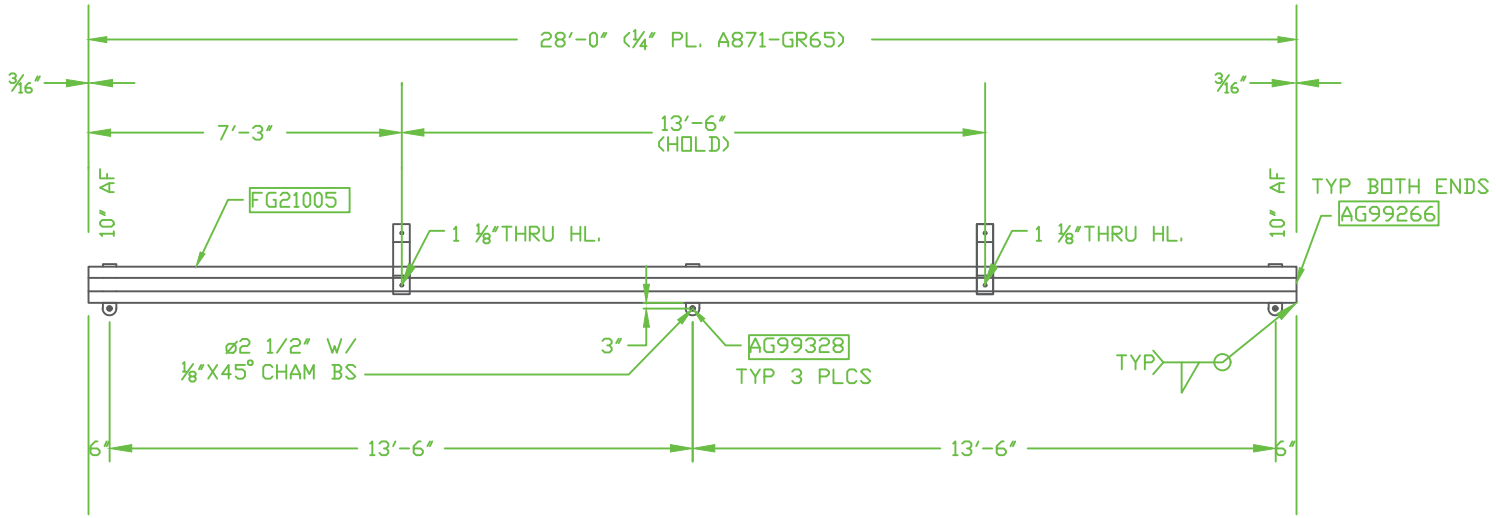
AG3967A

BILL OF MATERIAL	
PART NUMBER	QTY.
FG21005	1
AG99328	3
AG99266	2

MANUFACTURER NOTE:

MANUFACTURER IS RESPONSIBLE FOR MOUNTING BOLTS BEING LONG ENOUGH TO FIT POLE CLASSES SPECIFIED.

ALL WELDS UNLESS NOTED. 1/4



NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

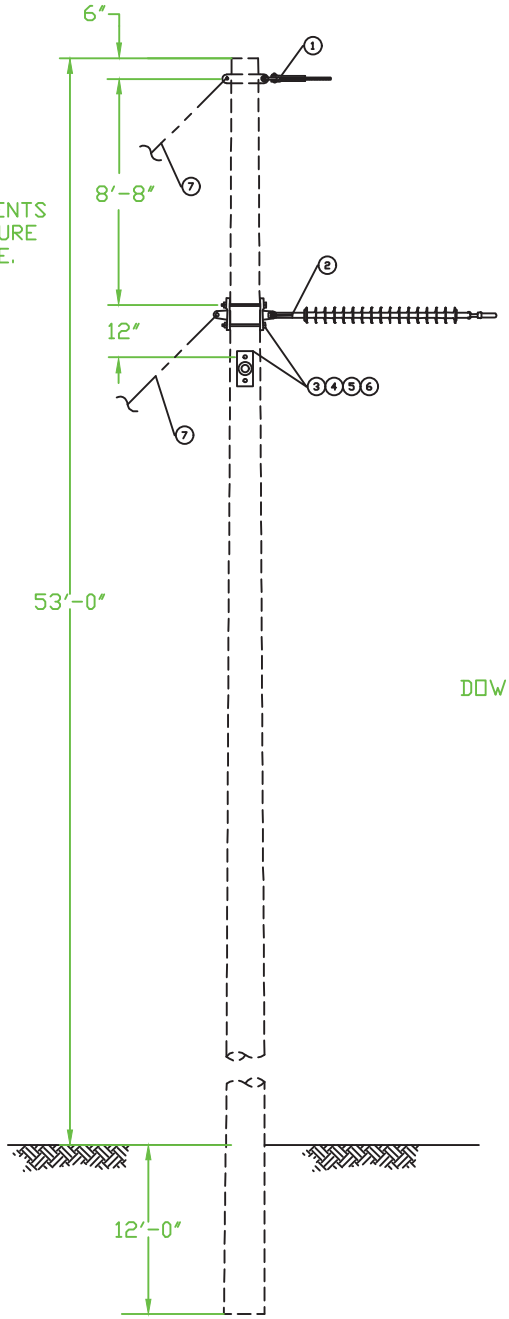
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 6
115 KV 3 PHASE, H-FRAME STRUCTURE, TANGENT

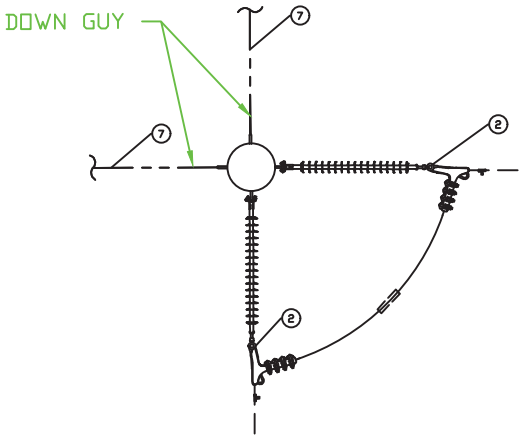
DWN. JLS		DATE: 11/01/18		DWG. NO.
CKD. KW		APPD. KW		
SCALE: N.T.S.		PAGE: 4 OF 4		TSH1.1
DATE	REVISION	DATE	REVISION	

NOTE: 8'-8" DIMENSION BETWEEN STATIC AND INSULATOR IS THE MINIMUM. ATTACHMENTS WILL BE FIELD DRILLED FOR EACH STRUCTURE BASED ON OVERHEAD CONDUCTOR CLEARANCE.



NOTE: DRAWING IS NOT TO SCALE

OVERHEAD VIEW



NOTE: DOWN GUYS OPPOSITE OF STATIC AND EACH DEADEND. ANGLE BETWEEN CONDUCTORS WILL BE DETERMINED IN FIELD.

65' STRUCTURE

LIST OF MATERIALS

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, DEADEND	–	TM-4
2	2	DEAD END ASSEMBLY, PRIMARY	–	TM-1EM
3	4	GUY PLATE, TRANSMISSION	–	TG-27D
4	4	BOLT, MACHINE, 3/4" x 14"	–	
5	4	SPRING LOCK WASHER, 3/4"	–	
6	4	NUT, 3/4"	–	
7	3	SINGLE DOWN GUY	–	TG-21A
	3	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

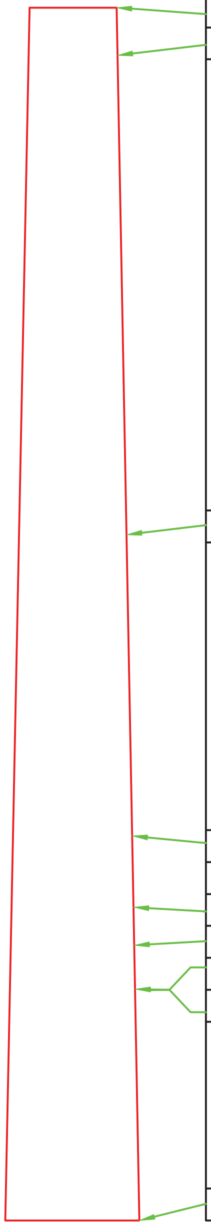
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

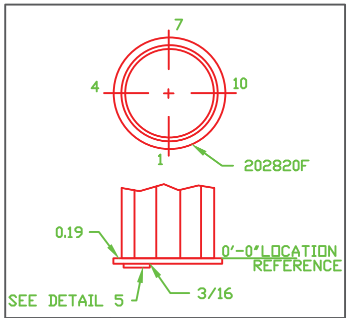
STRUCTURE 8A, 8B, 8C
115 KV 3 PHASE 3 POLE STRUCTURE
LARGE ANGLE, DOUBLE DEADEND (ALTERNATE DIMENSIONS)

DWN. JLS	DATE: 11/01/18	DWG. NO.
CKD. KW	APPD. KW	
SCALE: N.T.S.		TST4.2

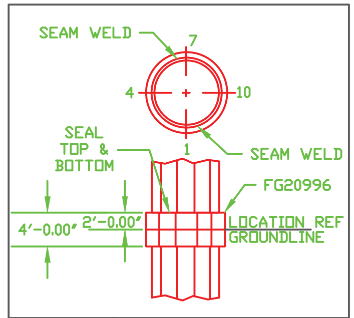
DATE	REVISION	DATE	REVISION



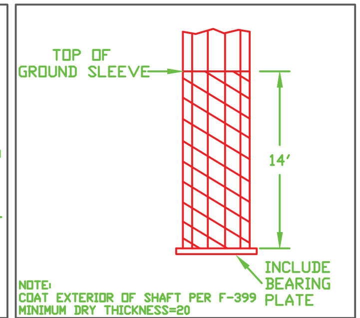
LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK-M-1	DETAIL
	0'-0.00"		7
	1'-6.00"		4
33'-0.00"			4
17'			5
15'			4
14'			3
12'			2
12'			GL
0'-00"			1



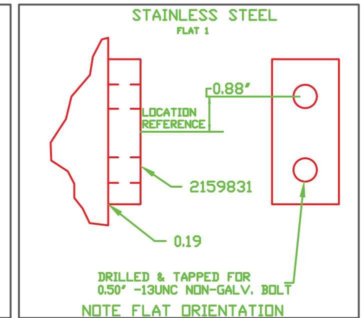
DETAIL 1 BEARING PLATE



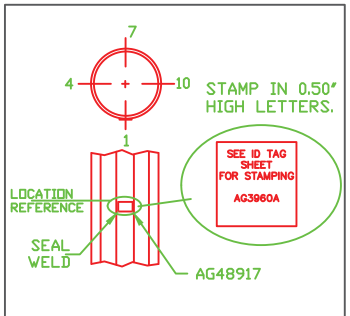
DETAIL 2 GROUND SLEEVE



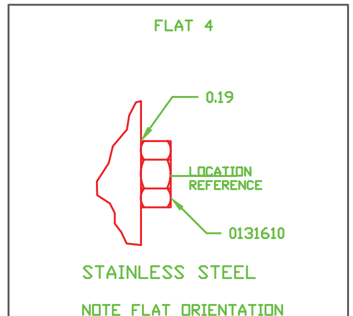
DETAIL 3 COATING



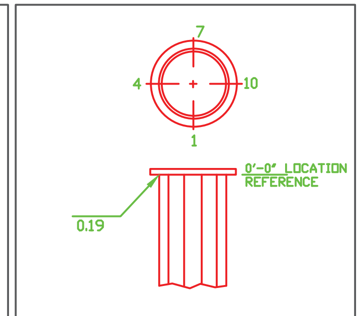
DETAIL 4 GROUNDING PAD



DETAIL 5 IDENT TAG



DETAIL 6 GROUNDING NUT



DETAIL 7 POLE CAP

THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
0.75"	0'-5.00"	4
0.75"	0'-9.00"	4
1.25"	2'-3.00"	1
1.25"	3'-6.00"	1

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

NOTES:
1. FLATS 1 AND 12 ARE ADJACENT TO SEAM WELD
2. ALL CROSS SECTION VIEWS ARE FROM SMALL END OF TUBE.
3. POLE TUBE DATA REF MATERIAL=S-99

TUBE LENGTH	END OD (IN) LARGE	SMALL	THICKNESS (IN)
65'			

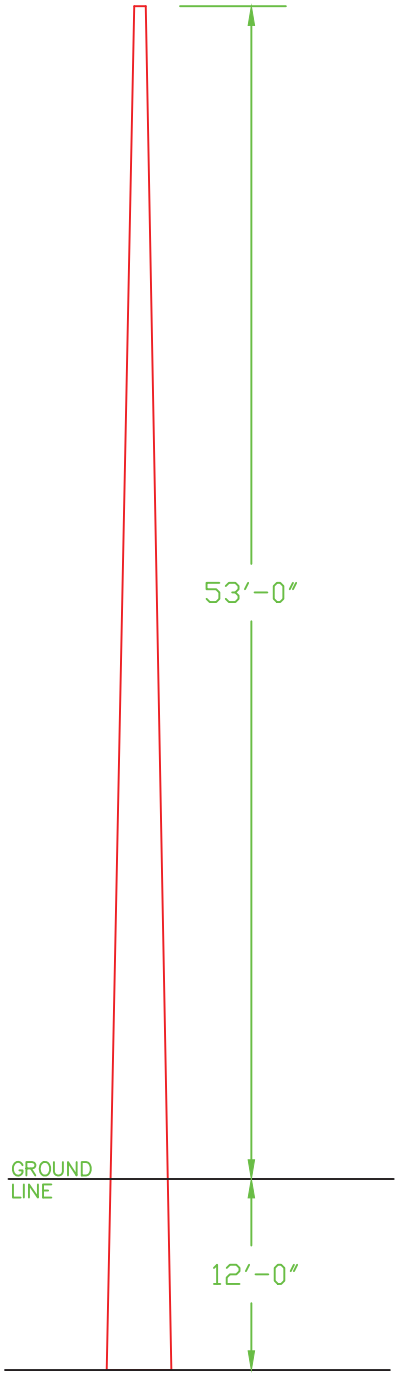
TUBE DIAMETERS MEASURED ACROSS FLATS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURES 9, 10, 11, 12, 13, 14, 15, 18, 19, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42
115 KV 3 PHASE, H-FRAME STRUCTURE, TANGENT

DWN. JLS		DATE: 11/01/18		DWG. NO.
CKD. KW		APPD. KW		
SCALE: N.T.S.		PAGE: 1 OF 4		TSH1.1
DATE	REVISION	DATE	REVISION	



ELEVATION VIEW
SEE FABRICATION DRAWINGS
FOR ADDITIONAL DETAIL

NOTE: DIMENSIONS IN THE DRAWING
ARE NOT TRUE TO PROPORTION.

65' WEATHERING STEEL POLE

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
	2	DOUBLE BOLT OHGW SUPPORT	–	TM–6B(S)
	2	OHGW ASSEMBLY, DEADEND	–	TM–4A
	3	TANGENT ASSEMBLY, PRIMARY	–	TM–1AM

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURES 9, 10, 11, 12, 13, 14, 15, 18, 19,
23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33,
34, 37, 38, 39, 40, 41, 42
115 KV 3 PHASE, H–FRAME STRUCTURE,
TANGENT

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE: 2 OF 4	
DATE	REVISION	DATE	REVISION

DWG. NO.

TSH1.1

65' WEATHERING STEEL POLE

AG3967Z

TOTAL HARDWARE QUANTITIES TO INCLUDE AN EXTRA 5% OVERAGE

BILL OF MATERIAL
(SHIPPING SEQ. = 1 FOR ALL)

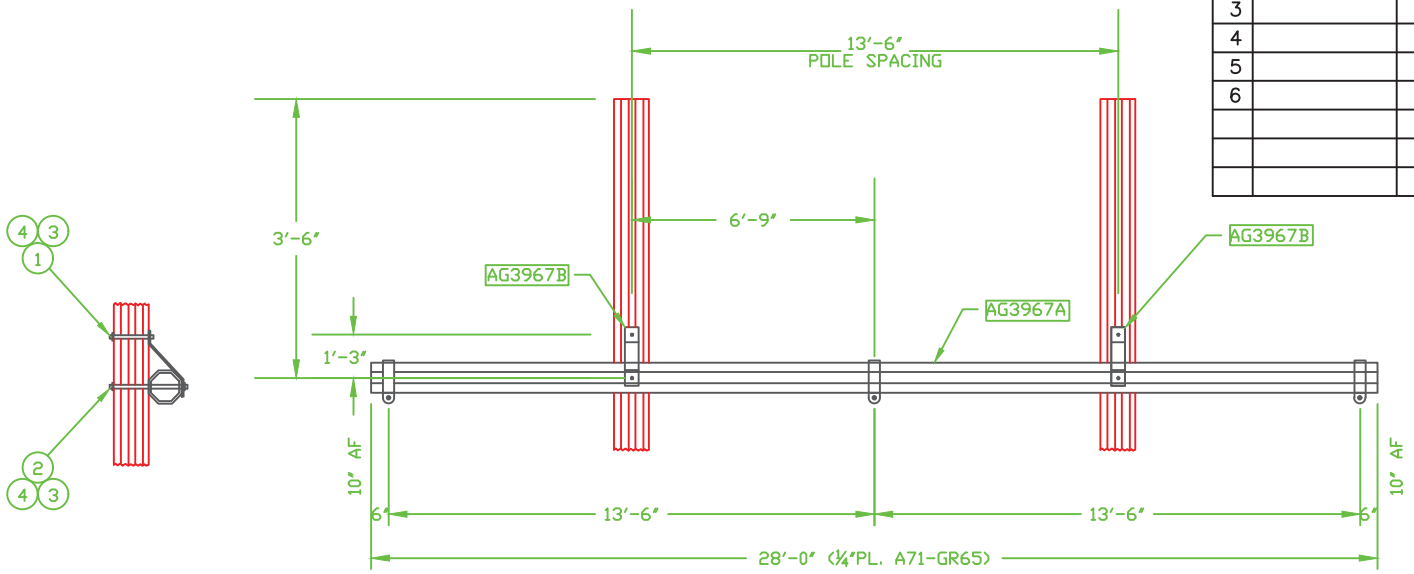
PART #	DESCRIPTION	UNIT WEIGHT	QTY PER STR.
AG3967A	CROSSARM	790	1
	GALVANIZED STEEL MOUNTING STRAP	20	2
AG99267	HARDWARE KIT		1

DESCRIPTION

LINE	PART NUMBER	HARDWARE SIZE				GEN.	FINISH	ASTM SPEC.	QTY PER STR.
		BOLT		NUT	WASHER				
		DIA.	LENGTH						
1		1				TYPE3	BARE	A325	2
2		1				TYPE3	BARE	A325	2
3				1		ANCO	BARE	A563	8
4					1	FLT	BARE	F436	16
5									
6									

MANUFACTURER NOTE:

MANUFACTURER IS RESPONSIBLE FOR MOUNTING BOLTS BEING LONG ENOUGH TO FIT POLE CLASSES SPECIFIED.



115 kV H-FRAME 28' CROSSARM

NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURES 9, 10, 11, 12, 13, 14, 15, 18, 19, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42
115 KV 3 PHASE, H-FRAME STRUCTURE, TANGENT

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE: 3 OF 4	
DATE	REVISION	DATE	REVISION

DWG. NO.

TSH1.1

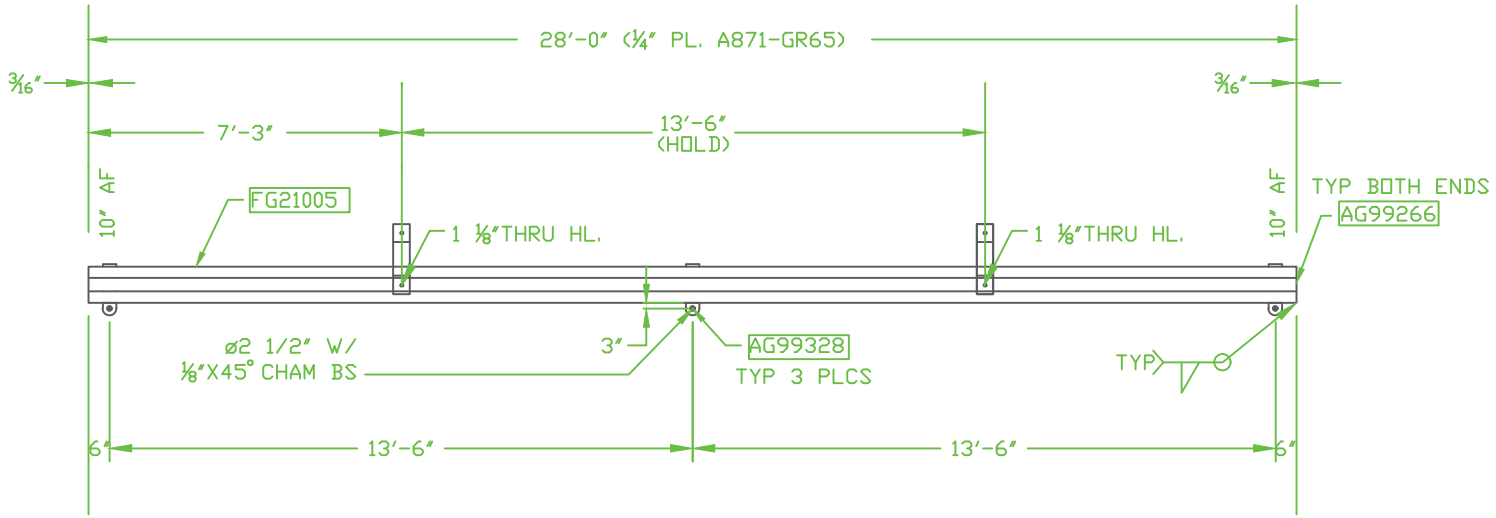
AG3967A

BILL OF MATERIAL	
PART NUMBER	QTY.
FG21005	1
AG99328	3
AG99266	2

MANUFACTURER NOTE:

MANUFACTURER IS RESPONSIBLE FOR MOUNTING BOLTS BEING LONG ENOUGH TO FIT POLE CLASSES SPECIFIED.

ALL WELDS UNLESS NOTED. 1/4



NOTE: DIMENSIONS IN THE DRAWING ARE NOT TRUE TO PROPORTION.

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

STRUCTURES 9, 10, 11, 12, 13, 14, 15, 18, 19, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42
115 KV 3 PHASE, H-FRAME STRUCTURE, TANGENT

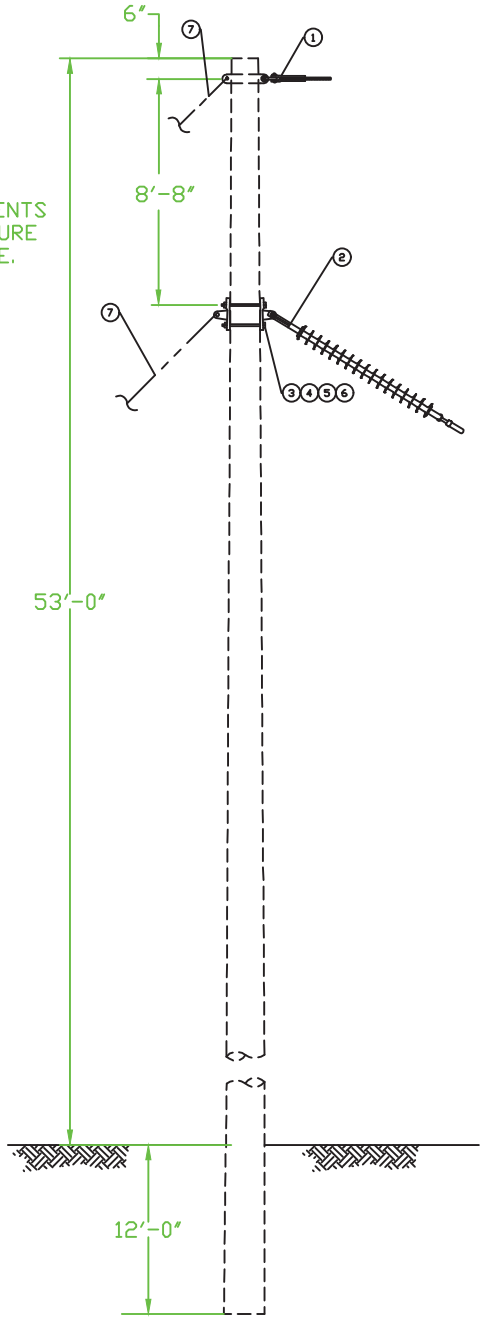
DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE: 4 OF 4	
DATE	REVISION	DATE	REVISION

DWG. NO.

TSH1.1

NOTE: 8′-8″ DIMENSION BETWEEN STATIC AND INSULATOR IS THE MINIMUM. ATTACHMENTS WILL BE FIELD DRILLED FOR EACH STRUCTURE BASED ON OVERHEAD CONDUCTOR CLEARANCE.

