GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

SPECIFICATION AND BID DOCUMENTS FOR THE INSTALLATION OF 115 KV TRANSMISSION STRUCTURES ALONG SUGG PARKWAY TAP

ISSUED FOR BIDS

ADVERTISEMENT FOR BIDS

Sealed proposals will be received in the Office of the Procurement Manager, Greenville Utilities Commission, 401 S. Greene Street, Greenville, North Carolina 27834 until 3:00 PM (EDST) on November 5, 2020 and immediately thereafter publicly opened and read for the installation of 115 kV Transmission structures along Sugg Parkway Tap.

Instructions for submitting bids and complete specifications will be available in the Office of the Procurement Manager, 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.**

All questions should be received by 5:00 PM (EDST) on October 28, 2020. Please e-mail questions to: haddocgc@guc.com

Notice to Bidders:

Greenville Utilities Commission is committed to the health and safety of our customers and employees.

We are taking the spread of COVID-19 very seriously and continue to monitor the latest Local, State, and Federal guidance.

We are presently closed to the public.

We are receiving FedEx, UPS, US Mail.

GREENVILLE UTILITIES COMMISSION
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SPECIFICATION AND BID DOCUMENTS
FOR THE INSTALLATION OF
115 KV TRANSMISSION STRUCTURES
ALONG SUGG PARKWAY TAP

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SECTION I

GENERAL INSTRUCTIONS FOR FORMAL BIDS

RELATED TO THE INSTALLATION OF 115 TRANSMISSION

STRUCTURES ALONG SUGG PARKWAY TAP CONTRACT

1. NOTICE TO BIDDERS

Sealed bids, subject to the conditions made a part hereof, will be received in the Office of the Procurement Manager, Greenville Utilities Commission, 401 S. Greene Street, Greenville, North Carolina 27834 until 3:00 PM (EDST) on November 5, 2020, 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 MANAGER, 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 Manager, Greenville Utilities Main Office, 401 S. Greene Street, Greenville, North Carolina.

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 January 4, 2021.

19.2. The completion date for the projects' on-site activities shall be June 3, 2021.

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 Manager, 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 Manager, 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 Manager. 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 Manager.**

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 Manager
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 at 1101 N. Holly Street. All other materials furnished by Owner shall be issued from the Owner's warehouse located at 701 Utility Way, 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 _____, 2020, 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
INSTALLATION OF 115 KV TRANSMISSION
STRUCTURES ALONG SUGG PARKWAY TAP

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.

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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 INSTALLATION
CONTRACT FOR 115 KV CIRCUIT SUGG PARKWAY TAP
TRANSMISSION LINE

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

Respectfully submitted this _____day of _____, 2020.

<table>
<tr><th>OWNER:</th><th>BIDDER</th></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 Manager
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="4"></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 June 3, 2021. 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 1 - Sugg Pkwy Pole Units - Galvanized Steel Vibratory Base				Unit Price			Extended Price
Stucture Number	Unit Number	Embedment Depth (ft)	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
1	75/ENG	30	1	$	$	$	$
2	75/ENG	25	1	$	$	$	$
3	75/S-09.0	20	1	$	$	$	$
4	75/ENG	30	1	$	$	$	$
5	75/S-07.4	20	1	$	$	$	$
6	70/S-06.5	20	1	$	$	$	$
7	70/S-06.5	20	1	$	$	$	$
8	70/S-06.5	20	1	$	$	$	$
9	70/S-06.5	20	1	$	$	$	$
10	70/S-06.5	20	1	$	$	$	$
11	70/S-06.5	20	1	$	$	$	$
12	70/S-06.5	20	1	$	$	$	$
13	70/S-06.5	20	1	$	$	$	$
14	70/S-06.5	20	1	$	$	$	$
15	70/S-06.5	20	1	$	$	$	$
16	75/ENG	25	1	$	$	$	$
17	80/S-09.0	20	1	$	$	$	$
18	80/ENG	30	1	$	$	$	$
21	80/S-10.0	20	1	$	$	$	$
22	85/ENG	30	1	$	$	$	$
23	80/ENG	25	1	$	$	$	$
24	80/S-10.0	20	1	$	$	$	$
25	80/S-10.0	20	1	$	$	$	$
30	75/ENG	30	1	$	$	$	$
Part 1 - Sugg Pkwy Pole Units - Galvanized Steel Direct Embed				**Unit Price**			**Extended Price**
Stucture Number	**Unit Number**	**Embedment Depth (ft)**	**NO. of Units**	**Labor**	**Materials**	**Labor & Materials**	**Labor & Materials**
Substation H-Frame 1	65/ENG	28'-3"	2	$	$	$	$
Substation H-Frame 2	65/ENG	28'-3"	2	$	$	$	$

Part 2 - Sugg Pkwy Pole Top Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TSV4	1	$	$	$	$
TS.DC.DA4	1	$	$	$	$
TS.DC.DA1	1	$	$	$	$
TS.TC.DA4	1	$	$	$	$
TPVD1.C1	1	$	$	$	$
TPZD1.C1	10	$	$	$	$
TSVD3.V3	1	$	$	$	$
TSVD6.V1.16	3	$	$	$	$
TSVD6.V6.16	2	$	$	$	$
TSVD6.V1.2	1	$	$	$	$
TPVD1.V6.16	1	$	$	$	$
TPVD1.TC1.2	1	$	$	$	$
TSH5.17	2	$	$	$	$

STEEL POLE TRANSMISSION CONSTRUCTION ASSEMBLY UNITS

Part 3 - Sugg Pkwy Guy Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TG-21A	7	$	$	$	$

Part 4 - Sugg Pkwy Anchor Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units	Labor	Materials	Labor & Materials	Labor & Materials
TA-2H	7	$	$	$	$

Part 5 - Sugg Pkwy Conductor Construction Assembly Units		Unit Price			Extended Price
Drawing Number	NO. of Units (mft.)	Labor	Materials	Labor & Materials	Labor & Materials
1272 AAC "Narcissus"	15.000	$	$	$	$
795 AAC "Arbutus"	10.000	$	$	$	$
336 ACSR "Merlin"	3.500	$	$	$	$
7 #9 Alumoweld	5.000	$	$	$	$

PROPOSAL SUMMARY

TRANSMISSION CONSTRUCTION ASSEMBLY UNITS	
Wood Pole Transmission Line	
Pole Removal	$
Distribution Conductor 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: INSTALLATION OF 115 KV TRANSMISSION STRUCTURES ALONG SUGG PARKWAY TAP

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**)

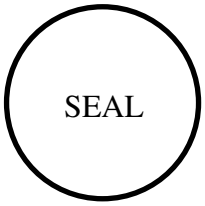
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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 employ 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 _____, 2020.

WHEREAS, the said Principal is herewith submitting a Proposal for

TRANSMISSION STRUCTURE INSTALLATION
OF SUGG PARKWAY TAP

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

November 5, 2020

1. SCOPE

This specification covers the removal, installation, and materials of 5 transmission structures along Greenville Utilities' Circuit 15, 115kV transmission line and the installation of 21 transmission structures along Sugg Parkway Tap, 115 kV transmission line. The 5 existing wooden transmission structures along Circuit 15 will be replaced with new steel structures. The existing conductors will not be replaced. There will be 5 spans of 795 AAC distribution conductor removed along Circuit 15 transmission structures. All hardware and insulators will be replaced. The construction of the new Sugg Parkway Tap includes 21 Transmission structures with distribution underbuild. New conductors will be installed for transmission and distribution. Fiber and telecommunication transfers should also be included. The proposal submitted by the contractor shall include all labor, equipment, and all other necessary items to complete this project.

The Circuit 15 115 kV transmission line consists of approximately 0.2 miles of 1272 AAC with 7#9 Alumoweld OHGW. Circuit 15 also includes approximately 0.2 miles of existing 12.47 kV distribution double circuit under build consisting of 795 AAC for all phases and a 336 ACSR neutral. The Sugg Parkway Tap, 115 kV transmission line consists of approximately one (1) mile of 1272 AAC with 7#9 Alumoweld OHGW. The Sugg Parkway Tap also includes approximately one (1) mile of 12.47 kV Distribution under build consisting of 795 AAC 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.

6.5. 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

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 and TMF-VPB-F)

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 may be responsible for field drilling transmission, distribution, fiber attachments, or any 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

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. (*Not Applicable for this project.)* 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 10% of rated strength as specified in IEEE 524. See sag and tension charts in Appendix E for each conductor's rated strength (Ultimate Tension). The Contractor shall obtain approval by the Commission's Engineer to exceed the 10% of rated strength limit. 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

November 5, 2020

1. SCOPE

All hardware and insulators needed to complete each transmission structure will be replaced. Conductors will not be replaced for existing transmission structures. 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-December.

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, 1/0 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, 1/0 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, 1/0 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*

Deadends for 1272 AAC, 795 AAC, 556 ACSR, 336 ACSR, 1/0 ACSR, and 7 No. 9 Alumoweld OHGW conductors may be bolted, quadrant type or full compression. 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-

17.1. Existing overhead conductor for the Circuit 15, 115kV Transmission Line is 1272 kcmil AAC and will be reused. Overhead conductor for Circuit 15, 12.47 kV distribution double circuit under build is 795 kcmil ACSR and will be reused. One distribution circuit will be removed. Fiber attachments will also be transferred.

17.2. Overhead conductor to be installed for the Sugg Parkway Tap, 115 kV Transmission Line is 1272 kcmil AAC and 12.47 kV distribution under build is 795 kcmil AAC with a 336 kcmil ACSR neutral. Fiber attachments will also be transferred.

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

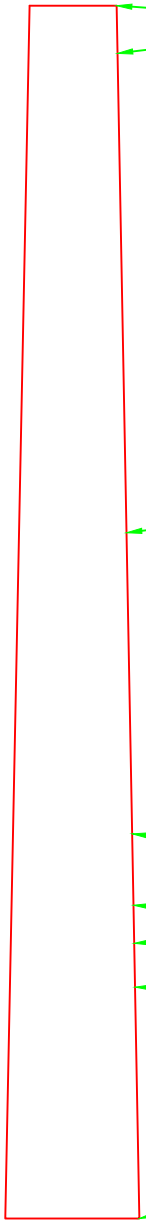
The successful bidder will be provided a list of Owner-furnished material pages as a "Standard" for reference. The Commission may substitute other manufacturer's products of equal or better quality.

[Balance of Page Left Blank Intentionally]

Appendix A: Sugg Parkway Tap Pole Replacement Schedule

Sugg Parkway Transmission						
Structure #	**Pole Height (ft.)**	**RUS Class**	**Embedment Vibratory Base (ft.)**	**Min. Base Diameter (ft.)**	**Structure Type**	**Drawing #**
1	75	ENG	30	4.1	Single Pole Angle	TSV4
2	75	ENG	25	4.1	Single Pole Angle	TS.DC.DA4
3	75	S-09.0	20	2.1	Single Pole Tangent	TS.DC.DA1
4	75	ENG	30	5.4	Single Pole Angle	TS.TC.DA4
5	75	S-07.4	20	1.9	Single Pole Small Angle	TPVD1.C1
6-15	70	S-06.5	20	1.75	Single Pole Tangent	TPZD1.C1
16	75	ENG	25	3.4	Single Pole Medium Angle	TSVD3.V3
17	80	S-09.0	20	2.2	Single Pole Tangent	TSVD6.V1.16
18	80	ENG	30	5.1	Single Pole Medium Angle	TSVD6.V6.16
21 & 24	80	S-10.0	20	2.3	Single Pole Tangent	TSVD6.V1.16
22	85	ENG	30	5.7	Single Pole Tangent with Angle Transmission Tap	TSVD6.V1.2
23	80	ENG	25	3.55	Single Pole Tangent with Distribution Tap	TPVD1.V6.16
25	80	S-10.0	20	2.3	Single Pole Tangent	TPVD1.TC1.2
30	75	ENG	30	4.9	Single Pole Medium Angle	TSVD6.V6.16
H-Frame 1 & 2	65	ENG	28.25	3.75	Deadend H-Frame	TSH5.17

Appendix B: Detail Construction Drawings



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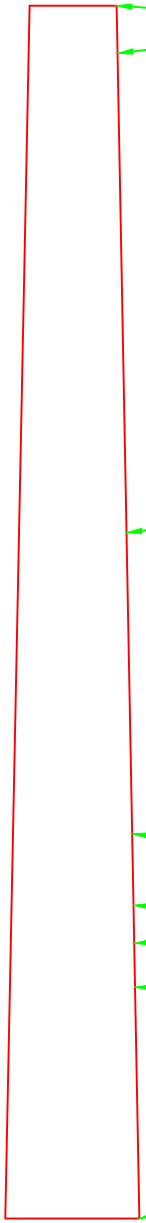
	1'-6.00"		4



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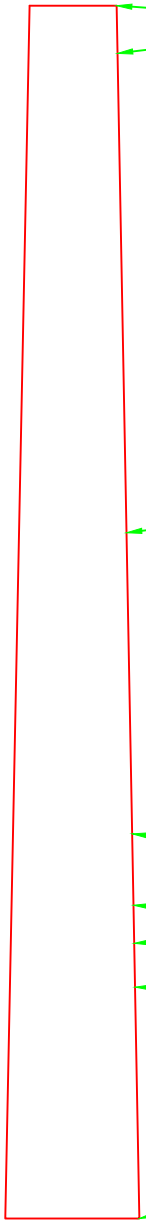

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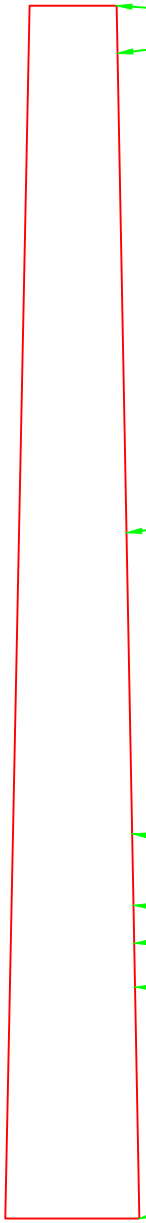

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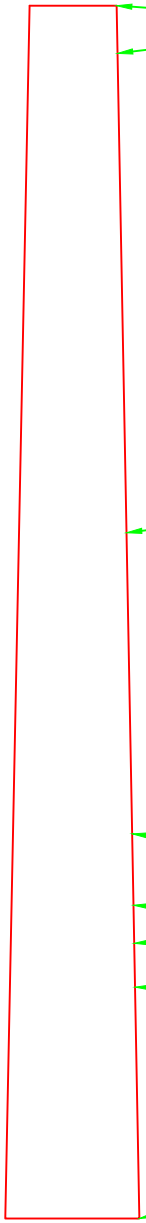

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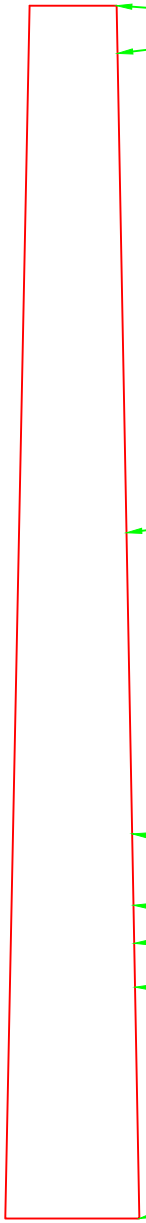
	1'-6.00"		4



LOCATION DIMENSION			
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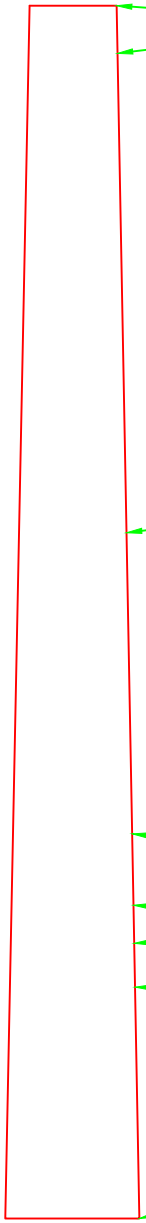
	1'-6.00"		4



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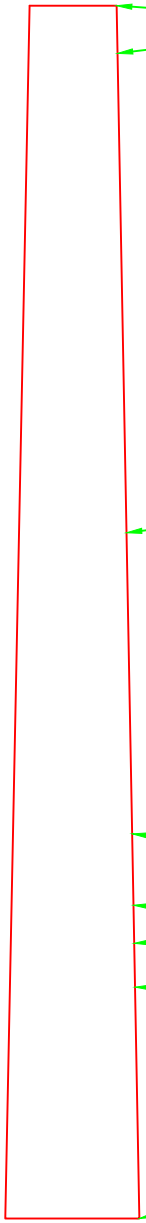

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FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
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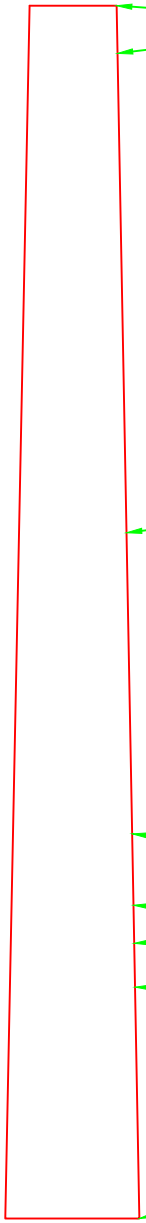
	1'-6.00"		4



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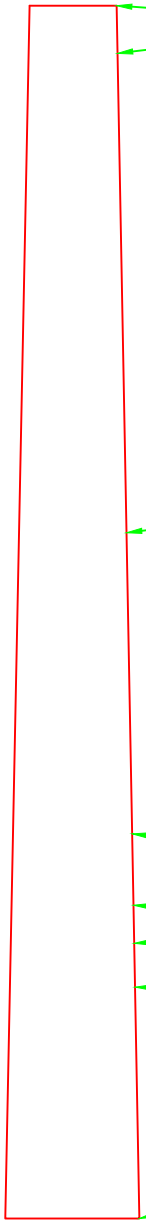
	1'-6.00"		4



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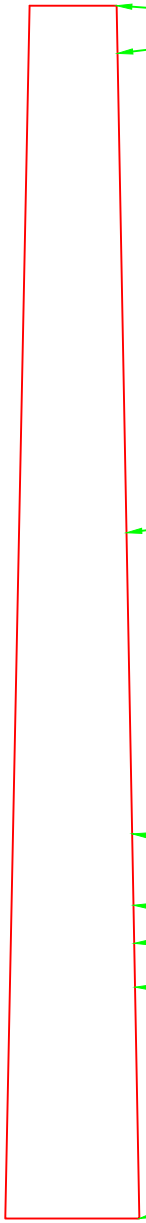

LOCATION DIMENSION			
FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
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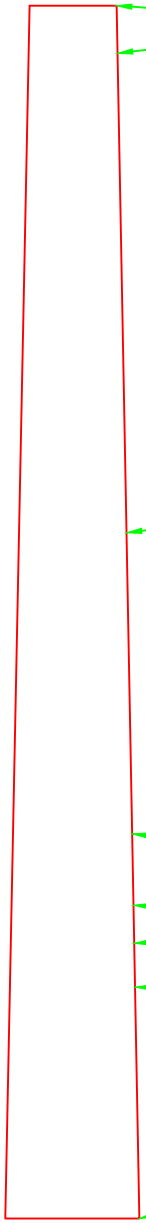
	1'-6.00"		4



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FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
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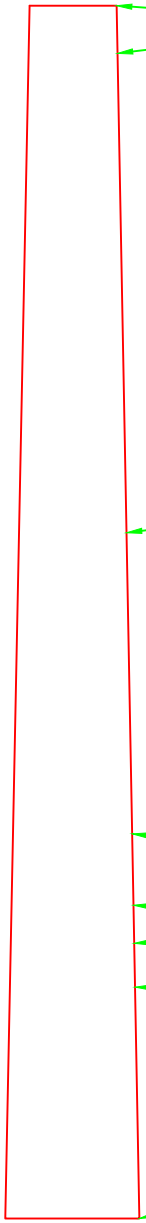
	1'-6.00"		4



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FROM LARGE END	FROM SMALL END	TOLERANCES BLANK=M-1	DETAIL
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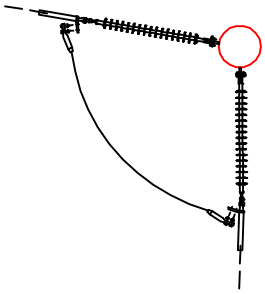
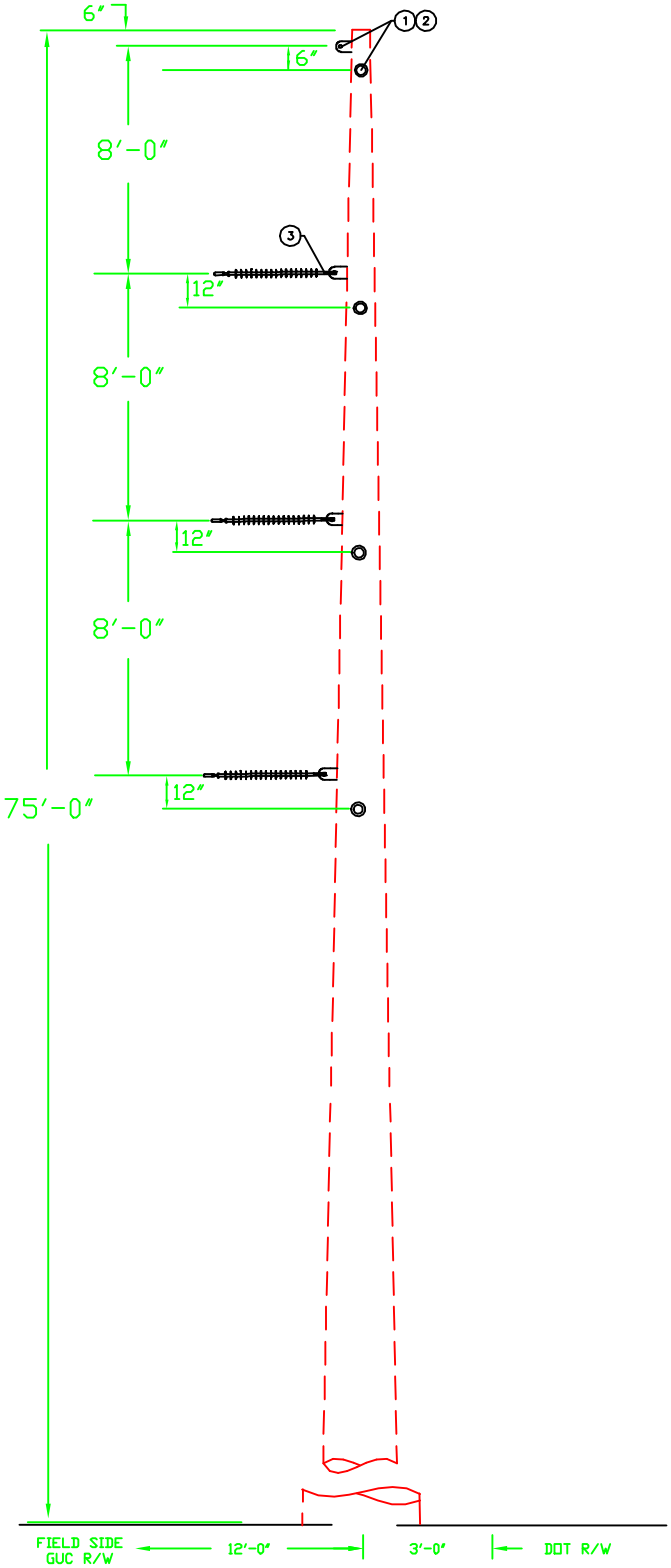
	1'-6.00"		4



OVERHEAD VIEW



NOTES:

1. THE ANGLE BETWEEN CONDUCTOR VANGS IS 110°.
2. DRAWING IS NOT TO SCALE.
3. SEE TMF-VPB-F DWG FOR EMBEDMENT INFORMATION.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	3	OHGW ASSEMBLY, DEADEND	–	TM-4E
2	1	OHGW GROUNDING ASSEMBLY	–	TM-2B
3	6	DEADEND ASSEMBLY, PRIMARY	–	TM-1EM
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM-9

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

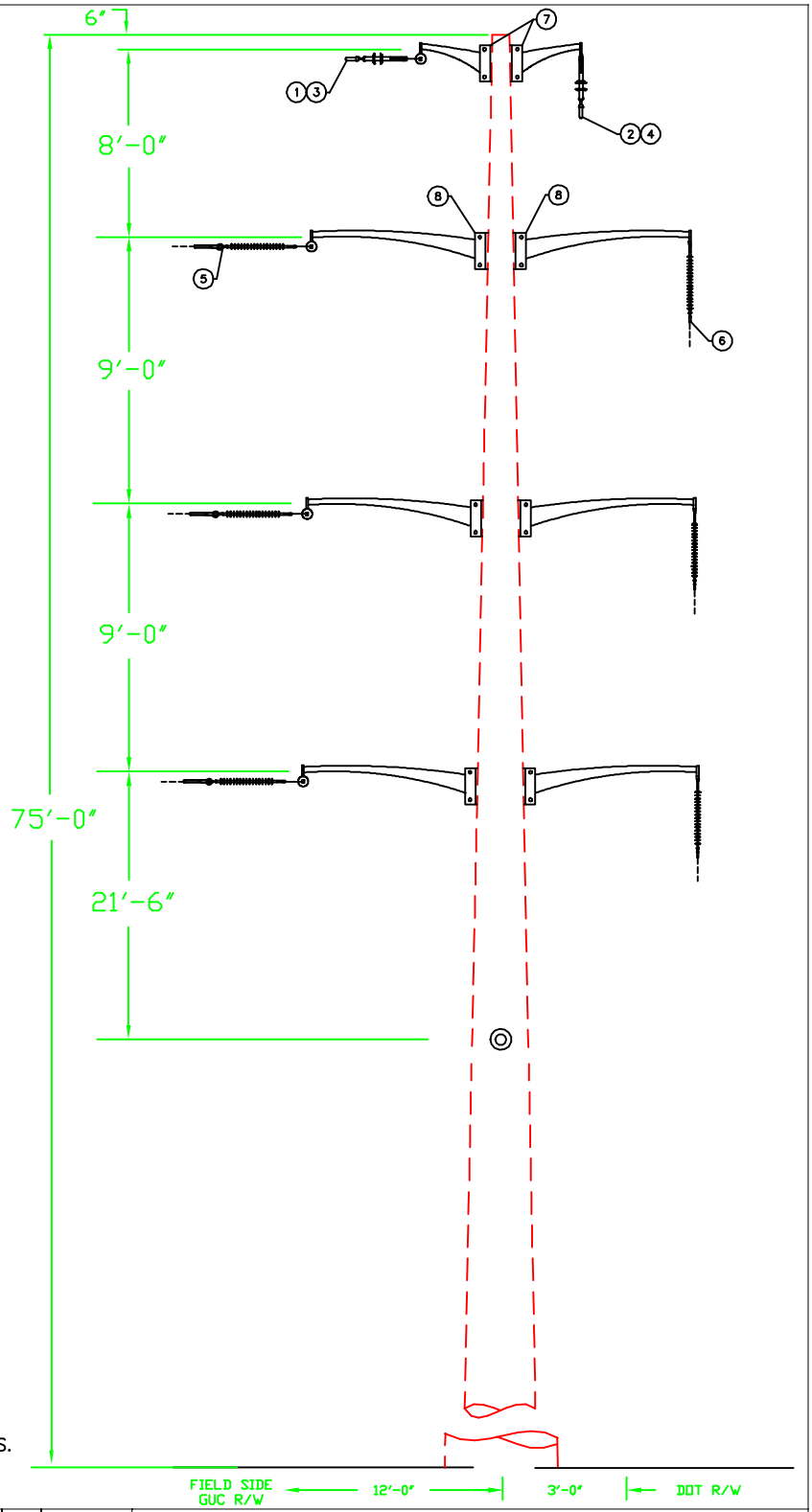
Greenville Utilities

SUGG PKWY STRUCTURE 1
115 KV 3 PHASE, VERTICAL STRUCTURE LARGE ANGLE, DOUBLE DEADEND SUSPENSION

DWN. JLS		DATE: 04/21/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION
09/17/2020	A		

DWG. NO.