NOTE: DRAWING IS NOT TO SCALE



65′ STRUCTURE

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, DEADEND	–	TM-4
2	1	ANGLE ASSEMBLY, PRIMARY	–	TM-1CM
3	2	GUY PLATE, TRANSMISSION	–	TG-27D
4	2	BOLT, MACHINE, 3/4″ x 14	–	
5	2	SPRING LOCK WASHER, 3/4″	–	
6	2	NUT, 3/4"	–	
7	2	SINGLE DOWN GUY	–	TG-21A
	2	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

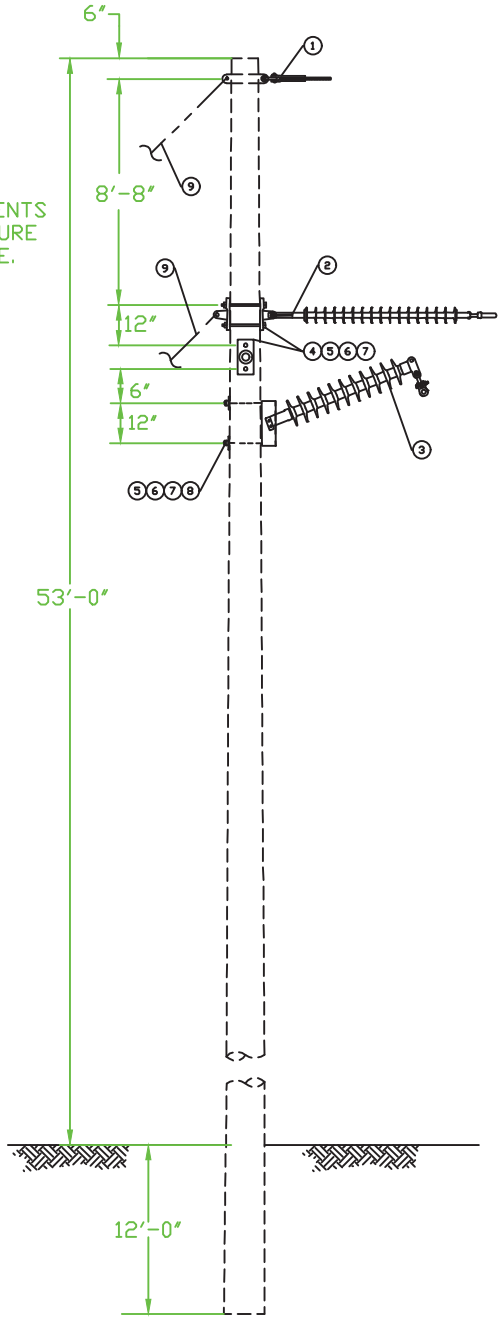
Greenville Utilities

STRUCTURE 16, 17
115 KV 3 PHASE 3 POLE STRUCTURE
LARGE ANGLE, SUSPENSION (ALTERNATE DIMENSIONS)

DWN. JLS	DATE: 11/01/18	DWG. NO.
CKD. KW	APPD. KW	
SCALE: N.T.S.		TST3.2

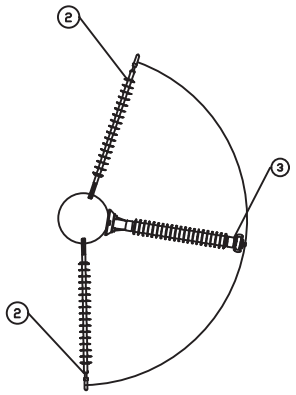
DATE	REVISION	DATE	REVISION

NOTE: 8′-8″ DIMENSION BETWEEN STATIC AND INSULATOR IS THE MINIMUM. ATTACHMENTS WILL BE FIELD DRILLED FOR EACH STRUCTURE BASED ON OVERHEAD CONDUCTOR CLEARANCE.



NOTE: DRAWING IS NOT TO SCALE

OVERHEAD VIEW



NOTE: DOWN GUYS OPPOSITE OF STATIC AND EACH DEADEND. ANGLE BETWEEN CONDUCTORS WILL BE DETERMINED IN FIELD.

65′ STRUCTURE

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, DEADEND	–	TM-4
2	2	DEAD END ASSEMBLY, PRIMARY	–	TM-1EM
3	1	115 KV POST INSULATOR, SMALL ANGLE	–	TM-3DM
4	4	GUY PLATE, TRANSMISSION	–	TG-27D
5	6	BOLT, MACHINE, 3/4″ x 14″	–	
6	6	SPRING LOCK WASHER, 3/4″	–	
7	6	NUT, 3/4″	–	
8	2	WASHER, SQUARE, 4″ x 4″ x 1/4″ w/ 15/16″	–	
9	3	SINGLE DOWN GUY	–	TG-21A
	3	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

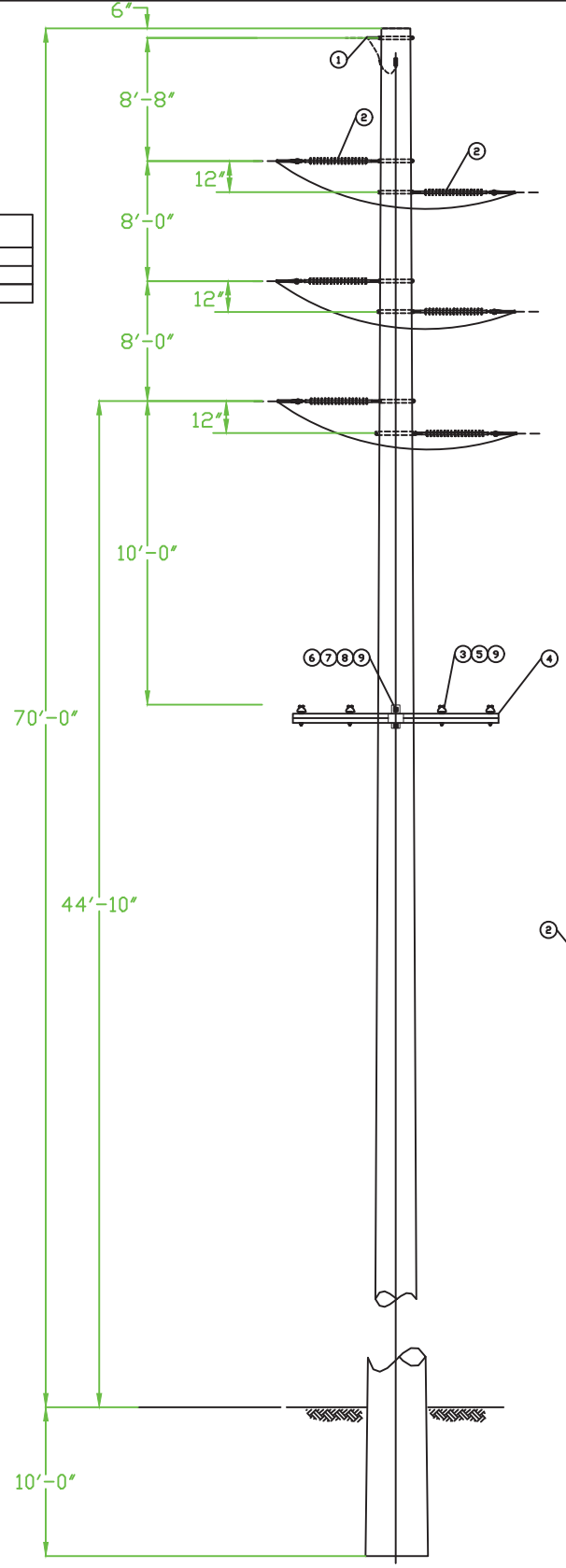
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 35, 36
115 KV 3 PHASE 3 POLE STRUCTURE
SMALL ANGLE, DOUBLE DEADEND (ALTERNATE DIMENSIONS)

DWN. JLS	DATE: 11/01/18		DWG. NO.
CKD. KW	APPD. KW		
SCALE: N.T.S.			TST6.2
DATE	REVISION	DATE	REVISION

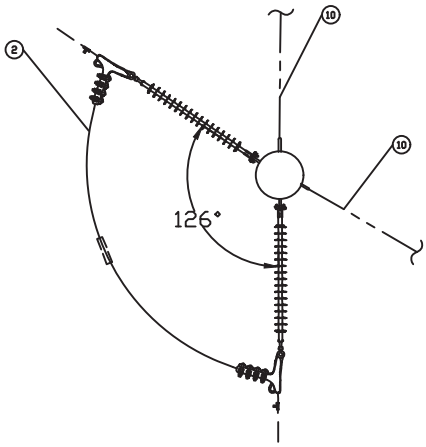
THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	35'-2.00"	1
1.00"	36'-2.00"	1



NOTE: DRAWING IS NOT TO SCALE

80' STRUCTURE

NOTE: CROSSARM LOCATION MAY BE ADJUSTED IN THE FIELD DEPENDING ON CLEARANCES



OVERHEAD VIEW OF STRUCTURE 43

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, DEADEND	–	TM-4
2	6	DEADEND ASSEMBLY, PRIMARY	–	TM-1EM
3	4	15 KV PIN INSULATOR	–	
4	1	10' DISTRIBUTION CROSSARM	–	
5	4	PINS, LONG SHANK CROSS	–	
6	2	BOLT, MACHINE, 5/8" x 18"	–	
7	2	SPRING LOCK WASHER, 5/8"	–	
8	2	NUT, 5/8"	–	
9	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	
10	7	SINGLE DOWN GUY	–	TG-21A
	7	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

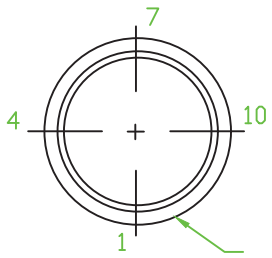
Greenville Utilities

STRUCTURE 43
115 KV 3 PHASE VERTICAL STRUCTURE
LARGE ANGLE, DEADENDS WITH CROSSARM DISTRIBUTION

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

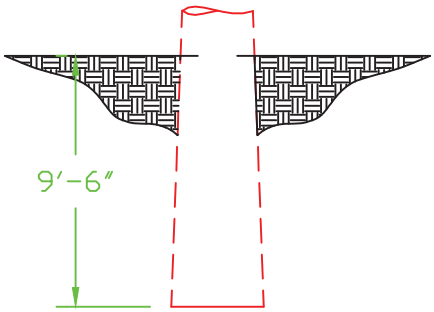
DWG. NO.

TSVD4.C1.3

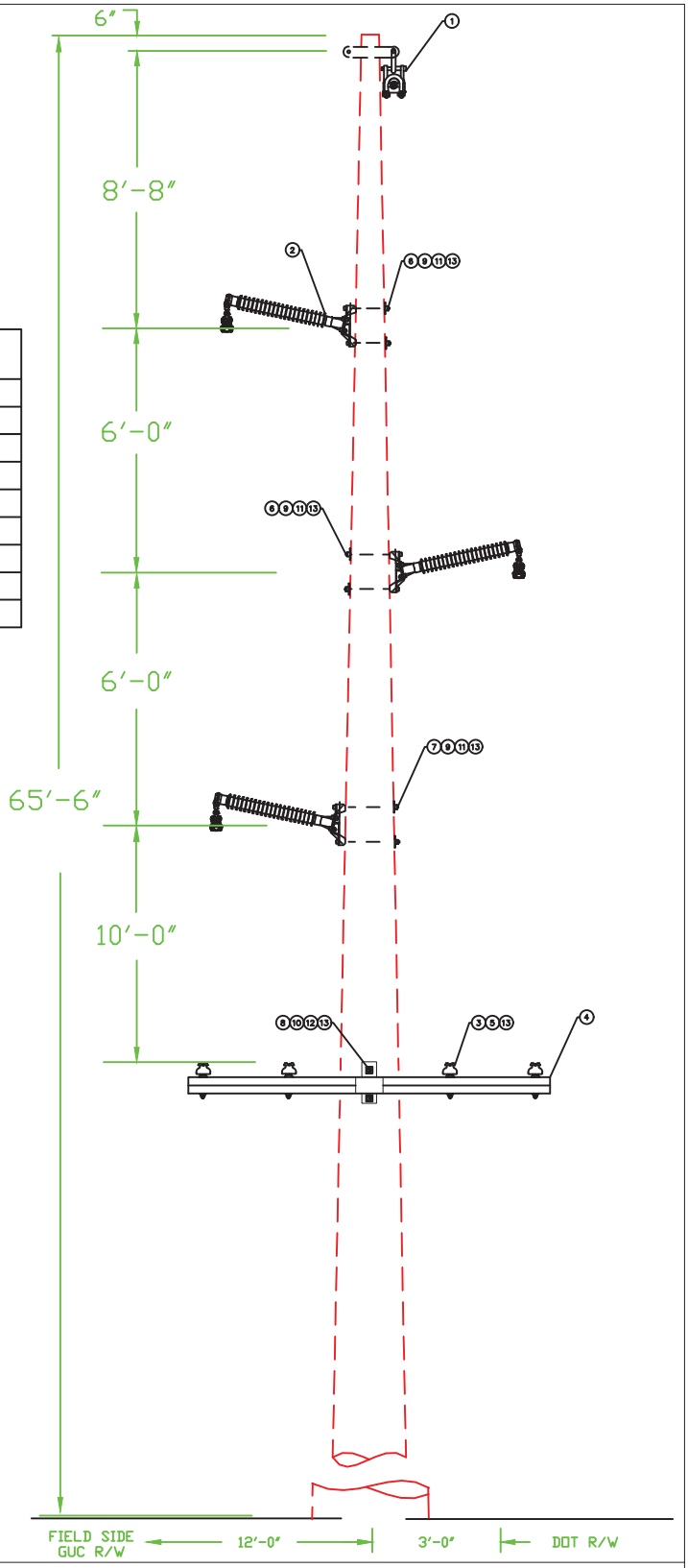


THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	8'–8.00"	4
1.25"	9'–8.00"	4
1.25"	14'–8.00"	10
1.25"	15'–8.00"	10
1.25"	20'–8.00"	4
1.25"	21'–8.00"	4
1.00"	31'–8.00"	1
1.00"	32'–8.00"	1

NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.



75' Structure Embedment



DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
3	4	15 KV PIN INSULATOR	–	
4	1	10' DISTRIBUTION CROSSARM	–	
5	4	PINS, LONG SHANK CROSS	–	
6	4	BOLT, MACHINE, 3/4" x 14"	–	
7	2	BOLT, MACHINE, 3/4" x 16"	–	
8	2	BOLT, MACHINE, 5/8" x 18"	–	
9	6	SPRING LOCK WASHER, 3/4"	–	
10	2	SPRING LOCK WASHER, 5/8"	–	
11	6	NUT, 3/4"	–	
12	2	NUT, 5/8"	–	
13	12	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

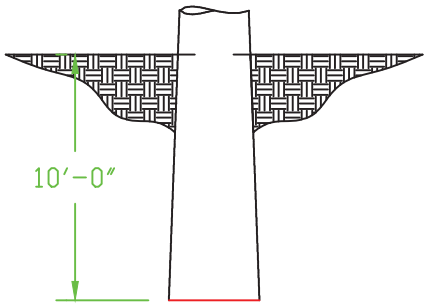
Greenville Utilities

STRUCTURES 44, 45, 46, 47, 49, 50, 52, 55, 56, 57, 58
115 KV 3 PHASE, Z–FRAME STRUCTURE, TANGENT, POST WITH CROSSARM DISTRIBUTION

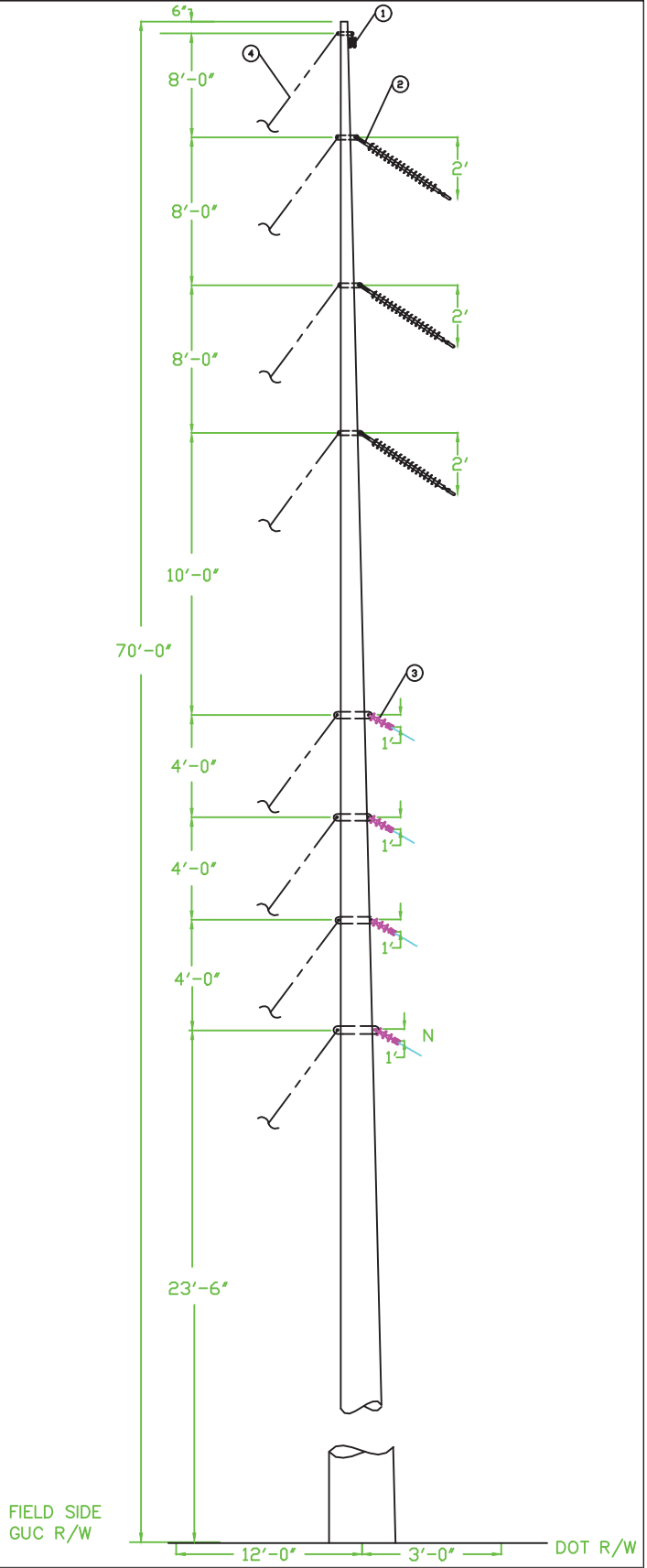
DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TPZD1.C1.3

NOTE: DRAWING IS NOT TO SCALE.



80' Structure Embedment



DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, ANGLE	–	TM-4A
2	3	ANGLE ASSEMBLY, PRIMARY	–	TM-1CM
3	4	ANGLE ASSEMBLY, SECONDARY	–	
4	8	SINGLE DOWN GUY	–	TG-21A
	8	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

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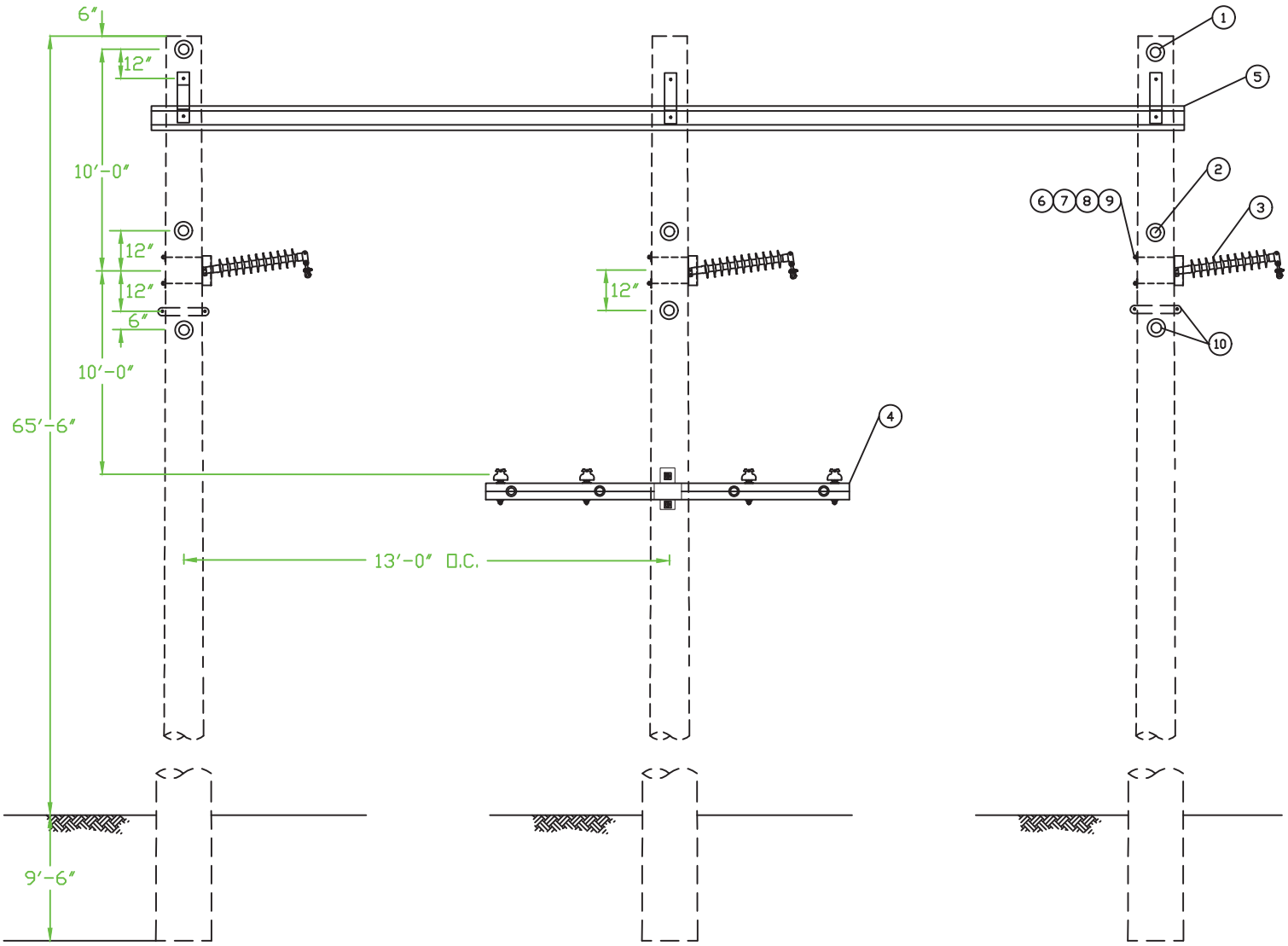
STRUCTURE 48
115 KV 3 PHASE VERTICAL DOUBLE CIRCUIT
STRUCTURE LARGE ANGLE, SUSPENSION

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

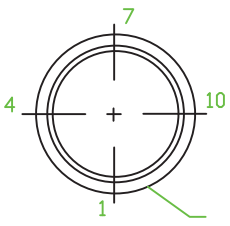
DWG. NO.