TSV4



NOTES:

1. DRAWING IS NOT TO SCALE.
2. SEE TMF–VPB–F DWG FOR EMBEDMENT INFORMATION.
3. DAVIT ARMS SHALL BE DESIGNED BY MANUFACTURER TO WITHSTAND SPECIFIED LOADS. SEE PLS–CADD STRUCTURE 2 LCA FILE.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	3	OHGW ASSEMBLY, DEADEND	–	TM–4E
2	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
3	1	OHGW GROUNDING ASSEMBLY	–	TM–2B
4	1	OHGW GROUNDING ASSEMBLY, TANGENT	–	TM–9X(S)
5	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
6	3	ANGLE ASSEMBLY, PRIMARY	–	TM–1CM
7	2	4' TUBULAR STEEL DAVIT ARM	–	
8	6	8' TUBULAR STEEL DAVIT ARM	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

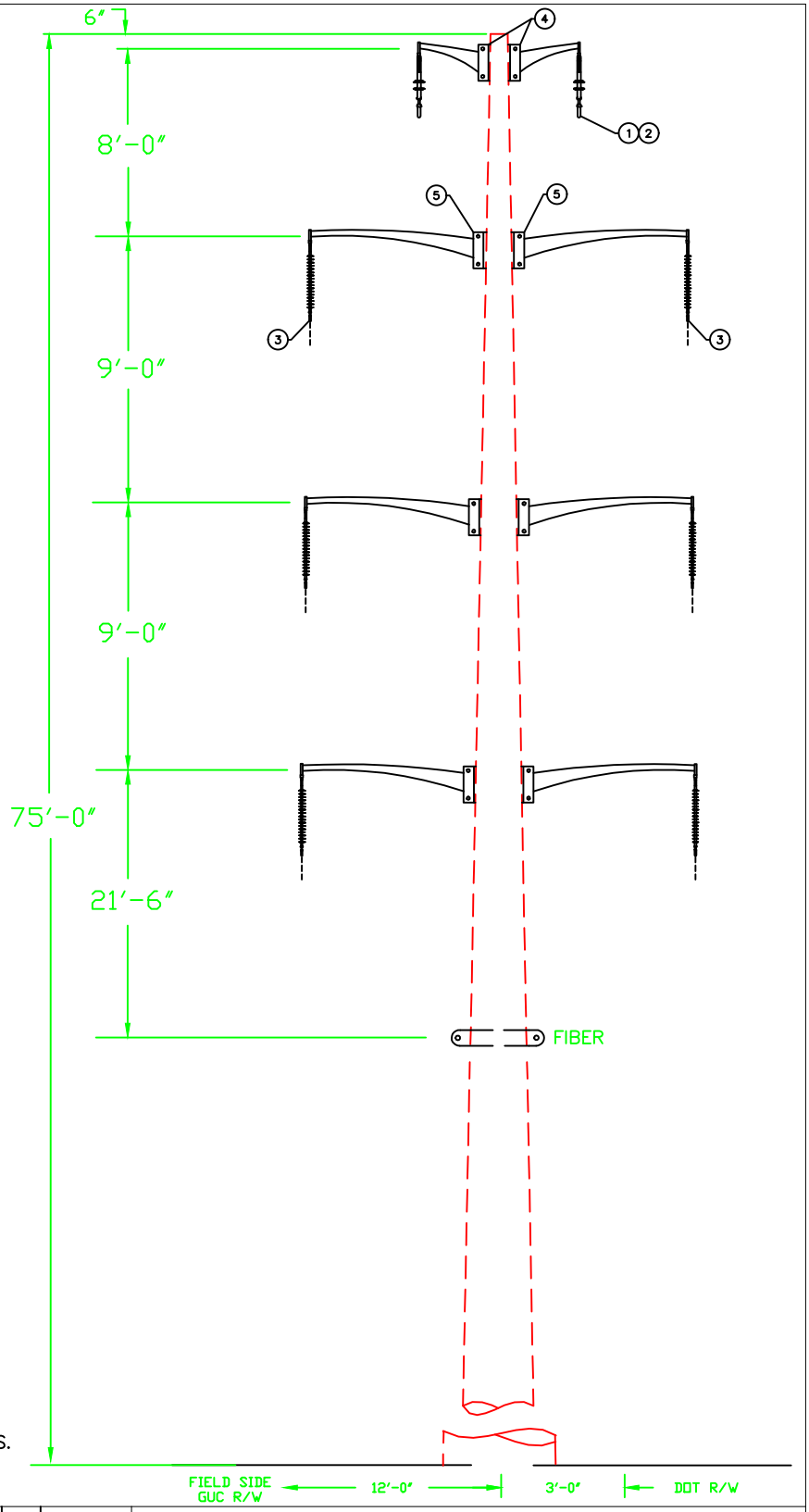
Greenville Utilities

SUGG PKWY STRUCTURE 2
115 KV 3 PHASE, VERTICAL DOUBLE DAVIT
LARGE ANGLE, DOUBLE DEADEND SUSPENSION

DWN. JLS		DATE: 04/21/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION
09/17/2020	A		

DWG. NO.

TS.DC.DA4



NOTES:

1. DRAWING IS NOT TO SCALE.
2. SEE TMF–VPB DWG FOR EMBEDMENT INFORMATION.
3. DAVIT ARMS SHALL BE DESIGNED BY MANUFACTURER TO WITHSTAND SPECIFIED LOADS. SEE PLS–CADD STRUCTURE 3 LCA FILE.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	2	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	2	OHGW GROUNDING ASSEMBLY, TANGENT	–	TM–9X(S)
3	6	TANGENT ASSEMBLY, PRIMARY	–	TM–1AM
4	2	4' TUBULAR STEEL DAVIT ARM	–	
5	6	8' TUBULAR STEEL DAVIT ARM	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

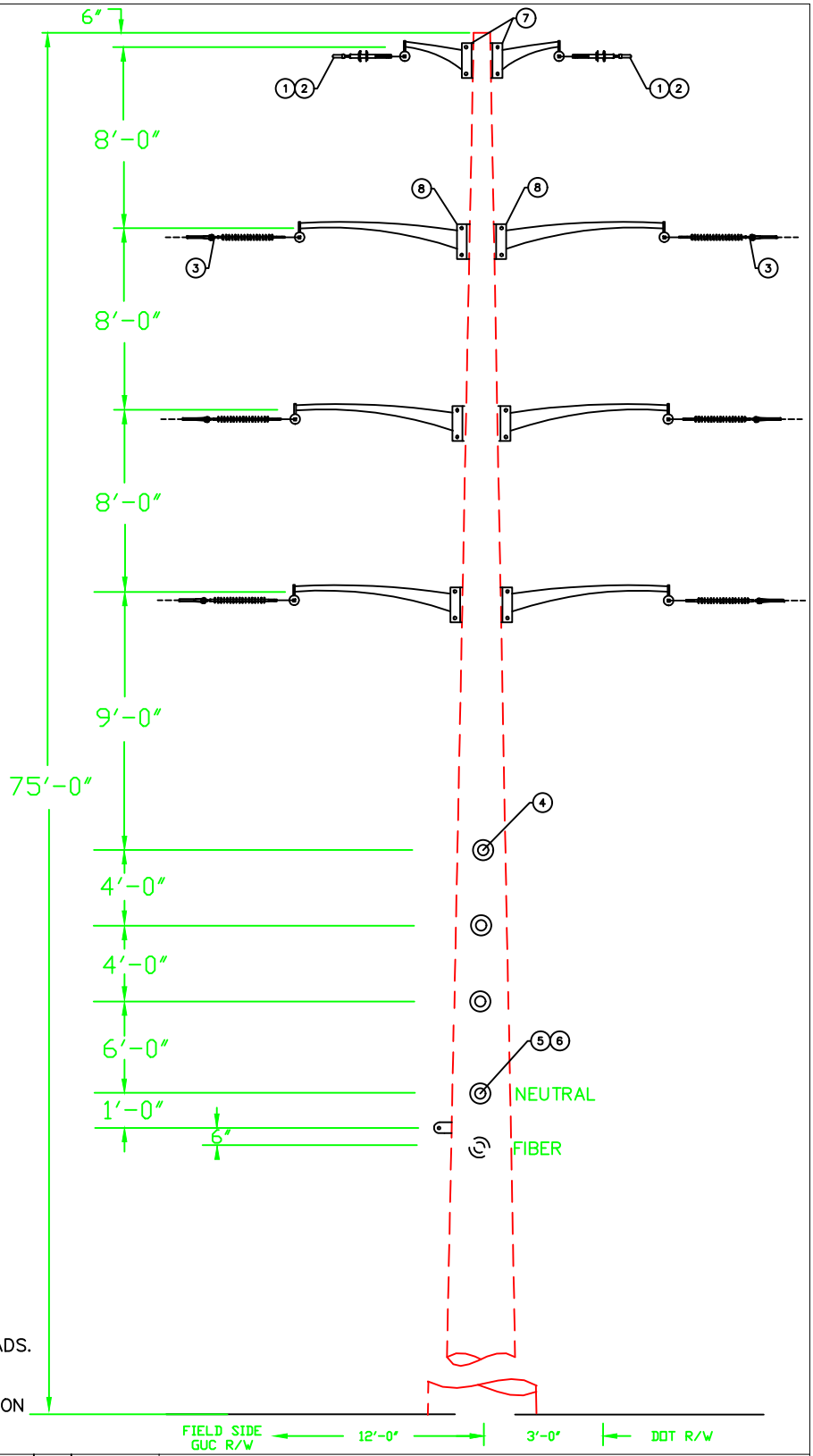
SUGG PKWY STRUCTURE 3
115 KV 3 PHASE, VERTICAL DOUBLE DAVIT
TANGENT, SUSPENSION

DWN. JLS | DATE: 04/21/2020
CKD. KW | APPD. KW
SCALE: N.T.S.

DATE	REVISION	DATE	REVISION

DWG. NO.

TS.DC.DA1



NOTES:

1. DRAWING IS NOT TO SCALE.
2. SEE TMF–VPB–F DWG FOR EMBEDMENT INFORMATION.
3. DAVIT ARMS SHALL BE DESIGNED BY MANUFACTURER TO WITHSTAND SPECIFIED LOADS. SEE PLS–CADD STRUCTURE 4 LCA FILE.
4. BOTTOM FIBER VANG IS 180° FROM DISTRIBUTION VANGS

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
1	4	OHGW ASSEMBLY, DEADEND	–	TM–4E
2	2	OHGW GROUNDING ASSEMBLY	–	TM–2B
3	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
4	3	ANGLE ASSEMBLY, SECONDARY	–	
5	1	NEUTRAL ASSEMBLY, ANGLE	–	TM–4A
6	1	NEUTRAL GROUNDING ASSEMBLY, ANGLE	–	TM–9X(S)
7	2	4’ TUBULAR STEEL DAVIT ARM	–	
8	6	8’ TUBULAR STEEL DAVIT ARM	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

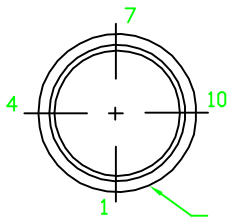
SUGG PKWY STRUCTURE 4
115 KV 3 PHASE, VERTICAL DOUBLE DAVIT
LARGE ANGLE, DOUBLE DEADEND SUSPENSION
W/DISTRIBUTION UB

DWN. JLS	DATE: 04/21/2020
CKD. KW	APPD. KW
SCALE: N.T.S.	

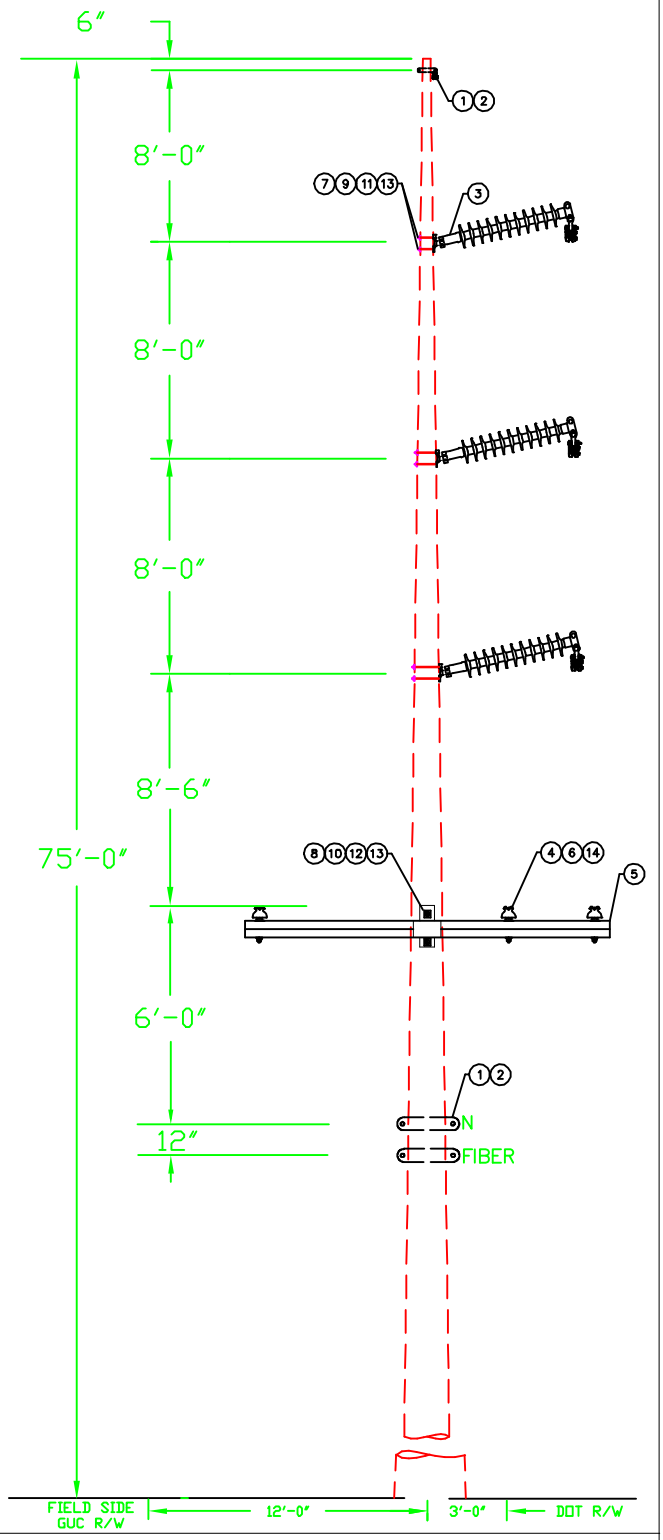
DATE	REVISION	DATE	REVISION

DWG. NO.

TS.TC.DA4



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	8'–0"	4
1.00"	9'–0"	4
1.00"	16'–0"	4
1.00"	17'–0"	4
1.00"	24'–0"	4
1.00"	25'–0"	4
3/4"	33'–0"	1
3/4"	34'–0"	1



NOTES:

1) DRAWING IS NOT TO SCALE.

2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

3) SEE TMF–VPB DWG FOR EMBEDMENT INFORMATION.

4) CROSSARM BRACES NOT SHOWN IN DRAWING. ATTACHMENT HOLE WILL BE FIELD DRILLED.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW/NEUTRAL ASSEMBLY, TANGENT	–	TM–4A
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–9X(S)
3	3	115 KV POST INSULATOR, SMALL ANGLE	–	TM–3DM
4	3	25 KV POST INSULATOR	–	
5	1	10' DISTRIBUTION CROSSARM	–	
6	3	PINS, 25KV CROSS	–	
7	6	BOLT, MACHINE, 3/4" x REQ	–	
8	2	BOLT, MACHINE, 5/8" x REQ	–	
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	8	WASHER, SQUARE, 4" x 4" x 1/4" w/ 13/16"	–	
14	6	WASHER, SQUARE, 3" x 3" x 1/4" w/ 13/16"	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9
			–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

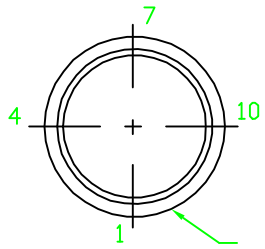
Greenville Utilities

SUGG PKWY STRUCTURE 5
115 KV 3 PHASE, VERTICAL STRUCTURE,
SMALL ANGLE POST WITH DISTRIBUTION ON
CROSSARM

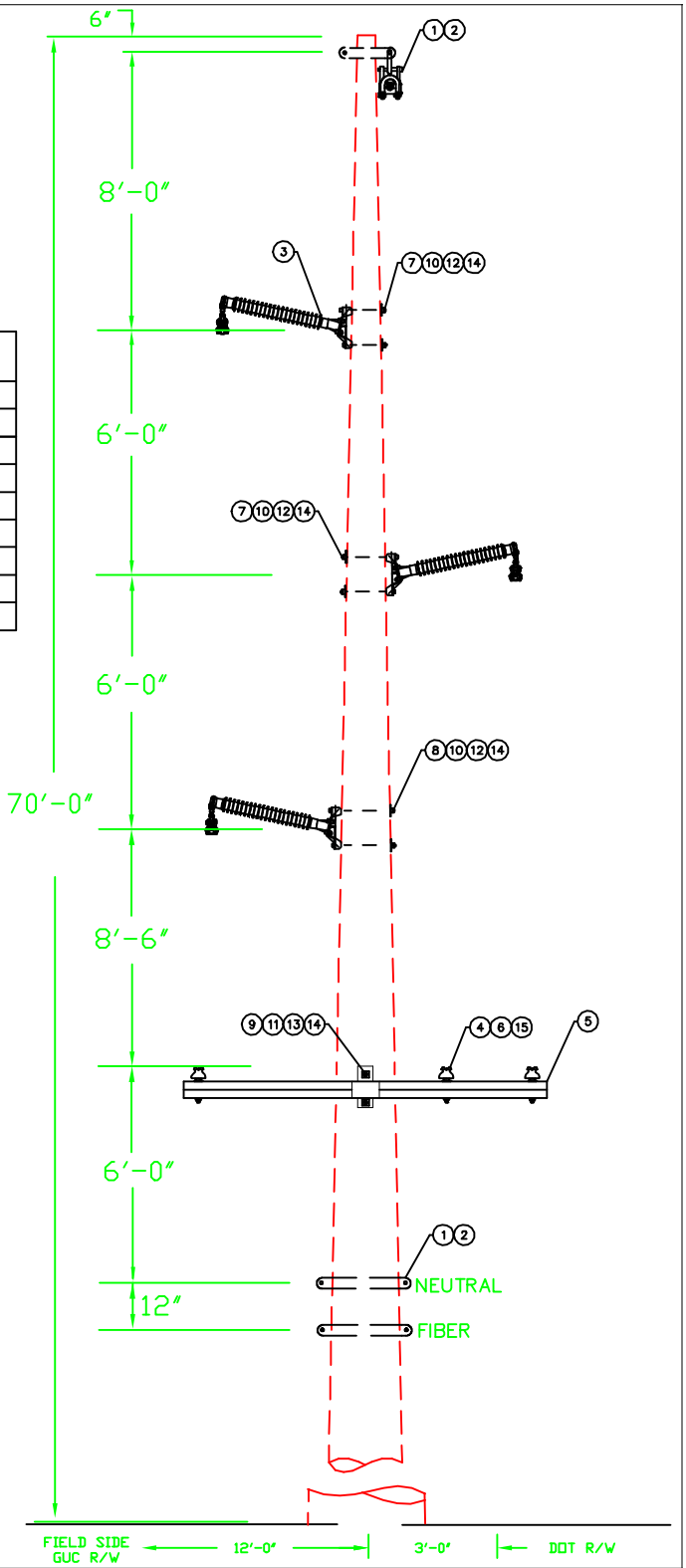
DWN. JLS		DATE: 04/23/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION
09/22/2020	A		

DWG. NO.

TPVD1.C1



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	8'–0"	4
1.00"	9'–0"	4
1.00"	14'–0"	4
1.00"	15'–0"	4
1.00"	20'–0"	4
1.00"	21'–0"	4
3/4"	29'–0"	1
3/4"	30'–0"	1



NOTES:

1) DRAWING IS NOT TO SCALE.
2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.
3) SEE TMF–VPB DWG FOR EMBEDMENT INFORMATION.
4) STRUCTURES 8 AND 12 WILL HAVE FIBER DEADENDS.
5) CROSSARM BRACES NOT SHOWN IN DRAWING. ATTACHMENT HOLE WILL BE FIELD DRILLED.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW/NEUTRAL ASSEMBLY, TANGENT	–	TM–4A
2	2	OHGW/NEUTRAL GROUNDING ASSY	–	TM–9X(S)
3	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
4	3	25 KV POST INSULATOR	–	
5	1	10' DISTRIBUTION CROSSARM	–	
6	3	PINS, 25 KV CROSS	–	
7	4	BOLT, MACHINE, 3/4" x REQ	–	
8	2	BOLT, MACHINE, 3/4" x REQ"	–	
9	2	BOLT, MACHINE, 5/8" x 20"	–	
10	6	SPRING LOCK WASHER, 3/4"	–	
11	2	SPRING LOCK WASHER, 5/8"	–	
12	6	NUT, 3/4"	–	
13	2	NUT, 5/8"	–	
14	8	WASHER, SQUARE, 4" x 4" x 1/4" w/ 13/16"	–	
15	6	WASHER, SQUARE, 3" x 3" x 1/4" w/ 13/16"	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

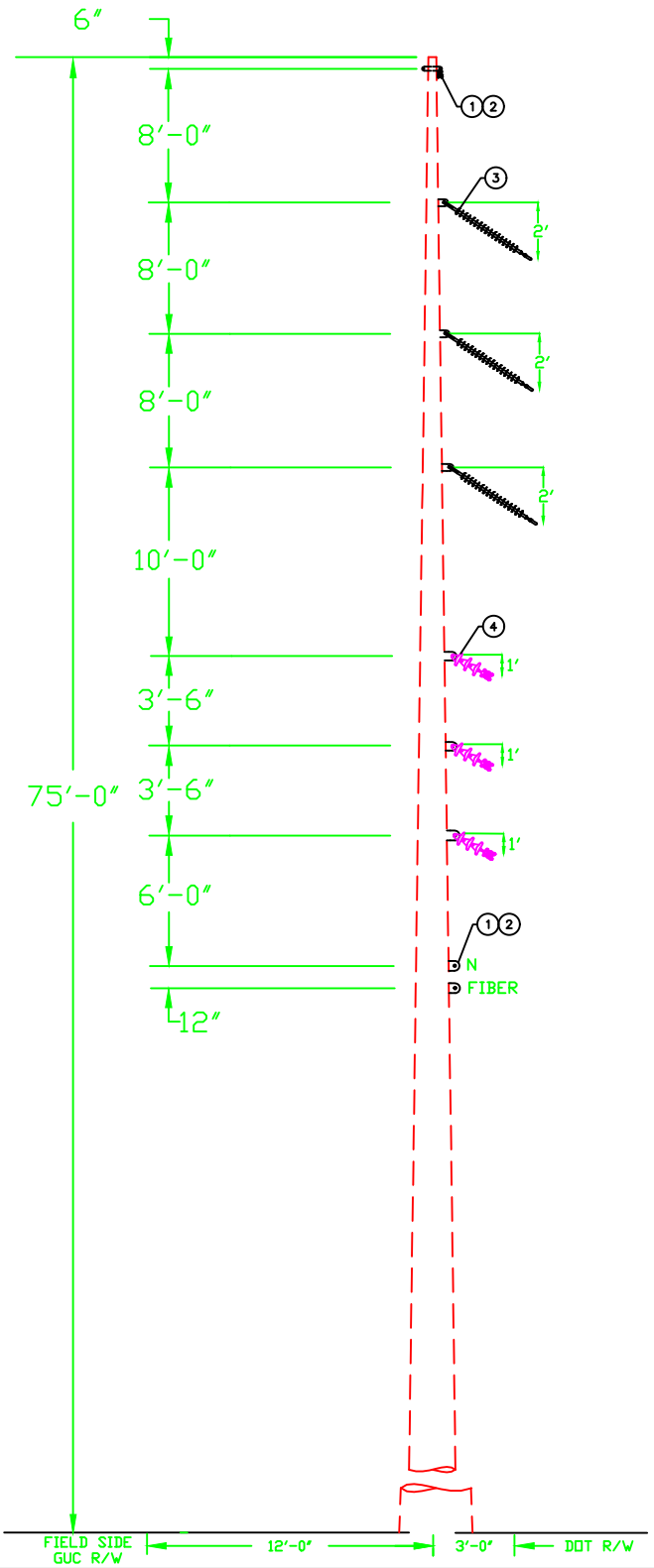
Greenville Utilities

SUGG PKWY STRUCTURE 6–15
115 KV 3 PHASE, Z–FRAME STRUCTURE,
TANGENT POST, W/DISTRIBUTION UB

DWN. JLS		DATE: 04/23/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION
09/17/2020	A		
09/22/2020	B		

DWG. NO.