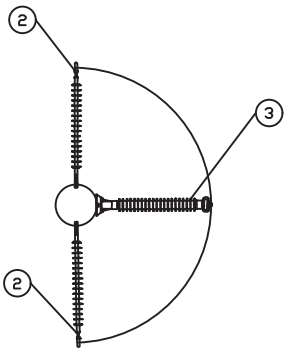
TSVD3.V3



NOTE: DRAWING IS NOT TO SCALE

THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	1'-6.00"	1
1.25"	2'-9.00"	1
1.25"	10'-0"	10
1.25"	11'-0"	10
1.00"	20'-0"	1
1.00"	21'-0"	1





NOTE: TOP VIEW OF STRUCTURE
TRANSMISSION DOUBLE DEADEND

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	4	OHGW ASSEMBLY, DEADEND w/ THRU VANG	–	TM-4
2	6	DEAD END ASSEMBLY, PRIMARY w/ THRU VANG	–	TM-1EM
3	3	115 KV POST INSULATOR, SMALL ANGLE	–	TM-3DM
4	1	DISTRIBUTION DOUBLE DEADEND CROSSARM ASSEMBLY	–	PAGE 3
5	1	30' WEATHERED STEEL CROSSARM ASSEMBLY	–	PAGE 2
6	6	BOLT, MACHINE, 3/4" x 16"	–	
7	6	SPRING LOCK WASHER, 3/4"	–	
8	6	NUT, 3/4"	–	
9	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	
10	8	SINGLE DOWN GUY w/ THRU VANG	–	TG-21A
11	8	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

STRUCTURE 53, 54 RIVER CROSSING
115 KV 3 PHASE 3 POLE DOUBLE CIRCUIT STRUCTURE
TANGENT, DOUBLE DEADEND, DISTRIBUTION CROSSARM

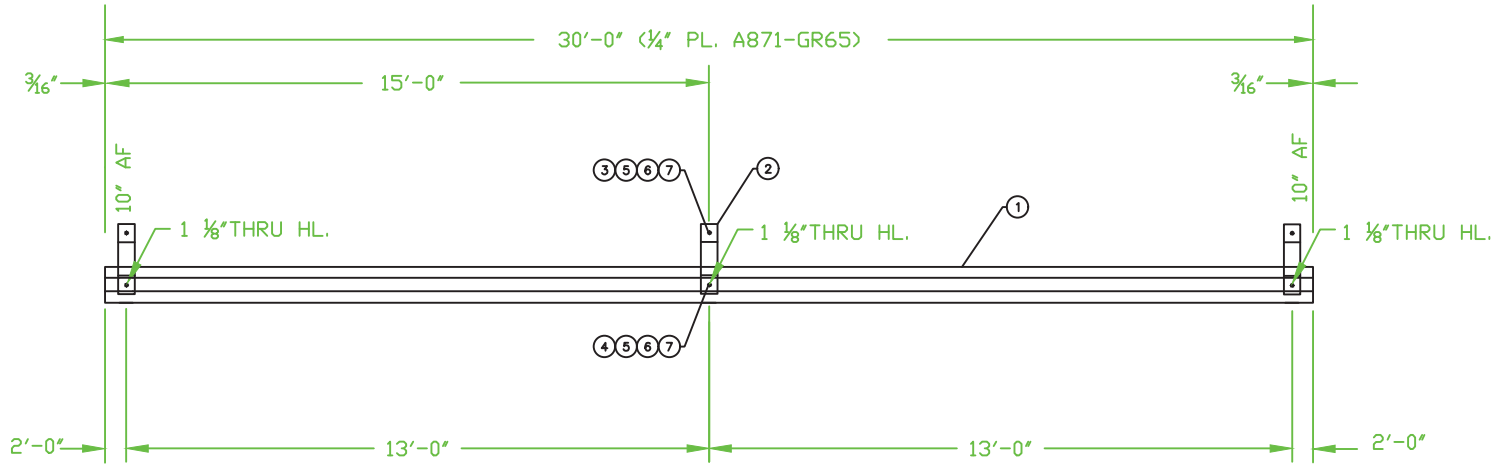
DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE 1 OF 3	
DATE	REVISION	DATE	REVISION

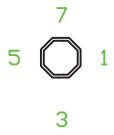
DWG. NO.
TSTD6.C6.5

MANUFACTURER NOTE:

MANUFACTURER IS RESPONSIBLE FOR MOUNTING BOLTS BEING LONG ENOUGH TO FIT POLE CLASSES SPECIFIED.

ALL WELDS UNLESS NOTED. 1/4





NOTE: DRAWING IS NOT TO SCALE.

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	1	30' WEATHERED STEEL CROSS ARM	—	
2	3	GALVANIZED STEEL MOUNTING STRAP	—	
3	3	BOLT, MACHINE 1" x 14"	—	
4	3	BOLT, MACHING 1" x REQ. LENGTH	—	
5	6	SPRING LOCK WASHER, 1"	—	
6	6	NUT, 1"	—	
7	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 1-1/8"	—	

LIST OF MATERIALS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

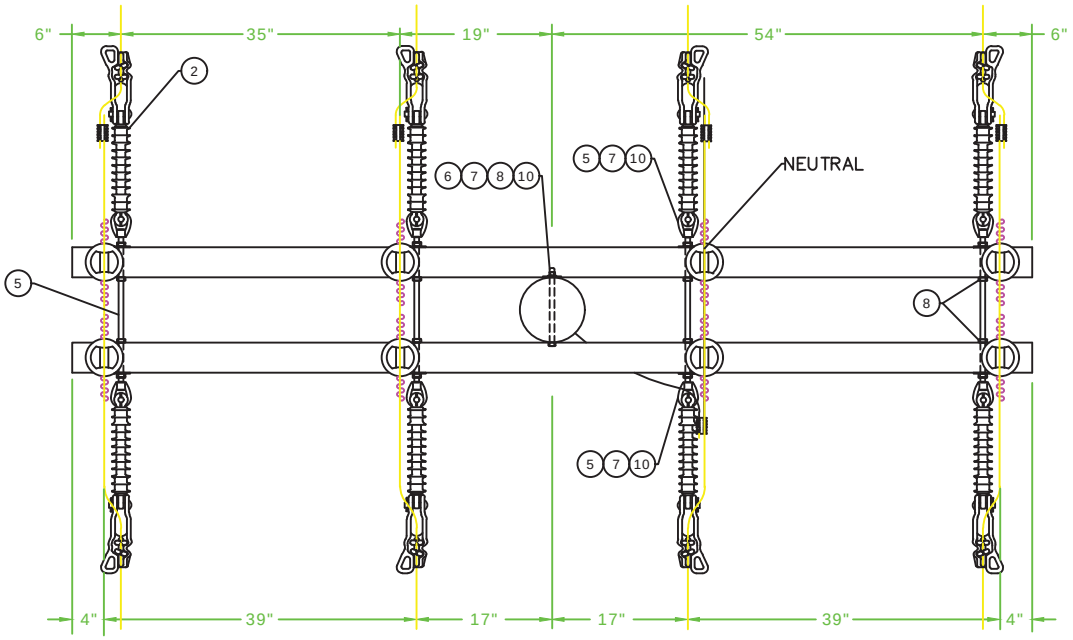
Greenville Utilities

STRUCTURE 53, 54 RIVER CROSSING
115 KV 3 PHASE 3 POLE DOUBLE CIRCUIT STRUCTURE
TANGENT, DOUBLE DEADEND, DISTRIBUTION CROSSARM

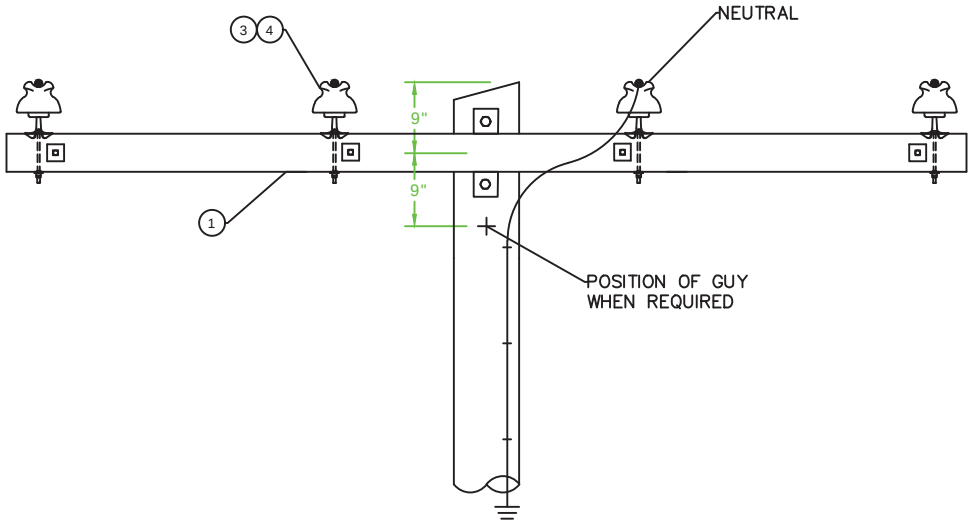
DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE 2 OF 3	
DATE	REVISION	DATE	REVISION

DWG. NO.

TSTD6.C6.5



PLAN VIEW



FRONT VIEW

NOTES:

1. GROUNDS ARE TO STOP AT THE NEUTRAL POSITION EXCEPT TO RISE TO A LIGHTNING ARRESTER OR TRANSFORMER.
2. ALL GUYS MUST CONTAIN A GUY STRAIN INSULATOR SUFFICIENT TO PROVIDE TWO FEET OF AIR CLEARANCE.
3. THE NEUTRAL INSULATOR IS TO BE DIFFERENT IN SIZE OR COLOR FROM THE PRIMARY INSULATORS PER NESC.

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	2	10' DISTRIBUTION CROSSARM	–	
2	8	DEAD END ASSEMBLY, SECONDARY	–	
3	8	15 KV PIN INSULATOR	–	
4	8	PINS, LONG SHANK CROSS	–	
5	4	BOLT, DOUBLE ARMING 5/8" x 24"	–	
6	2	BOLT, MACHINE 5/8" x 16"	–	
7	10	SPRING LOCK WASHER, 5/8"	–	
8	10	NUT, 5/8"	–	
9	8	NUT, EYE 5/8"	–	
10	14	WASHER, SQUARE, 4 x 4 x 1/4" w/ 15/16"	–	

LIST OF MATERIALS

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

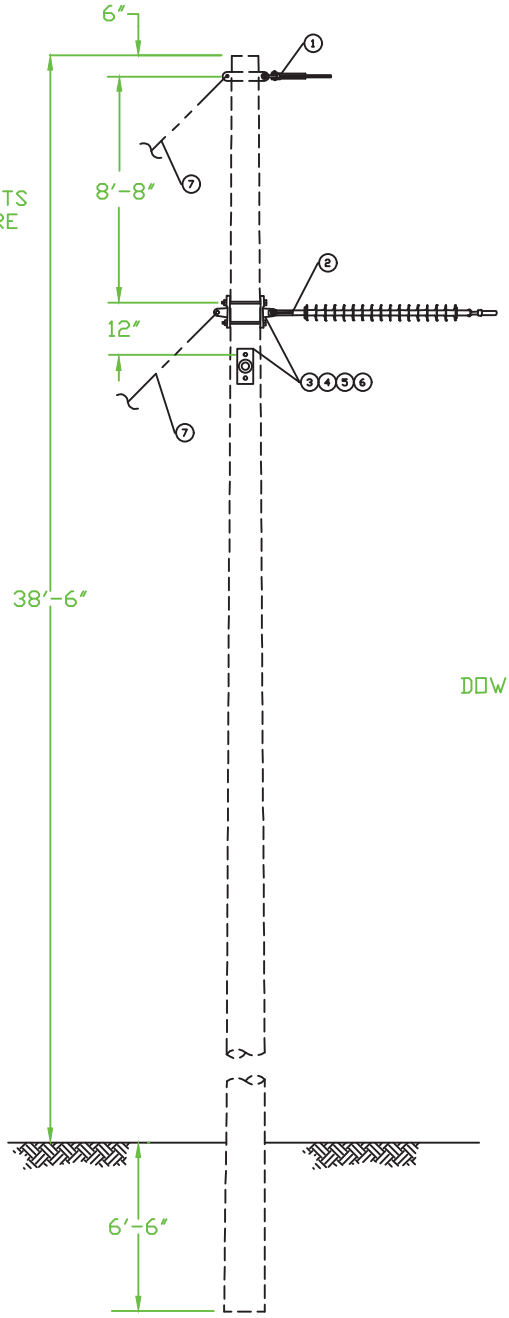
STRUCTURE 53, 54 RIVER CROSSING
115 KV 3 PHASE POLE DOUBLE CIRCUIT STRUCTURE
TANGENT, DOUBLE DEADEND, DISTRIBUTION CROSSARM

DWN. JLS		DATE: 11/01/18	
CKD. KW		APPD. KW	
SCALE: N.T.S.		PAGE 3 OF 3	
DATE	REVISION	DATE	REVISION

DWG. NO.

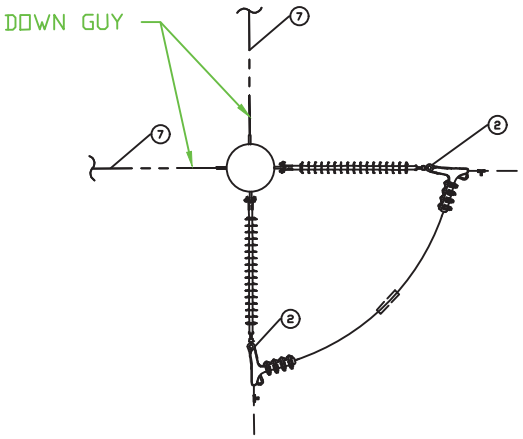
TSTD6.C6.5

NOTE: 8′-8″ DIMENSION BETWEEN STATIC AND INSULATOR IS THE MINIMUM. ATTACHMENTS WILL BE FIELD DRILLED FOR EACH STRUCTURE BASED ON OVERHEAD CONDUCTOR CLEARANCE.



NOTE: DRAWING IS NOT TO SCALE

OVERHEAD VIEW



NOTE: DOWN GUYS OPPOSITE OF STATIC AND EACH DEADEND. ANGLE BETWEEN CONDUCTORS WILL BE DETERMINED IN FIELD.

45′ STRUCTURE

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, DEADEND	–	TM-4
2	2	DEAD END ASSEMBLY, PRIMARY	–	TM-1EM
3	4	GUY PLATE, TRANSMISSION	–	TG-27D
4	4	BOLT, MACHINE, 3/4″ x 14″	–	
5	4	NUT, 3/4″	–	
6	4	SPRING LOCK WASHER, 3/4″	–	
7	3	SINGLE DOWN GUY	–	TG-21A
	3	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

LIST OF MATERIALS

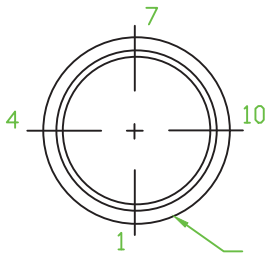
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

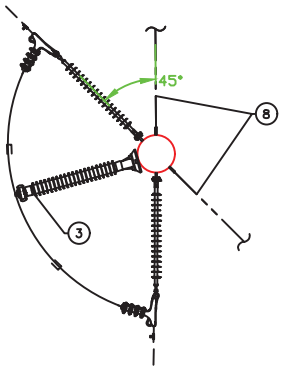
STRUCTURE 60
115 KV 3 PHASE 3 POLE STRUCTURE
LARGE ANGLE, DEADEND (ALTERNATE DIMENSIONS)

DWN. JLS	DATE: 11/01/18	DWG. NO.
CKD. KW	APPD. KW	
SCALE: N.T.S.		TST4.2

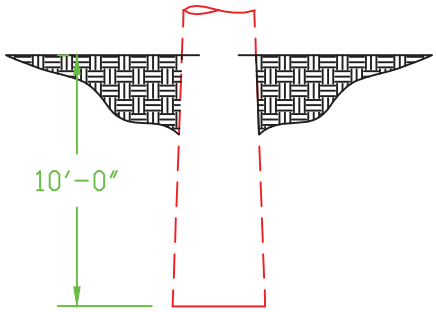
DATE	REVISION	DATE	REVISION



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	10'–0"	3
1.25"	11'–0"	3
1.25"	18'–0"	3
1.25"	19'–0"	3
1.25"	26'–0"	3
1.25"	27'–0"	3

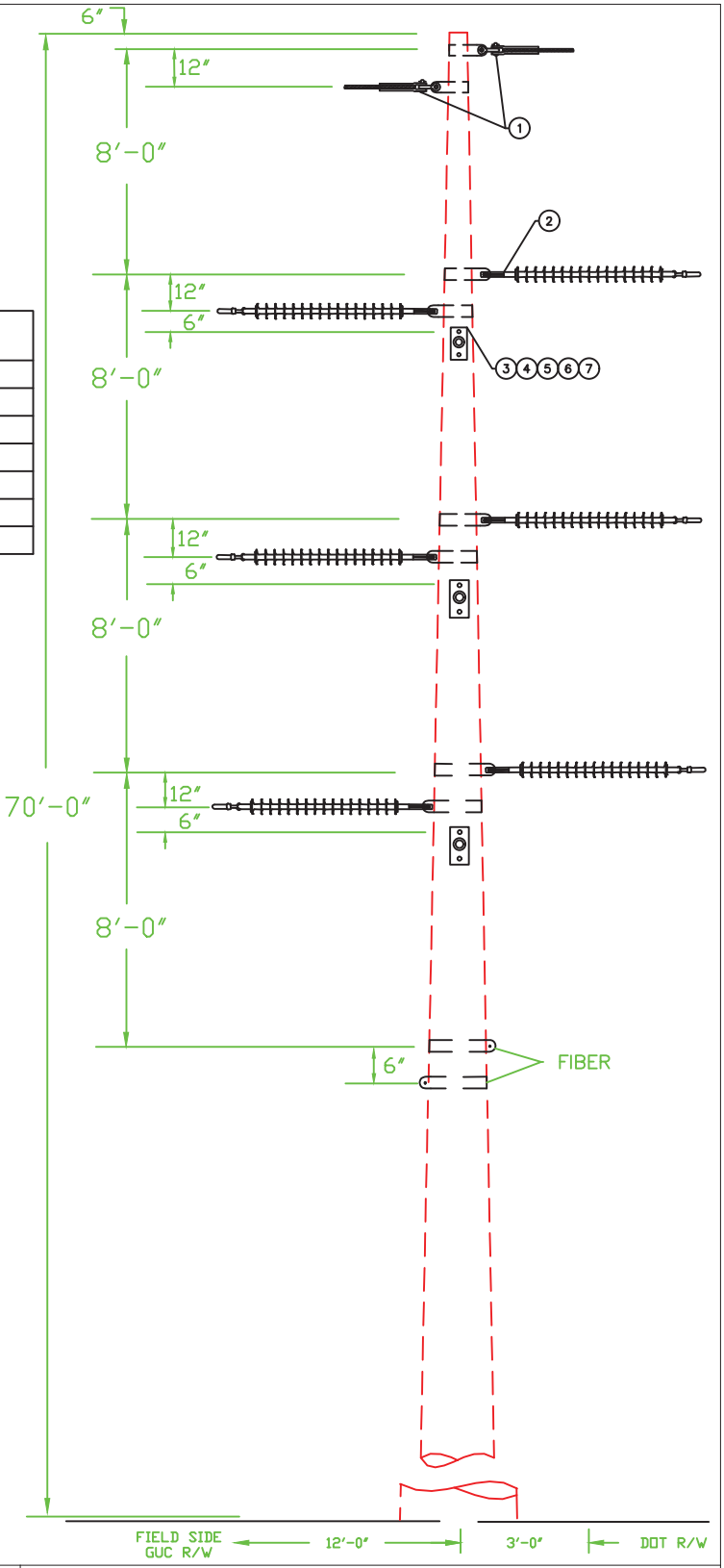


OVERHEAD VIEW



80' Structure Embedment

NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.



DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, DEADEND	–	TM–4E
2	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
3	3	115 KV POST INSULATOR	–	TM–3DM
4	6	BOLT, MACHINE, 3/4" x 16"	–	
5	6	SPRING LOCK WASHER, 3/4"	–	
6	6	NUT, 3/4"	–	
7	6	WASHER SQUARE, 4"x4"x1/4" w/ 15/16"	–	
8	8	SINGLE DOWN GUY	–	TG–21A
	8	ANCHOR ASSEMBLY, TRANSMISSION	–	TA–2H

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

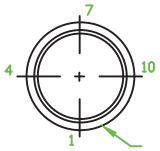
Greenville Utilities

CKT 15 STRUCTURE 1
115 KV 3 PHASE, VERTICAL STRUCTURE LARGE ANGLE, DOUBLE DEADEND SUSPENSION

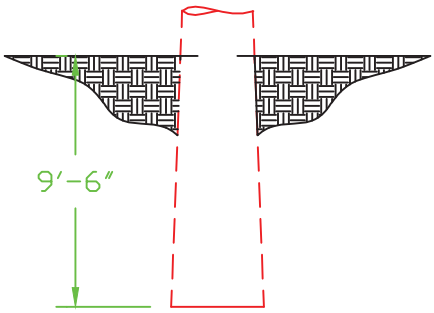
DWN. JLS	DATE: 03/20/19		
CKD. KW	APPD. KW		
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

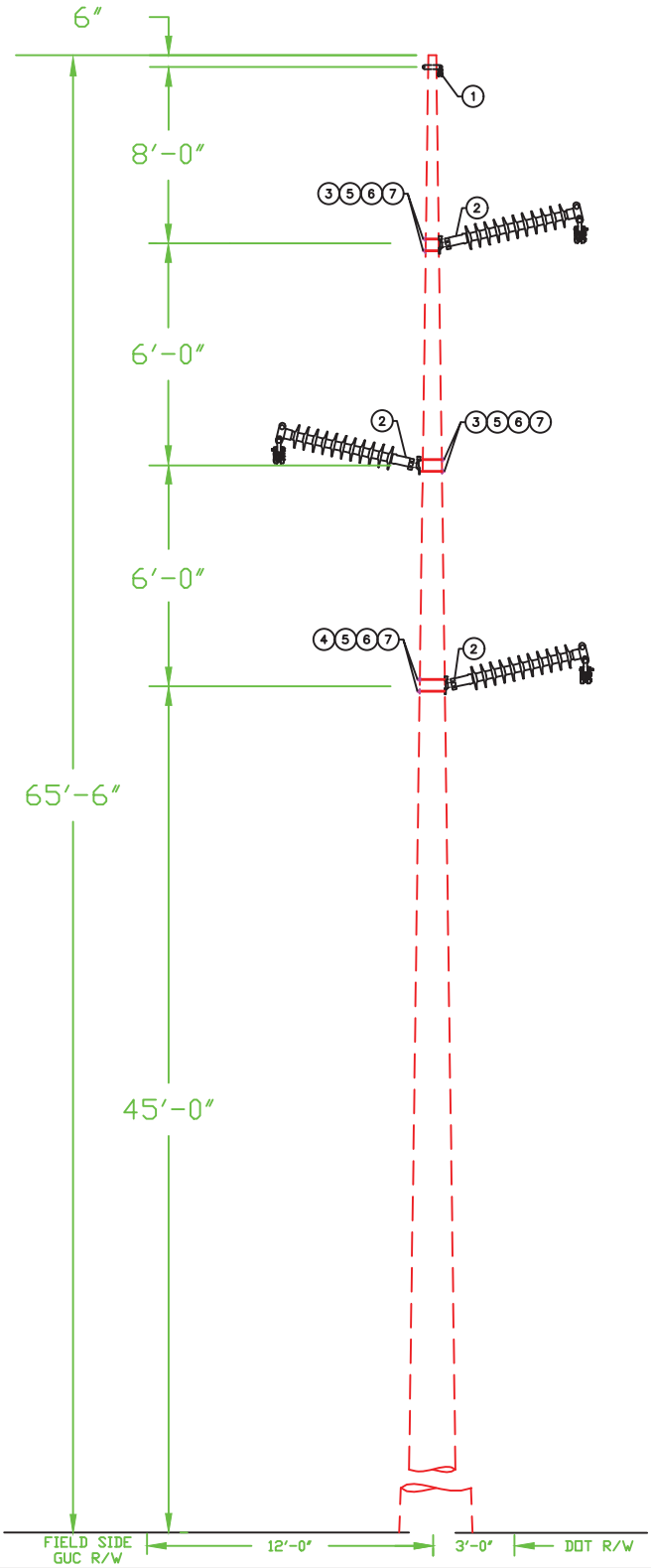
TSV4.2



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	8'–0"	4
1.25"	9'–0"	4
1.25"	14'–0"	4
1.25"	15'–0"	4
1.25"	20'–0"	4
1.25"	21'–0"	4



75' STRUCTURE EMBEDMENT



NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
3	4	BOLT, MACHINE, 3/4" x 14"	–	
4	2	BOLT, MACHINE, 3/4" x 16"	–	
5	6	SPRING LOCK WASHER, 3/4"	–	
6	6	NUT, 3/4"	–	
7	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

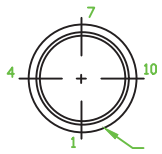
Greenville Utilities

CIRCUIT 15 STRUCTURE 2
115 KV 3 PHASE, Z–FRAME STRUCTURE,
TANGENT, POST INSULATORS

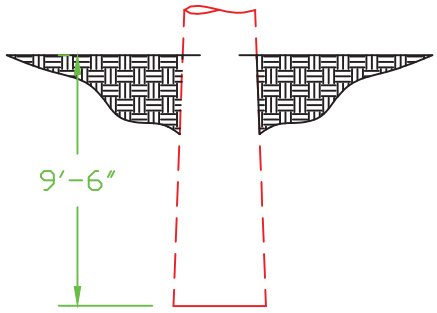
DWN. JLS		DATE: 04/22/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