TPZD1.C1



NOTES:

1) DRAWING IS NOT TO SCALE.

2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.

3) SEE TMF–VPB–F DWG FOR EMBEDMENT INFORMATION.

DWG. REF.	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW/NEUTRAL ASSEMBLY, ANGLE	–	TM–4A
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–9X(S)
3	3	ANGLE ASSEMBLY, PRIMARY	–	TM–1CM
4	3	ANGLE ASSEMBLY, SECONDARY	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

LIST OF MATERIALS

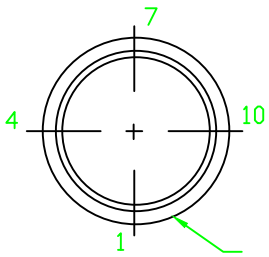
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

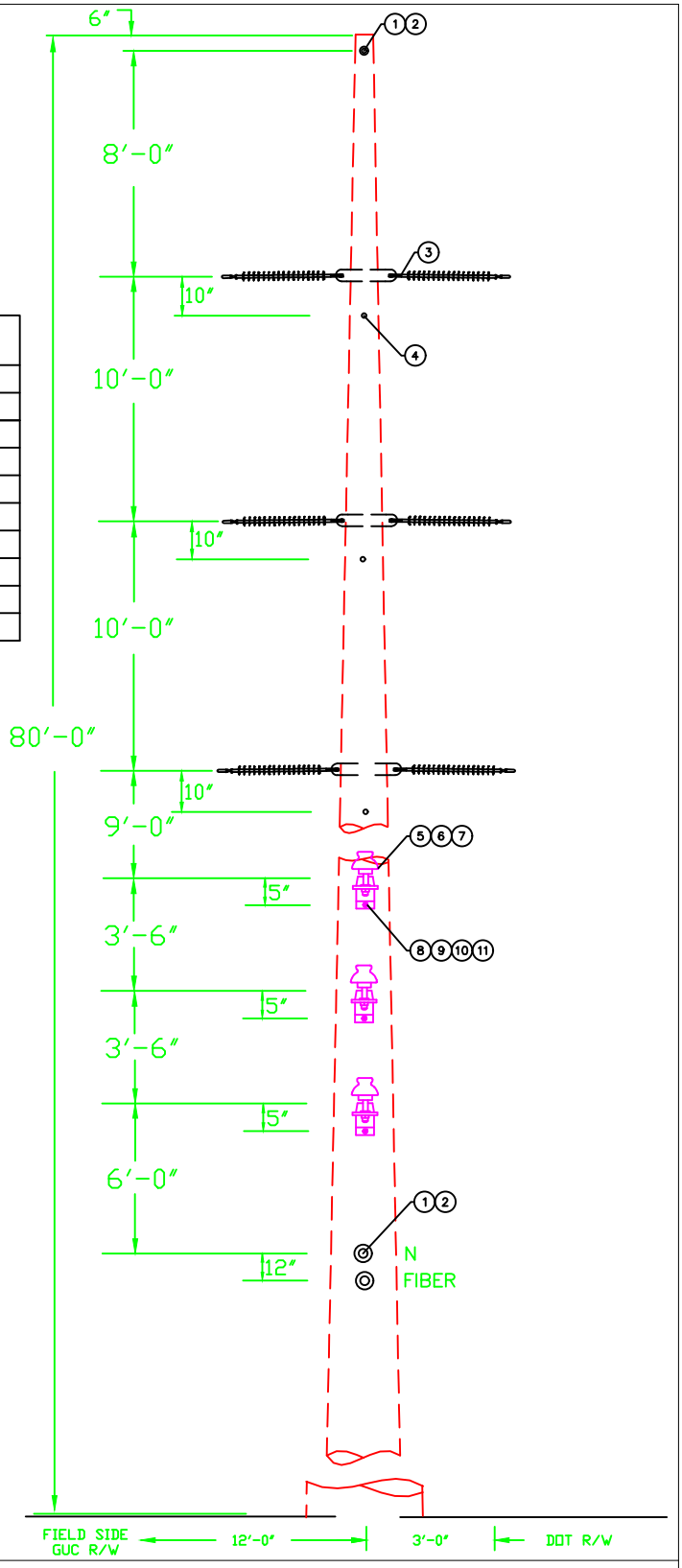
SUGG PKWY STRUCTURE 16
115 KV 3 PHASE, VERTICAL DOUBLE CIRCUIT
STRUCTURE, LARGE ANGLE, SUSPENSION

DWN. JLS		DATE: 04/23/20	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TSVD3.V3



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.25"	9'–4.00"	1
1.25"	19'–4.00"	1
1.25"	29'–4.00"	1
3/4"	37'–6.00"	1
3/4"	37'–11.00"	1
3/4"	41'–0.00"	1
3/4"	41'–5.00"	1
3/4"	44'–6.00"	1
3/4"	44'–11.00"	1



NOTES:

1. DRAWING IS NOT TO SCALE. ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.
2. SEE TMF–VPB DWG FOR EMBEDMENT INFORMATION.
3. TRANSMISSION VERTICAL GANG SWITCH NOT SHOWN IN DRAWING. SEE SWITCH DRAWING FOR SWITCH DETAILS.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW/NEUTRAL ASSEMBLY, TANGENT	–	TM–4A
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–9X(S)
3	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
4	1	VERTICAL GANG SWITCH, TRANSMISSION	–	
5	3	25 kV POST INSULATOR	–	
6	3	BRACKETS, MIF	–	
7	3	25 KV PIN	–	
8	6	BOLT, MACHINE, 5/8" x REQ	–	
9	6	SPRING LOCK WASHER, 5/8"	–	
10	6	NUT, 5/8"	–	
11	6	WASHER, 2 1/4" SQUARE	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

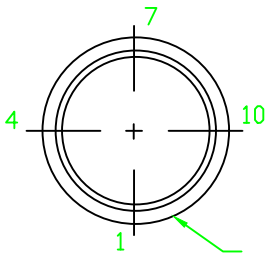
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

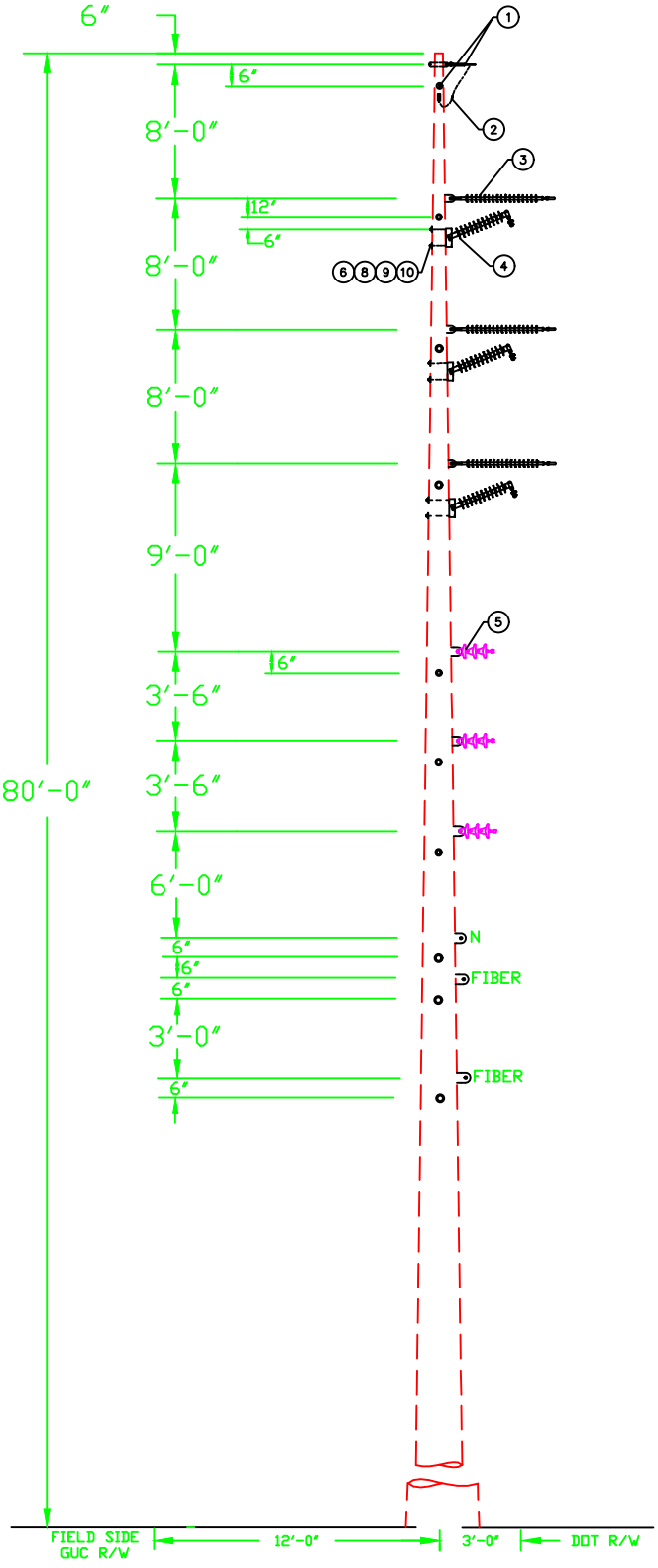
SUGG PKWY STRUCTURE 17, 21, & 24
115 KV 3 PHASE, VERTICAL STRUCTURE DOUBLE DEADEND TANGENT, W GANG SWITCH, DISTRIBUTION UB

DWN. JLS		DATE: 04/23/20	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

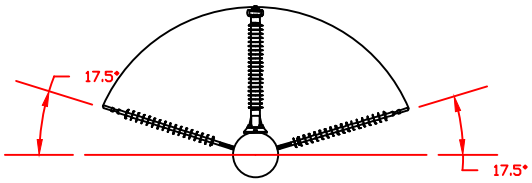
DWG. NO.
TSVD6.V1.16



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	10'–0"	7
1.00"	11'–0"	7
1.00"	18'–0"	7
1.00"	19'–0"	7
1.00"	26'–0"	7
1.00"	27'–0"	7



OVERHEAD VIEW



NOTES:

1. DRAWING IS NOT TO SCALE.
2. SEE TMF–VPB–F DWG FOR EMBEDMENT INFORMATION.
3. VERTICAL GANG SWITCH ON DISTRIBUTION NOT SHOWN IN DRAWING. MOUNTING HOLES WILL BE FIELD DRILLED.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	4	OHGW/NEUTRAL ASSEMBLY, DEADEND	–	TM–4E
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–2B
3	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
4	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
5	6	DEADEND ASSEMBLY, SECONDARY	–	
6	4	BOLT, MACHINE, 3/4" x REQ	–	
7	2	BOLT, MACHINE, 3/4" x REQ	–	
8	8	SPRING LOCK WASHER, 3/4"	–	
9	8	NUT, 3/4"	–	
10	6	WASHER SQUARE, 4"x4"x1/4", w/13/16"	–	
	1	VERTICAL GANG SWITCH, DISTRIBUTION	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

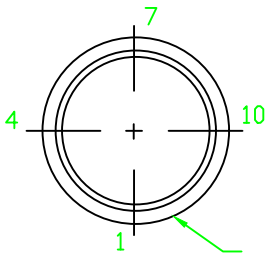
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

SUGG PKWY STRUCTURE 18
115 KV 3 PHASE, VERTICAL STRUCTURE, SMALL ANGLE DOUBLE DEADEND SUSPENSION, W/POST & DISTRIBUTION UB

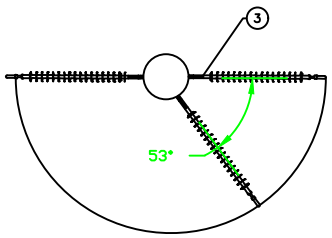
DWN. JLS		DATE: 04/23/20	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

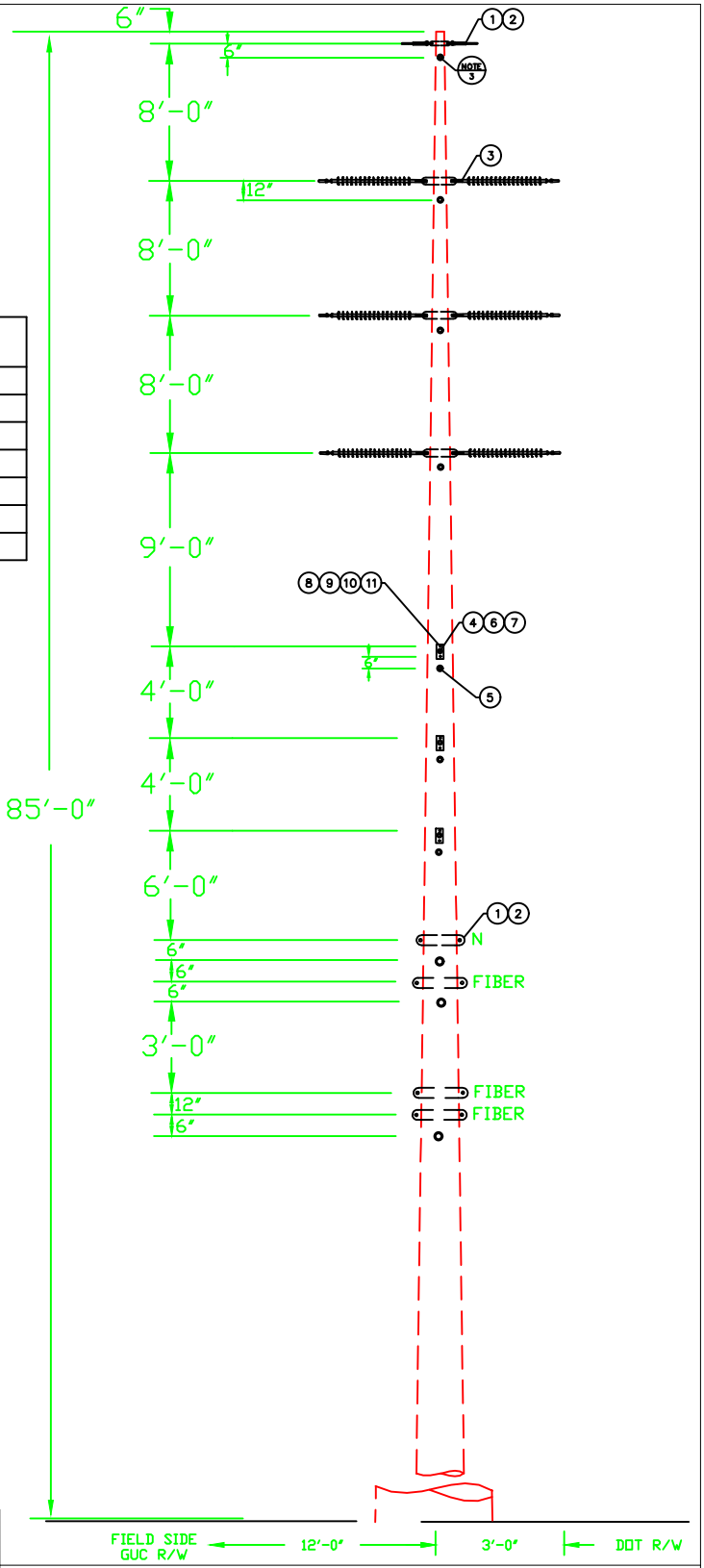
DWG. NO.
TSVD6.V6.16



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
3/4"	33'–6"	1
3/4"	33'–11"	1
3/4"	37'–6"	1
3/4"	37'–11"	1
3/4"	41'–6"	1
3/4"	41'–11"	1

OVERHEAD VIEW





NOTES:

1. DRAWING IS NOT TO SCALE.
2. SEE TMF–VPB–F DWG FOR EMBEDMENT INFORMATION.
3. BOTTOM VANGS ARE 53° CW FROM FLAT 10. SEE OVERHEAD DETAIL ABOVE.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	6	OHGW/NEUTRAL ASSEMBLY, DEADEND	–	TM–4E
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–2C
3	9	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
4	3	25 KV POST INSULATOR	–	
5	3	DEADEND ASSEMBLY, SECONDARY	–	
6	3	BRACKETS, MIF	–	
7	3	25 KV PIN	–	
8	6	BOLT, MACHINE, 5/8" x REQ	–	
9	6	SPRING LOCK WASHER, 5/8"	–	
10	6	NUT, 5/8"	–	
11	6	WASHER, 2 1/4" SQUARE	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

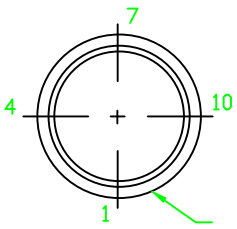
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

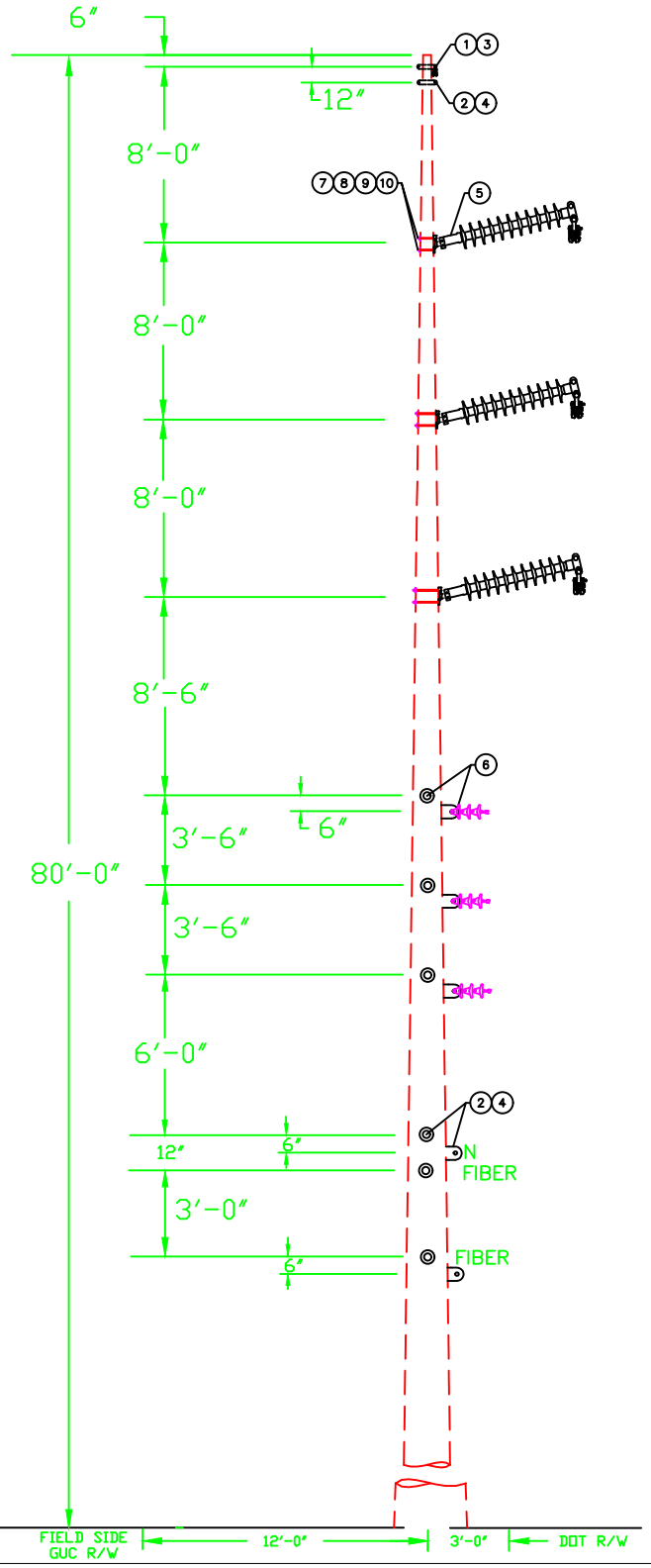
SUGG PKWY STRUCTURE 22
115 KV 3 PHASE, VERTICAL STRUCTURE
TANGENT DOUBLE DEADEND, SUSPENSION
W/DISTRIBUTION UB

DWN. JLS		DATE: 04/28/20	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TSVD6.V1.2



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	8'–0"	4
1.00"	9'–0"	4
1.00"	16'–0"	4
1.00"	17'–0"	4
1.00"	24'–0"	4
1.00"	25'–0"	4



NOTES:

1) DRAWING IS NOT TO SCALE.
2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.
3) SEE TMF–VPB DWG FOR EMBEDMENT INFORMATION.
4) VERTICAL GANG SWITCH ON DISTRIBUTION NOT SHOWN IN DRAWING. MOUNTING HOLES WILL BE FIELD DRILLED.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	1	OHGW ASSEMBLY, TANGENT	–	TM–4A
2	4	OHGW/NEUTRAL ASSEMBLY, DEADEND	–	TM–4E
3	1	OHGW GROUNDING ASSEMBLY, TANGENT	–	TM–9X(S)
4	4	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–2A
5	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
6	9	DEADEND ASSEMBLY, SECONDARY	–	
7	6	BOLT, MACHINE, 3/4" x REQ	–	
8	6	SPRING LOCK WASHER, 3/4"	–	
9	6	NUT, 3/4"	–	
10	8	WASHER, SQUARE, 4" x 4" x 1/4" w/ 13/16"	–	
	1	VERTICAL GANG SWITCH, DISTRIBUTION	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

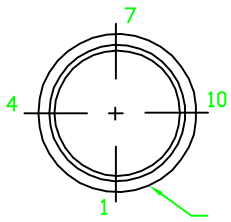
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

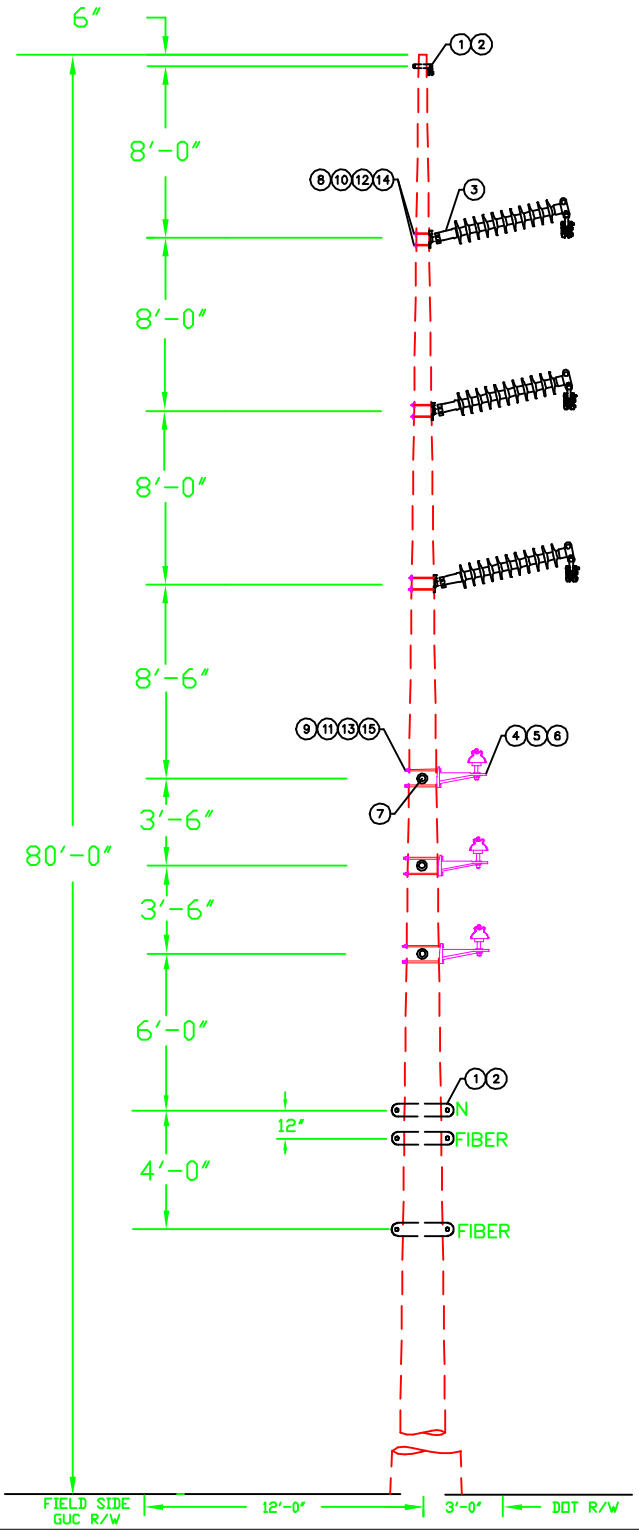
SUGG PKWY STRUCTURE 23
115 KV 3 PHASE, VERTICAL STRUCTURE,
TANGENT POST WITH DISTRIBUTION UB