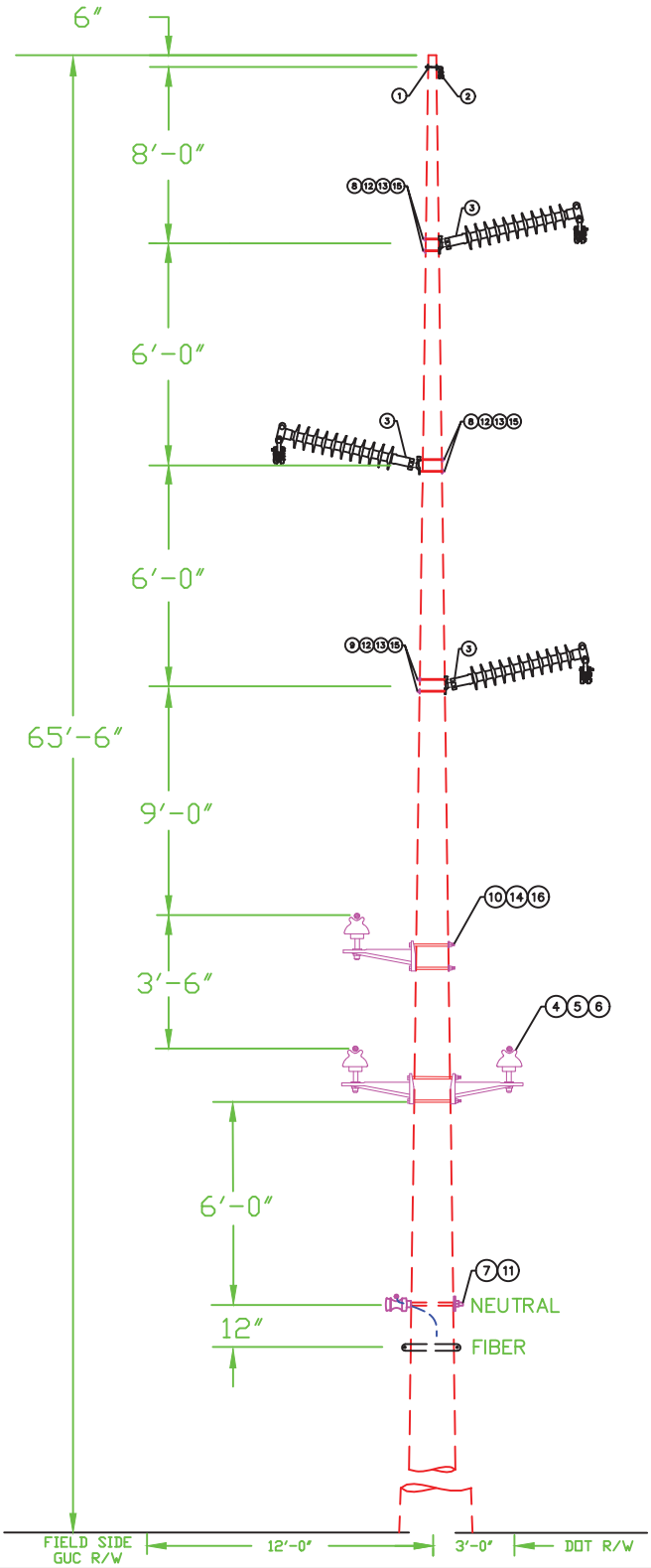
TPZ1



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	0'–6.00"	51° CCW FROM 1
1.25"	8'–0"	51° CCW FROM 1
1.25"	9'–0"	51° CCW FROM 1
1.25"	14'–0"	51° CCW FROM 1
1.25"	15'–0"	51° CCW FROM 1
1.25"	20'–0"	51° CCW FROM 1
1.25"	21'–0"	51° CCW FROM 1
1.00"	30'–0"	4
1.00"	30'–5"	4
1.00"	33'–6"	4
1.00"	33'–11"	4
1.00"	39'–11"	4



75' STRUCTURE EMBEDMENT



NOTE:

1. DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.
2. MIF BRACKETS ARE NOT MOUNTED TO SAME FACE AS 115 KV POST INSULATORS. SEE BORING DETAIL

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	SINGLE BOLT OHGW SUPPORT	–	TM–6A(S)
2	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
3	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
4	3	BRACKETS, MIF	–	
5	3	PIN, SHANK	–	
6	3	15 KV PIN INSULATOR	–	
7	1	SPOOL INSULATOR, NEUTRAL	–	
8	4	BOLT, MACHINE, 3/4" x 14"	–	
9	2	BOLT, MACHINE, 3/4" x 16"	–	
10	4	BOLT, MACHINE, 5/8" x 16"	–	
11	1	BOLT, SPOOL, 5/8" x 18"	–	
12	6	SPRING LOCK WASHER, 3/4"	–	
13	6	NUT, 3/4"	–	
14	4	NUT, 5/8"	–	
15	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	
16	4	WASHER, 2 1/4" SQUARE		

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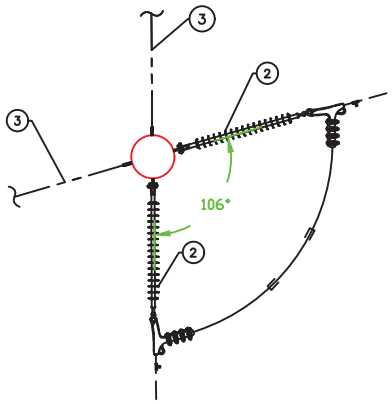
GREENVILLE, NORTH CAROLINA

Greenville Utilities

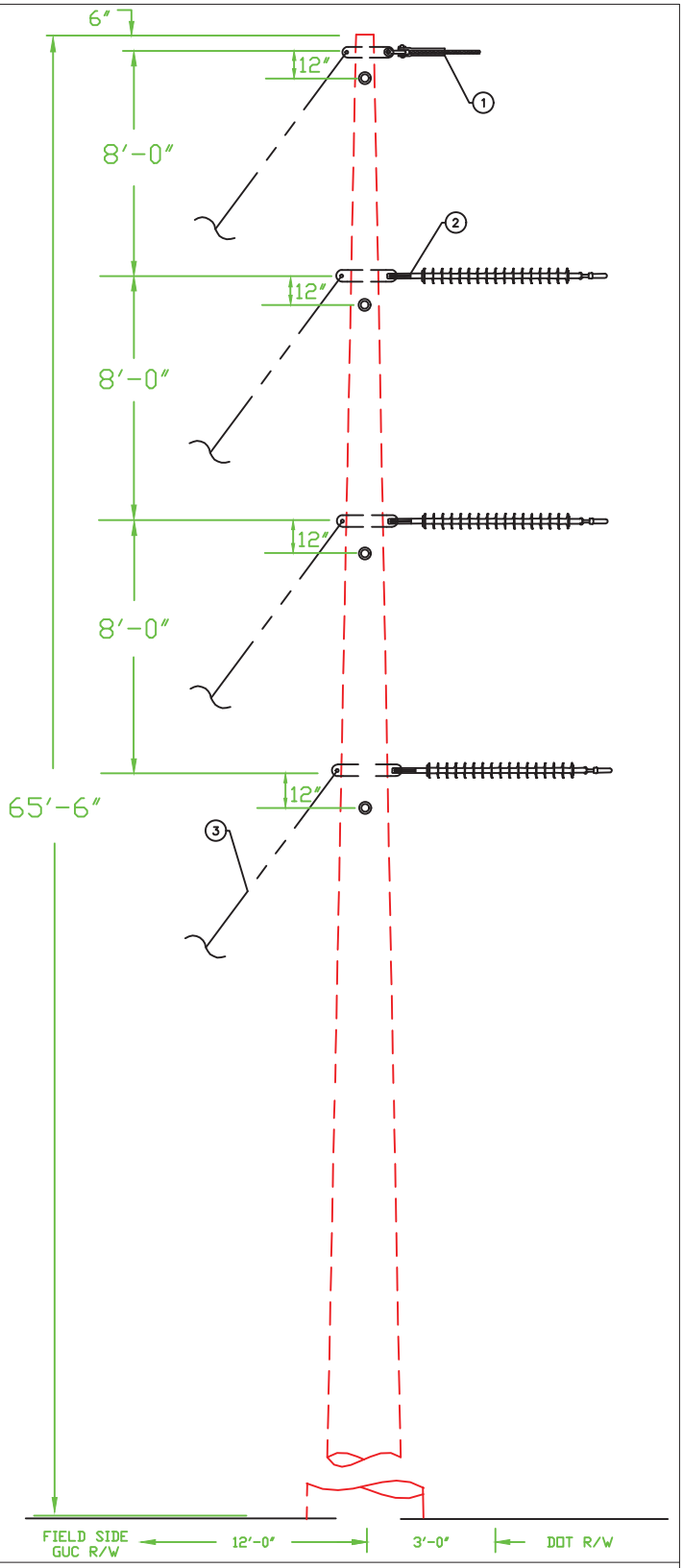
CIRCUIT 15 STRUCTURE 3
115 KV 3 PHASE, Z–FRAME STRUCTURE,
TANGENT, POST INSULATORS

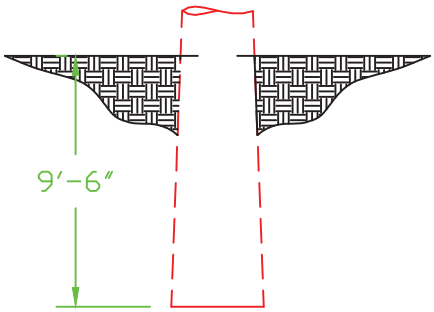
DWN. JLS		DATE: 04/23/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TPZD1.V1.2



OVERHEAD VIEW





75' Structure Embedment

NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, DEADEND	–	TM–4
2	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
3	8	SINGLE DOWN GUY	–	TG–21A
	8	ANCHOR ASSEMBLY, TRANSMISSION	–	TA–2H

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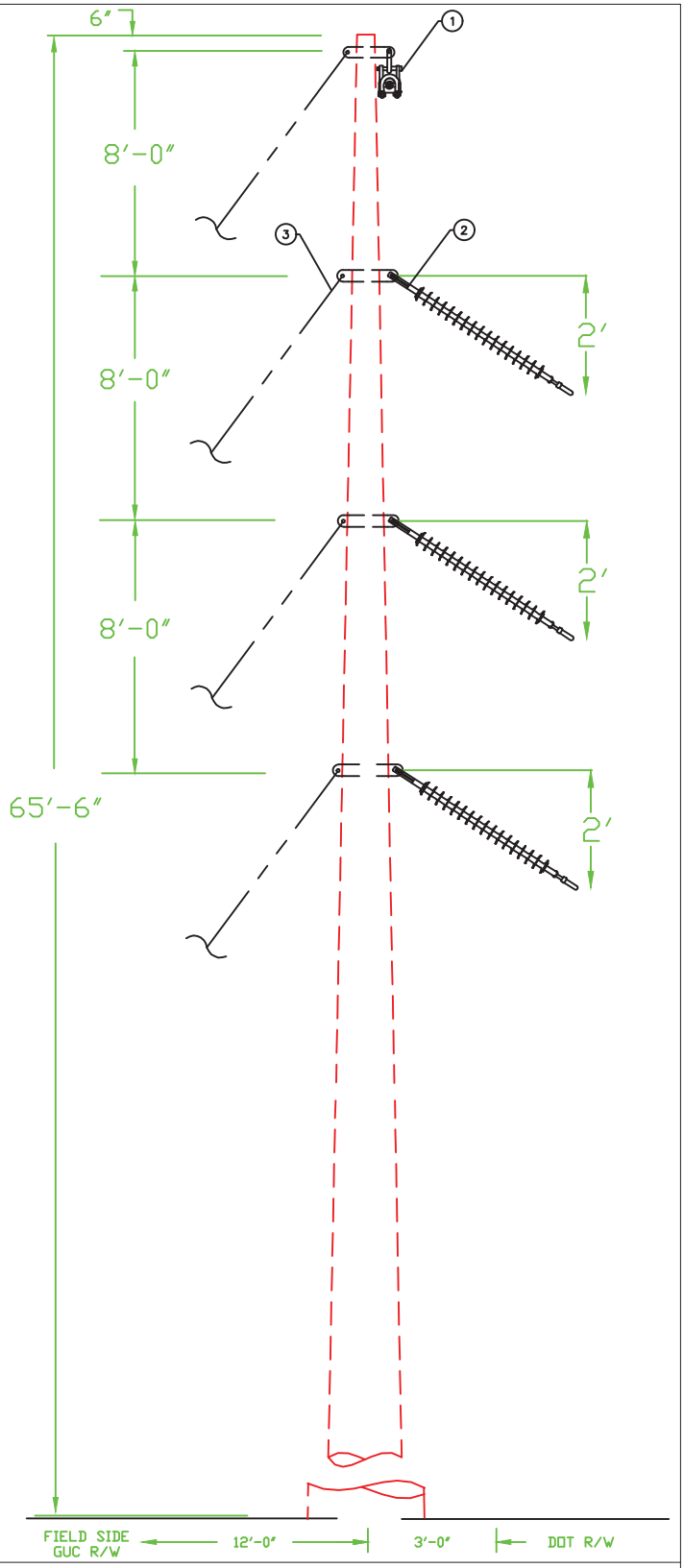
Greenville Utilities

CIRCUIT 15 STRUCTURE 4
115 KV 3 PHASE, VERTICAL STRUCTURE LARGE ANGLE, DOUBLE DEADEND SUSPENSION

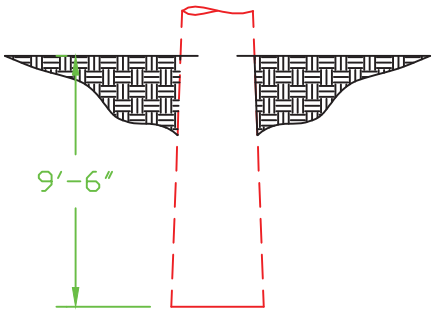
DWN. JLS		DATE: 04/22/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

TSV4



NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.



75' Structure Embedment

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, ANGLE	–	TM-4A
2	3	ANGLE ASSEMBLY, PRIMARY	–	TM-1CM
3	4	SINGLE DOWN GUY	–	TG-21A
	4	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

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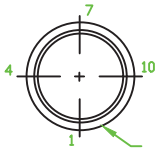
CIRCUIT 15 STRUCTURE 6
115 KV 3 PHASE, VERTICAL STRUCTURE LARGE ANGLE, SUSPENSION

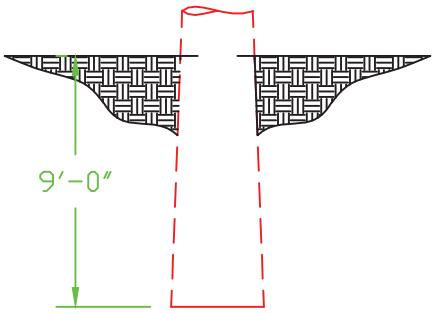
DWN. JLS		DATE: 04/22/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

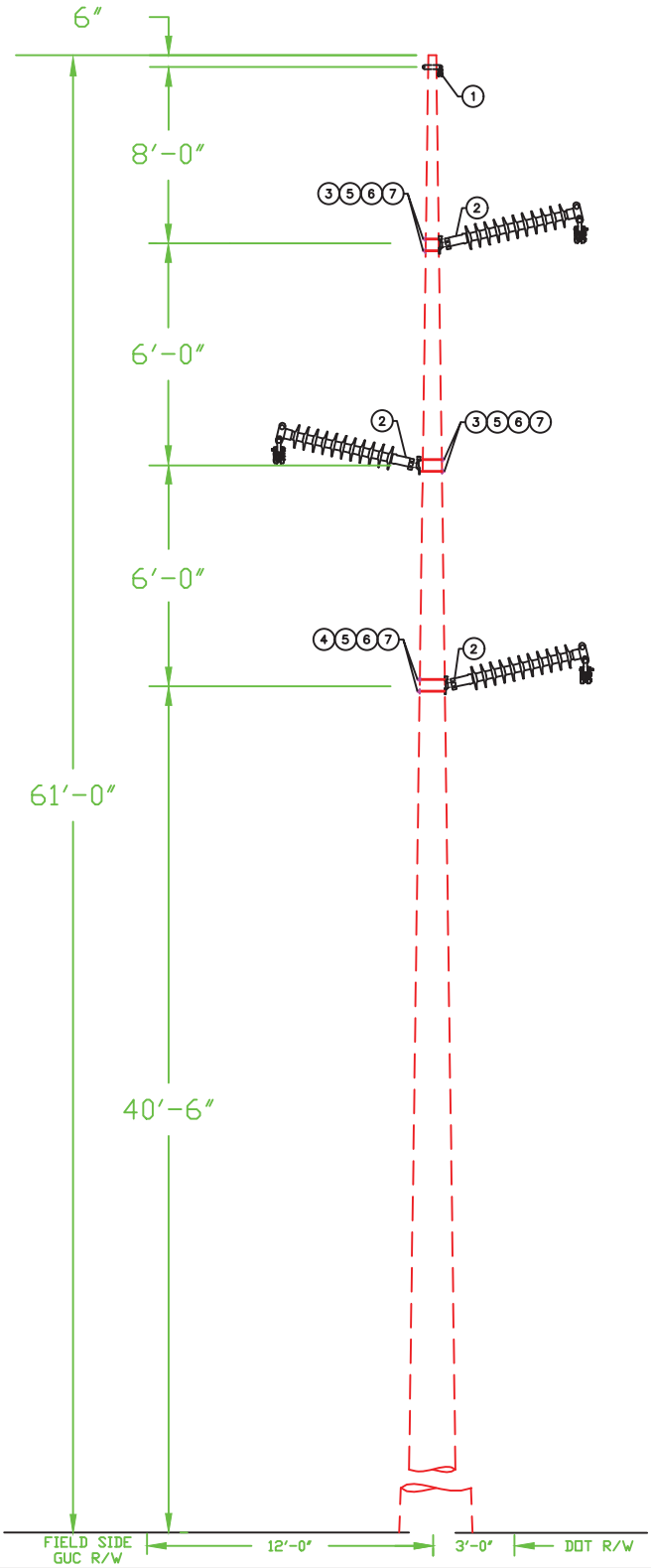
TSV3



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	8'–0"	4
1.25"	9'–0"	4
1.25"	14'–0"	4
1.25"	15'–0"	4
1.25"	20'–0"	4
1.25"	21'–0"	4



70' STRUCTURE EMBEDMENT



NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
3	4	BOLT, MACHINE, 3/4" x 14"	–	
4	2	BOLT, MACHINE, 3/4" x 16"	–	
5	6	SPRING LOCK WASHER, 3/4"	–	
6	6	NUT, 3/4"	–	
7	6	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	

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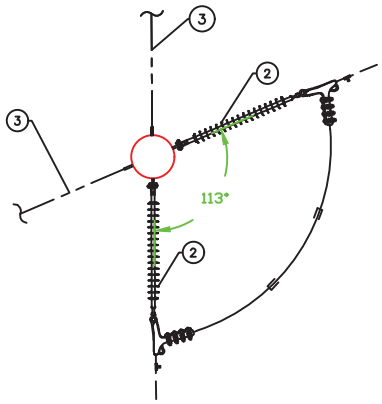
CIRCUIT 15 STRUCTURES 7, 8, 9
115 KV 3 PHASE, Z–FRAME STRUCTURE,
TANGENT, POST INSULATORS

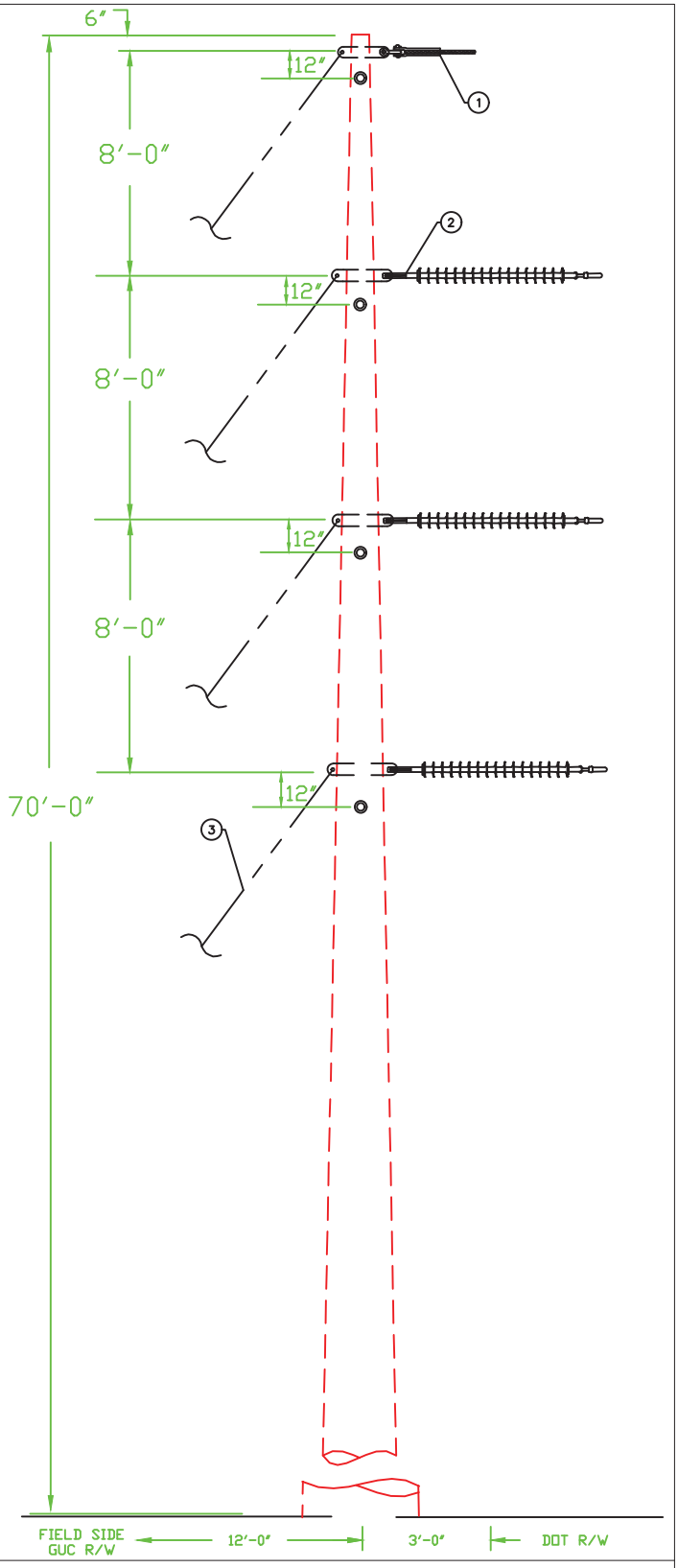
DWN. JLS		DATE: 04/22/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

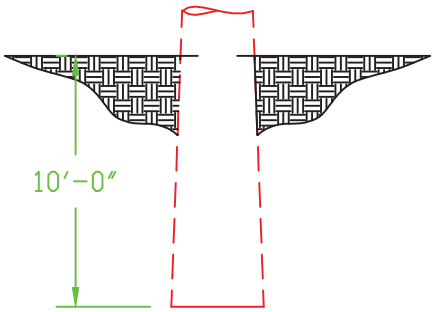
DWG. NO.

TPZ1



OVERHEAD VIEW





80' Structure Embedment

NOTE: DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, DEADEND	–	TM–4
2	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
3	8	SINGLE DOWN GUY	–	TG–21A
	8	ANCHOR ASSEMBLY, TRANSMISSION	–	TA–2H

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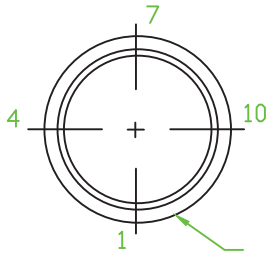
CIRCUIT 15 STRUCTURE 10
115 KV 3 PHASE, VERTICAL STRUCTURE LARGE ANGLE, DOUBLE DEADEND SUSPENSION

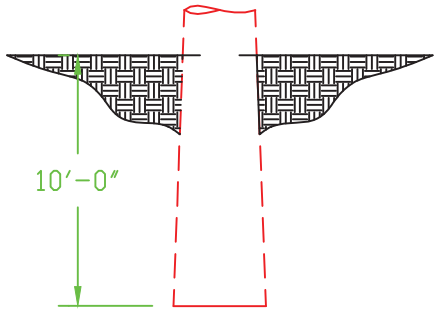
DWN. JLS		DATE: 04/24/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

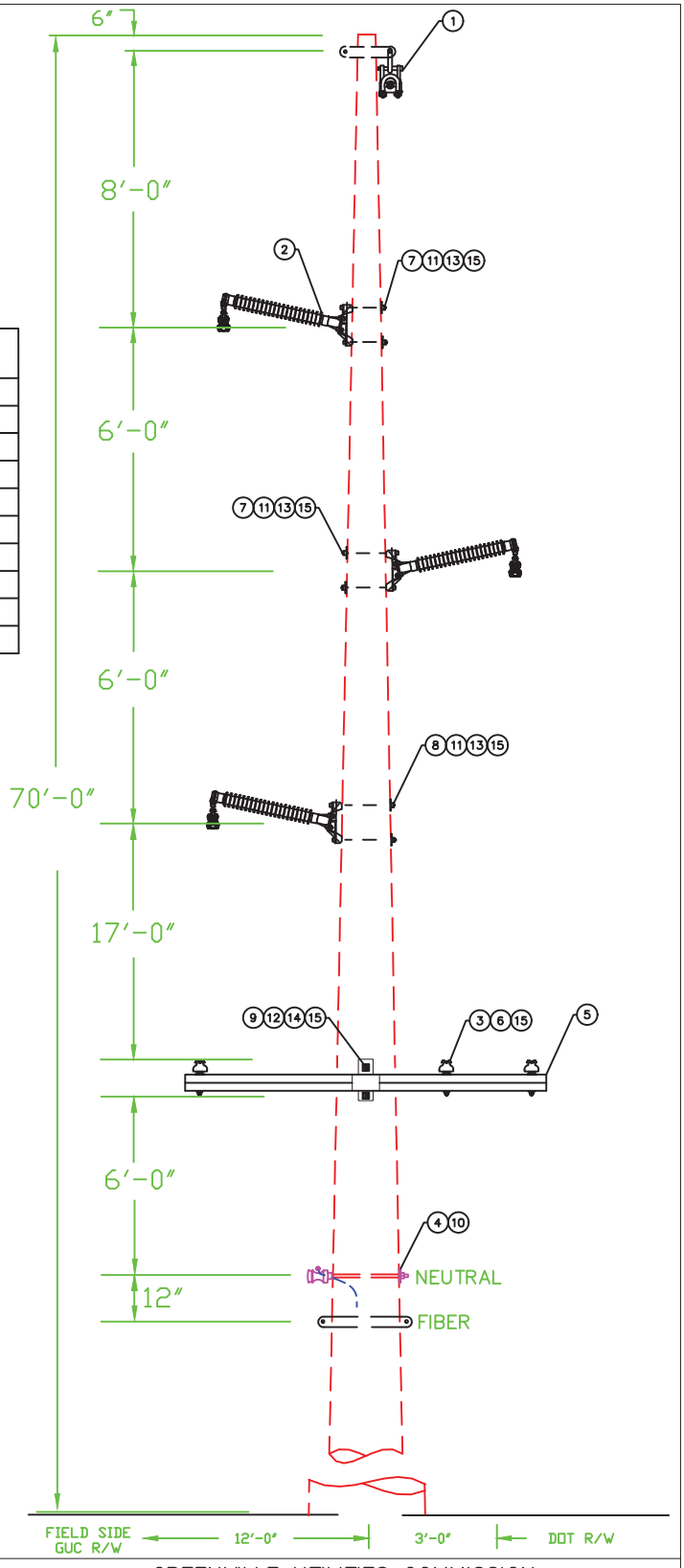
TSV4



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	8'–0"	4
1.25"	9'–0"	4
1.25"	14'–0"	10
1.25"	15'–0"	10
1.25"	20'–0"	4
1.25"	21'–0"	4
1.00"	37'–0"	1
1.00"	38'–0"	1
1.00"	44'–0"	4



80' Structure Embedment



NOTES:

1) DRAWING IS NOT TO SCALE.
2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
3	3	15 KV PIN INSULATOR	–	
4	1	SPOOL INSULATOR, NEUTRAL	–	
5	1	8' DISTRIBUTION CROSSARM	–	
6	3	PINS, LONG SHANK CROSS	–	
7	4	BOLT, MACHINE, 3/4" x 14"	–	
8	2	BOLT, MACHINE, 3/4" x 16"	–	
9	2	BOLT, MACHINE, 5/8" x 18"	–	
10	1	BOLT, SPOOL, 5/8" x 18"	–	
11	6	SPRING LOCK WASHER, 3/4"	–	
12	2	SPRING LOCK WASHER, 5/8"	–	
13	6	NUT, 3/4"	–	
14	2	NUT, 5/8"	–	
15	11	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"	–	

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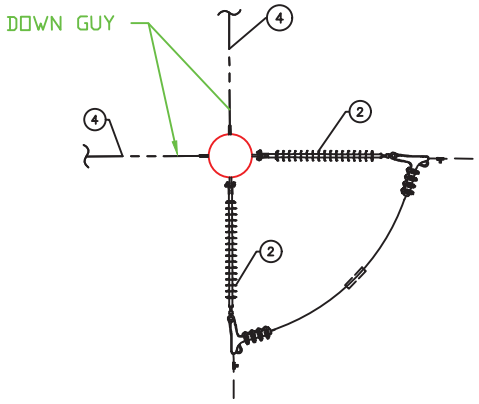
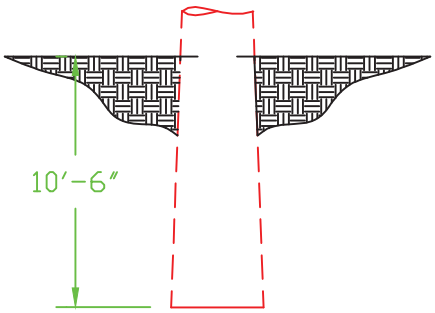
CKT 11 STRUCTURES 1–3 AND 5–13
115 KV 3 PHASE, Z–FRAME STRUCTURE,
TANGENT POST, WITH DISTRIBUTION AND
NEUTRAL ON CROSSARM

DWN. JLS		DATE: 04/25/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

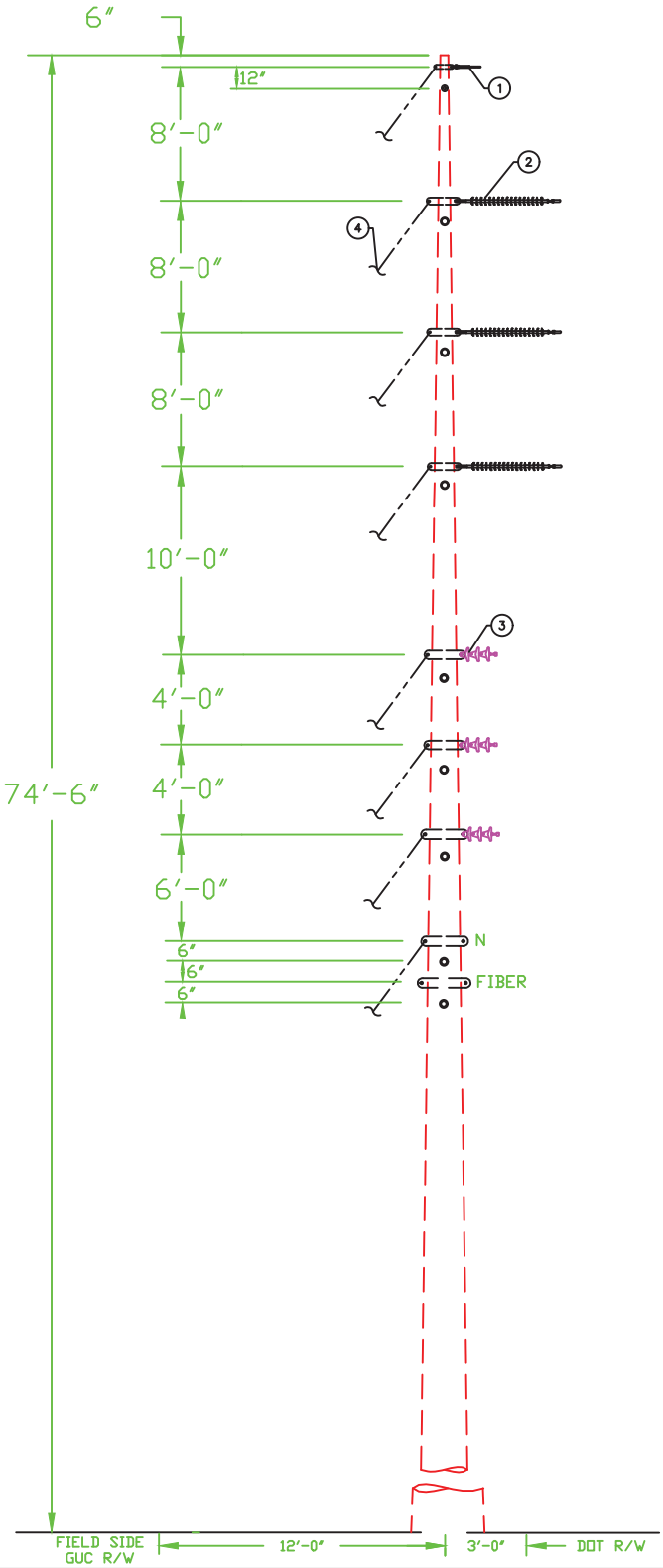
DWG. NO.
TPZD1.C1.3



OVERHEAD VIEW



85' STRUCTURE EMBEDMENT



NOTES:

1) DRAWING IS NOT TO SCALE.
2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.
3) GUY PLATE TRANSMISSION ASSEMBLY (TG-27D) CAN BE USED IN PLACE OF VANGS.

LIST OF MATERIALS

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, DEADEND	–	TM-4E
2	6	DEADEND ASSEMBLY, PRIMARY	–	TM-1EM
3	6	DEADEND ASSEMBLY, SECONDARY	–	
4	16	SINGLE DOWN GUY	–	TG-21A
	16	ANCHOR ASSEMBLY, TRANSMISSION	–	TA-2H

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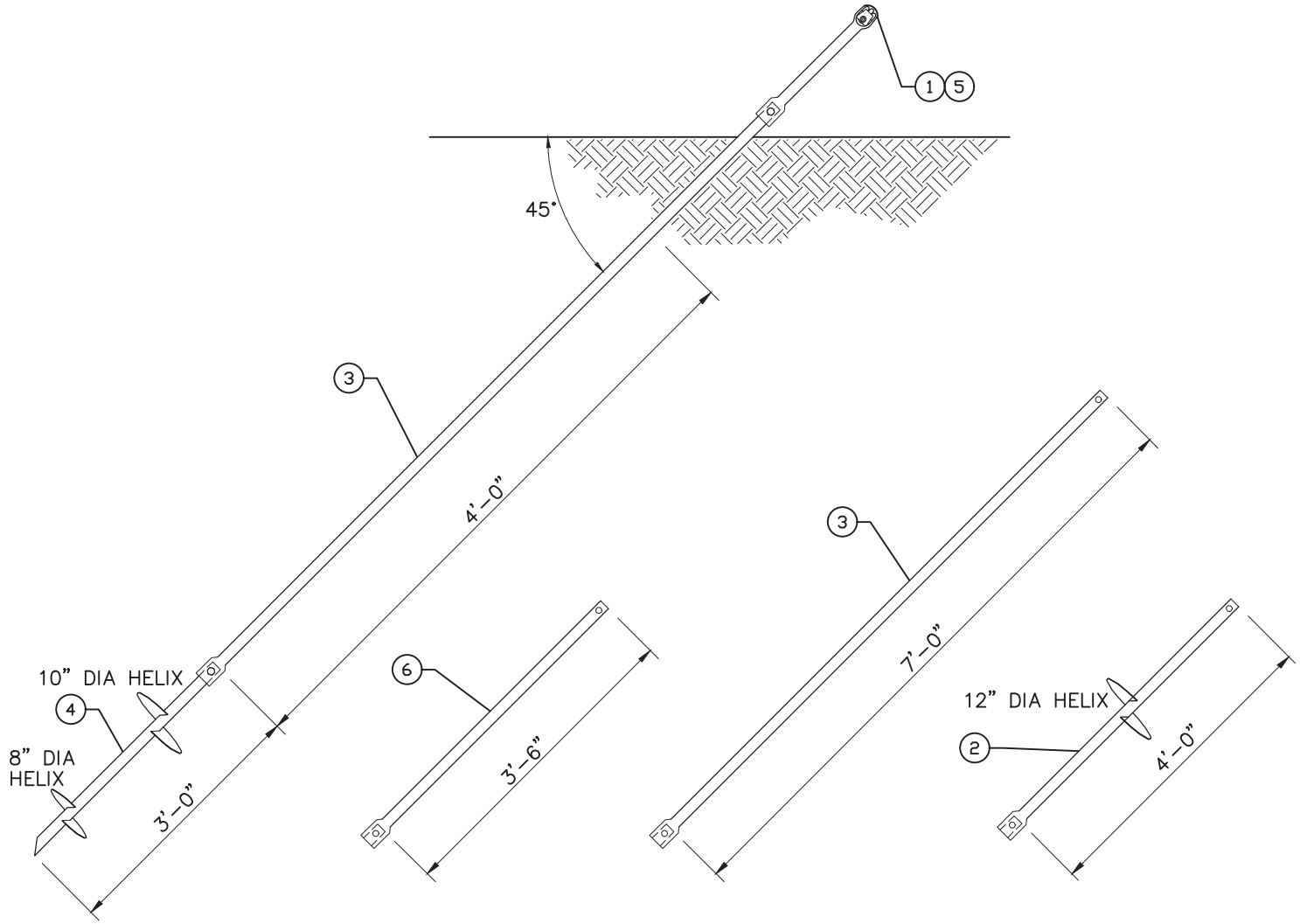
CIRCUIT 11 STRUCTURE 4
115 KV 3 PHASE, VERTICAL DOUBLE CIRCUIT STRUCTURE, LARGE ANGLE, DOUBLE DEADEND SUSPENSION

DWN. JLS		DATE: 04/17/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TSVD4.V4



NOTES:

1) MAXIMUM WORKING LOAD VALUES BASED UPON USE OF ANCHOR IN CLASS 6 SOIL CONDITIONS.

2) MAXIMUM WORKING LOAD FOR THE TA-2H = 23,000 LBS.
MAXIMUM WORKING LOAD FOR THE TA-2H WITH THE TA-4HE = 32,000 LBS.

3) ANCHOR TO BE POWER INSTALLED USING TORQUE INDICATOR WITH A MINIMUM TORQUE VALUE OF:
2,300 FT.-LBS. FOR THE TA-2H
3,000 FT.-LBS. FOR THE TA-2H WITH THE TA-4HE
AND MAXIMUM OF 6,000 FT.-LBS.

4) WHEN SPECIFICALLY CALLED FOR ON THE PLAN & PROFILE AND/OR STAKING SHEETS, THE TA-4HE (ITEM 2) SHALL BE INSTALLED CONNECTED DIRECTLY TO THE DOUBLE HELIX ANCHOR ASSEMBLY (ITEM 4) WITH THE SEVEN FOOT EXTENSION ASSEMBLY (ITEM 3) THEN BEING CONNECTED TO THE TA-4HE.

DWG. REF.	LIST OF MATERIALS ea.	DESCRIPTION
1		ANCHOR – CLAMP, BONDING
2		ANCHOR – EXTENSION ASSEMBLY, 12" HELIX
		(1-1/2" SQUARE SHAFT x 4'-0")
3		ANCHOR – EXTENSION ASSEMBLY
		(1-1/2" SQUARE SHAFT x 7'-0")
4		ANCHOR – DOUBLE HELIX (8", 10")
		(1-1/2" SQUARE SHAFT x 3'-0")
5		ANCHOR – TWINEYE ASSEMBLY, FOR DOUBLE HELIX
6		ANCHOR – EXTENSION ASSEMBLY
		(1-1/2" SQUARE SHAFT x 3'-6")

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GREENVILLE, NORTH CAROLINA

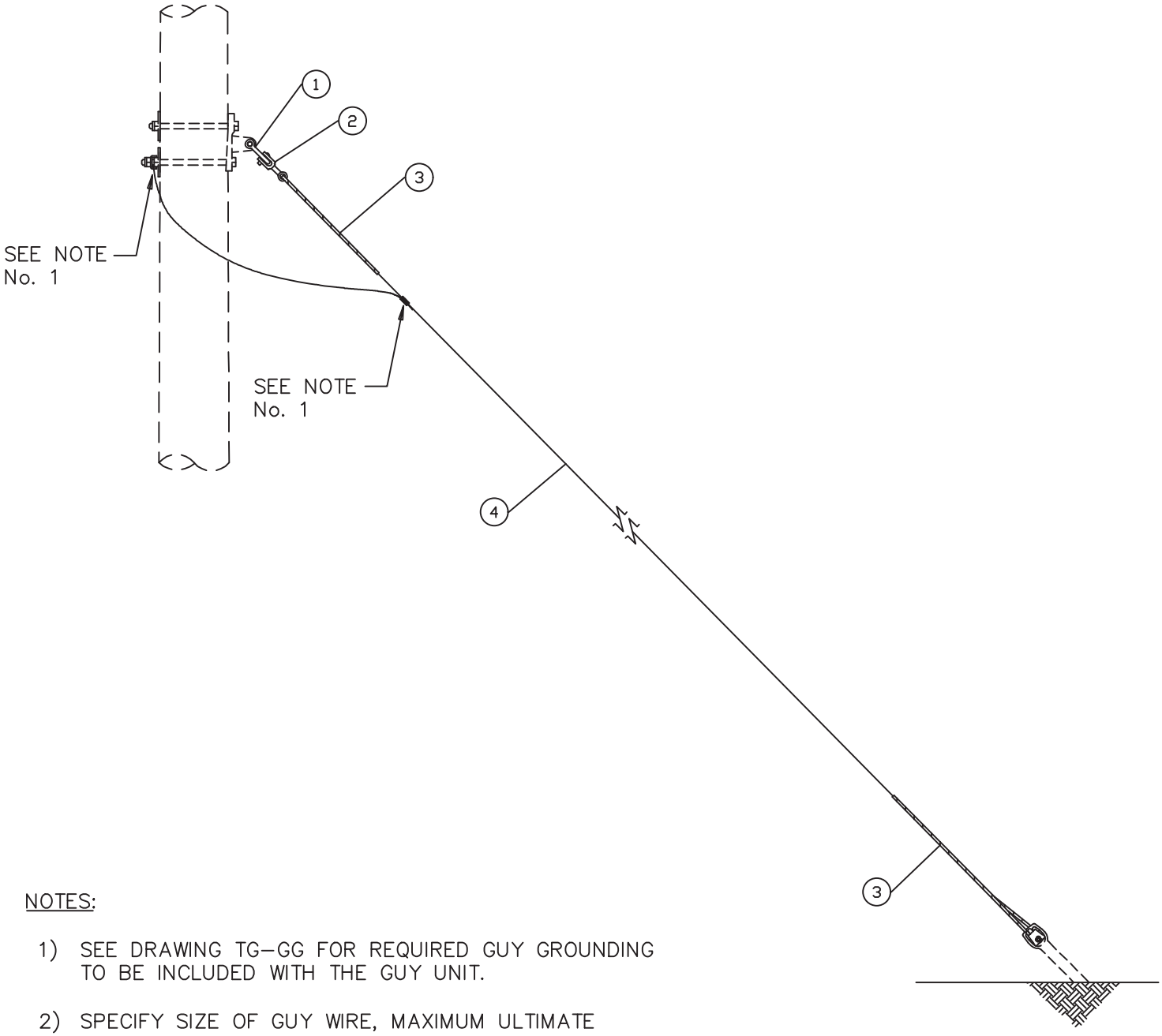
Greenville Utilities

TRANSMISSION AND DISTRIBUTION
ANCHOR ASSEMBLY

DWN. JLS	DATE: 03/14/19
CKD. KW	APPD. KW
SCALE: N.T.S.	

DATE		DATE	REVISION

DWG. NO.
TA-2



NOTES:

1) SEE DRAWING TG–GG FOR REQUIRED GUY GROUNDING TO BE INCLUDED WITH THE GUY UNIT.

2) SPECIFY SIZE OF GUY WIRE, MAXIMUM ULTIMATE RATED STRENGTH TO BE 33,000 LBS. REFER TO SPECIFIC WIRE SPECIFICATIONS FOR RATED STRENGTH.

3) "M" INDICATES INCLUSION ON ANCHOR ASSEMBLY.

DWG. REF.	TG–21		LIST OF MATERIALS
	A	A(M)	DESCRIPTION
1	–	1	ANCHOR SHACKLE, 30,000 LBS (MINIMUM)
2	1	1	CLEVIS – THIMBLE TYPE (40,000 LBS)
3	2	2	GUY – GRIP, PREFORMED, FOR GUY WIRE
4	*	*	GUY – WIRE
			* GUY WIRE AS REQUIRED

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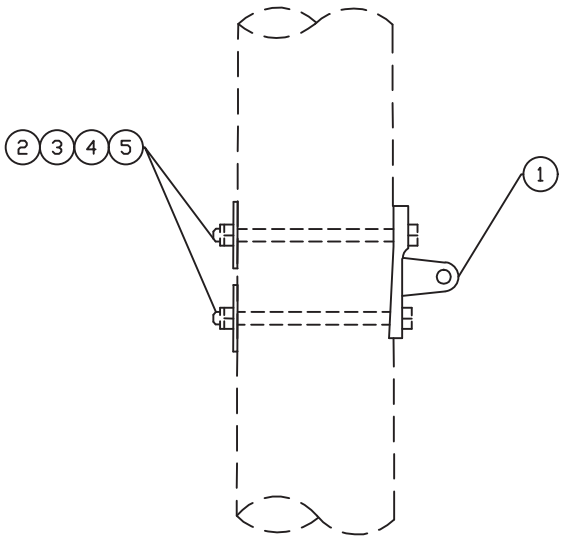
GREENVILLE, NORTH CAROLINA

Greenville Utilities

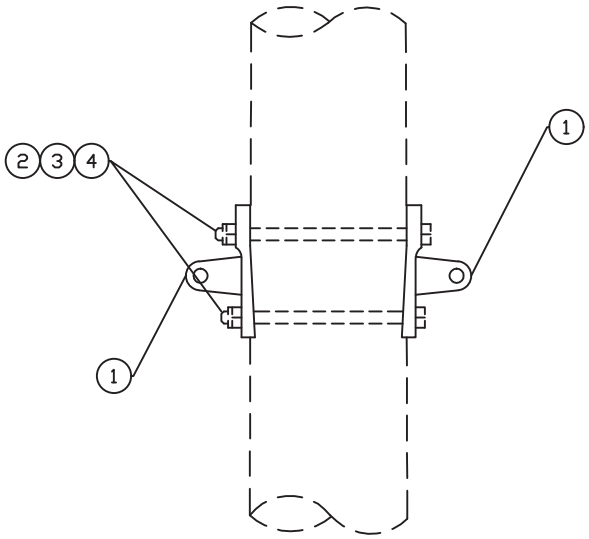
SINGLE DOWN GUY – WITH PREFORMED GRIPS.