DWN. JLS		DATE: 04/29/20	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TPVD1.V6.16



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	8'–0"	4
1.00"	9'–0"	4
1.00"	16'–0"	4
1.00"	17'–0"	4
1.00"	24'–0"	4
1.00"	25'–0"	4
3/4"	33'–0"	4
3/4"	33'–5"	4
3/4"	36'–6"	4
3/4"	36'–11"	4
3/4"	40'–0"	4
3/4"	40'–5"	4



NOTES:

1) DRAWING IS NOT TO SCALE.
2) ALL DIMENSIONS ARE O.C. OF INSULATOR MOUNTS.
3) SEE TMF–VPB DWG FOR EMBEDMENT INFORMATION.
4) GUY ON EACH DEADEND NOT SHOWN IN DRAWING.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	2	OHGW/NEUTRAL ASSEMBLY, TANGENT	–	TM–4A
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–9X(S)
3	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
4	3	25 KV POST INSULATOR	–	
5	3	BRACKETS, MIF	–	
6	3	25 KV PIN	–	
7	3	DEADEND ASSEMBLY, SECONDARY	–	
8	6	BOLT, MACHINE, 3/4" x REQ	–	
9	6	BOLT, MACHINE, 5/8" x REQ	–	
10	6	SPRING LOCK WASHER, 3/4"	–	
11	6	SPRING LOCK WASHER, 5/8"	–	
12	6	NUT, 3/4"	–	
13	6	NUT, 5/8"	–	
14	12	WASHER, SQUARE, 4" x 4" x 1/4" w/ 13/16"	–	
15	6	WASHER, 2 1/4" SQUARE	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

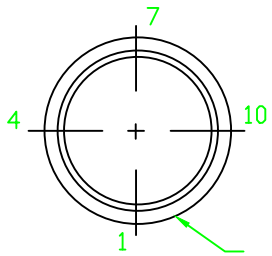
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

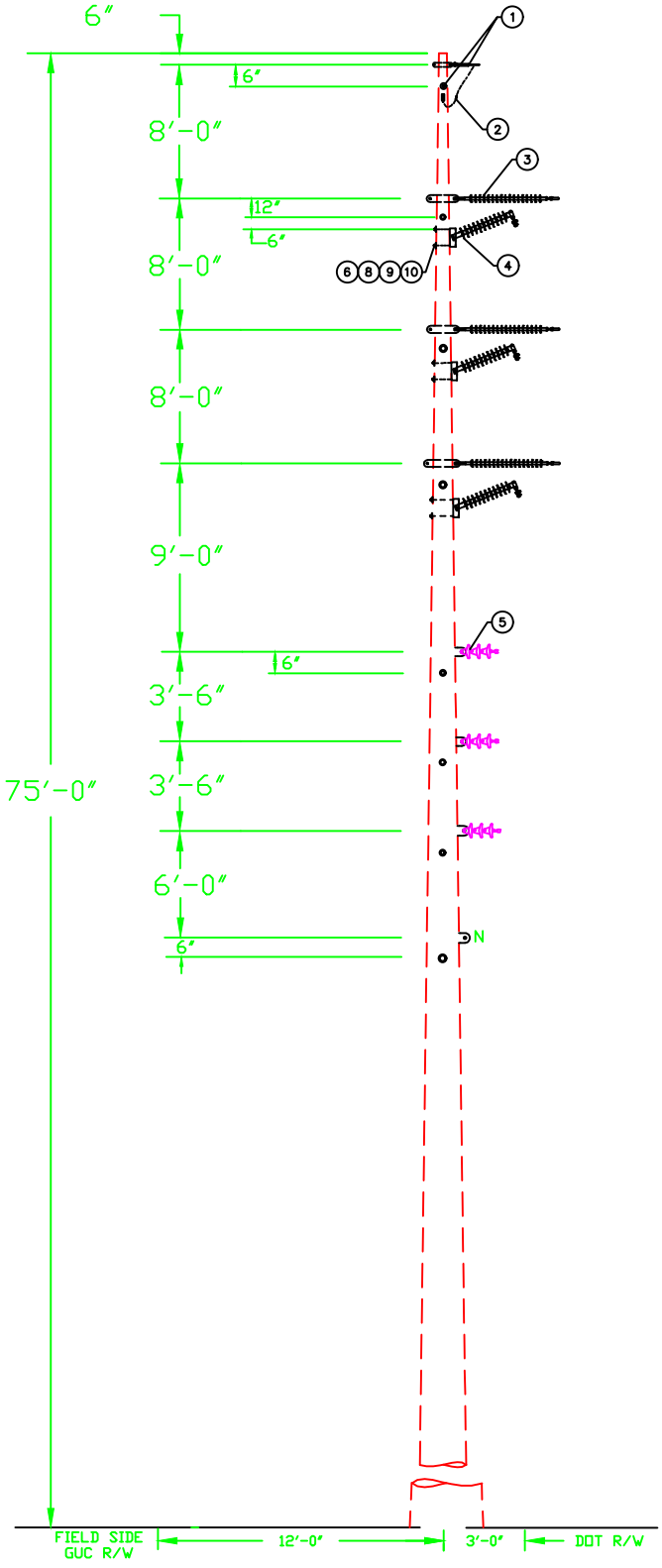
SUGG PKWY STRUCTURE 25
115 KV 3 PHASE, VERTICAL STRUCTURE,
TANGENT POST WITH VERTICAL CROSSARM
DISTRIBUTION UB

DWN. JLS		DATE: 04/29/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION
09/18/2020	A		

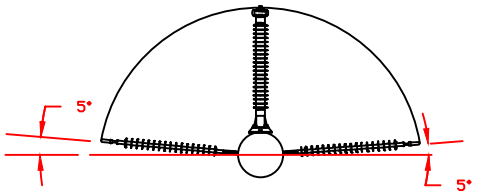
DWG. NO.
TPVD1.TC1.2



THRU HOLE BORING DETAIL		
DIAMETER	FROM SMALL END	FLAT#
1.00"	10'–0"	7
1.00"	11'–0"	7
1.00"	18'–0"	7
1.00"	19'–0"	7
1.00"	26'–0"	7
1.00"	27'–0"	7



OVERHEAD VIEW



NOTES:

1. DRAWING IS NOT TO SCALE.
2. SEE TMF–VPB–F DWG FOR EMBEDMENT INFORMATION.
3. VERTICAL GANG SWITCH ON DISTRIBUTION NOT SHOWN IN DRAWING. MOUNTING HOLES WILL BE FIELD DRILLED.
4. TRANSMISSION WILL BE TEMPORARILY GUYED. BOTTOM VANGS ARE FOR FUTURE EXPANSION.

DWG. REF.	LIST OF MATERIALS			
	ea.	DESCRIPTION	ITEM	DET.
1	4	OHGW/NEUTRAL ASSEMBLY, DEADEND	–	TM–4E
2	2	OHGW/NEUTRAL GROUNDING ASSEMBLY	–	TM–2B
3	6	DEADEND ASSEMBLY, PRIMARY	–	TM–1EM
4	3	115 KV POST INSULATOR, TANGENT	–	TM–3DM
5	6	DEADEND ASSEMBLY, SECONDARY	–	
6	4	BOLT, MACHINE, 3/4" x REQ	–	
7	2	BOLT, MACHINE, 3/4" x REQ	–	
8	8	SPRING LOCK WASHER, 3/4"	–	
9	8	NUT, 3/4"	–	
10	6	WASHER SQUARE, 4"x4"x1/4", w/13/16"	–	
	1	VERTICAL GANG SWITCH, DISTRIBUTION	–	
	1	DRIVEN GROUND ROD ASSEMBLY	–	TM–9

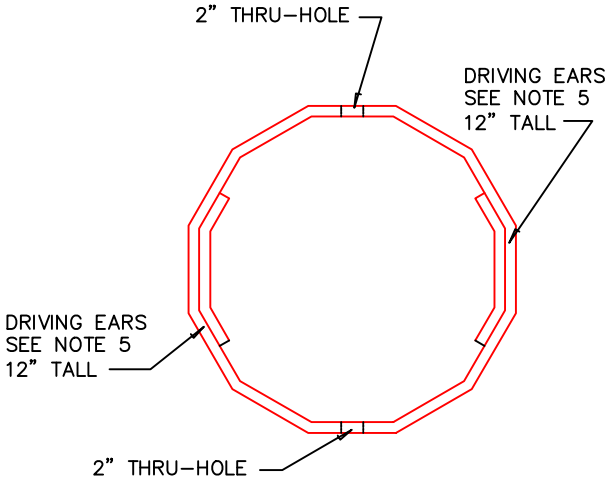
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

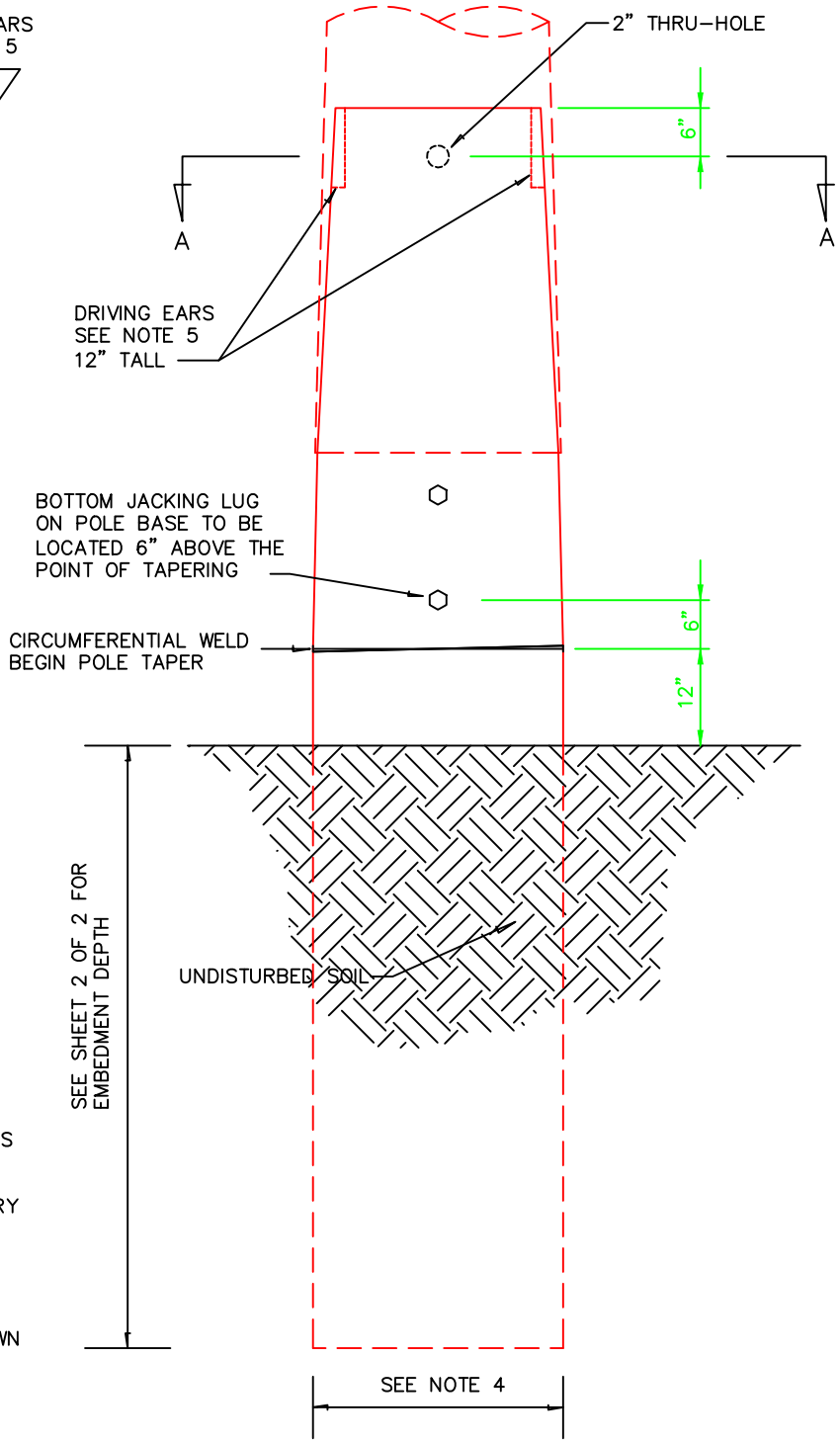
SUGG PKWY STRUCTURE 30
115 KV 3 PHASE, VERTICAL STRUCTURE, SMALL ANGLE DOUBLE DEADEND SUSPENSION, W/POST & DISTRIBUTION UB

DWN. JLS		DATE: 04/23/20	
CKD. KW		APPD. KW	
SCALE: N.T.S.			
DATE	REVISION	DATE	REVISION

DWG. NO.
TSVD6.V6.16



SECTION A-A
N.T.S



NOTES:

1. VIBRATORY POLE BASE TO BE INSTALLED USING VIBRATORY HAMMER, THE FREQUENCY AND STROKE AMPLITUDE RANGES FOR INSTALLATION OF THE POLE BASE TO BE PER MANUFACTURERS RECOMMENDATIONS.
2. TAPER OF POLE TO MATCH TAPER OF VIBRATORY POLE BASE.
3. OVERLAP LENGTH TO BE DETERMINED BY MANUFACTURER.
4. VIBRATORY BASE DIAMETERS AND DEPTHS SHOWN ON SHEET 2 OF 2 ARE MINIMUM. POLE MANUFACTURER IS TO VERIFY VIBRATORY POLE BASE IS ADEQUATE FOR DESIGN LOADS.
5. MANUFACTURER SHALL DETERMINE ADEQUATE SIZE OF DRIVING EARS.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
	1	VIBRATORY POLE BASE	–	

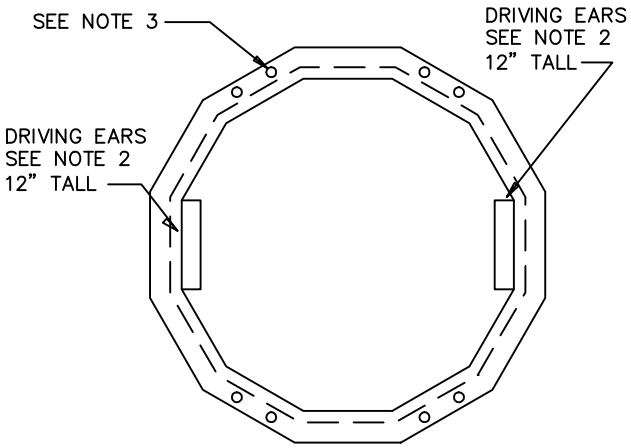
GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

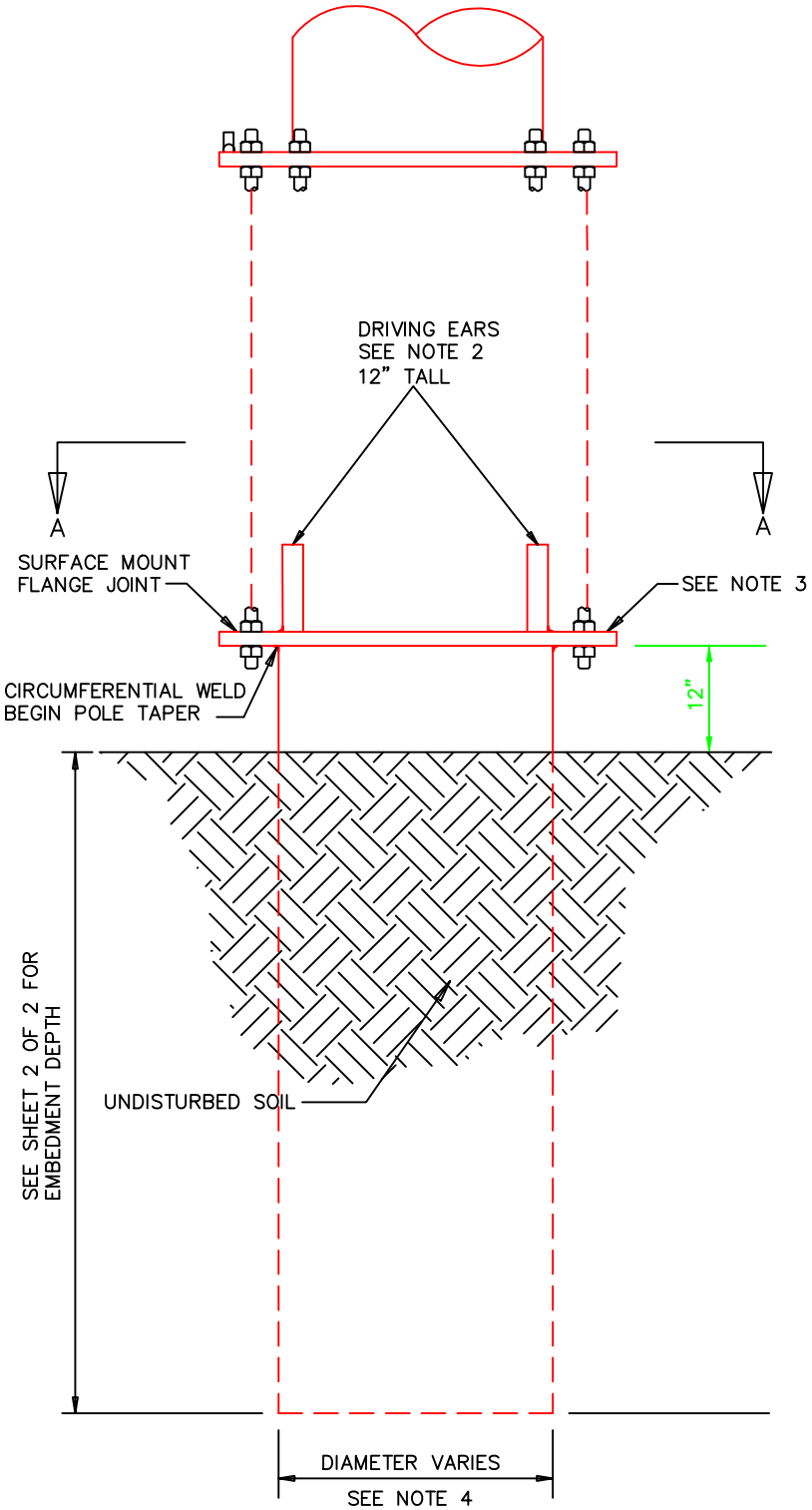
VIBRATORY DRIVEN POLE BASE

DWN. JLS		DATE: 05/01/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.		SHEET: 1 OF 2	
DATE	REVISION	DATE	REVISION

DWG. NO.
TMF-VPB



SECTION A–A
N.T.S



NOTES:

1. VIBRATORY POLE BASE TO BE INSTALLED USING VIBRATORY HAMMER, THE FREQUENCY AND STROKE AMPLITUDE RANGES FOR INSTALLATION OF THE POLE BASE TO BE PER MANUFACTURERS RECOMMENDATIONS.
2. MANUFACTURER SHALL DETERMINE ADEQUATE SIZE OF DRIVING EARS.
3. FLANGE SIZE AND BOLT PATTERN TO BE DETERMINED BY MANUFACTURER. BOLT PATTERN OF POLE TO MATCH BOLT PATTERN OF FOUNDATION FLANGE JOINT.
4. VIBRATORY BASE DIAMETERS AND DEPTHS SHOWN ON SHEET 2 OF 2 ARE MINIMUM. POLE MANUFACTURER IS TO VERIFY VIBRATORY POLE BASE IS ADEQUATE FOR DESIGN LOADS.

DWG. REF.	ea.	LIST OF MATERIALS DESCRIPTION	ITEM	DET.
	1	VIBRATORY POLE BASE, FLANGE MOUNT	–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

VIBRATORY DRIVEN POLE BASE
FLANGE TYPE

DWN. JLS		DATE: 05/01/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.		SHEET: 1 OF 2	
DATE	REVISION	DATE	REVISION

DWG. NO.
TMF–VPB–F

115 KV TRANSMISSION SUGG PARKWAY			
POLE NUMBER	HEIGHT/CLASS	EMBEDMENT DEPTH	VIBRATORY BASE DIAMETER
1	75/ENG	30′-0″	4.1′
2	75/ENG	25′-0″	4.1′
3	75/S-09.0	20′-0″	2.1′
4	75/ENG	30′-0″	5.4′
5	75/S-07.4	20′-0″	1.9′
6-15	70/S-06.5	20′-0″	1.75′
16	75/ENG	25′-0″	3.4′
17	80/S-09.0	20′-0″	2.2′
18	80/ENG	30′-0″	5.1′
21 & 24	80/S-10.0	20′-0″	2.3′
22	85/ENG	30′-0″	5.7′
23	80/ENG	25′-0″	3.55′
25	80/S-10.0	20′-0″	2.3′
30	75/ENG	30′-0″	4.9′

DWG. REF.		LIST OF MATERIALS		
	ea.	DESCRIPTION	ITEM	DET.
	1	VIBRATORY POLE BASE	–	

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

Greenville Utilities

VIBRATORY DRIVEN POLE BASE

DWN. JLS		DATE: 05/01/2020	
CKD. KW		APPD. KW	
SCALE: N.T.S.		SHEET: 2 OF 2	
DATE	REVISION	DATE	REVISION

DWG. NO.

TMF-VPB

Appendix C: Plan and Profile Drawings

GREENVILLE UTILITIES COMMISSION

115KV TRANSMISSION LINE

SUGG PARKWAY SUBSTATION TAP

ROUTE MAP

NOTES

1. NEW TRANSMISSION - 115KV (OPERATION) / 115KV (INSULATION)
   PHASE CONDUCTOR - THREE (3) 1272.0 KCMIL AAC, 61/0 STRAND (NARCISSUS)
   LOADING DISTRICT - MEDIUM (DESIGN) / MEDIUM (ACTUAL)
   MAXIMUM CONDUCTOR DESIGN TEMPERATURE - 167 DEG F
   O.H.G.W. - 7 NO. 9 ALUMOWELD

   SEE SAG AND TENSION CHARTS FOR RULING SPAN
   & NESC MEDIUM CONDUCTOR DESIGN TENSION BY SECTION
   THE SAG AND TENSION CHARTS ARE LOCATED IN THE
   LABOR BID PACKAGE.

2. CURRENT DISTRIBUTION - 12.47/7.2KV (OPERATION) / 24.9/14.4KV (INSULATION
   PHASE CONDUCTORS (SINGLE CIRCUIT UNDERBUILD)
   THREE (3) 795.0 KCMIL AAC, 37 STRANDING (ARBUTUS)
   (DOUBLE CIRCUIT UNDERBUILD)
   ONE CIRCUIT ALONG 264 WILL BE REMOVED
   NEUTRAL CONDUCTOR - 336 KCMIL ACSR, 18 STRANDING (MERLIN)
   LOADING DISTRICT - MEDIUM (DESIGN) / MEDIUM (ACTUAL)
   MAXIMUM CONDUCTOR DESIGN TEMPERATURE - 167 DEG F

   SEE SAG AND TENSION CHARTS FOR RULING SPAN
   & NESC MEDIUM CONDUCTOR DESIGN TENSION BY SECTION
   THE SAG AND TENSION CHARTS ARE LOCATED IN THE
   LABOR BID PACKAGE.

3. FIBER OPTIC UNDERBUILD
   FIBER OPTIC CONDUCTOR ONE (1) 96 FIBER
   LOADING DISTRICT - MEDIUM (DESIGN) / MEDIUM (ACTUAL)
   MAXIMUM CONDUCTOR DESIGN TEMPERATURE - 120 DEG F

   SEE SAG AND TENSION CHARTS FOR RULING SPAN
   & NESC MEDIUM CONDUCTOR DESIGN TENSION BY SECTION
   THE SAG AND TENSION CHARTS ARE LOCATED IN THE
   LABOR BID PACKAGE.

4. FOR CONDUCTOR SPACING, SEE GREENVILLE UTILITIES COMMISSION
   CONSTRUCTION DRAWINGS AND TYPICAL CONDUCTOR SEPARATION
   DRAWINGS IN LABOR CONTRACT.