DWN. JLS		DATE: 03/15/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.
TG–21



TG–27C



TG–27D

DWG. REF.	TG–27		LIST OF MATERIALS
	C	D	DESCRIPTION
1	1	2	TRANSMISSION GUY PLATE
2	2	2	BOLT, MACHINE, 3/4" x Required Length
3	2	2	SPRING LOCK WASHER, 3/4"
4	2	2	NUT, 3/4"
5	2	–	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"

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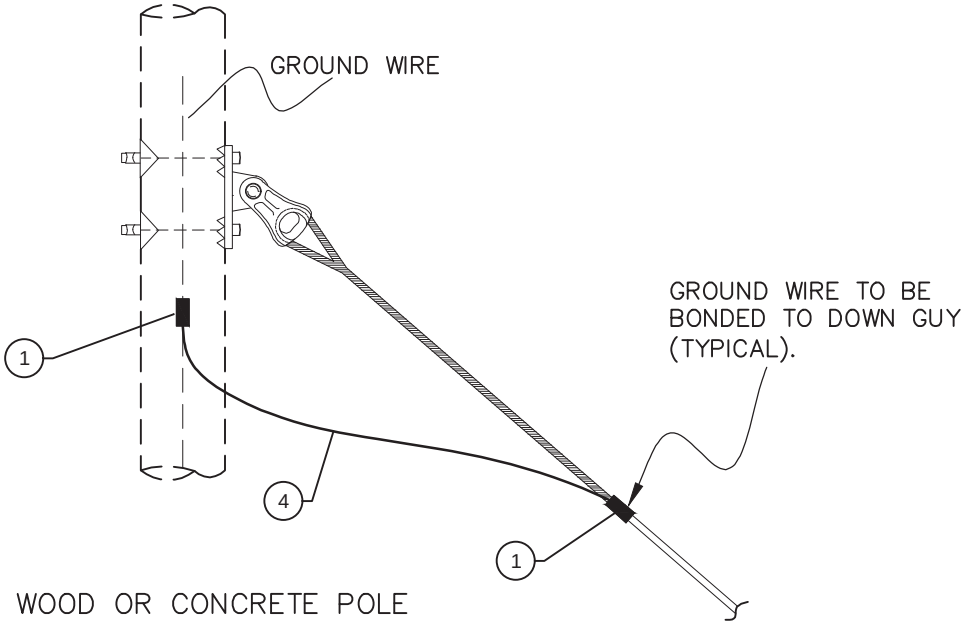
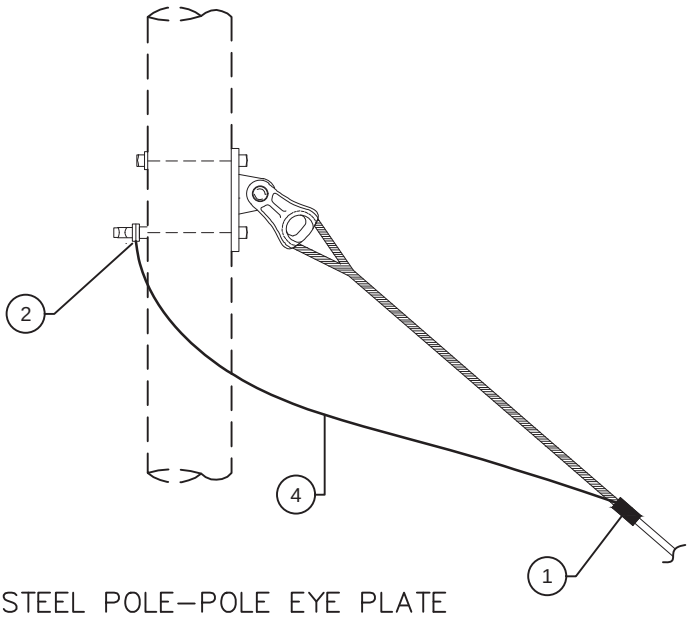
TRANSMISSION AND DISTRIBUTION LINE
GUY ATTACHMENT UNITS

DWN. JLS		DATE: 03/12/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

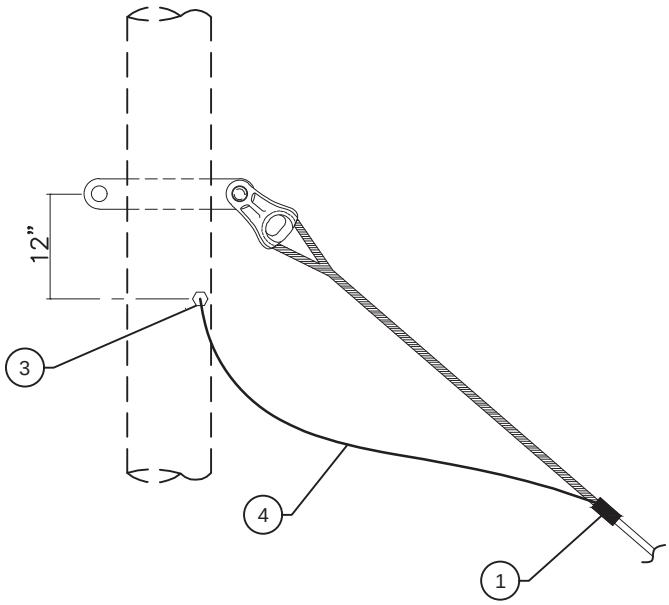
DWG. NO.
TG–27



WOOD OR CONCRETE POLE



STEEL POLE–POLE EYE PLATE



STEEL POLE–THRU VANG

DWG. REF.	LIST OF MATERIALS	
	ea.	DESCRIPTION
1	1	CONNECTOR – COMPRESSION, #4 S.D. TO #4 S.D.
2	1	BONDING CLIP, FOR #4 S.D.
3	1	CABLE TAP LUG, BRONZE BOLTED, FOR #4 S.D.
4	5	GROUND – WIRE, #4 S.D. (ft.)

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GREENVILLE, NORTH CAROLINA

Greenville Utilities

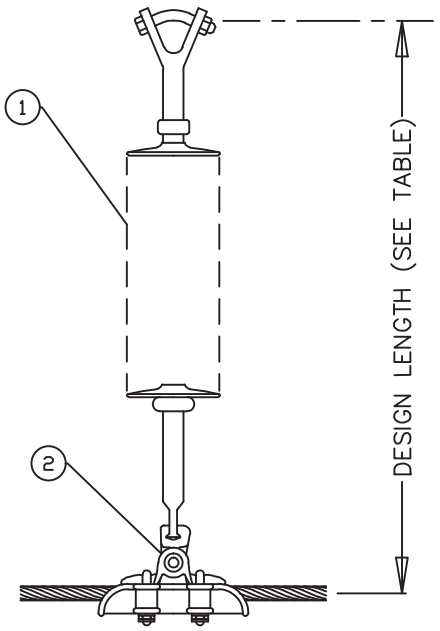
TRANSMISSION GUY GROUNDING GUIDE

DWN. JLS		DATE: 03/14/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

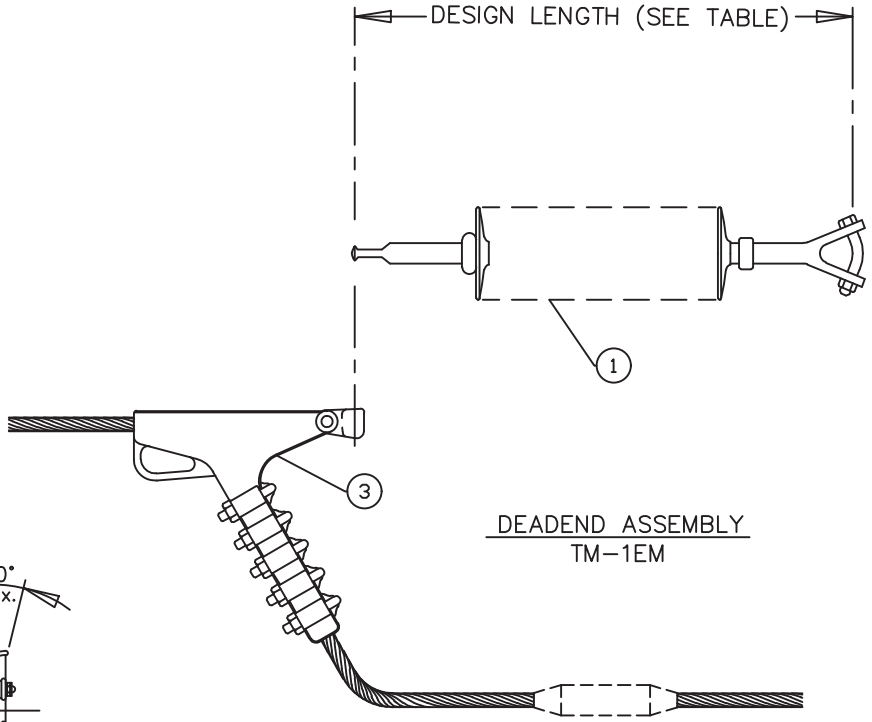
DWG. NO.
TG–GG

NOTES:

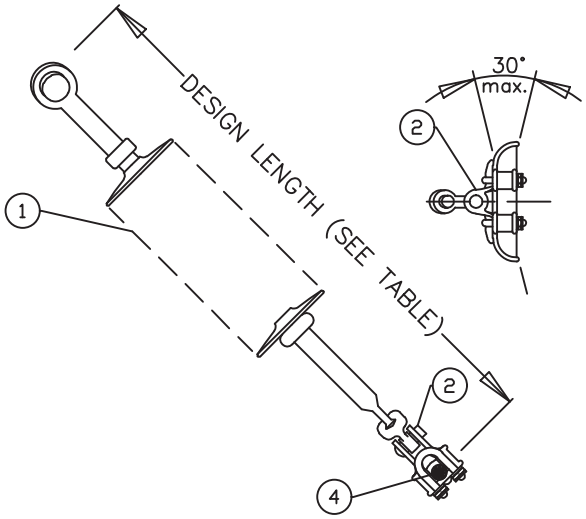
1. THE TABLE BELOW SHALL BE COMPLETED FOR EACH PROJECT.
2. SUITABLE SUSPENSION CLAMPS MUST BE SELECTED FOR THE CONDUCTOR BEING USED. THE FOLLOWING ARE TO BE CONSIDERED: TYPE OF CONDUCTOR, DIAMETER OF CONDUCTOR (CONSIDERING ARMOR RODS AND/OR LINERS), ETC.
3. THE CAPACITY OF THE HARDWARE MUST BE EQUAL TO OR GREATER THAN THE SPECIFIED MECHANICAL LOAD OF THE INSULATOR UNITS SHOWN IN THE TABLE BELOW.



TANGENT ASSEMBLY
TM–1AM (OR) TM–1BM



DEADEND ASSEMBLY
TM–1EM



ANGLE ASSEMBLY
TM–1CM

115 KV	ASSEMBLY		
	TANGENT	ANGLE	DEADEND
QUANTITY OF UNITS	1	1	1
INSULATION LEVEL (kV)	138	138	138
LEAKAGE DISTANCE (in.)	139	139	139
SPEC. MECH. LOAD (lb.)	25,000	25,000	25,000
INSULATOR WEIGHT (lb.)	11.9	11.9	11.9
DESIGN LENGTH (in.)	59.6	59.6	59.6
COLOR OF UNITS	GRAY	GRAY	GRAY

LIST OF MATERIALS

DWG. REF.	ITEM	DESCRIPTION
1		INSULATOR, SUSPENSION. POLYMER
2		CLAMP, SUSPENSION x REQ. CONDUCTOR SIZE
3		DEADEND SHOE, x REQ. CONDUCTOR SIZE
4	*	ARMOR ROD x REQ. CONDUCTOR SIZE
5		CORONA RING FOR 115 KV INSULATOR
	*	Armor Rod not required if suspension clamp is cushioned

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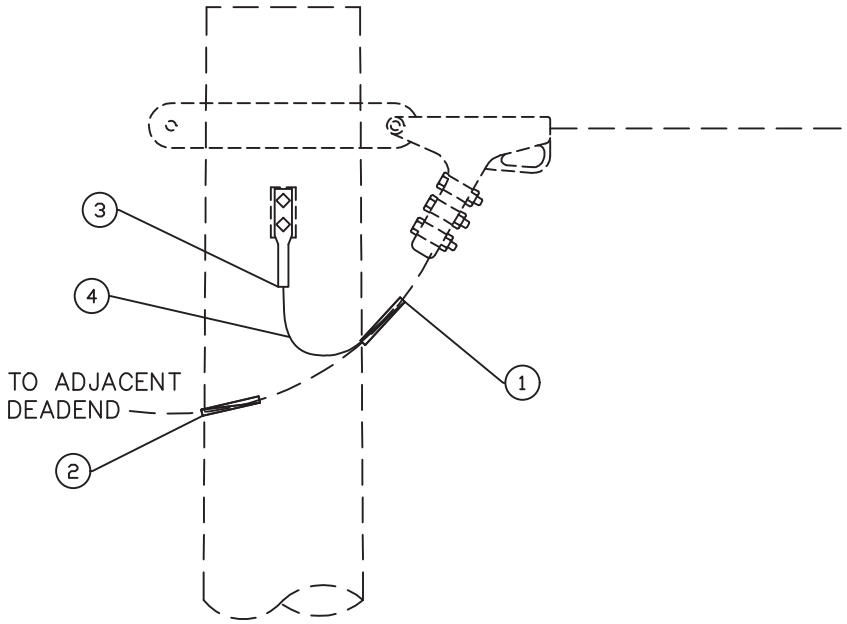
GREENVILLE, NORTH CAROLINA

Greenville Utilities

SUSPENSION INSULATOR ASSEMBLY

DWN. JLS	DATE: 03/11/19	DWG. NO.
CKD. KW	APPD. KW	
SCALE: N.T.S.		TM–1

DATE	DATE	REVISION



TM–2A SINGLE DEADEND
TM–2B DOUBLE DEADEND
TM–2C TRIPLE DEADEND

DWG. REF.	TM–2			LIST OF MATERIALS
	A	B	C	DESCRIPTION
1	1	1	1	CONNECTOR – COMPRESSION, OHGW TO #4
2	–	1	2	CONNECTOR – COMPRESSION SLEEVE OHGW TO OHGW
3	1	1	1	CONNECTOR – COMPRESSION, NEMA 2 HOLE #4
4	5	5	5	GROUND WIRE, #4 (ft.)

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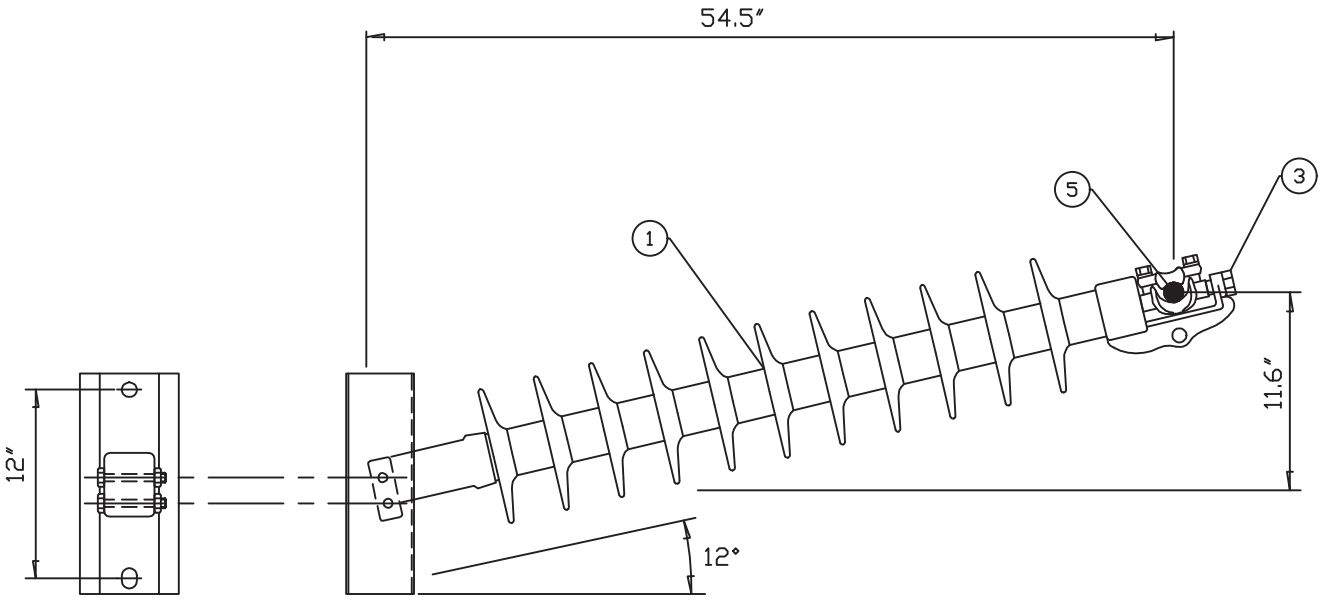
GREENVILLE, NORTH CAROLINA

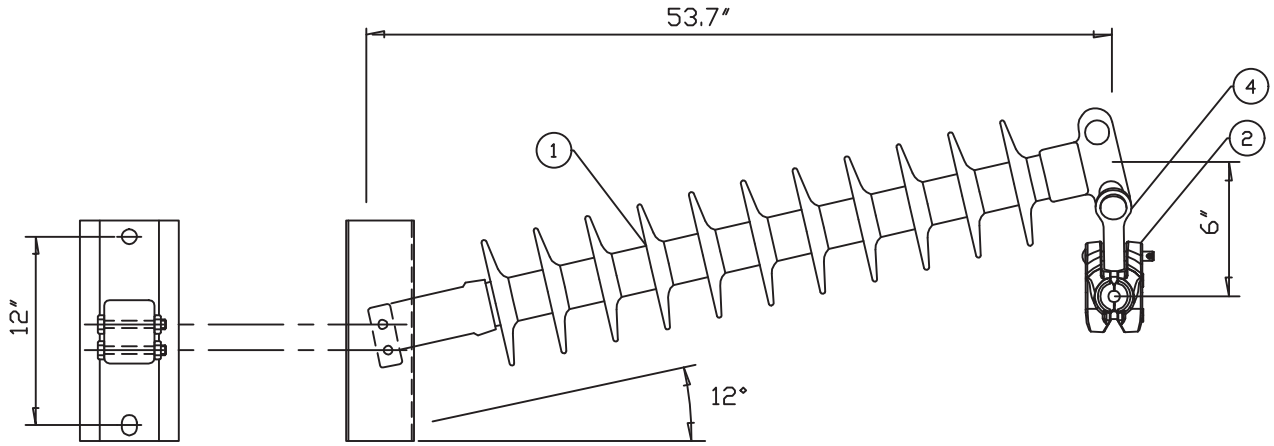
TRANSMISSION OHGW STEEL POLE
DEADEND GROUNDING ASSEMBLY

DWN. JLS		DATE: 03/12/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.
TM–2



TM-3BM - HORIZONTAL POST INSULATOR



TM-3DM - HORIZONTAL POST INSULATOR - TANGENT & SMALL ANGLE

DWG. REF.	TM-3		LIST OF MATERIALS
	BM	DM	DESCRIPTION
1	1	1	INSULATOR, POLYMER HORIZONTAL POST
2	–	1	CLAMP, SUSPENSION x REQ. CONDUCTOR SIZE
3	1	–	CLAMP, TRUNION x REQ. CONDUCTOR SIZE
4	–	1	Y-CLEVIS, BALL
5	1	*	ARMOR ROD x REQ. CONDUCTOR SIZE
		*	Armor Rod not required if suspension clamp is cushioned

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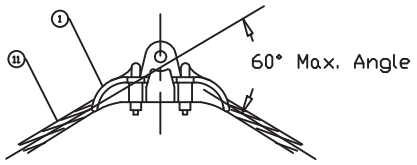
GREENVILLE, NORTH CAROLINA

Greenville Utilities

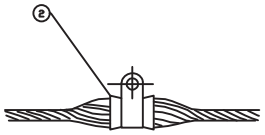
HORIZONTAL POST INSULATOR ASSEMBLY

DWN. JLS		DATE: 03/01/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

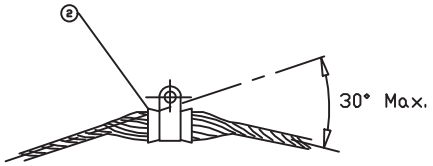
DWG. NO.
TM-3



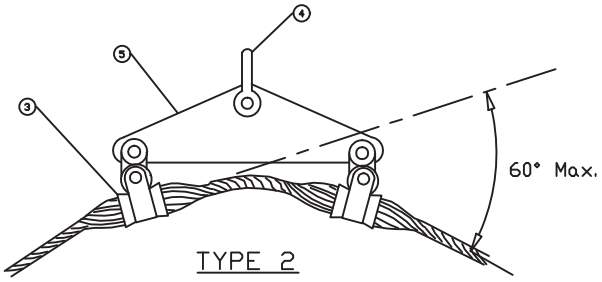
TANGENT & ANGLE CLAMP
TM-4A



TANGENT ASSEMBLY
TM-4B

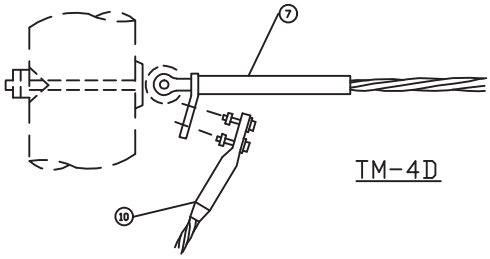


TYPE 1

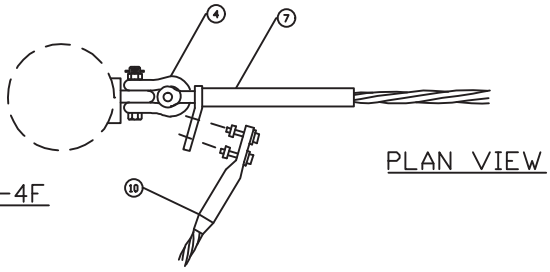


TYPE 2

ANGLE ASSEMBLY
TM-4C (NOTE 1)

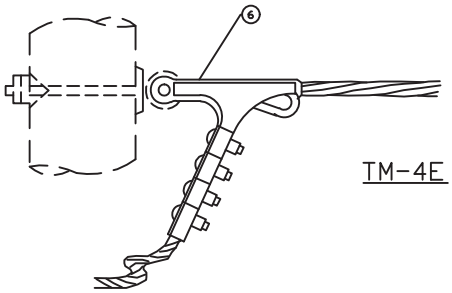


TM-4D

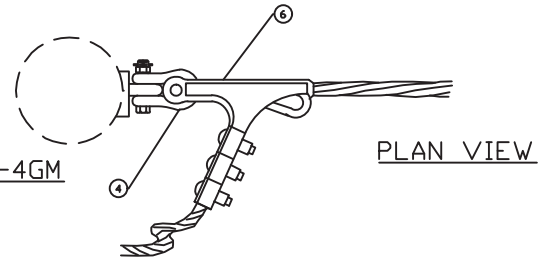


TM-4F

PLAN VIEW



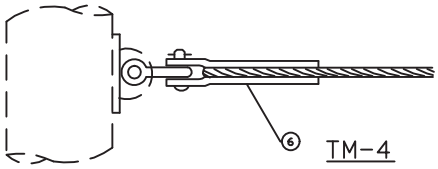
TM-4E



TM-4GM

PLAN VIEW

DEADEND ASSEMBLY



TM-4

NOTES:

1. The appropriate cushioned suspension angle assembly shall be installed for the line angles shown on the plan-profile drawings:
   - A. For angles from 0 degrees to 30 degrees, use type 1
   - B. For angles from 30 degrees to 60 degrees use type 2

DWG. REF.	ITEM	DESCRIPTION
1		CLAMP, SUSPENSION (TO 60°)
2		CLAMP, CUSHIONED SUSPENSION
3		CLAMP, CUSHIONED SUSP. & CLEVIS EYE
4		ANCHOR SHACKLE 40,000 LBS. BNC
5		YOLK PLATE
6		CLAMP BOLTED DEADEND (3 BOLT)
7		CLAMP, COMPRESSION DEADEND
8		LINK, EXTENSION, CLEVIS 6"
9		JUMPER CONNECTOR, COMPRESSION
10		JUMPER TERMINAL, COMPRESSION
11		ARMOR ROD

LIST OF MATERIALS

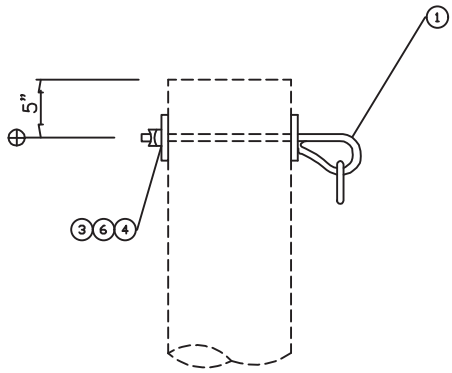
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

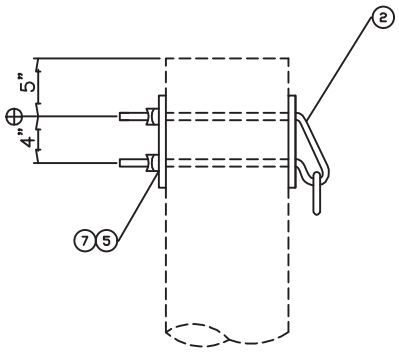
O.H.G.W. ASSEMBLIES CUSHIONED SUSPENSION AND SUSPENSION CLAMPS

DWN. JLS		DATE: 02/27/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.
TM-4



SINGLE BOLT O.H.G.W. SUPPORT
TM–6A(S)



DOUBLE BOLT O.H.G.W. SUPPORT
TM–6B(S)

NOTES

1. Designated strength limitations of the overhead groundwire support assemblies are:

	Allowable Vertical Load
TM–6A(S)	5,000 lbs.
TM–6B(S)	5,000 lbs.