5. DANGER!!! ALL LINES ARE TO BE CONSIDERED ENERGIZED UNLESS
   PHYSICALLY CHECKED AND CLEARLY GROUNDED IN ACCORDANCE
   WITH OWNER`S OR CONTRACTOR`S SAFETY REGULATIONS AND
   PROCEDURES, WHICHEVER IS MORE STRINGENT.

6. ALL RIGHT-OF-WAY ACQUISITION TO BE COORDINATED BY
   GREENVILLE UTILITIES COMMISSION.

7. 1:1 GUY LEADS ARE DESIRED WHERE POSSIBLE. ENGINEER SHALL
   APPROVE ANCHOR POSISIONS. THE CONTRACTOR IS RESPOSIBLE
   FOR ENSURING A MINIMUM CLEARANCE OF 36" FROM GUY WIRES TO
   115KV TRANSMISSION AND 12" FROM GUY WIRES TO 12.47/7.2KV
   DISTRIBUTION UNDERBUILD PHASE CONDUCTORS. IF GUY LEADS
   SHOWN DO NOT PROVIDE MINIMUM CLEARANCE, CONTACT ENGINEER.

8. CLEARLY IDENTIFY NEUTRAL CONDUCTOR IN THE FIELD.

9. TRANSMISSION STRUCTURES SHALL BE TUBULAR STEEL CLASSED
   BY GROUNDLINE MOMENT (FT-KIPS). THE DESIGNATION SHOWN IN THE
   ASSEMBLY UNITS IS AS FOLLOWS; POLE HEIGHT/GROUNDLINE MOMENT
   (FT-KIPS). SETTING DEPTHS ARE INDICATED ON PLAN AND PROFILE SHEETS.

10. GUY STRAND; TRANSMISSION AND DISTRIBUTION - 7/16" E.H.S. STEEL
    UNLESS OTHERWISE NOTED.

11. TPV2 UNGUYED STRUCTURES SHALL BE RAKED 6" AWAY
    FROM THE STACKED POST INSULATORS.

12. WATER AND SEWER MAIN LINE LOCATIONS WERE PROVIDED
    AS SHOWN BY GREENVILLE UTILITIES COMMISSION. CONTRACTOR
    IS RESPONSIBLE FOR LOCATING ACTUAL UNDERGROUND UTLITIES
    PRIOR TO DIGGING AND/OR INSTALLING VIBRATORY POLE BASES.
    SHOULD CONFLICTS ARISE, CONTACT ENGINEER IMMEDIATELY.

13. STRUCTURES ARE NOT INTENDED TO BE CLIMBABLE UNDER
    ENERGIZED CONDITIONS.

14. DISTRIBUTION DESIGN, STAKING SHEETS, INSTALLATION AND
    TRANSFERS BY GREENVILLE UTILITIES COMMISSION.

15. ALL NEW TRANSMISSION POLES ARE VIBRATORY POLE BASE
    UNLESS NOTED OTHERWISE.

DATE	REVISIONS AND RECORD OF ISSUE
5/12/2020	PRELIMINARY DESIGN
9/23/2020	REVISION A

STAMP

NORTH

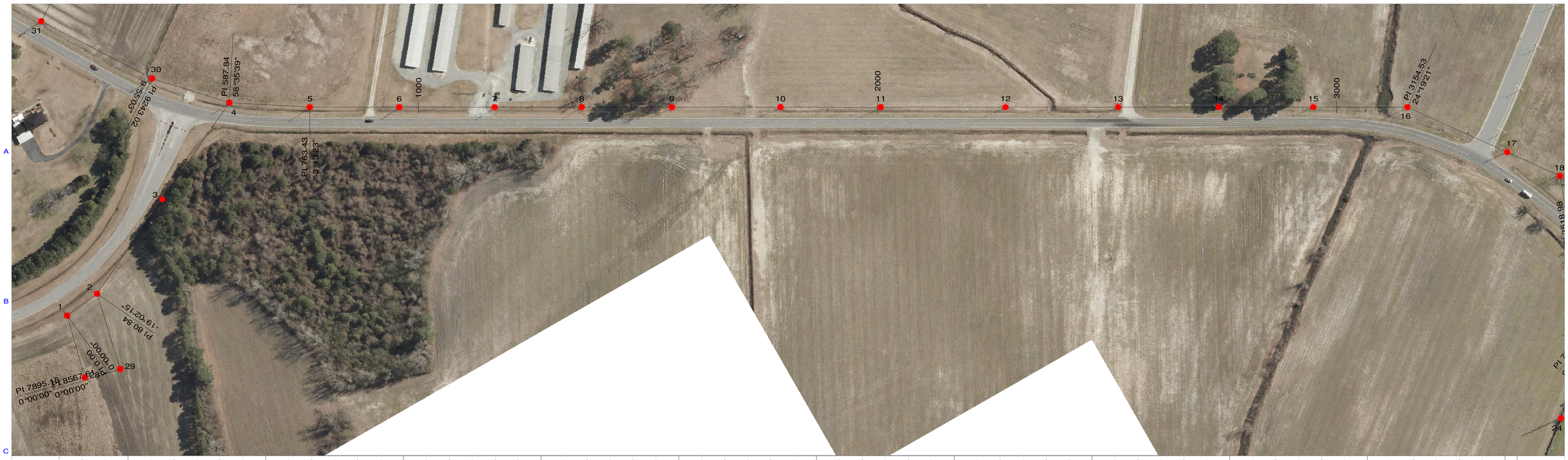
DRAWN JLS
DATE 05/12/2020
ENGINEER JLS
CHECKED KW

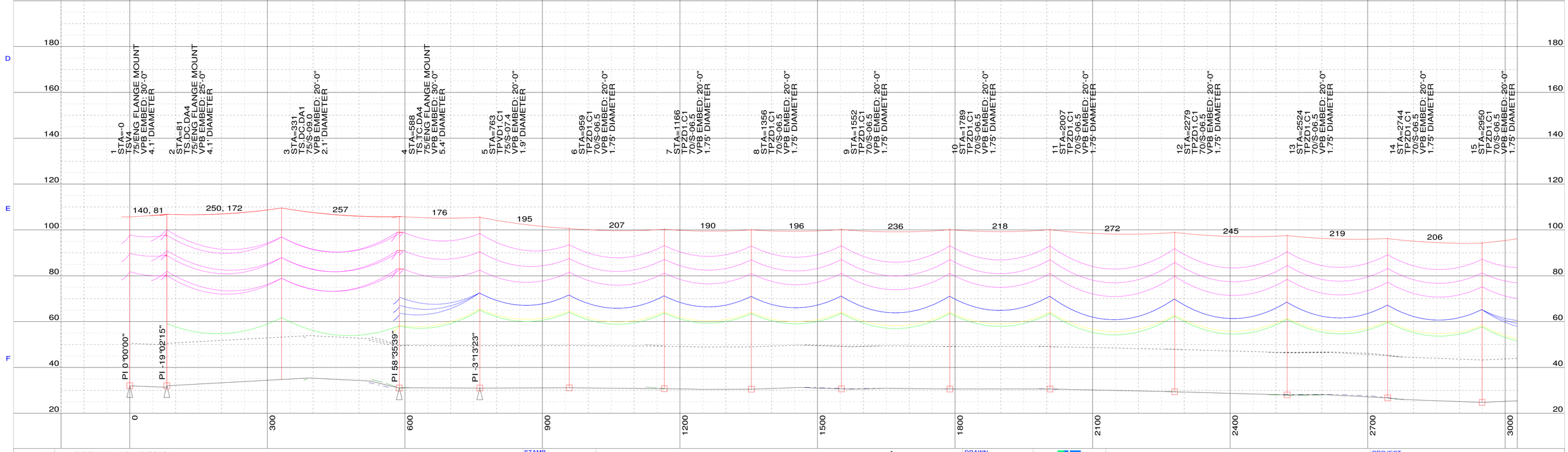
Greenville Utilities

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

PROJECT
115KV TRANSMISSION LINE
SUGG PARKWAY SUBSTATION TAP

AREA | SHEET 1 OF 5 | REV A





5/12/2020	PRELIMINARY DESIGN	STAMP
9/23/2020	REVISION A	
DATE	REVISIONS AND RECORD OF ISSUE	

100.0 FT. HORIZ. SCALE
20.0 FT. VERT. SCALE

NORTH

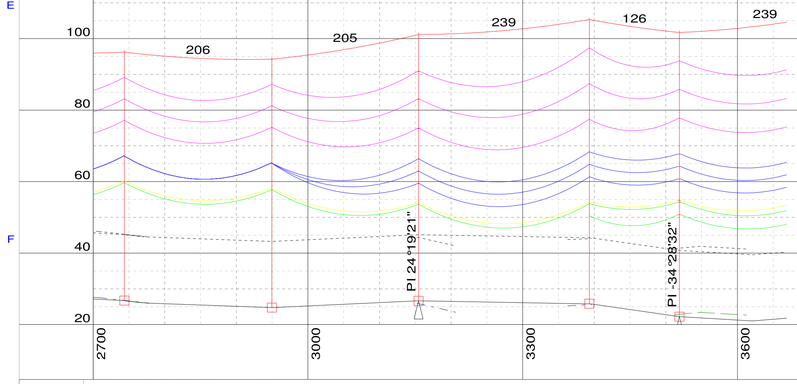
DRAWN	JLS
DATE	05/12/2020
ENGINEER	JLS
CHECKED	KW

Greenville Utilities

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

PROJECT
115KV TRANSMISSION LINE
SUGG PARKWAY SUBSTATION TAP

AREA	SHEET	REV
	2 OF 5	A



5/12/2020	PRELIMINARY DESIGN
9/23/2020	REVISION A
DATE	REVISIONS AND RECORD OF ISSUE

STAMP

100.0 FT. HORIZ. SCALE
20.0 FT. VERT. SCALE

NORTH

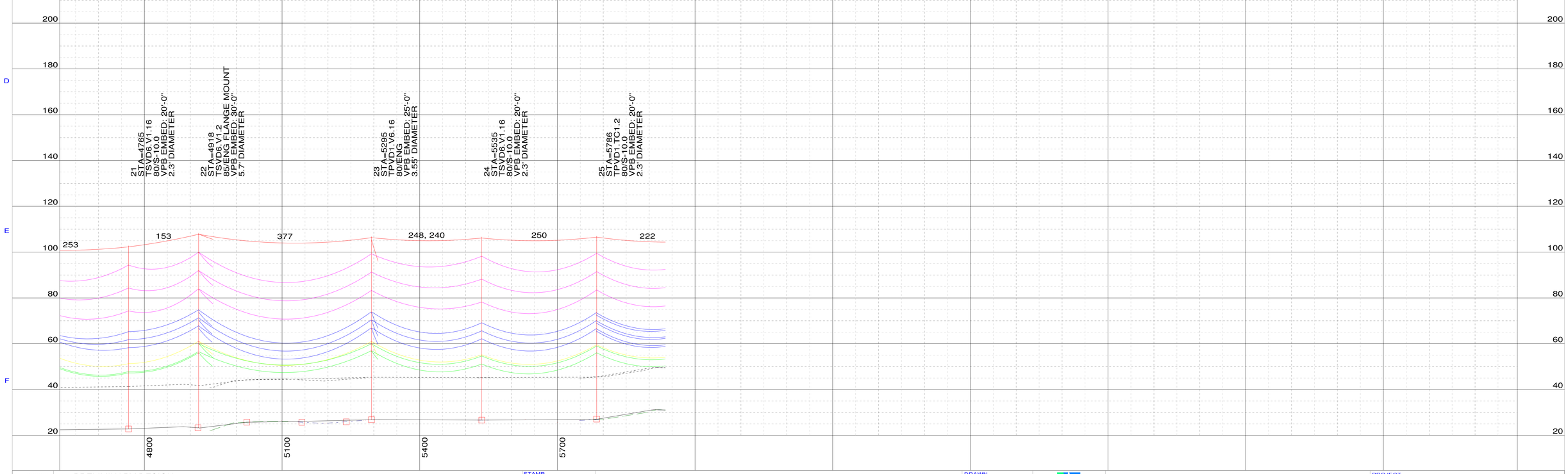
DRAWN	JLS
DATE	05/12/2020
ENGINEER	JLS
CHECKED	KW

Greenville Utilities

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

PROJECT
115KV TRANSMISSION LINE
SUGG PARKWAY SUBSTATION TAP

AREA | SHEET 3 OF 5 | REV A



5/12/2020	PRELIMINARY DESIGN	STAMP
9/23/2020	REVISION A	
DATE	REVISIONS AND RECORD OF ISSUE	

100.0 FT. HORIZ. SCALE
20.0 FT. VERT. SCALE
NORTH

DRAWN	JLS
DATE	05/12/2020
ENGINEER	JLS
CHECKED	KW

Greenville Utilities

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

PROJECT
115KV TRANSMISSION LINE
SUGG PARKWAY SUBSTATION TAP

AREA | SHEET 4 OF 5 | REV A

DATE	REVISIONS AND RECORD OF ISSUE
5/12/2020	PRELIMINARY DESIGN
9/23/2020	REVISION A

STAMP

100.0 FT. HORIZ. SCALE
20.0 FT. VERT. SCALE

NORTH

DRAWN JLS
DATE 05/12/2020
ENGINEER JLS
CHECKED KW

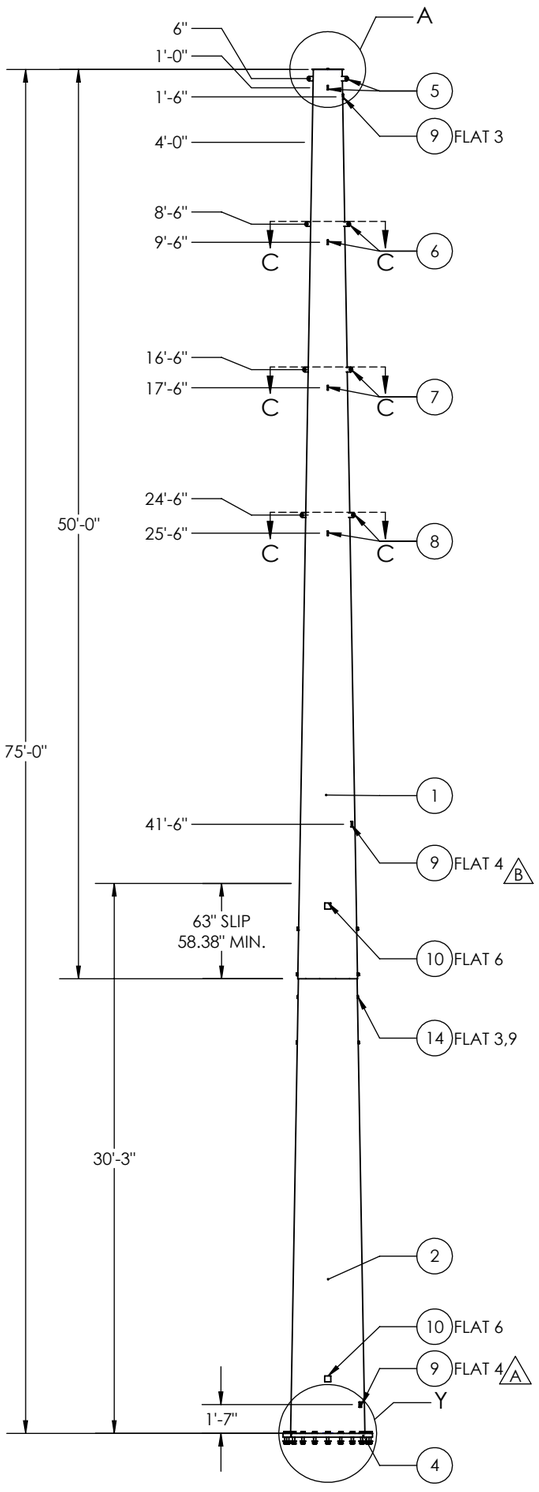
Greenville Utilities

GREENVILLE UTILITIES COMMISSION
GREENVILLE, NORTH CAROLINA

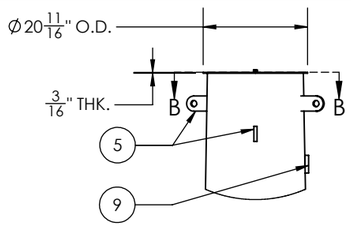
PROJECT
115KV TRANSMISSION LINE
SUGG PARKWAY SUBSTATION TAP

AREA | SHEET 5 OF 5 | REV A

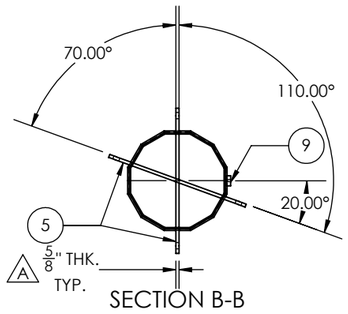
Appendix D: Pole Manufacturer's Structure Drawings



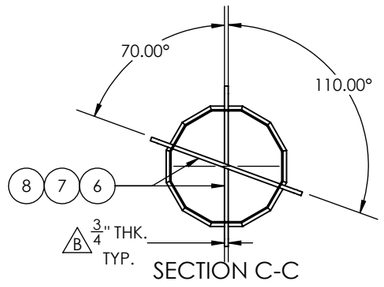
FRONT VIEW
(FLAT 6)



DETAIL A



SECTION B-B



SECTION C-C

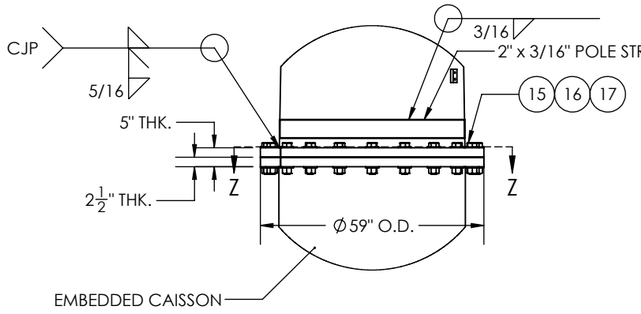
TOP SHAFT WEIGHT: 4397 LBS
BOT SHAFT WEIGHT: 5819 LBS
(INCLUDES 6% FOR GALVANIZING)

B

STR NO. 01
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 2811

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

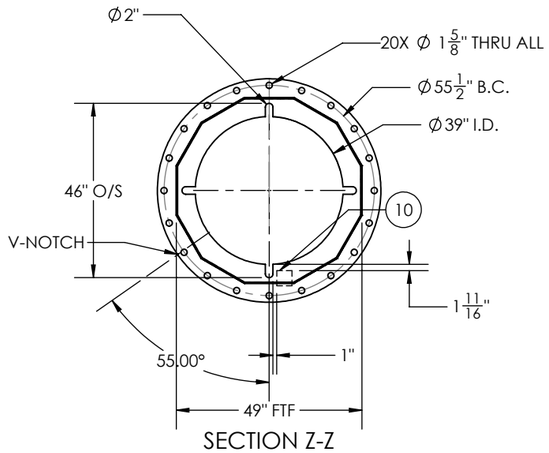
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T0101	39.42" x 19" x 0.25" x 50'- 0"	A572 Gr.65	1
2	9338-T0201	49" x 36.65" x 0.3125" x 30'- 3"	A572 Gr.65	1
3	9338-2201	TOP PLATE	A36	1
4	9338-2001	BASE PLATE	A572 Gr.50	1
5	9338-3023	POLE VANG T1	A572 Gr.50	2
6	9338-3129	POLE VANG T2	A572 Gr.50	2
7	9338-3135	POLE VANG T2	A572 Gr.50	2
8	9338-3142	POLE VANG T2	A572 Gr.50	2
9	9338-1900	NEMA PAD	SS	3
10	9338-2301	IDENTIFICATION TAG	A36	3
11	-	TOP PLATE STRIP	A36	1
12	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
13	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
14	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	8
15	HHBOLT 1.5000-6x7.25x2.25-C	HEX BOLT, HEAVY	A325	20
16	Regular FW 1.5	FLAT WASHER	F436	40
17	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	20



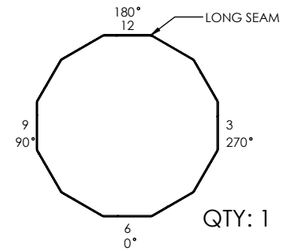
DETAIL Y

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



SECTION Z-Z



QTY: 1

Approved: Jacob Swink 9/18/2020

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.

700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 1 of 26 | REV. B

GREENVILLE SUGGS
75' POLE
STR NO. 01

CAISSON WEIGHT: 6602 LBS
(INCLUDES 6% FOR GALVANIZING)

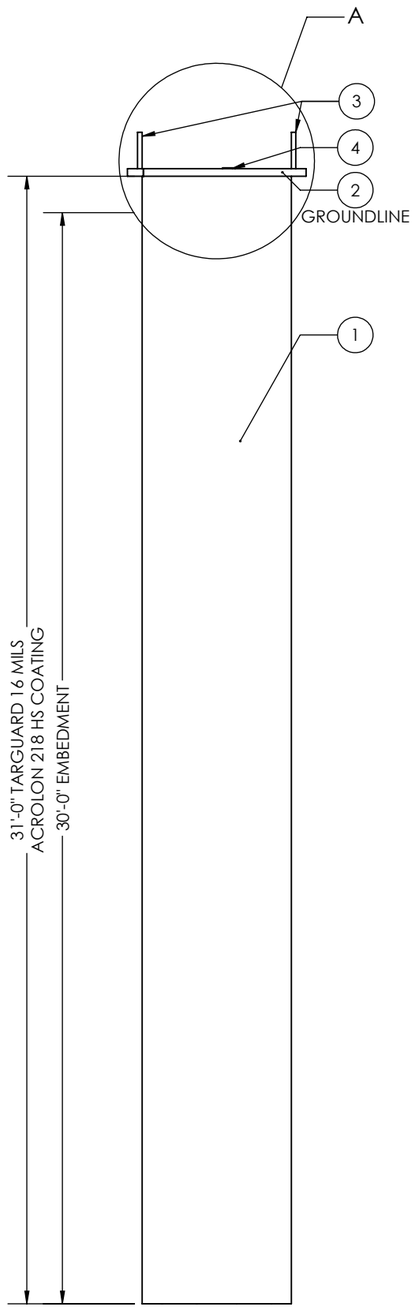
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T0301	49.2" x 49.2" x 0.3125" x 31'- 0"	A572 Gr.65	1
2	9338-2001	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	1

APPLICABLE CODES
WELDING: AWS D1.1

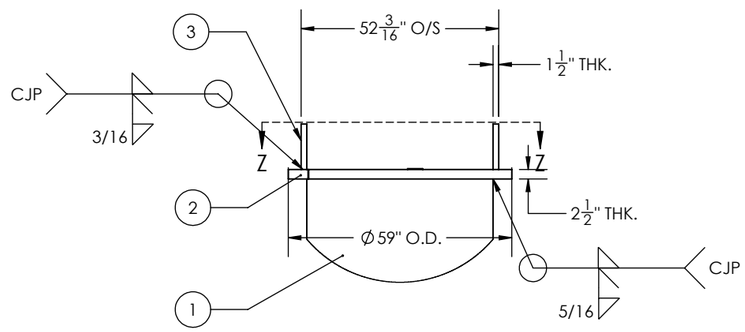
GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.

STR NO. 01
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 2811

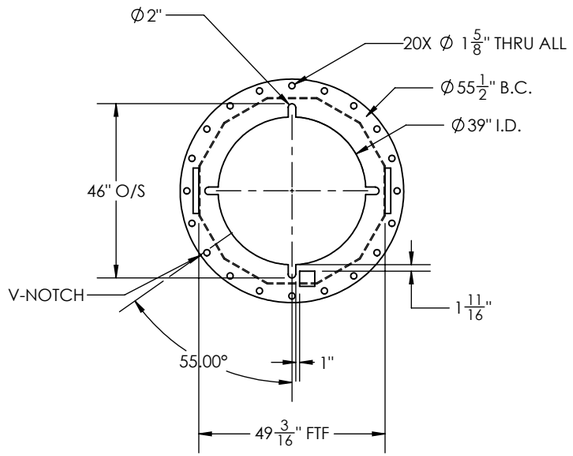
IDENTIFICATION PLATE (A)
3/8" LETTERS



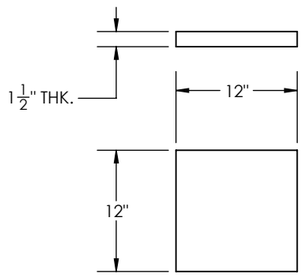
FRONT VIEW
(FLAT 6)



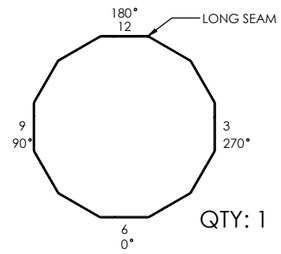
DETAIL A



SECTION Z-Z



(A) DRIVING EAR DETAIL



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.

700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

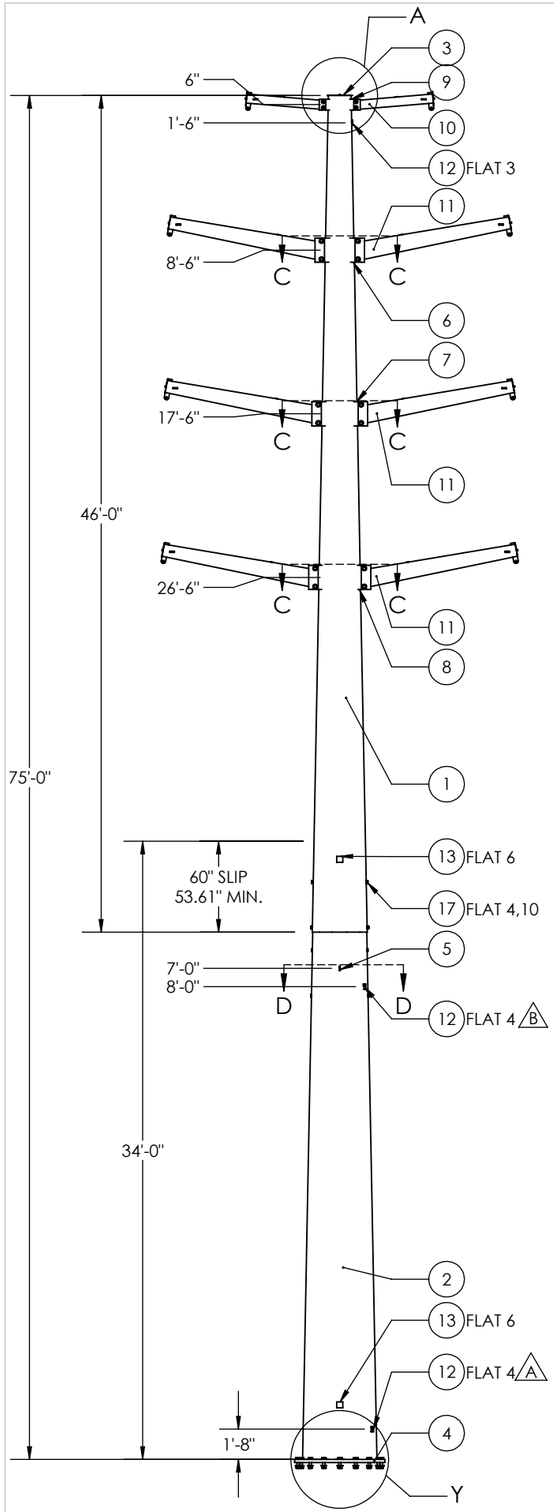
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

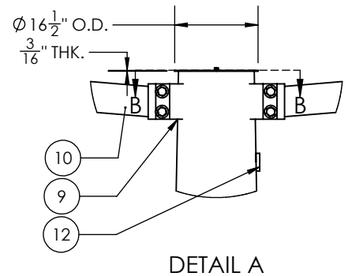
THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 2 of 26 | REV. A

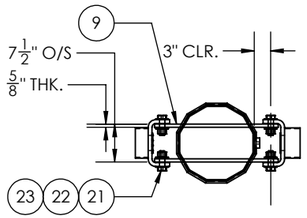
GREENVILLE SUGGS
75' POLE
STR NO. 01



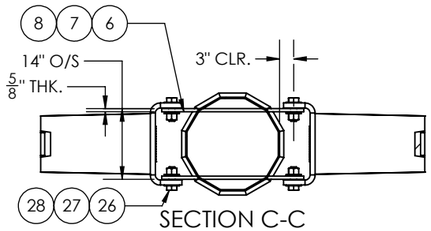
FRONT VIEW
(FLAT 6)



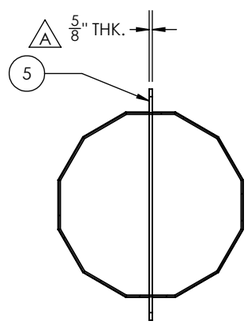
DETAIL A



SECTION B-B



SECTION C-C



SECTION D-D

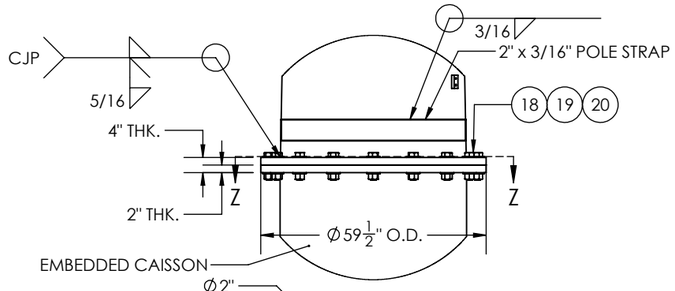
TOP SHAFT WEIGHT: 4776 LBS
BOT SHAFT WEIGHT: 6025 LBS
(INCLUDES 6% FOR GALVANIZING)

B

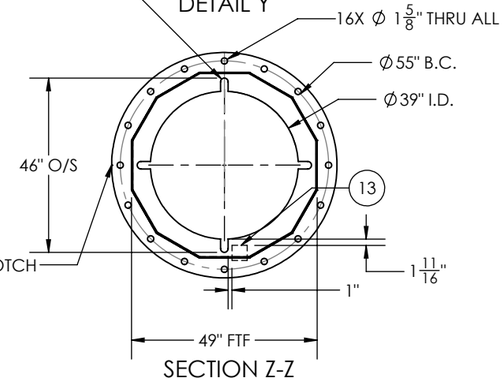
STR NO. 02
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 2811

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T0401	36.24" x 15" x 0.25" x 46'- 0"	A572 Gr.65	1
2	9338-T0501	49" x 33.3" x 0.3125" x 34'- 0"	A572 Gr.65	1
3	9338-2202	TOP PLATE	A36	1
4	9338-2002	BASE PLATE	A572 Gr.50	1
5	9338-3057	POLE VANG T1	A572 Gr.50	1
6	9338-3501	ARM CONNECTION VANG	A572 Gr.50	2
7	9338-3502	ARM CONNECTION VANG	A572 Gr.50	2
8	9338-3503	ARM CONNECTION VANG	A572 Gr.50	2
9	9338-3510	ARM CONNECTION VANG	A572 Gr.50	2
10	9338-4902	4'-0" OHGW ARM	-	2
11	9338-4900	8'-0" DAVIT ARM	-	6
12	9338-1900	NEMA PAD	SS	3
13	9338-2301	IDENTIFICATION TAG	A36	3
14	-	TOP PLATE STRIP	A36	1
15	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
16	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
17	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	8
18	HHBOLT 1.5000-6x6.25x2.25-C	HEX BOLT, HEAVY	A325	16
19	Regular FW 1.5	FLAT WASHER	F436	32
20	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	16
21	HHBOLT 1.0000-8x3.25x1.75-C	HEX BOLT, HEAVY	A325	8
22	Regular FW 1	FLAT WASHER	F436	16
23	HHNUT 1.0000-8-B-C	HEX NUT, HEAVY	A563	8
26	HHBOLT 1.2500-7x3.75x2-N	HEX BOLT, HEAVY	A325	24
27	Regular FW 1.25	FLAT WASHER	F436	48
28	HHNUT 1.2500-7-B-N	ANCO LOCK NUT	A563	24



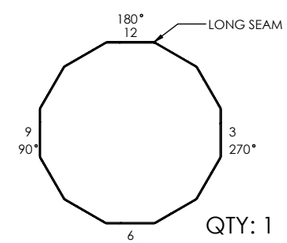
DETAIL Y



SECTION Z-Z

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.

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SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338
PART NO. -
DWG NO. 20-9338 MAIN SHEET: 3 of 26
REV. B

GREENVILLE SUGGS
75' POLE
STR NO. 02

CAISSON WEIGHT: 5527 LBS
(INCLUDES 6% FOR GALVANIZING)

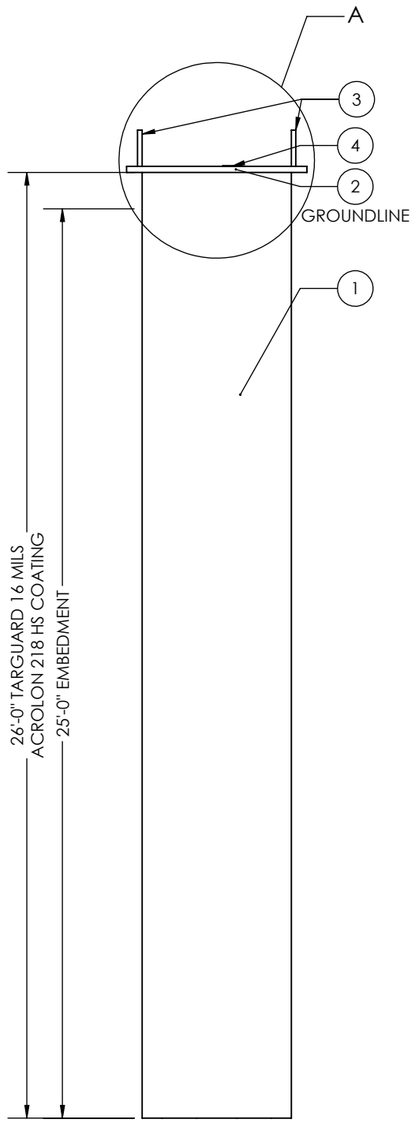
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T0601	49.2" x 49.2" x 0.3125" x 26'- 0"	A572 Gr.65	1
2	9338-2002	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	1

APPLICABLE CODES
WELDING: AWS D1.1

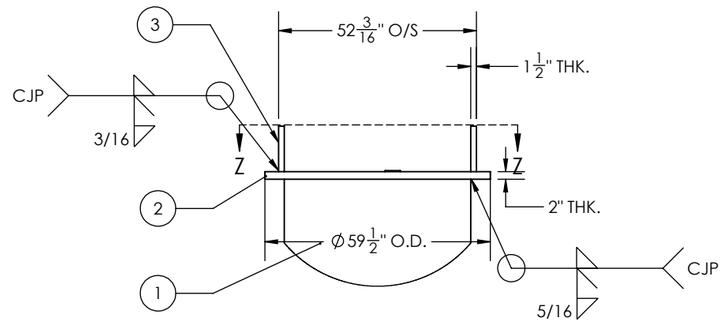
GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.

STR NO. 02
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 2811

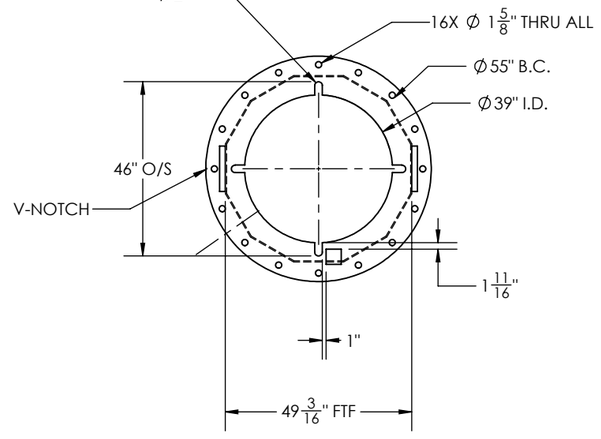
IDENTIFICATION PLATE (A)
3/8" LETTERS



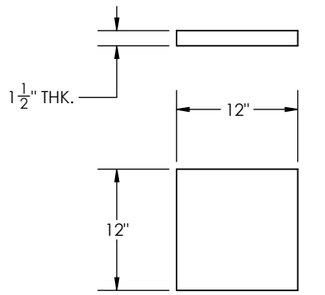
FRONT VIEW
(FLAT 6)



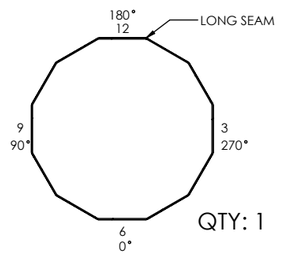
DETAIL A



SECTION Z-Z



(A) DRIVING EAR DETAIL



QTY: 1

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CHMINDUSTRIES.COM

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TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

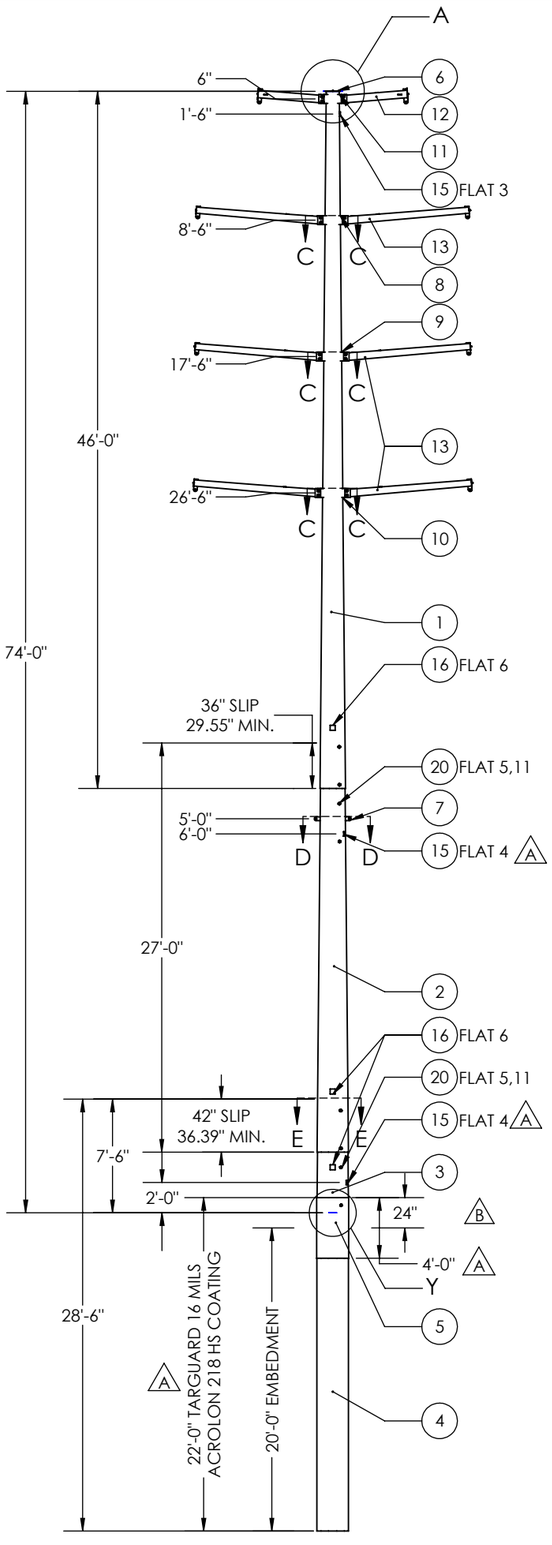
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.	CAD	09/15/2020

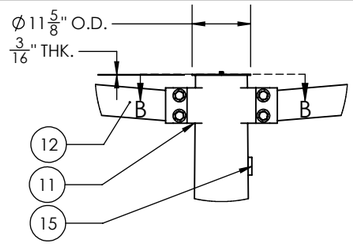
THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 4 of 26 | REV. A

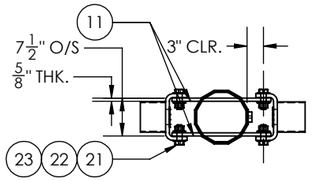
GREENVILLE SUGGS
75' POLE
STR NO. 02



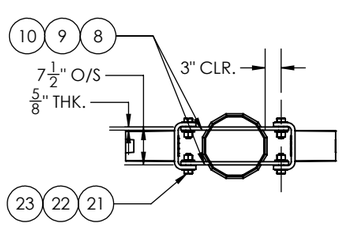
FRONT VIEW
(FLAT 6)



DETAIL A



SECTION B-B

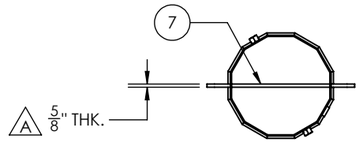


SECTION C-C

TOP SHAFT WEIGHT: 2436 LBS
BOT SHAFT WEIGHT: 1755 LBS
CAISSON WEIGHT: 2029 LBS
(INCLUDES 6% FOR GALVANIZING)

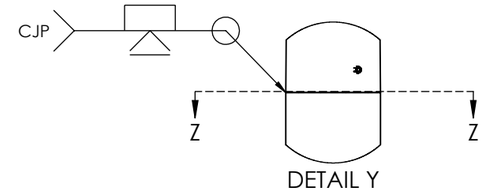
STR NO. 03
HEIGHT: 75'
STR TYPE: S-09.0
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 676

B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM



SECTION D-D

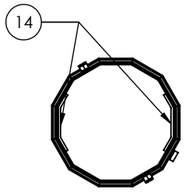
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T0701	20.2" x 10.25" x 0.25" x 46'- 0"	A572 Gr.65	1
2	9338-T0801	24.76" x 18.92" x 0.25" x 27'- 0"	A572 Gr.65	1
3	9338-T0901	25" x 23.38" x 0.25" x 7'- 6"	A572 Gr.65	1
4	9338-T1001	25" x 25" x 0.25" x 21'- 0"	A572 Gr.65	1
5	9338-T4701	25.375" x 25.375" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2203	TOP PLATE	A36	1
7	9338-3024	POLE VANG T1	A572 Gr.50	1
8	9338-3504	ARM CONNECTION VANG	A572 Gr.50	2
9	9338-3505	ARM CONNECTION VANG	A572 Gr.50	2
10	9338-3506	ARM CONNECTION VANG	A572 Gr.50	2
11	9338-3511	ARM CONNECTION VANG	A572 Gr.50	2
12	9338-4902	4'-0" OHGW ARM	-	2
13	9338-4901	8'-0" DAVIT ARM	-	6
14	9338-3900	DRIVING EARS	A572 Gr.50	2
15	9338-1900	NEMA PAD	SS	3
16	9338-2301	IDENTIFICATION TAG	A36	3
17	-	TOP PLATE STRIP	A36	1
18	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
19	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
20	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16
21	HHBOLT 1.0000-8x3.25x1.75-C	HEX BOLT, HEAVY	A325	32
22	Regular FW 1	FLAT WASHER	F436	64



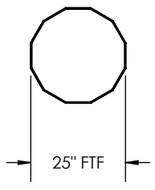
DETAIL Y

APPLICABLE CODES
WELDING: AWS D1.1

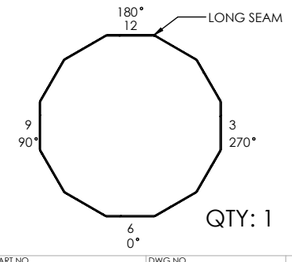
GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



SECTION E-E



SECTION Z-Z



QTY: 1

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TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

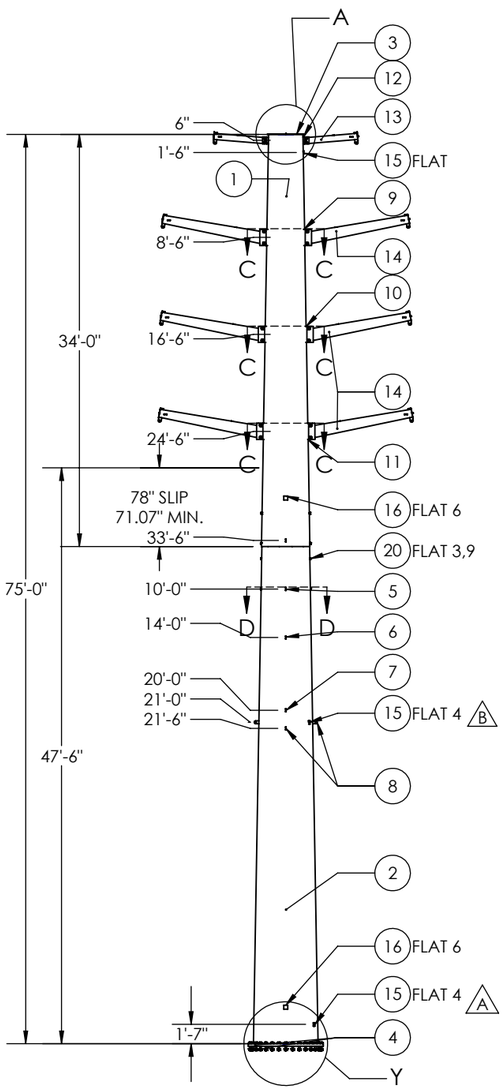
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.	CAD	09/15/2020

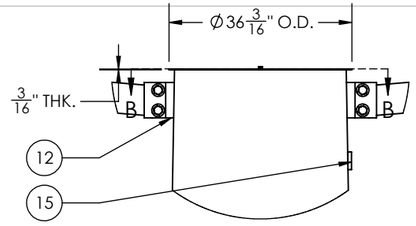
THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 5 of 26 | REV. B

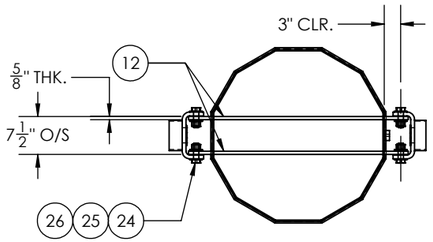
GREENVILLE SUGGS
75' S-09.0
STR NO. 03



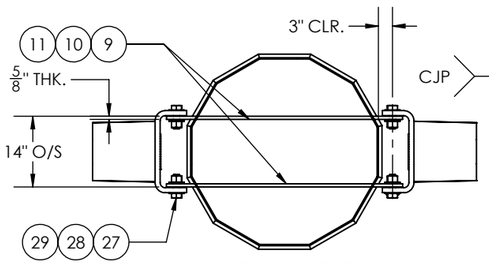
FRONT VIEW
(FLAT 6)



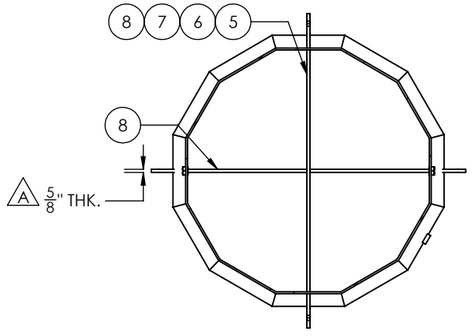
DETAIL A



SECTION B-B



SECTION C-C

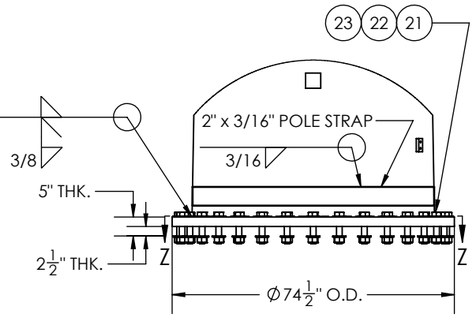


SECTION D-D

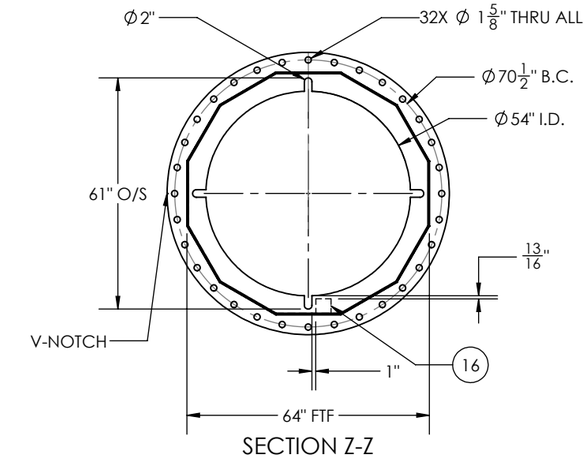
TOP SHAFT WEIGHT: 5596 LBS
BOT SHAFT WEIGHT: 12883 LBS
(INCLUDES 6% FOR GALVANIZING) B

STR NO. 04
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 5388

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM



DETAIL Y

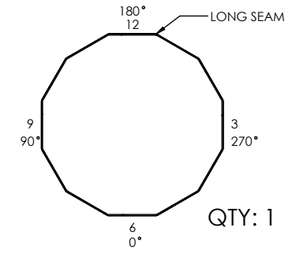


SECTION Z-Z

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T1101	47.88" x 34" x 0.25" x 34'- 0"	A572 Gr.65	1
2	9338-T1201	64" x 44.6" x 0.375" x 47'- 6"	A572 Gr.65	1
3	9338-2204	TOP PLATE	A36	1
4	9338-2003	BASE PLATE	A572 Gr.50	1
5	9338-3080	POLE VANG T1	A572 Gr.50	2
6	9338-3082	POLE VANG T1	A572 Gr.50	1
7	9338-3084	POLE VANG T1	A572 Gr.50	1
8	9338-3090	POLE VANG T1	A572 Gr.50	2
9	9338-3507	ARM CONNECTION VANG	A572 Gr.50	2
10	9338-3508	ARM CONNECTION VANG	A572 Gr.50	2
11	9338-3509	ARM CONNECTION VANG	A572 Gr.50	2
12	9338-3512	ARM CONNECTION VANG	A572 Gr.50	2
13	9338-4902	4'-0" OHGW ARM	-	2
14	9338-4900	8'-0" DAVIT ARM	-	6
15	9338-1900	NEMA PAD	SS	3
16	9338-2301	IDENTIFICATION TAG	A36	3
17	-	TOP PLATE STRIP	A36	1
18	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
19	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
20	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	8
21	HHBOLT 1.5000-6x7.25x2.25-C	HEX BOLT, HEAVY	A325	32
22	Regular FW 1.5	FLAT WASHER	F436	64
23	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	32
24	HHBOLT 1.0000-8x3.25x1.75-C	HEX BOLT, HEAVY	A325	11
25	Regular FW 1	FLAT WASHER	F436	22
26	HHNUT 1.0000-8-B-C	HEX NUT, HEAVY	A563	11
27	HHBOLT 1.2500-7x3.75x2-N	HEX BOLT, HEAVY	A325	21
28	Regular FW 1.25	FLAT WASHER	F436	42
29	HHNUT 1.2500-7-B-N	ANCO LOCK NUT	A563	21