DWG. REF.	TM–6 A	TM–6 B	LIST OF MATERIALS DESCRIPTION
1	1	–	SUPPORT, SINGLE BOLT OHGW, 3/4"
2	–	1	SUPPORT, DOUBLE BOLT OHGW, 5/8"
3	1	–	WASHER, SQUARE, 4" x 4" x 1/4" w/ 15/16"
4	1	–	NUT, 3/4"
5	–	2	NUT, 5/8"
6	1	–	SPRING LOCK WASHER, 3/4"
7	–	2	SPRING LOCK WASHER, 5/8"

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

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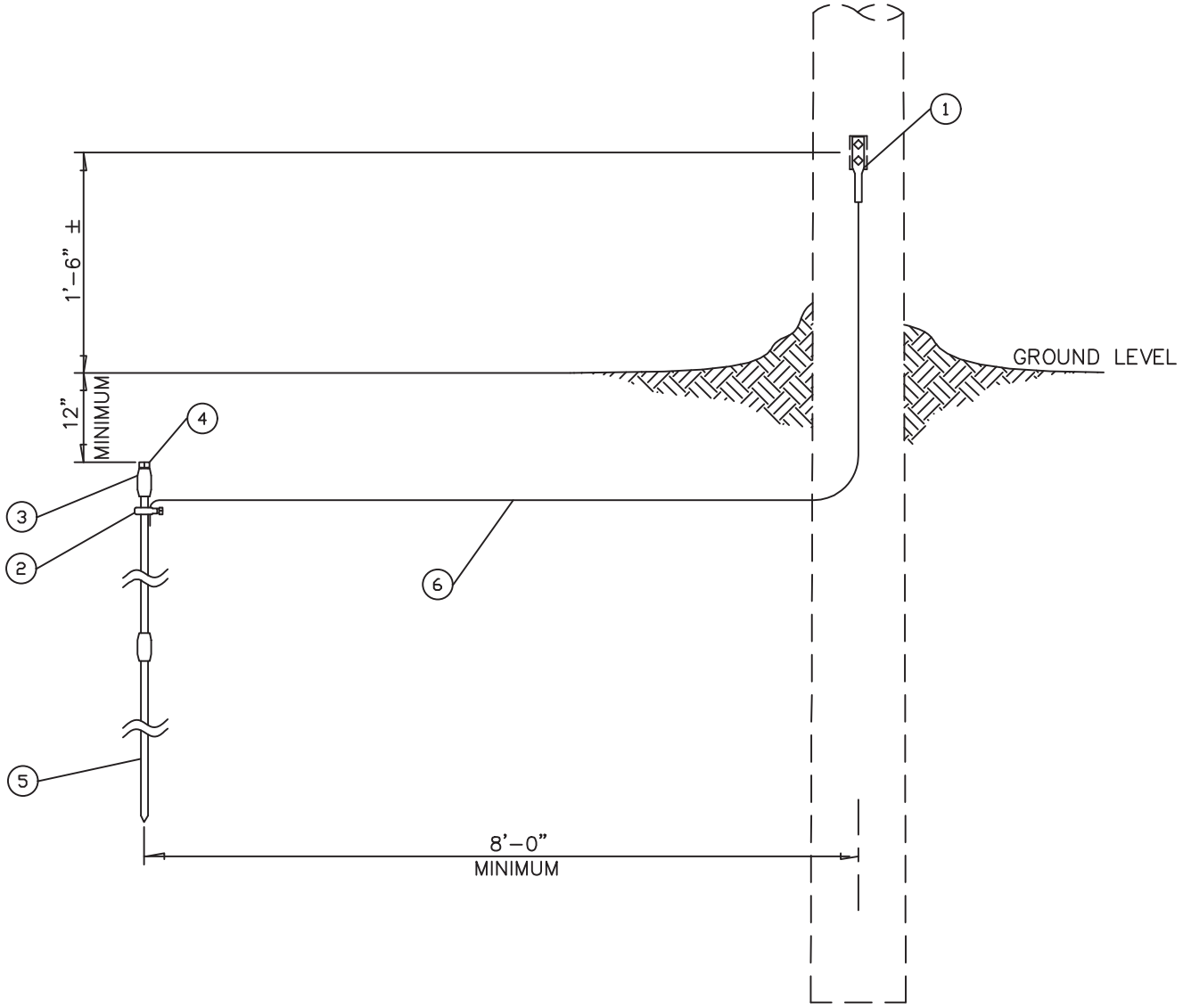
O.H.G.W. SUPPORT ASSEMBLY FOR STEEL POLES

DWN. JLS		DATE: 02/26/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.
TM–6(S)



NOTES:

1) MAXIMUM GROUND RESISTANCE READING SHALL BE 25 OHMS. IF THE CLAMP–ON RESISTANCE MEASUREMENT IS USED, THE GROUND ROD SHALL BE INSTALLED AND TEMPORARILY BONDED UNTIL THE GROUND RESISTANCE READING IS TAKEN. ADDITIONAL ROD SECTIONS SHALL BE ADDED AS NECESSARY TO REDUCE RESISTANCE TO 25 OHMS MAXIMUM.

2) SPECIFY TM–9R FOR ADDITIONAL GROUND ROD SECTION AND COUPLING.

3) GROUND ROD TO BE INSTALLED IN UNDISTURBED SOIL.

DWG. REF.	TM–9		LIST OF MATERIALS
	SP	R	DESCRIPTION
1	1	–	CONNECTOR – COMPRESSION, NEMA 2 HOLE #4
2	1	–	GROUND – ROD CLAMP, GALVANIZED, 5/8"
3	1	1	GROUND – ROD COUPLING, GALVANIZED, 5/8" THREADED
4	1	–	GROUND – DRIVING STUD, STEEL, 5/8"
5	1	1	GROUND – ROD, GALVANIZED, 5/8" x 10'–0"
6	15	–	GROUND – WIRE, #4 (ft.)

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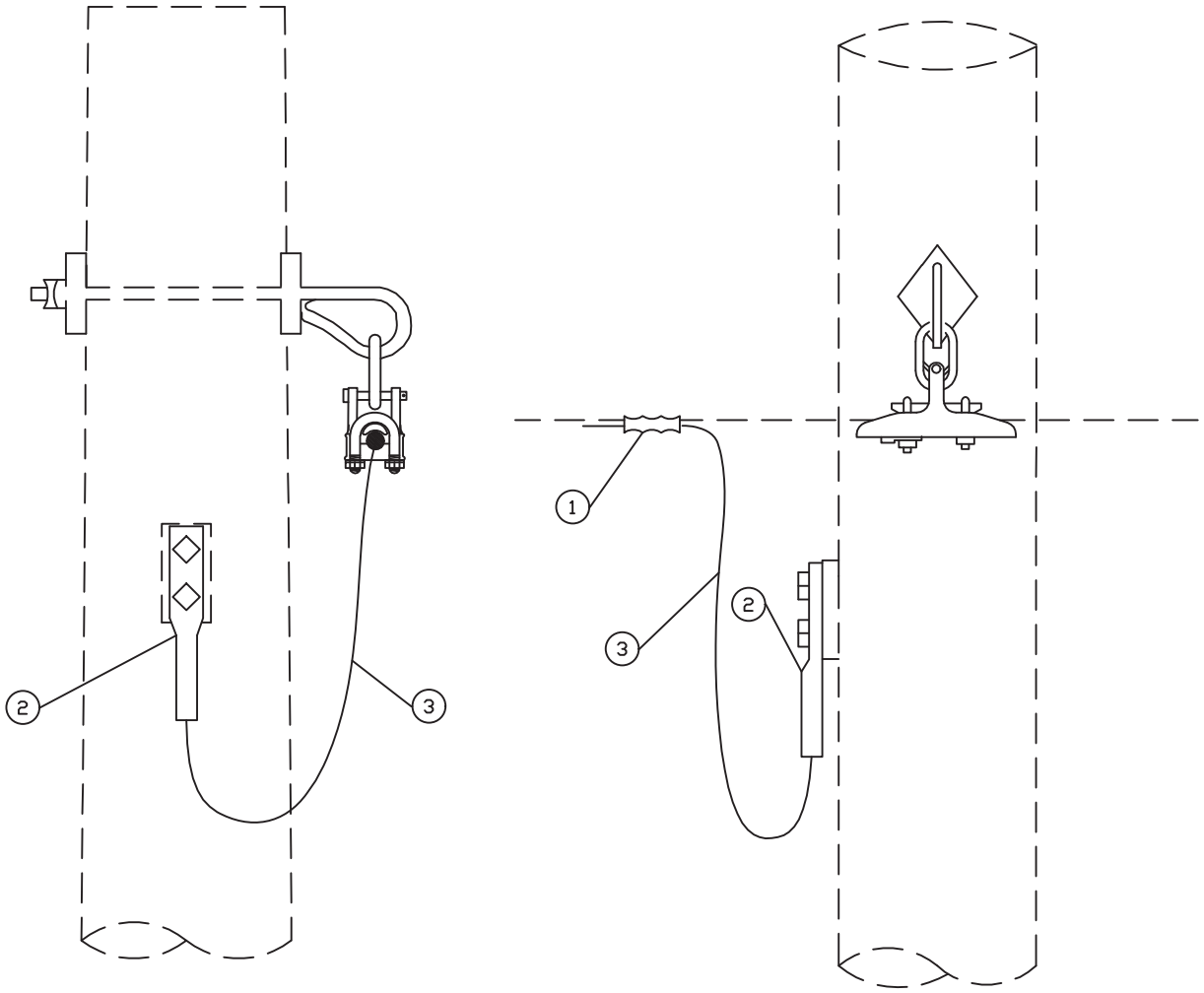
DRIVEN GROUND ROD GROUNDING ASSEMBLY – STEEL POLE

DWN. JLS	DATE: 03/13/19
CKD. KW	APPD. KW
SCALE: N.T.S.	

DATE		DATE	REVISION

DWG. NO.

TM–9



DWG. REF.	LIST OF MATERIALS	
	ea.	DESCRIPTION
1	1	CONNECTOR – COMPRESSION, BI–METALLIC, 7 No. 9
		ALUMOWELD TO #4
2	1	CONNECTOR – COMPRESSION, NEMA 2–HOLE FOR #4
3	5	GROUND – WIRE, #4 (ft.)

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Greenville Utilities

OVERHEAD GROUND WIRE GROUNDING ASSEMBLY – STEEL POLE

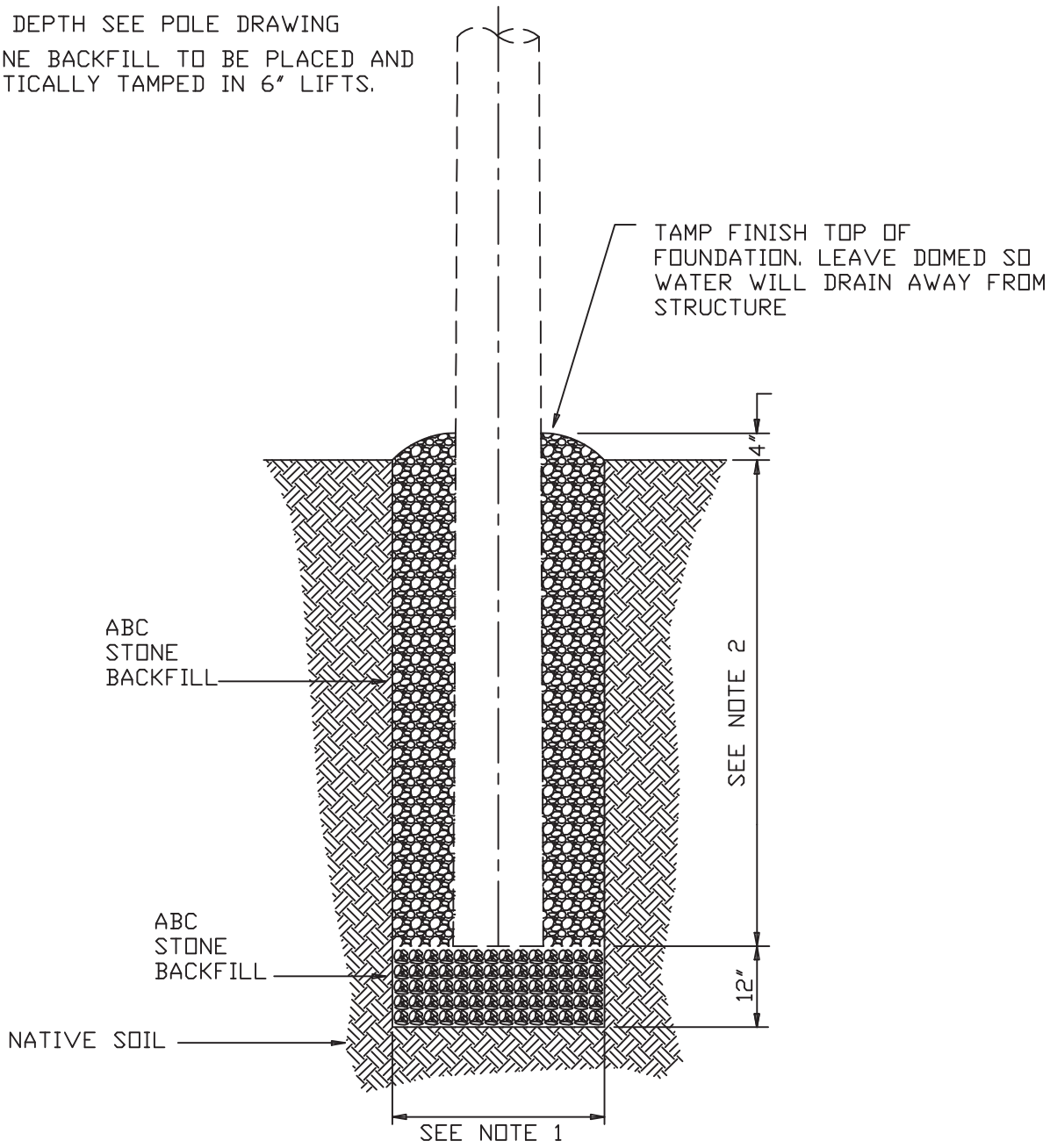
DWN. JLS		DATE: 03/13/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.

TM–9X(S)

NOTES:

1. HOLE DIAMETER SHALL BE EQUAL TO THE POLE BUTT DIAMETER PLUS 18″, UNLESS OTHERWISE NOTED.
2. SETTING DEPTH SEE POLE DRAWING
3. ABC STONE BACKFILL TO BE PLACED AND PNEUMATICALLY TAMPED IN 6″ LIFTS.



DWG. REF.	LIST OF MATERIALS	
	ea.	DESCRIPTION
	*	ABC STONE BACKFILL
		* SIGNIFIES AS REQUIRED

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

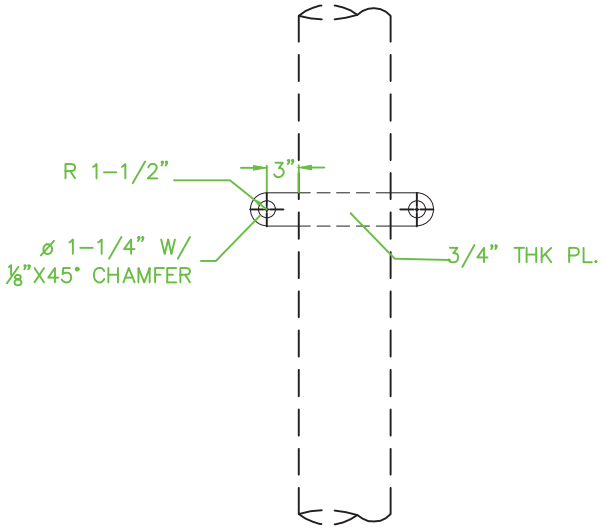
Greenville Utilities

ABC STONE BACKFILL FOUNDATION

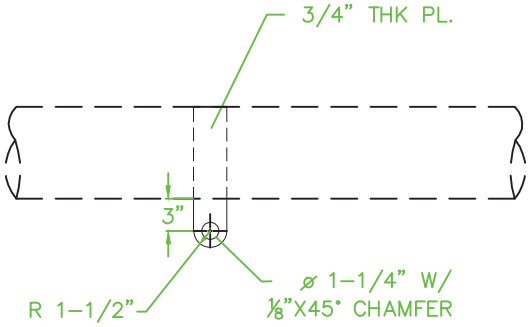
DWN. JLS		DATE: 02/27/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.

TMF–EMB



STEEL POLE THRU VANG



CROSSARM THRU VANG

DWG. REF.	LIST OF MATERIALS	
	ea.	DESCRIPTION

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

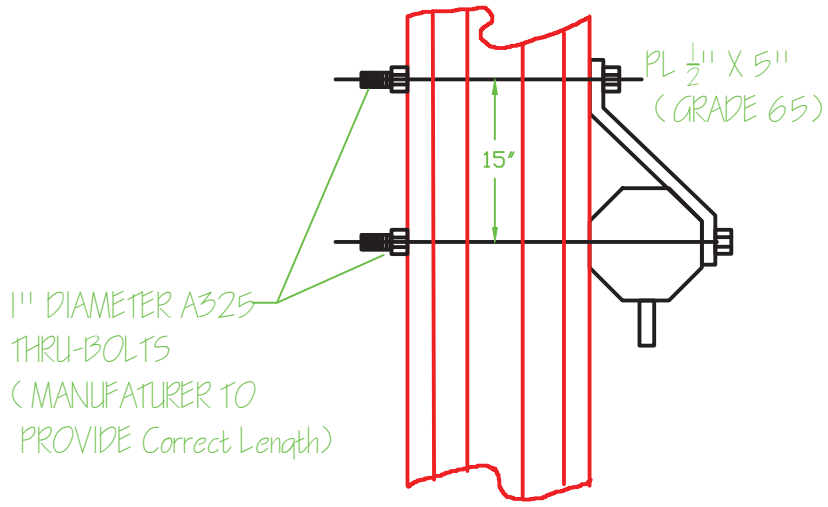
Greenville Utilities

STEEL POLE/CROSSARM THRU VANG

DWN. JLS		DATE: 04/01/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE		DATE	REVISION

DWG. NO.

TV–1



DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

H-FRAME CROSSARM STRAP

DWN. JLS		DATE: 05/01/19	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.

AG3967B

Appendix E: Pole Manufacturer's Structure Analysis

Project Name : 229469 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 50' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229469\229469.pol
Date run : 3:12:27 PM Thursday, March 21, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229469\h2.lca

*** Analysis Results:

Maximum element usage is 92.94% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 46.70% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	1.25	4.16	185.81	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-1.25	4.16	185.81	0.00	185.81	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	39.04	-1.75	39.08	-0.00	-6.72	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	46.50	50.00	9.25	6.97	3.26	3.26	46.70

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1367	1: H2 PEP	92.94	185.81

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	92.94	1: H2 PEP	11	1367.5

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	92.94	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	92.94	P	11

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 1367.5
Total: 1367.5

*** End of Report

Project Name : 229470 (GREENVILLE UTILITIES COMPANY)
Project Notes: 70' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229470\229470.pol
Date run : 1:15:03 PM Tuesday, March 26, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229470\h2.lca

*** Analysis Results:

Maximum element usage is 97.76% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 62.79% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	2.04	4.16	264.61	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-2.04	4.16	264.61	0.00	264.61	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	73.44	-4.49	73.57	-0.00	-9.35	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	65.10	70.00	9.67	9.77	6.13	6.13	62.79

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1307	1: H2 PEP	87.60	179.40
P	2	933	1: H2 PEP	97.76	264.61

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	97.76	1: H2 PEP	15	2240.3

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	97.76	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	97.76	P	15

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 2240.3
Total: 2240.3

*** End of Report

Project Name : 229471 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 75' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229471\229471.pol
Date run : 1:24:04 PM Tuesday, March 26, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229471\H2.lca

*** Analysis Results:

Maximum element usage is 97.96% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 67.05% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	2.23	4.16	284.46	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-2.23	4.16	284.46	0.00	284.46	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	84.00	-5.52	84.18	-0.00	-10.10	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	69.75	75.00	9.67	10.46	7.01	7.01	67.05

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1307	1: H2 PEP	87.61	179.44
P	2	1142	1: H2 PEP	97.96	266.72

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	97.96	1: H2 PEP	16	2448.8

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	97.96	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	97.96	P	16

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 2448.8
Total: 2448.8

*** End of Report

Project Name : 229472 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 55' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229472\229472.pol
Date run : 1:21:21 PM Tuesday, March 26, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229472\H2.lca

*** Analysis Results:

Maximum element usage is 95.46% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 50.90% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	1.48	4.16	205.51	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-1.48	4.16	205.51	0.00	205.51	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	46.81	-2.28	46.86	-0.00	-7.27	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	51.15	55.00	9.67	7.67	3.91	3.91	50.90

Tubes Summary:

Pole Label	Tube Num.	Weight	Load Case	Maximum Usage	Resultant Moment

		(lbs)		%	(ft-k)
P	1	727	1: H2 PEP	72.19	104.94
P	2	894	1: H2 PEP	95.46	205.51

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	95.46	1: H2 PEP	13	1620.6

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	95.46	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	95.46	P	13

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 1620.6
Total: 1620.6

*** End of Report

Project Name : 229473 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 65' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229473\229473.pol
Date run : 10:30:56 AM Friday, March 29, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229473\H2.lca

*** Analysis Results:

Maximum element usage is 96.92% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 59.46% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	1.78	4.16	244.77	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-1.78	4.16	244.77	0.00	244.77	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	64.59	-3.74	64.70	-0.00	-8.80	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	60.45	65.00	9.67	9.07	5.39	5.39	59.46

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	664	1: H2 PEP	74.14	104.30
P	2	1288	1: H2 PEP	96.92	244.77

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	96.92	1: H2 PEP	14	1951.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	96.92	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	96.92	P	14

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):

Weight of Steel Poles:	1951.4
Total:	1951.4

*** End of Report

Project Name : 229474 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 65' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229474\229474.pol
Date run : 10:34:45 AM Friday, March 29, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229474\H2.lca

*** Analysis Results:

Maximum element usage is 97.35% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 60.50% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	1.82	4.16	244.88	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-1.82	4.16	244.88	0.00	244.88	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	65.72	-3.86	65.83	-0.00	-8.89	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	60.45	65.00	9.67	9.07	5.49	5.49	60.50

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	727	1: H2 PEP	72.09	104.82
P	2	1272	1: H2 PEP	97.35	244.88

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	97.35	1: H2 PEP	14	1999.3

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	97.35	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	97.35	P	14

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 1999.3
Total: 1999.3

*** End of Report

Project Name : 229475 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 80' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229475\229475.pol
Date run : 3:27:08 PM Tuesday, March 26, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229475\H2.lca

*** Analysis Results:

Maximum element usage is 97.43% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 71.19% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	2.34	4.16	304.20	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-2.34	4.16	304.20	0.00	304.20	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	95.10	-6.73	95.34	-0.00	-10.93	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	74.40	80.00	9.67	11.16	7.94	7.94	71.19

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1214	1: H2 PEP	90.59	178.86
P	2	1370	1: H2 PEP	97.43	304.20

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	97.43	1: H2 PEP	17	2584.6

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	97.43	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	97.43	P	17

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 2584.6
Total: 2584.6

*** End of Report

Project Name : 229476 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 75' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229476\229476.pol
Date run : 3:41:29 PM Tuesday, March 26, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229476\H2.lca

*** Analysis Results:

Maximum element usage is 97.96% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 67.05% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	2.23	4.16	284.46	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-2.23	4.16	284.46	0.00	284.46	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	84.00	-5.52	84.18	-0.00	-10.10	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	69.75	75.00	9.67	10.46	7.01	7.01	67.05

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1307	1: H2 PEP	87.61	179.44
P	2	1142	1: H2 PEP	97.96	266.72

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	97.96	1: H2 PEP	16	2448.8

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	97.96	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	97.96	P	16

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 2448.8
Total: 2448.8

*** End of Report

Project Name : 229477 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 80' H2 POLE (GREENCILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229477\229477.pol
Date run : 2:53:51 PM Friday, March 29, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229477\H2.lca

*** Analysis Results:

Maximum element usage is 97.43% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 71.19% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	2.34	4.16	304.20	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-2.34	4.16	304.20	0.00	304.20	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	95.10	-6.73	95.33	-0.00	-10.93	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	74.40	80.00	9.67	11.16	7.94	7.94	71.19

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	806	1: H2 PEP	79.80	124.42
P	2	1778	1: H2 PEP	97.43	304.20

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	97.43	1: H2 PEP	17	2584.6

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	97.43	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	97.43	P	17

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 2584.6
Total: 2584.6

*** End of Report

Project Name : 229478 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 75' H3 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229478\229478.pol
Date run : 1:22:16 PM Friday, March 29, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229478\H3.lca

*** Analysis Results:

Maximum element usage is 98.24% for Steel Pole "P" in load case "1: H3 PEP"
Maximum insulator usage is 48.75% for Clamp "L" in load case "1: H3 PEP"
Maximum pole deflection usage is 59.68% for "P" in load case "1: H3 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H3 PEP	P:f	2.47	4.87	333.11	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H3 PEP	P:f	-0.00	-4.87	-2.47	4.87	333.11	0.00	333.11	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H3 PEP	P:t	-0.00	74.81	-4.33	74.93	-0.00	-8.81	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H3 PEP	% Pole Height	15.00	69.75	75.00	11.18	10.46	6.24	6.24	59.68

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1461	1: H3 PEP	85.31	209.41
P	2	1246	1: H3 PEP	98.24	333.11

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	98.24	1: H3 PEP	16	2707.8

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H3 PEP	98.24	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H3 PEP	98.24	P	16

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	48.75	1: H3 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 2707.8
Total: 2707.8

*** End of Report

Project Name : 229479 (GREENVILLE UTILITIES COMMISSION)
Project Notes: 45' H2 POLE (GREENVILLE UTILITIES SUBSTATION)
Project File : W:\Jobs\2019\229479\229479.pol
Date run : 8:37:26 AM Monday, April 22, 2019
by : PLS-POLE Version 15.50
Licensed to : Rohn Products
Engineer : SAO

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: W:\Jobs\2019\229479\H2.lca

*** Analysis Results:

Maximum element usage is 90.62% for Steel Pole "P" in load case "1: H2 PEP"
Maximum insulator usage is 83.20% for Clamp "L" in load case "1: H2 PEP"
Maximum pole deflection usage is 41.43% for "P" in load case "1: H2 PEP"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
1: H2 PEP	P:f	1.09	4.16	166.28	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
1: H2 PEP	P:f	-0.00	-4.16	-1.09	4.16	166.28	0.00	166.28	0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
1: H2 PEP	P:t	-0.00	31.18	-1.23	31.21	-0.00	-5.87	-0.00

Pole Deflection Usages For All Load Cases:

Pole Label	Load Case	Deflection Check	Deflection Limit %	Height (ft)	Length (ft)	Tip Diameter (in)	Allowable Deflection (ft)	Actual Deflection (ft)	Deflection From Vertical Axis (ft)	Usage %
P	1: H2 PEP	% Pole Height	15.00	41.85	45.00	9.25	6.28	2.60	2.60	41.43

Tubes Summary:

Pole	Tube	Weight	Load Case	Maximum	Resultant

Label	Num.	(lbs)		Usage %	Moment (ft-k)
P	1	1196	1: H2 PEP	90.62	166.28

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	90.62	1: H2 PEP	10	1196.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
1: H2 PEP	90.62	P	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
1: H2 PEP	90.62	P	10

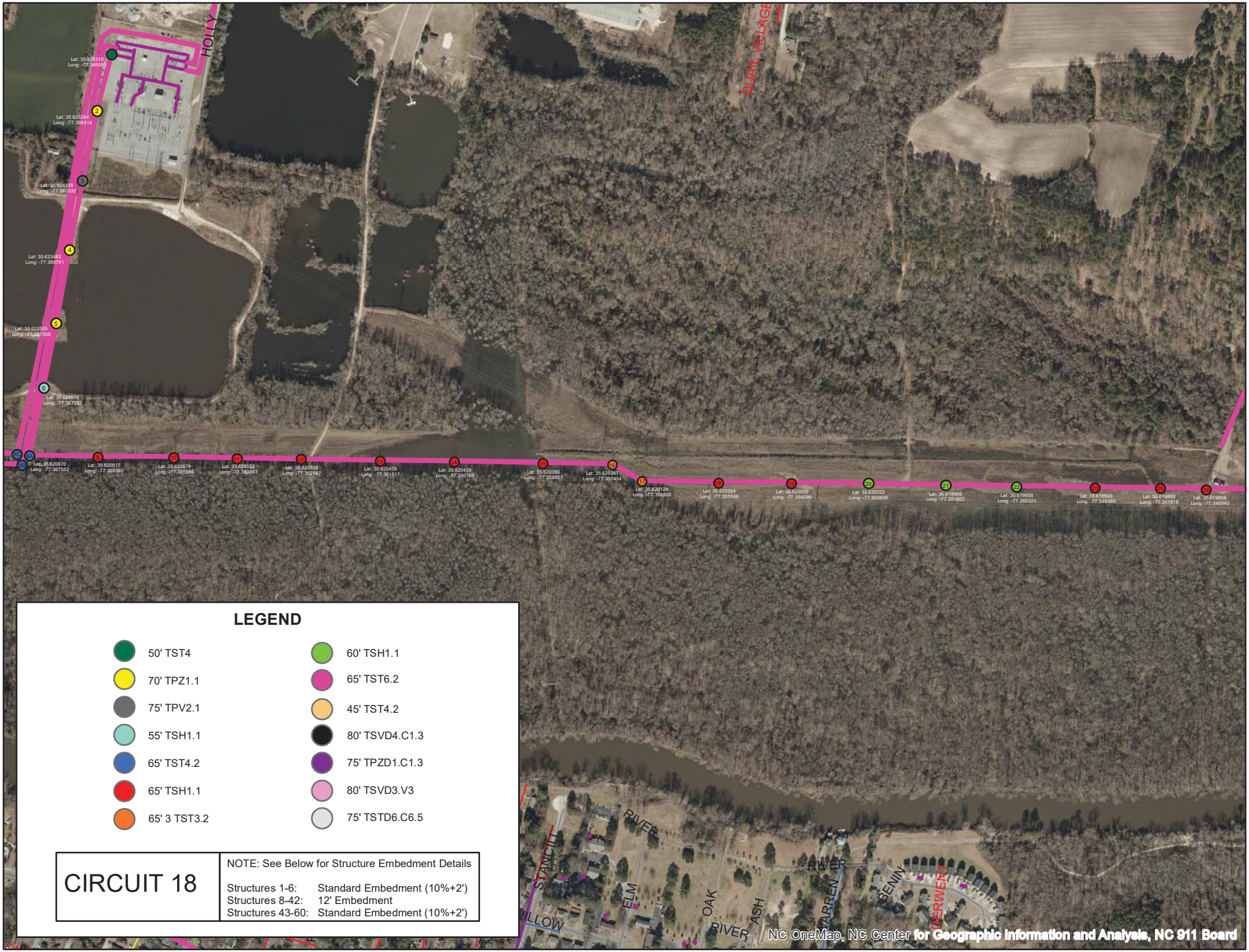
Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
L	Clamp	83.20	1: H2 PEP	0.0

*** Weight of structure (lbs):
Weight of Steel Poles: 1196.4
Total: 1196.4

*** End of Report

Appendix F: Vicinity Maps



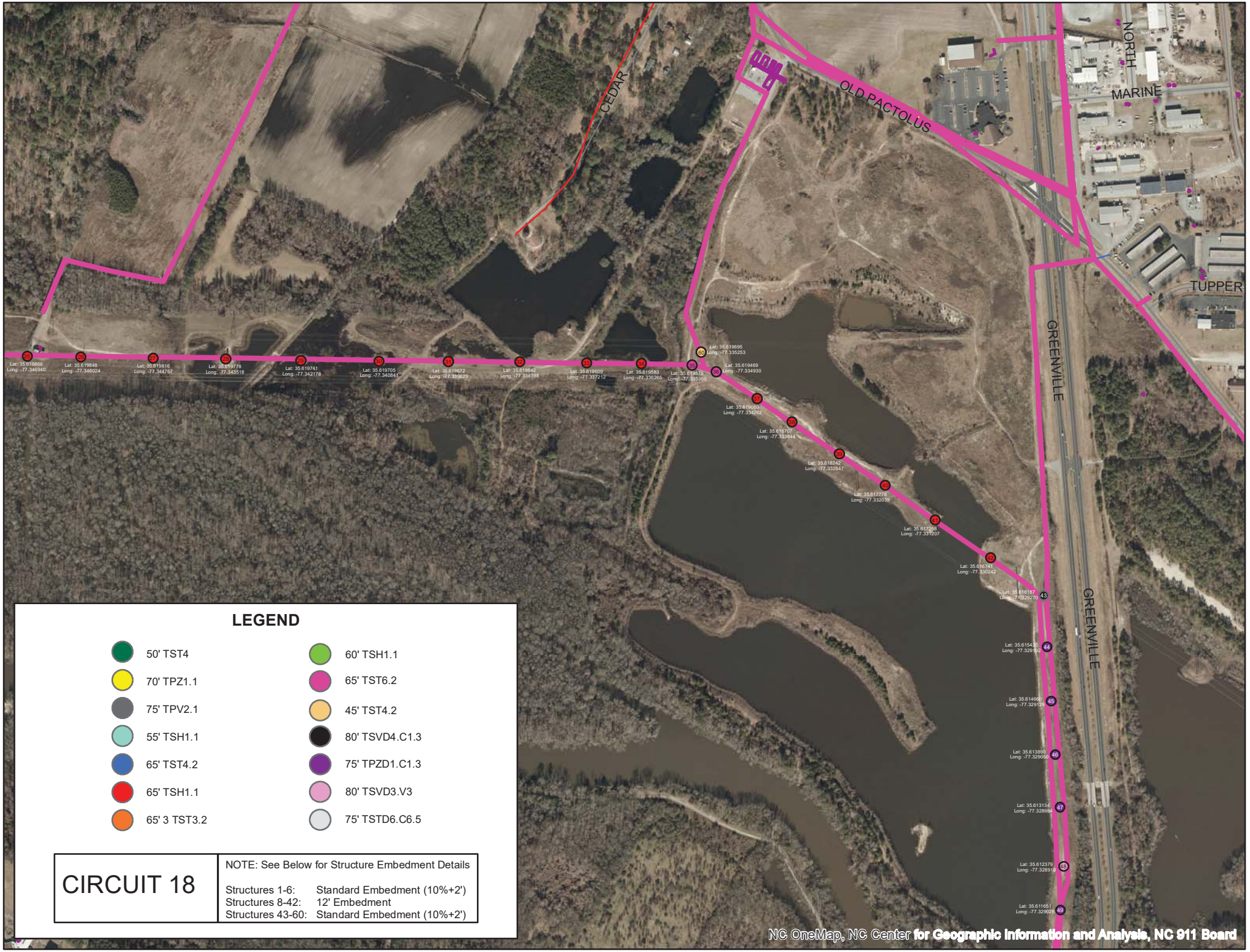
LEGEND

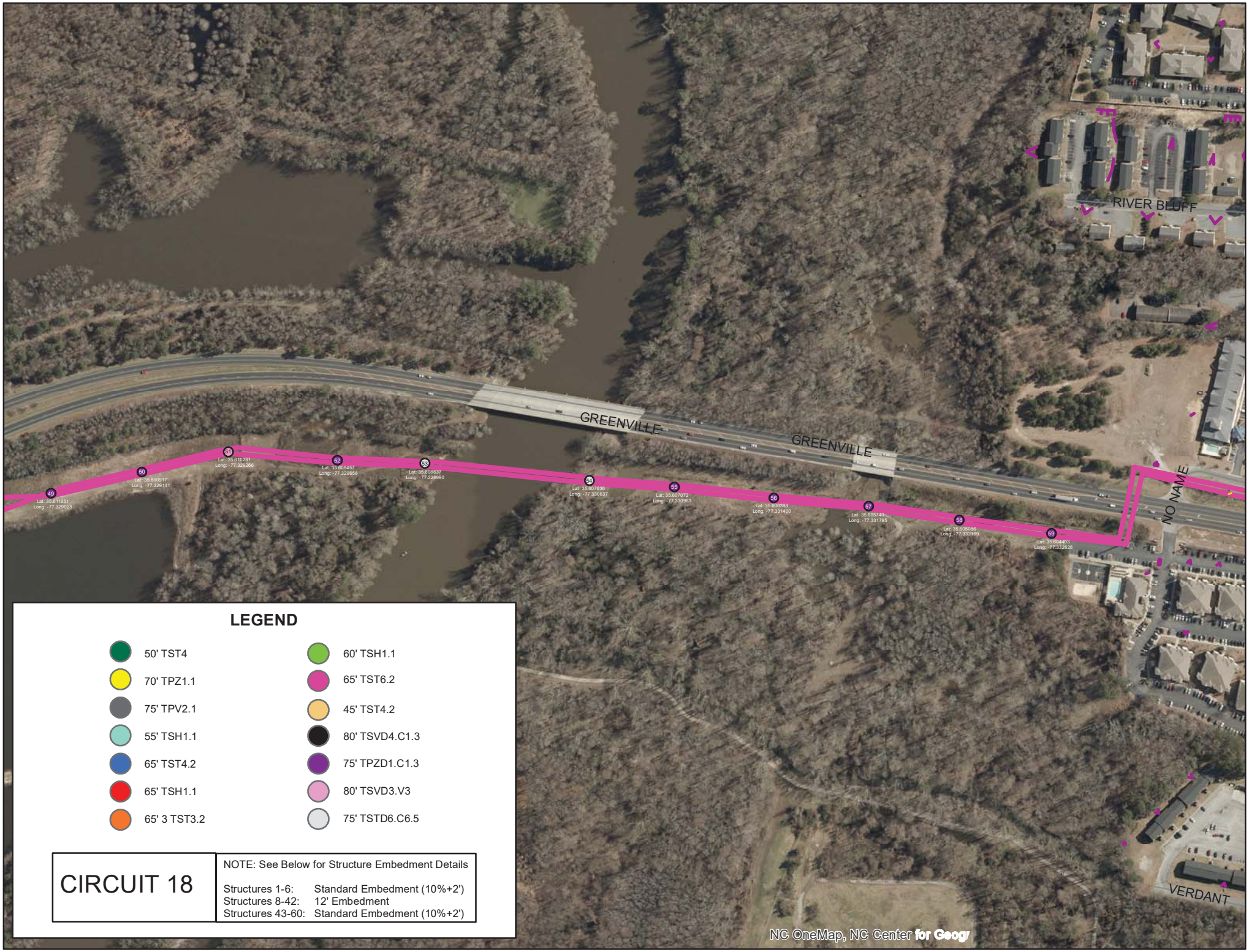
- 50' TST4
- 70' TPZ1.1
- 75' TPV2.1
- 55' TSH1.1
- 65' TST4.2
- 65' TSH1.1
- 65' 3 TST3.2
- 60' TSH1.1
- 65' TST6.2
- 45' TST4.2
- 80' TSVD4.C1.3
- 75' TPZD1.C1.3
- 80' TSVD3.V3
- 75' TSTD6.C6.5

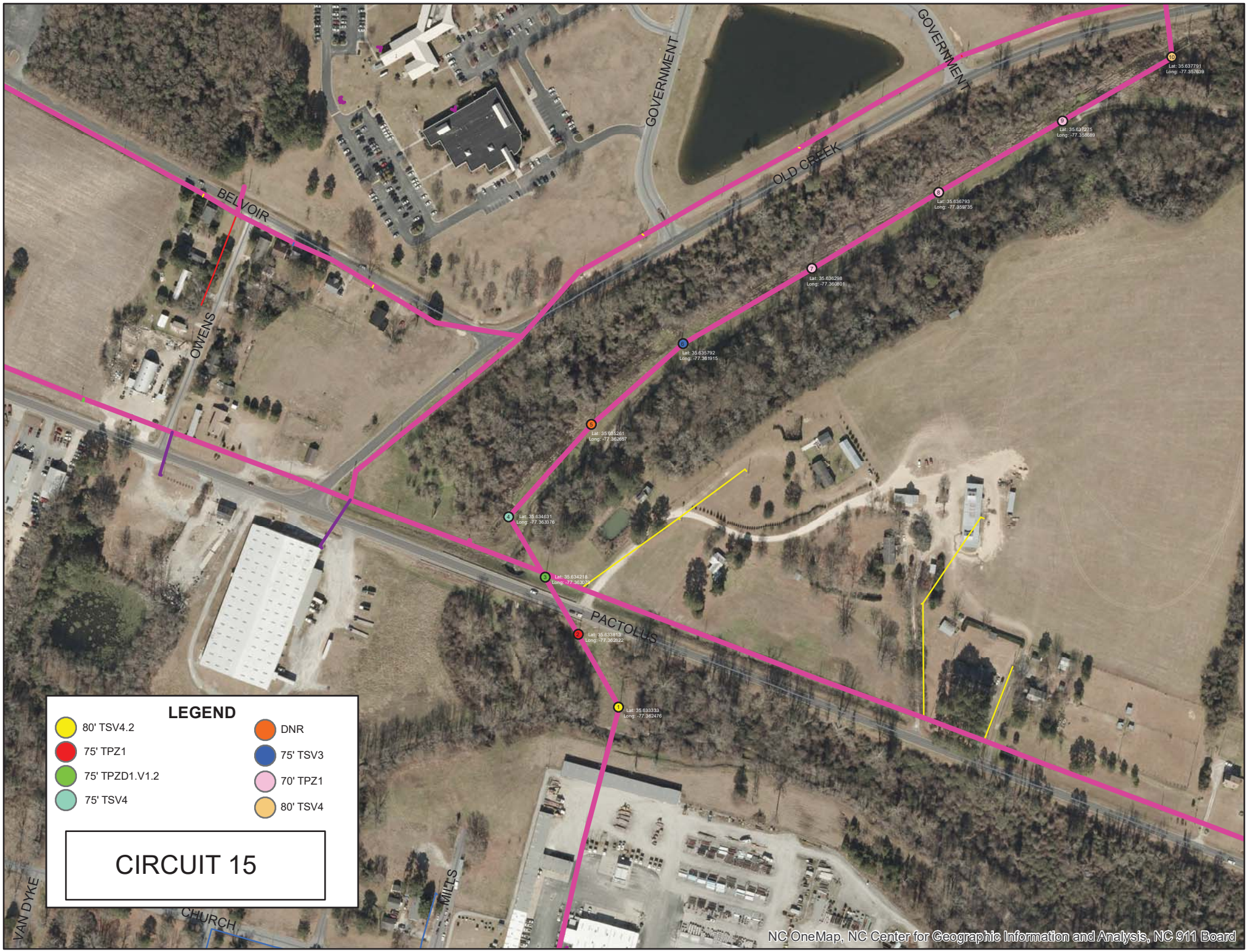
CIRCUIT 18

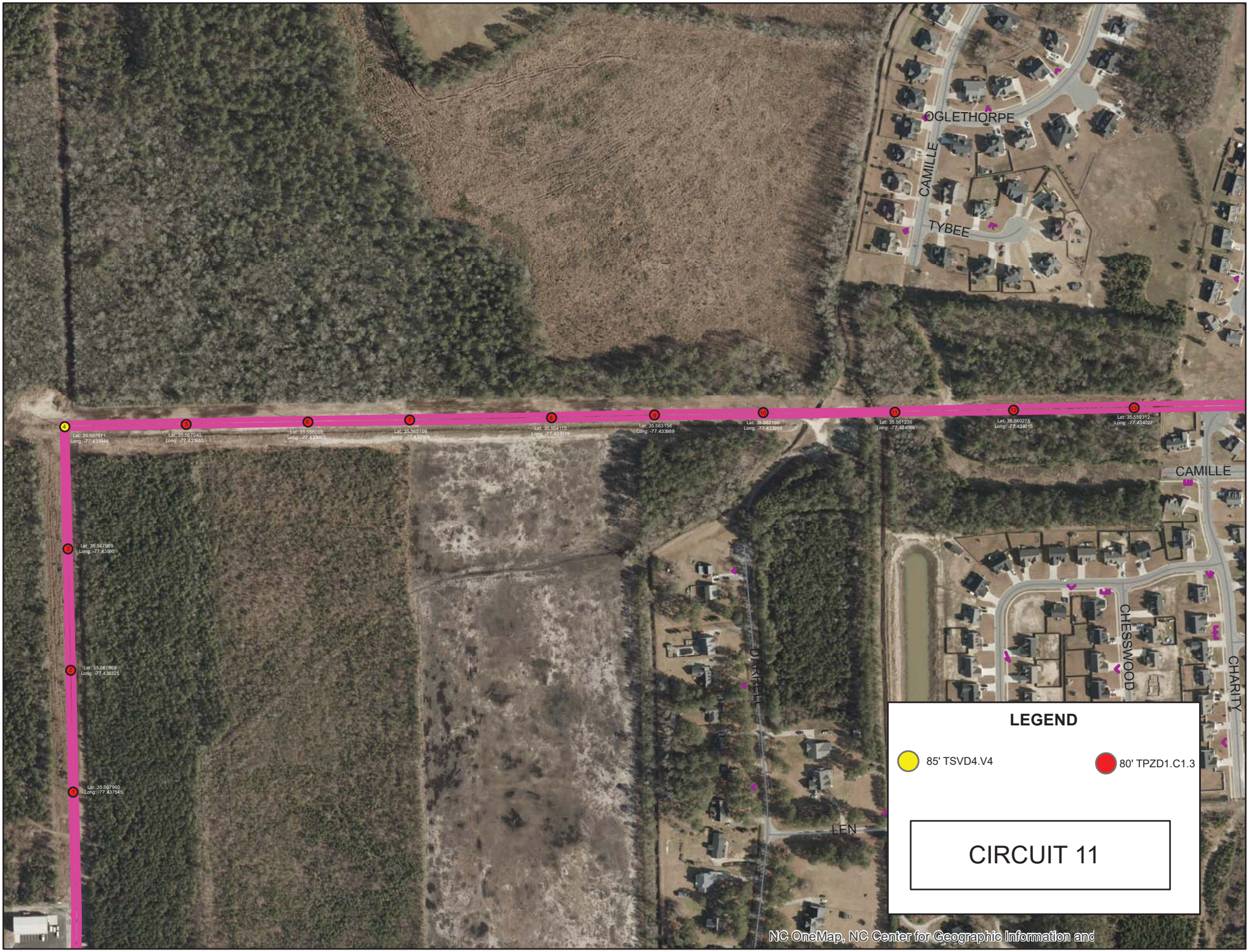
NOTE: See Below for Structure Embedment Details

Structures 1-6: Standard Embedment (10%+2')
Structures 8-42: 12' Embedment
Structures 43-60: Standard Embedment (10%+2')


CEDAR
OLD PACTOLUS
NORTH
MARINE
TUPPER
GREENVILLE
GREENVILLE
LEGEND
50' TST4
70' TPZ1.1
75' TPV2.1
55' TSH1.1
65' TST4.2
65' TSH1.1
65' 3 TST3.2
60' TSH1.1
65' TST6.2
45' TST4.2
80' TSVD4.C1.3
75' TPZD1.C1.3
80' TSVD3.V3
75' TSTD6.C6.5
CIRCUIT 18
NOTE: See Below for Structure Embedment Details
Structures 1-6: Standard Embedment (10%+2')
Structures 8-42: 12' Embedment
Structures 43-60: Standard Embedment (10%+2')
NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board


RIVER BLUFF
GREENVILLE
GREENVILLE
NO NAME
VERDANT
49
Lat: 35.611651
Long: -77.329023
50
Lat: 35.610917
Long: -77.329141
51
Lat: 35.610231
Long: -77.329266
52
Lat: 35.609457
Long: -77.329658
53
Lat: 35.608837
Long: -77.329990
54
Lat: 35.607636
Long: -77.330637
55
Lat: 35.607072
Long: -77.330983
56
Lat: 35.606353
Long: -77.331400
57
Lat: 35.605740
Long: -77.331795
58
Lat: 35.605086
Long: -77.332199
59
Lat: 35.604403
Long: -77.332626
LEGEND
50' TST4
70' TPZ1.1
75' TPV2.1
55' TSH1.1
65' TST4.2
65' TSH1.1
65' 3 TST3.2
60' TSH1.1
65' TST6.2
45' TST4.2
80' TSVD4.C1.3
75' TPZD1.C1.3
80' TSVD3.V3
75' TSTD6.C6.5
CIRCUIT 18
NOTE: See Below for Structure Embedment Details
Structures 1-6: Standard Embedment (10%+2')
Structures 8-42: 12' Embedment
Structures 43-60: Standard Embedment (10%+2')
NC OneMap, NC Center for Geogr


GOVERNMENT
GOVERNMENT
OLD CREEK
BELVOIR
OWENS
PACTOLUS
VAN DYKE
CHURCH
MILLS
1 Lat: 35.633333 Long: -77.362476
2 Lat: 35.633813 Long: -77.362822
3 Lat: 35.634216 Long: -77.363074
4 Lat: 35.634631 Long: -77.363376
5 Lat: 35.635261 Long: -77.362897
6 Lat: 35.635792 Long: -77.361915
7 Lat: 35.636298 Long: -77.360801
8 Lat: 35.636793 Long: -77.359735
9 Lat: 35.637275 Long: -77.358689
10 Lat: 35.637791 Long: -77.357639
LEGEND
80' TSV4.2
75' TPZ1
75' TPZD1.V1.2
75' TSV4
DNR
75' TSV3
70' TPZ1
80' TSV4
CIRCUIT 15
NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board


OGLETHORPE
CAMILLE
TYBEE
CAMILLE
CHESSWOOD
CHARITY
DANIELL
LEN
4 Lat: 35.567971 Long: -77.433946
5 Lat: 35.567040 Long: -77.433955
6 Lat: 35.566069 Long: -77.433963
7 Lat: 35.565109 Long: -77.433968
8 Lat: 35.564115 Long: -77.433978
9 Lat: 35.563156 Long: -77.433989
10 Lat: 35.562190 Long: -77.433999
11 Lat: 35.561238 Long: -77.434006
12 Lat: 35.560275 Long: -77.434015
13 Lat: 35.559312 Long: -77.434027
3 Lat: 35.567969 Long: -77.43390
2 Lat: 35.567969 Long: -77.436325
1 Lat: 35.567960 Long: -77.437545
LEGEND
85' TSVD4.V4
80' TPZD1.C1.3
CIRCUIT 11
NC OneMap, NC Center for Geographic Information and