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 6 of 26 | REV. B

GREENVILLE SUGGS
75' POLE
STR NO. 04

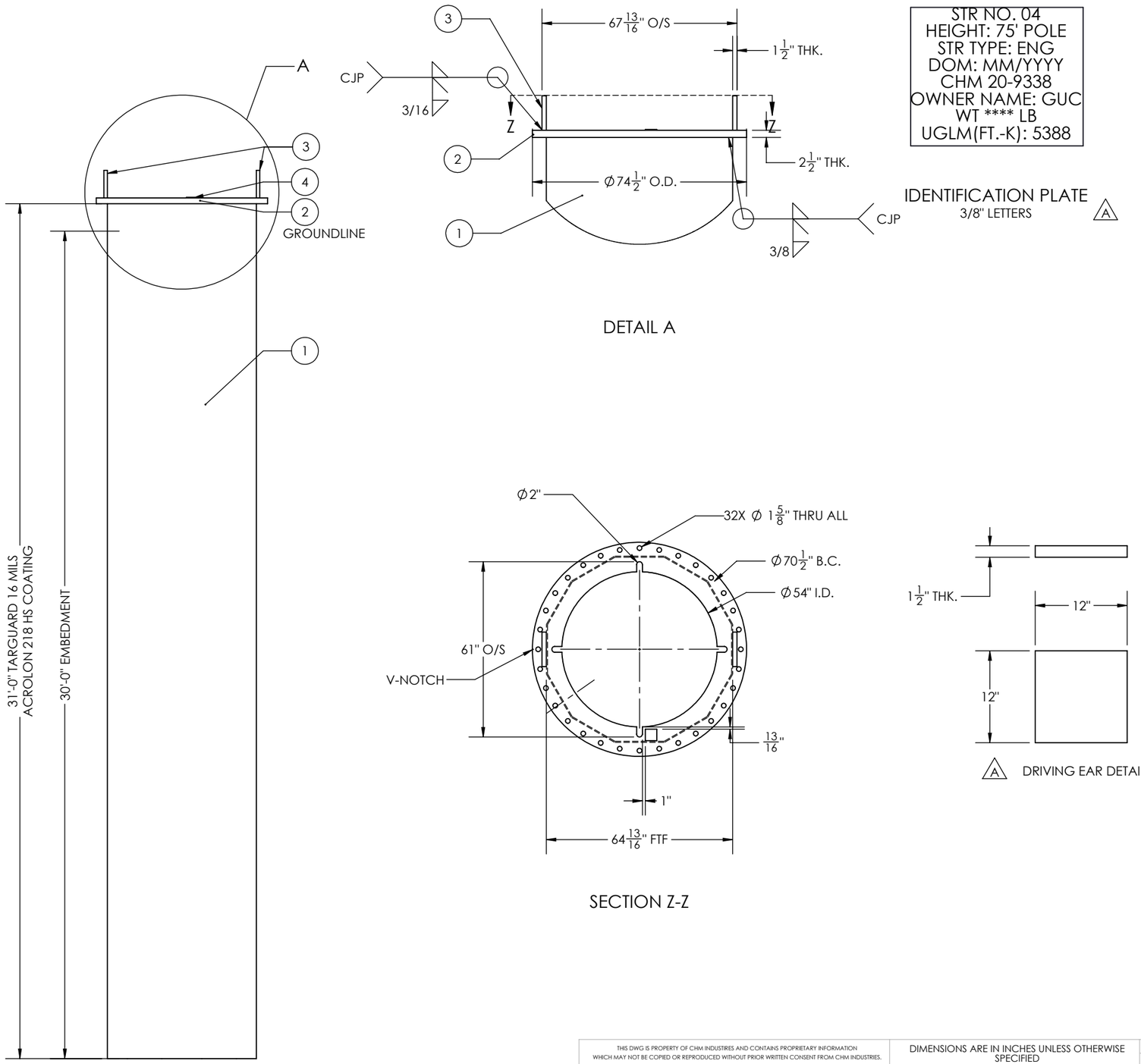
CAISSON WEIGHT: 10190 LBS
(INCLUDES 6% FOR GALVANIZING)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T1301	64.8" x 64.8" x 0.375" x 31'- 0"	A572 Gr.65	1
2	9338-2003	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	1

STR NO. 04
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 5388

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.



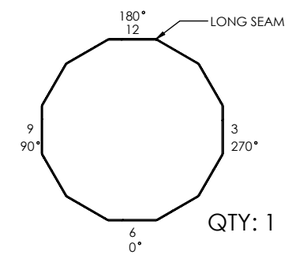
FRONT VIEW
(FLAT 6)

DETAIL A

IDENTIFICATION PLATE
3/8" LETTERS
A

SECTION Z-Z

A DRIVING EAR DETAIL



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 7 of 26 | REV. A

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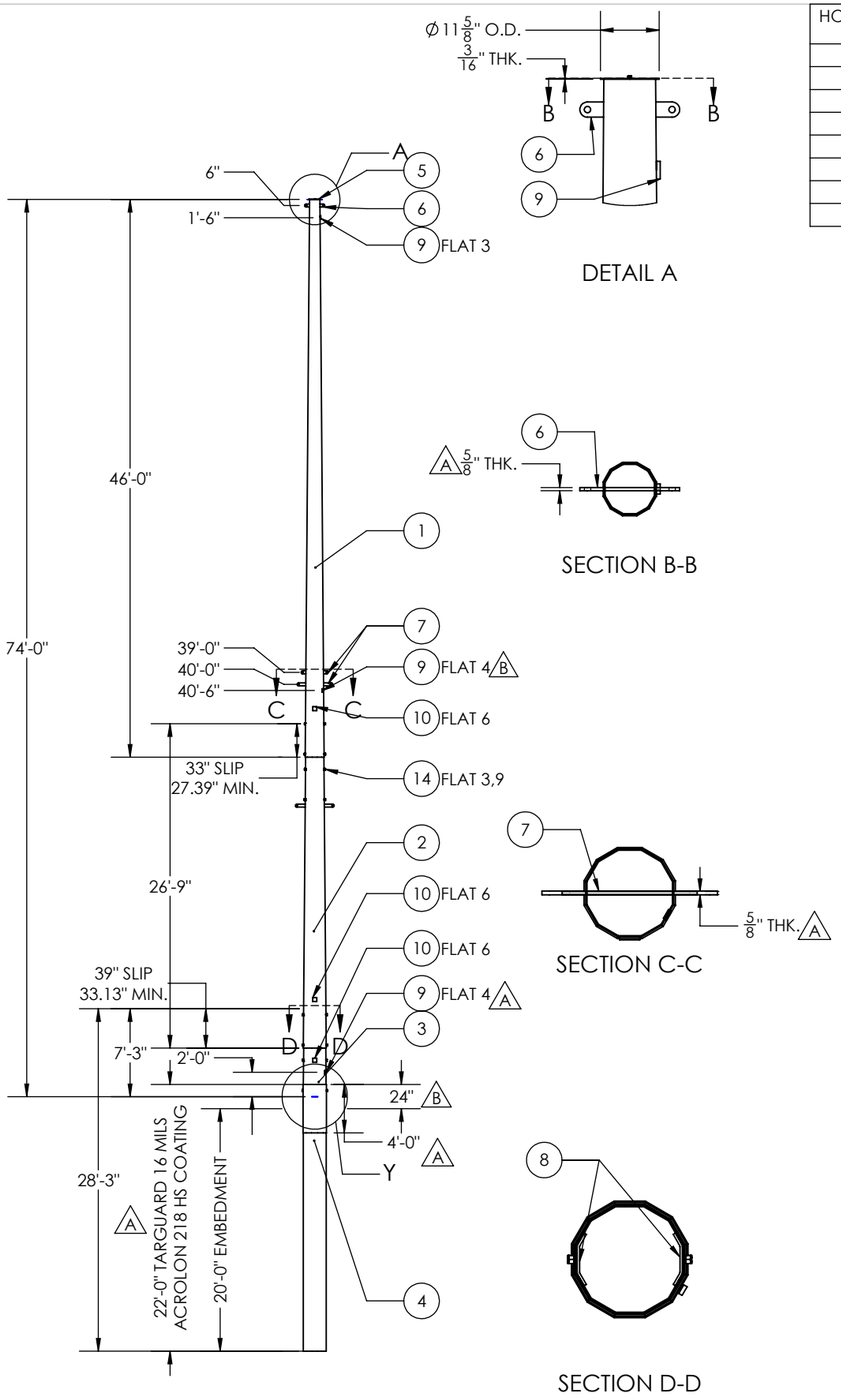
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

GREENVILLE SUGGS
75' POLE
STR NO. 04



DETAIL A

SECTION B-B

SECTION C-C

SECTION D-D

FRONT VIEW
(FLAT 6)

HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	8'-0"	3,9	90°,270°
1"	9'-0"	3,9	90°,270°
1"	16'-0"	3,9	90°,270°
1"	17'-0"	3,9	90°,270°
1"	24'-0"	3,9	90°,270°
1"	25'-0"	3,9	90°,270°
3/4"	33'-0"	6,12	0°,180°
3/4"	34'-0"	6,12	0°,180°

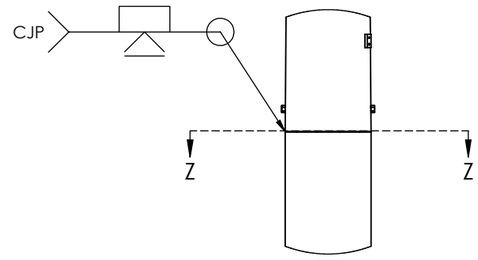
TOP SHAFT WEIGHT: 1959 LBS
BOT SHAFT WEIGHT: 1582 LBS
CAISSON WEIGHT: 1826 LBS
(INCLUDES 6% FOR GALVANIZING)

STR NO. 05
HEIGHT: 75'
STR TYPE: S-07.4
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 555

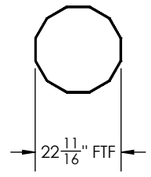
B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

B

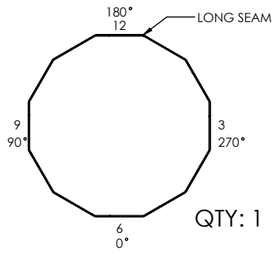
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T1401	18.76" x 10.25" x 0.25" x 46'- 0"	A572 Gr.65	1
2	9338-T1501	22.58" x 17.63" x 0.25" x 26'- 9"	A572 Gr.65	1
3	9338-T1601	22.7" x 21.36" x 0.25" x 7'- 3"	A572 Gr.65	1
4	9338-T1701	22.7" x 22.7" x 0.25" x 21'- 0"	A572 Gr.65	1
5	9338-2203	TOP PLATE	A36	1
6	9338-3005	POLE VANG T1	A572 Gr.50	1
7	9338-3019	POLE VANG T1	A572 Gr.50	2
8	9338-3901	DRIVING EARS	A572 Gr.50	2
9	9338-1900	NEMA PAD	SS	3
10	9338-2301	IDENTIFICATION TAG	A36	3
11	-	TOP PLATE STRIP	A36	1
12	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
13	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
14	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16
15	9338-T4801	23.075" x 23.075" x 0.1875" x 4'- 0"	A572 Gr.65	1
16	9338-3135	POLE VANG T2	A572 Gr.50	1
17	9338-3142	POLE VANG T2	A572 Gr.50	1



DETAIL Y



SECTION Z-Z



QTY: 1

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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682.286.0086 FX
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BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

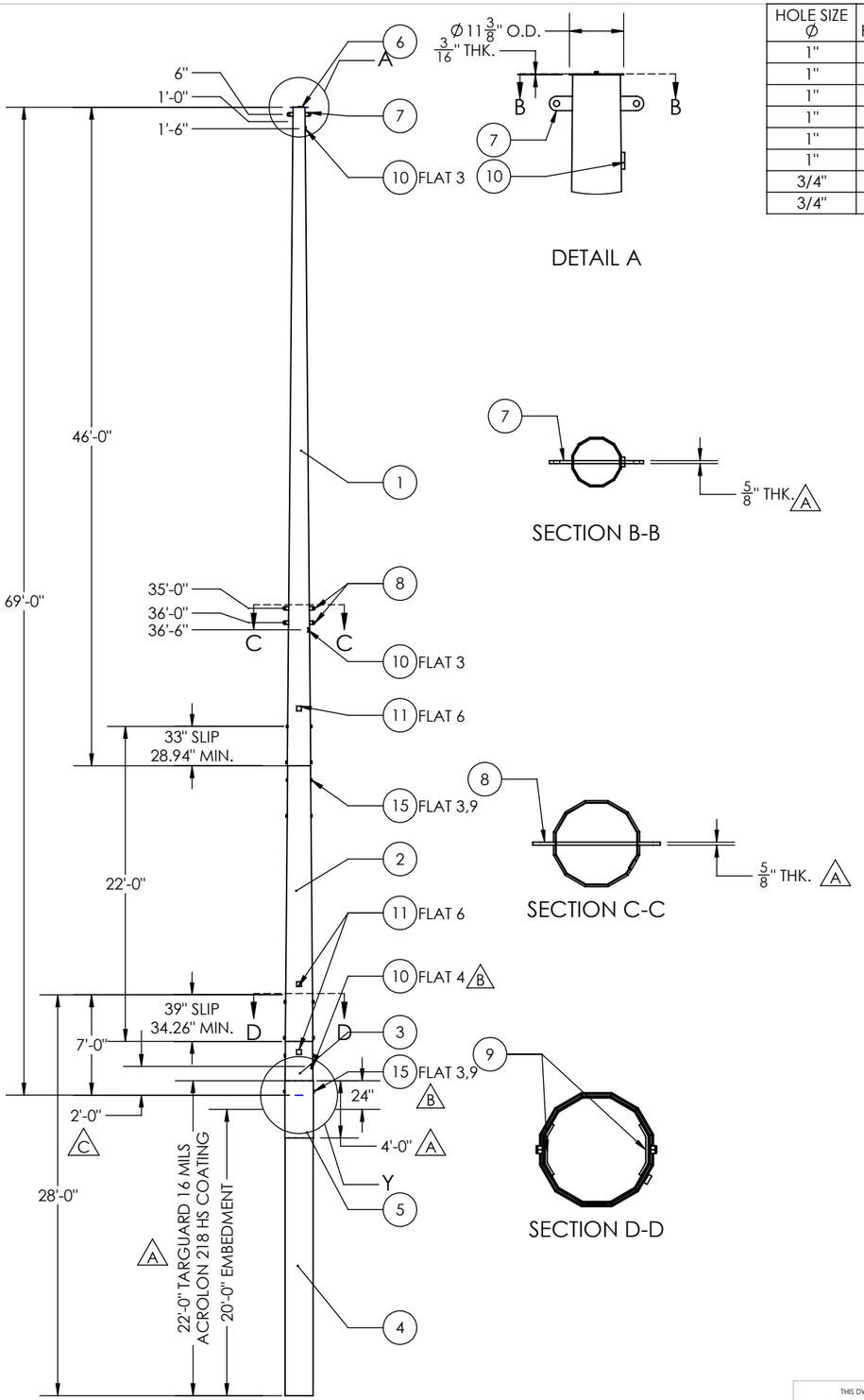
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 8 of 26 | REV. B

GREENVILLE SUGGS
75' S-07.4
STR NO. 05



FRONT VIEW
(FLAT 6)

DETAIL A

SECTION B-B

SECTION C-C

SECTION D-D

HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	8'-0"	3,9	90°,270°
1"	9'-0"	3,9	90°,270°
1"	14'-0"	3,9	90°,270°
1"	15'-0"	3,9	90°,270°
1"	20'-0"	3,9	90°,270°
1"	21'-0"	3,9	90°,270°
3/4"	29'-0"	6,12	0°,180°
3/4"	30'-0"	6,12	0°,180°

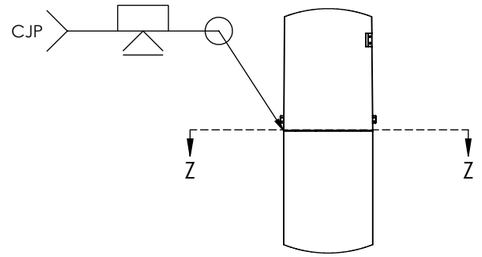
TOP SHAFT WEIGHT: 1524 LBS
BOT SHAFT WEIGHT: 1033 LBS
CAISSON WEIGHT: 1409 LBS
(INCLUDES 6% FOR GALVANIZING)

STR NO. 06,07,09-11,13-15
HEIGHT: 70' POLE
STR TYPE: S-06.5
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 443

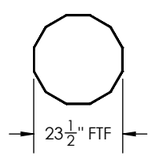
B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

B

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T1801	19.67" x 10.01" x 0.1875" x 46'- 0"	A572 Gr.65	1
2	9338-T1901	23.21" x 18.59" x 0.1875" x 22'- 0"	A572 Gr.65	1
3	9338-T2001	23.5" x 22.03" x 0.1875" x 7'- 0"	A572 Gr.65	1
4	9338-T2101	23.5" x 23.5" x 0.1875" x 21'- 0"	A572 Gr.65	1
5	9338-T4901	23.875" x 23.875" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2205	TOP PLATE	A36	1
7	9338-3005	POLE VANG T1	A572 Gr.50	1
8	9338-3019	POLE VANG T1	A572 Gr.50	2
9	9338-3902	DRIVING EARS	A572 Gr.50	2
10	9338-1900	NEMA PAD	SS	3
11	9338-2301	IDENTIFICATION TAG	A36	3
12	-	TOP PLATE STRIP	A36	1
13	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
14	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
15	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16



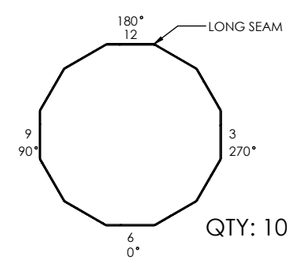
DETAIL Y



SECTION Z-Z

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 10

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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SAGINAW, TEXAS 76179
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682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

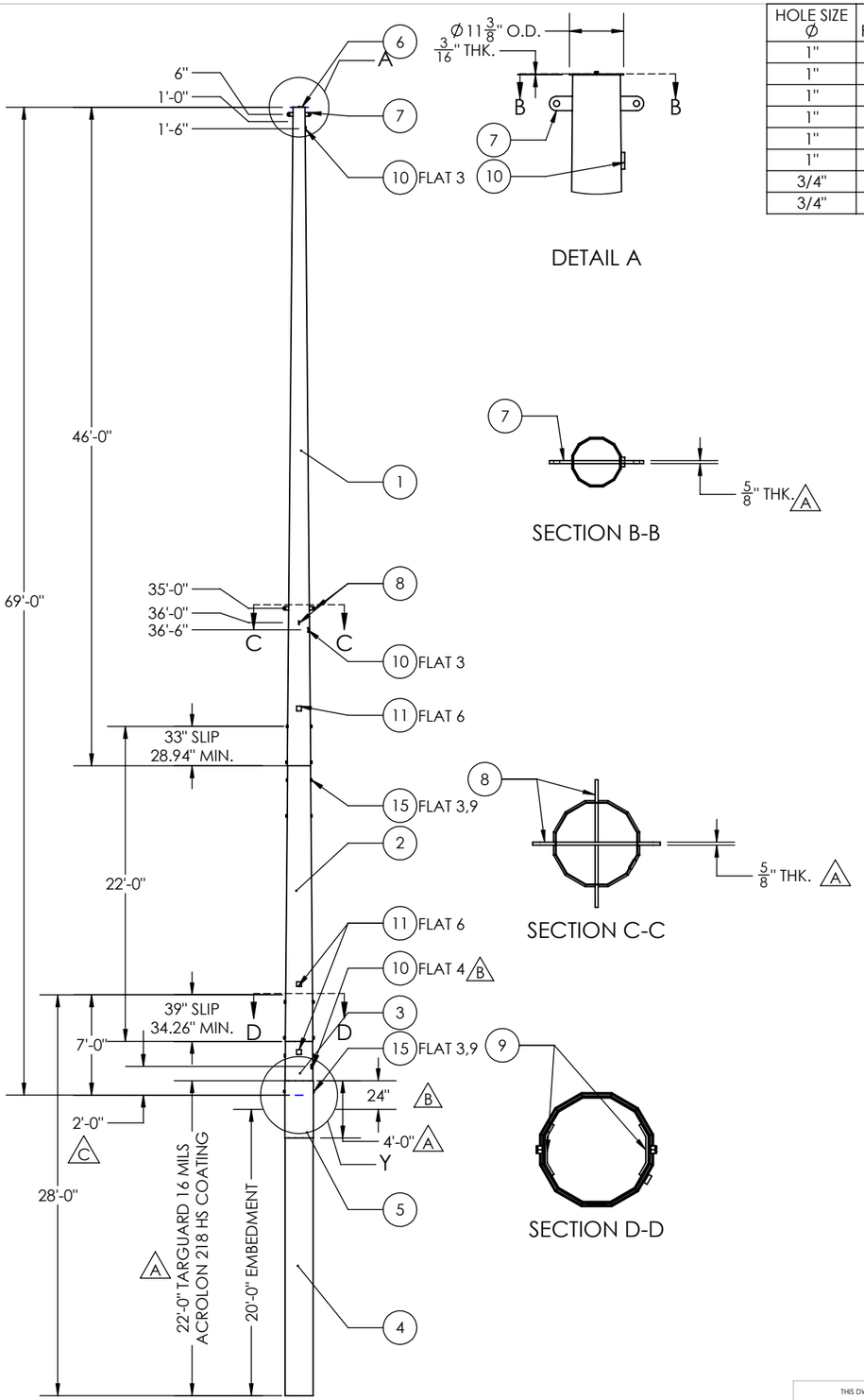
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS
B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/18/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338
PART NO. -
DWG NO. 20-9338 MAIN SHEET: 9 of 26
REV. C

GREENVILLE SUGGS
70' POLE
STR NO. 06,07,09-11,13-15



DETAIL A

SECTION B-B

SECTION C-C

SECTION D-D

FRONT VIEW
(FLAT 6)

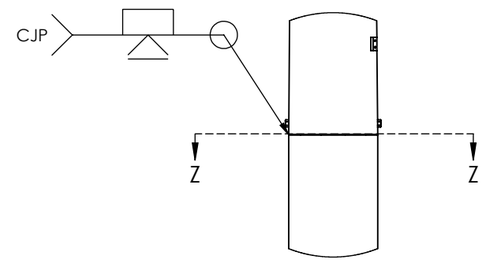
HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	8'-0"	3,9	90°,270°
1"	9'-0"	3,9	90°,270°
1"	14'-0"	3,9	90°,270°
1"	15'-0"	3,9	90°,270°
1"	20'-0"	3,9	90°,270°
1"	21'-0"	3,9	90°,270°
3/4"	29'-0"	6,12	0°,180°
3/4"	30'-0"	6,12	0°,180°

TOP SHAFT WEIGHT: 1524 LBS
BOT SHAFT WEIGHT: 1033 LBS
CAISSON WEIGHT: 1409 LBS
(INCLUDES 6% FOR GALVANIZING)

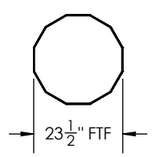
STR NO. 08,12
HEIGHT: 70' POLE
STR TYPE: S-06.5
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 443

B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T1801	19.67" x 10.01" x 0.1875" x 46'- 0"	A572 Gr.65	1
2	9338-T1901	23.21" x 18.59" x 0.1875" x 22'- 0"	A572 Gr.65	1
3	9338-T2001	23.5" x 22.03" x 0.1875" x 7'- 0"	A572 Gr.65	1
4	9338-T2101	23.5" x 23.5" x 0.1875" x 21'- 0"	A572 Gr.65	1
5	9338-T4901	23.875" x 23.875" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2205	TOP PLATE	A36	1
7	9338-3005	POLE VANG T1	A572 Gr.50	1
8	9338-3019	POLE VANG T1	A572 Gr.50	2
9	9338-3902	DRIVING EARS	A572 Gr.50	2
10	9338-1900	NEMA PAD	SS	3
11	9338-2301	IDENTIFICATION TAG	A36	3
12	-	TOP PLATE STRIP	A36	1
13	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
14	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
15	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16



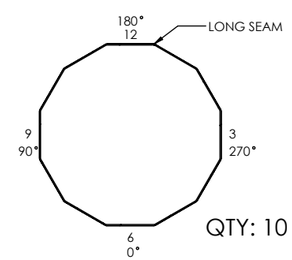
DETAIL Y



SECTION Z-Z

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 10

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS
B
DO NOT SCALE DRAWING

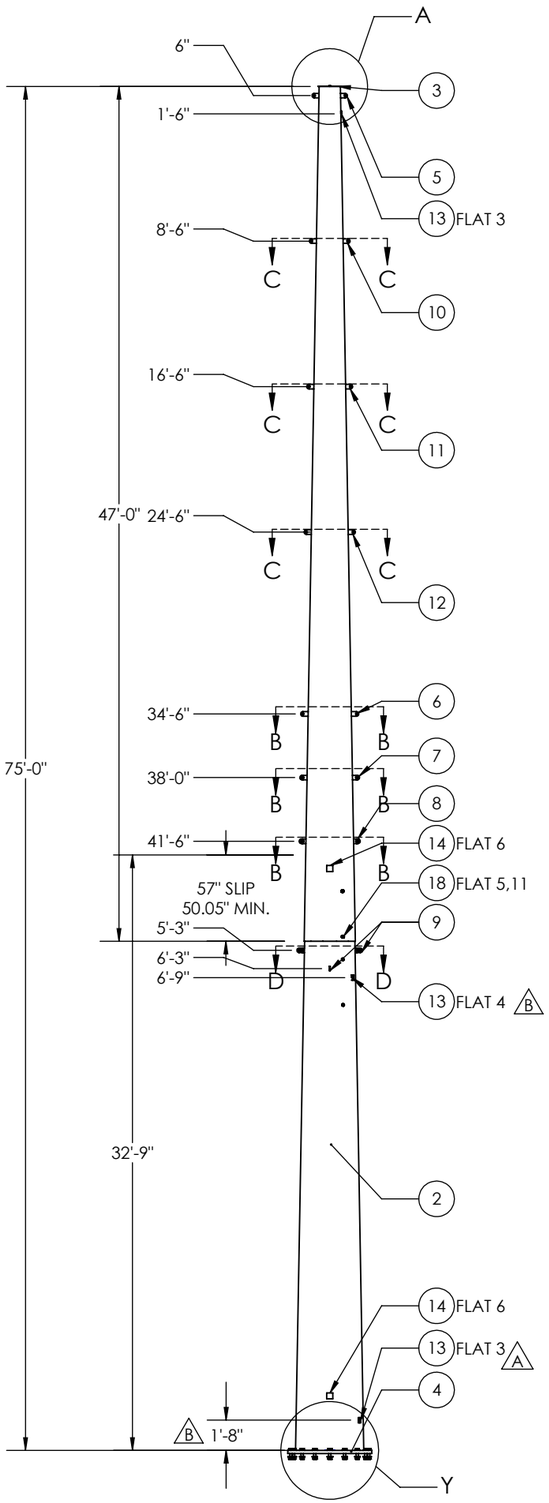
	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/18/2020

THIRD ANGLE PROJECTION

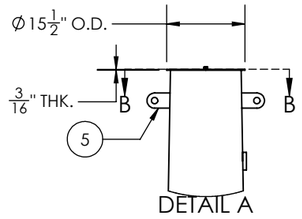
KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 10 of 26 | REV. C

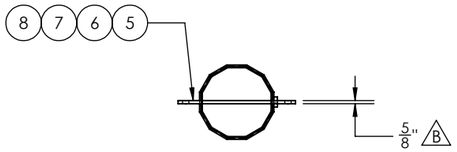
GREENVILLE SUGGS
70' POLE
STR NO. 08,12



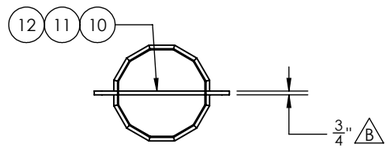
FRONT VIEW
(FLAT 6)



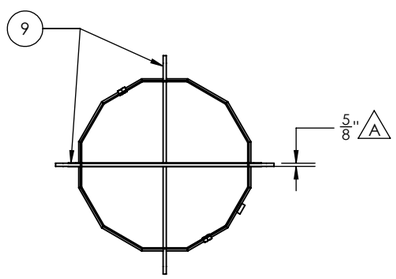
DETAIL A



SECTION B-B



SECTION C-C



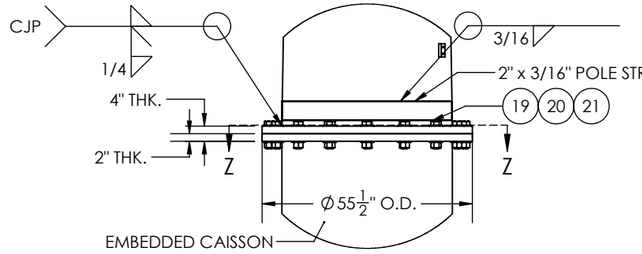
SECTION D-D

TOP SHAFT WEIGHT: 2588 LBS
BOT SHAFT WEIGHT: 4537 LBS
(INCLUDES 6% FOR GALVANIZING) B

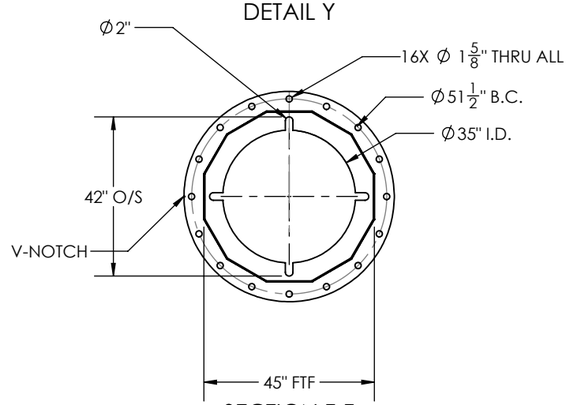
STR NO. 16
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 1693

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T2201	33.74" x 14" x 0.1875" x 47'- 0"	A572 Gr.65	1
2	9338-T2301	45" x 31.25" x 0.25" x 32'- 9"	A572 Gr.65	1
3	9338-2206	TOP PLATE	A36	1
4	9338-2004	BASE PLATE	A572 Gr.50	1
5	9338-3012	POLE VANG T1	A572 Gr.50	1
6	9338-3042	POLE VANG T1	A572 Gr.50	1
7	9338-3044	POLE VANG T1	A572 Gr.50	1
8	9338-3046	POLE VANG T1	A572 Gr.50	1
9	9338-3052	POLE VANG T1	A572 Gr.50	2
10	9338-3119	POLE VANG T2	A572 Gr.50	1
11	9338-3126	POLE VANG T2	A572 Gr.50	1
12	9338-3133	POLE VANG T2	A572 Gr.50	1
13	9338-1900	NEMA PAD	SS	3
14	9338-2301	IDENTIFICATION TAG	A36	3
15	-	TOP PLATE STRIP	A36	1
16	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
17	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
18	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	8
19	HHBOLT 1.5000-6x6.25x2.25-C	HEX BOLT, HEAVY	A325	16
20	Regular FW 1.5	FLAT WASHER	F436	32
21	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	16
24	9338-3142	POLE VANG T2	A572 Gr.50	4



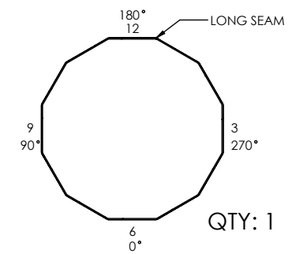
DETAIL Y



SECTION Z-Z

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.

700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 11 of 26 | REV. B

GREENVILLE SUGGS
75' POLE
STR NO. 16

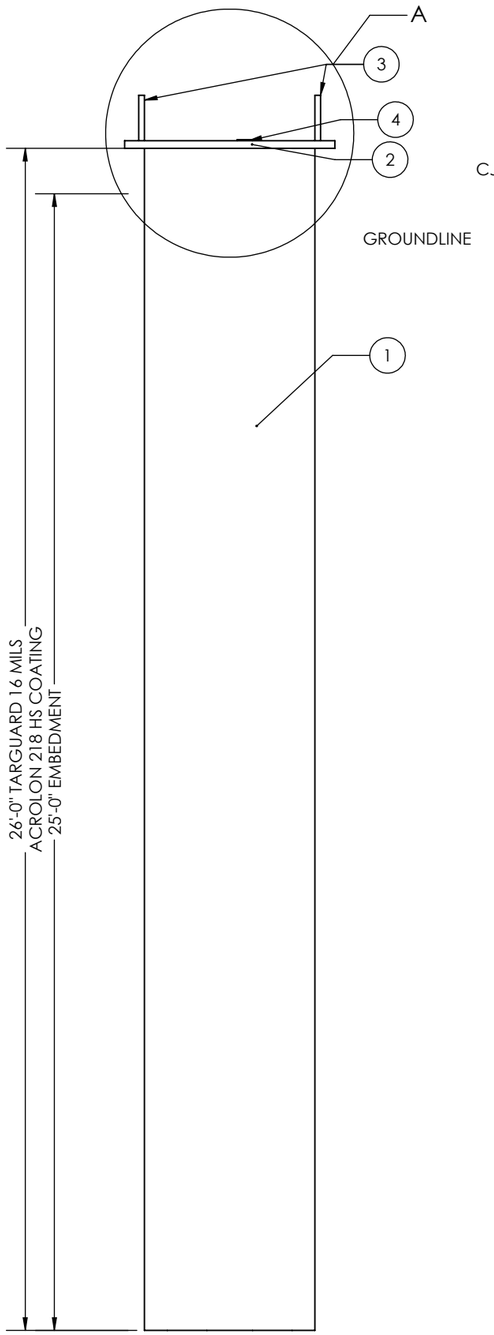
CAISSON WEIGHT: 4222 LBS
(INCLUDES 6% FOR GALVANIZING)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T2401	45" x 45" x 0.25" x 26'- 0"	A572 Gr.65	1
2	9338-2004	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	1

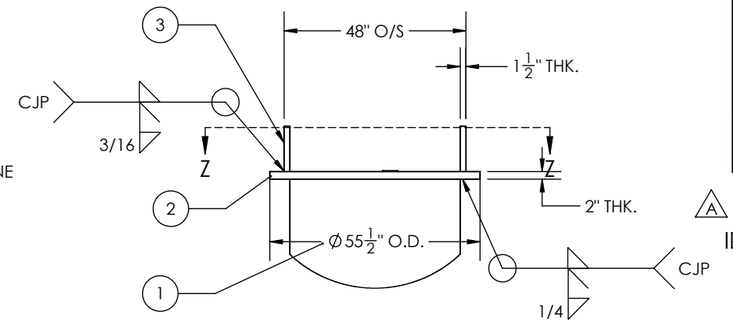
STR NO. 16
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 1693

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.

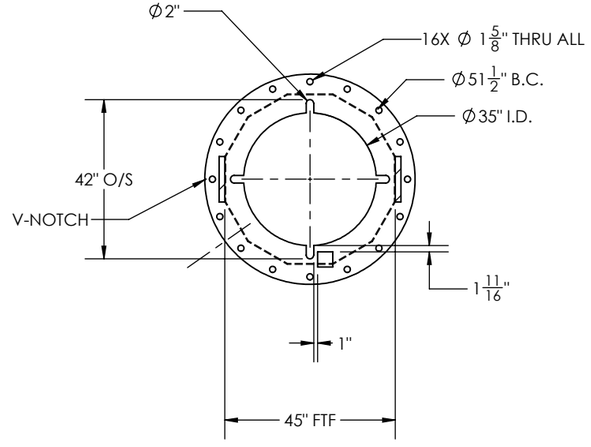


FRONT VIEW
(FLAT 6)

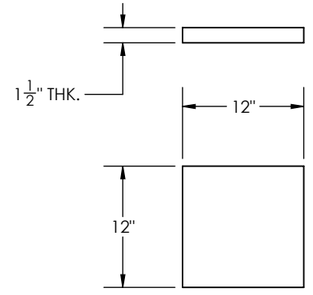


DETAIL A

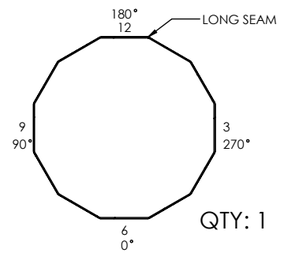
A IDENTIFICATION PLATE
3/8" LETTERS



SECTION Z-Z



A DRIVING EAR DETAIL



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.

700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

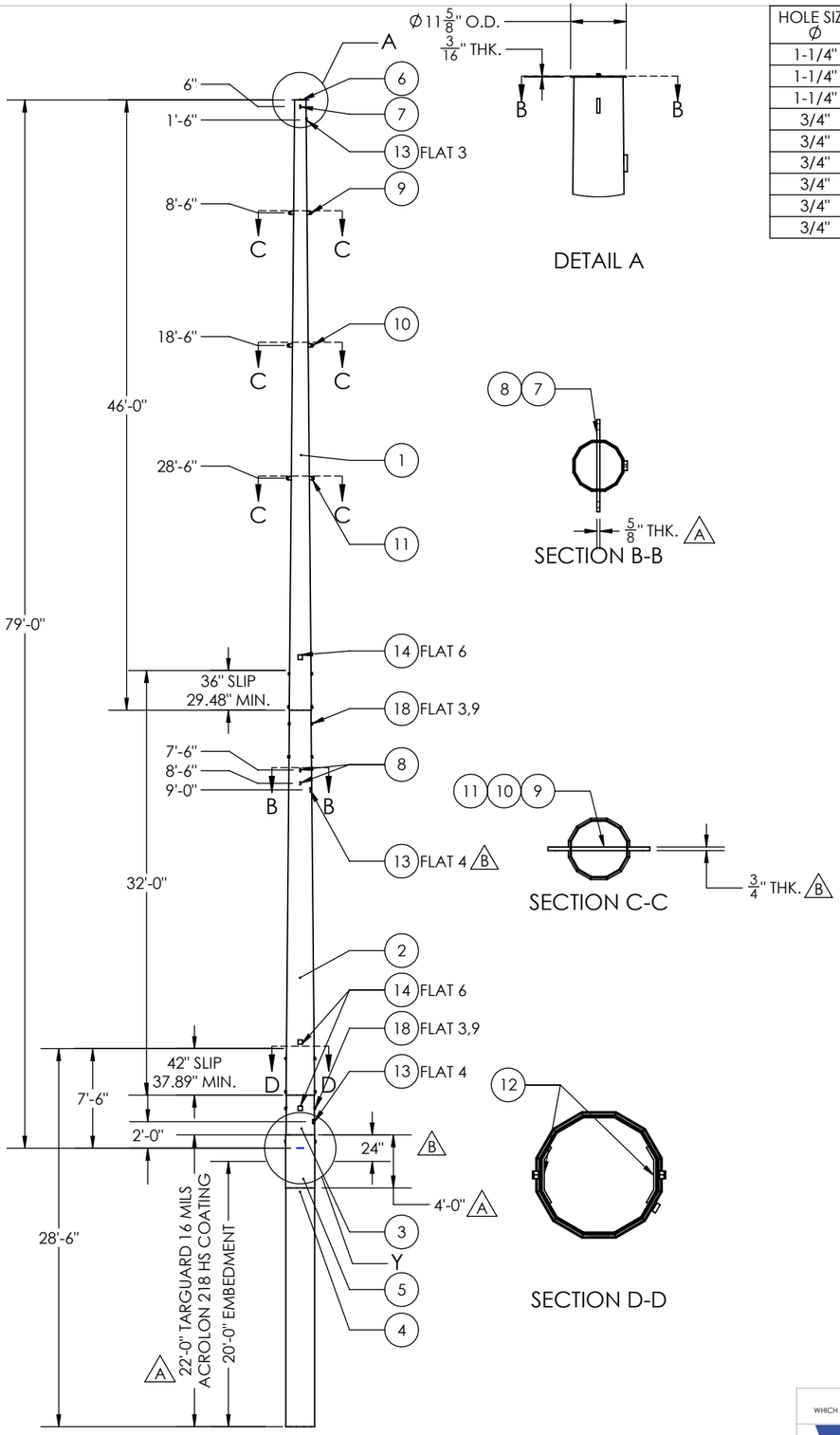
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 12 of 26 | REV. A

GREENVILLE SUGGS
75' POLE
STR NO. 16



HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1-1/4"	9'-4"	6,12	0°,180°
1-1/4"	19'-4"	6,12	0°,180°
1-1/4"	29'-4"	6,12	0°,180°
3/4"	37'-6"	6,12	0°,180°
3/4"	37'-11"	6,12	0°,180°
3/4"	41'-0"	6,12	0°,180°
3/4"	41'-5"	6,12	0°,180°
3/4"	44'-6"	6,12	0°,180°
3/4"	44'-11"	6,12	0°,180°

TOP SHAFT WEIGHT: 2061 LBS
BOT SHAFT WEIGHT: 2133 LBS
CAISSON WEIGHT: 2112 LBS
(INCLUDES 6% FOR GALVANIZING) B

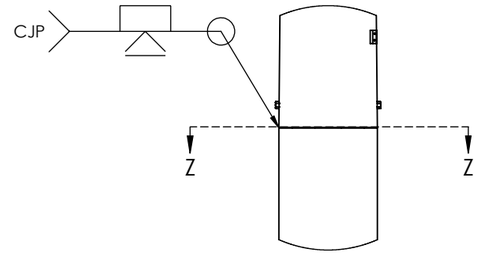
STR NO. 17
HEIGHT: 80'
STR TYPE: S-09.0
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 732

B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

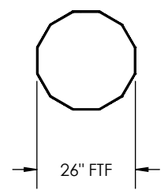
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T2501	20.15" x 10.25" x 0.25" x 46'- 0"	A572 Gr.65	1
2	9338-T2601	25.76" x 18.88" x 0.25" x 32'- 0"	A572 Gr.65	1
3	9338-T2701	26" x 24.39" x 0.25" x 7'- 6"	A572 Gr.65	1
4	9338-T2801	26" x 26" x 0.25" x 21'- 0"	A572 Gr.65	1
5	9338-T5001	26.375" x 26.375" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2203	TOP PLATE	A36	1
7	9338-3004	POLE VANG T1	A572 Gr.50	1
8	9338-3025	POLE VANG T1	A572 Gr.50	2
9	9338-3108	POLE VANG T2	A572 Gr.50	1
10	9338-3113	POLE VANG T2	A572 Gr.50	1
11	9338-3116	POLE VANG T2	A572 Gr.50	1
12	9338-3903	DRIVING EARS	A572 Gr.50	2
13	9338-1900	NEMA PAD	SS	3
14	9338-2301	IDENTIFICATION TAG	A36	3
15	-	TOP PLATE STRIP	A36	1
16	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
17	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
18	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16
19	9338-3142	POLE VANG T2	A572 Gr.50	1

APPLICABLE CODES
WELDING: AWS D1.1

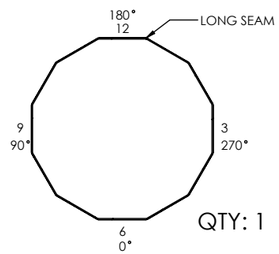
GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



DETAIL Y



SECTION Z-Z



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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SAGINAW, TEXAS 76179
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682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

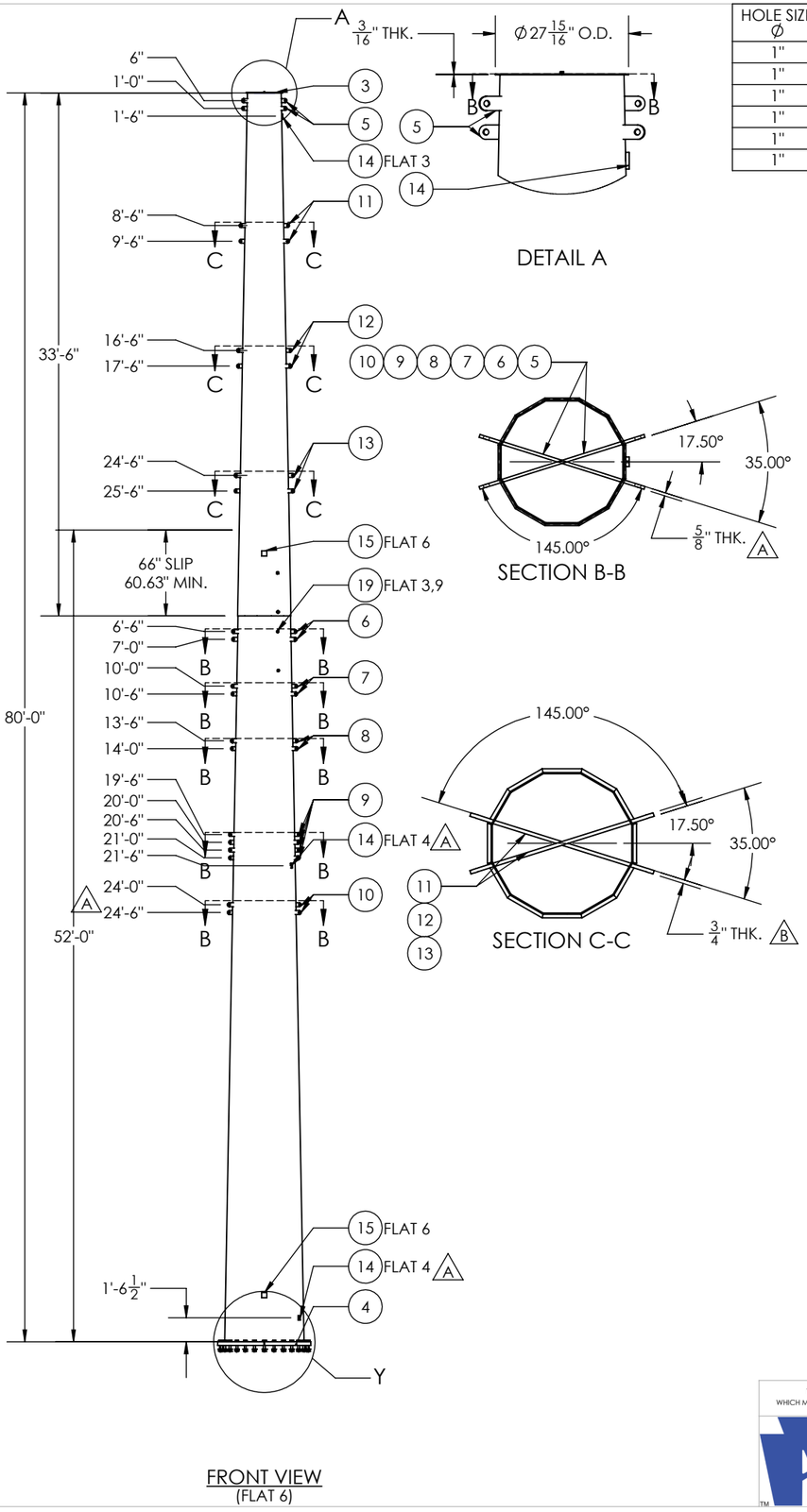
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 13 of 26 | REV. B

GREENVILLE SUGGS
80' S-09.0
STR NO. 17



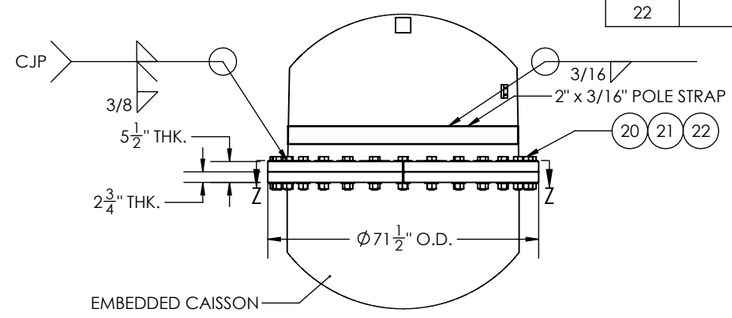
HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	10-0"	6,12	0°,180°
1"	11'-0"	6,12	0°,180°
1"	18'-0"	6,12	0°,180°
1"	19'-0"	6,12	0°,180°
1"	26'-0"	6,12	0°,180°
1"	27'-0"	6,12	0°,180°

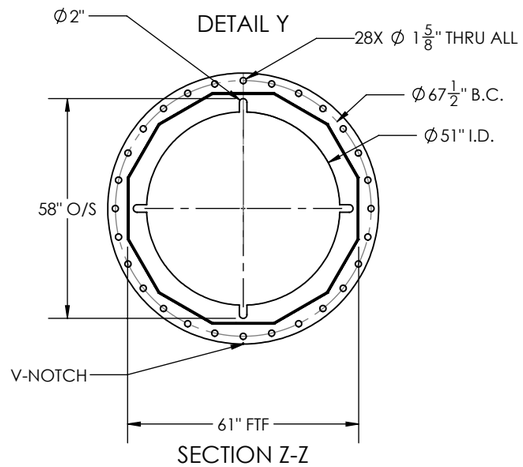
TOP SHAFT WEIGHT: 3486 LBS
BOT SHAFT WEIGHT: 13149 LBS
(INCLUDES 6% FOR GALVANIZING) B

STR NO. 18
HEIGHT: 80' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 5088

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

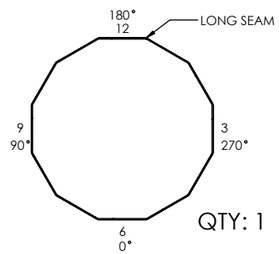
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T2901	40.92" x 26" x 0.25" x 33'- 6"	A572 Gr.65	1
2	9338-T3001	61" x 37.84" x 0.375" x 52'- 0"	A572 Gr.65	1
3	9338-2207	TOP PLATE	A36	1
4	9338-2005	BASE PLATE	A572 Gr.50	1
5	9338-3038	POLE VANG T1	A572 Gr.50	2
6	9338-3070	POLE VANG T1	A572 Gr.50	2
7	9338-3072	POLE VANG T1	A572 Gr.50	2
8	9338-3074	POLE VANG T1	A572 Gr.50	2
9	9338-3080	POLE VANG T1	A572 Gr.50	4
10	9338-3084	POLE VANG T1	A572 Gr.50	2
11	9338-3146	POLE VANG T2	A572 Gr.50	2
12	9338-3154	POLE VANG T2	A572 Gr.50	2
13	9338-3162	POLE VANG T2	A572 Gr.50	2
14	9338-1900	NEMA PAD	SS	3
15	9338-2301	IDENTIFICATION TAG	A36	3
16	-	TOP PLATE STRIP	A36	1
17	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
18	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
19	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	8
20	HHBOLT 1.5000-6x7.75x2.25-C	HEX BOLT, HEAVY	A325	28
21	Regular FW 1.5	FLAT WASHER	F436	56
22	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	28





APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 14 of 26 | REV. B

GREENVILLE SUGGS
80' POLE
STR NO. 18

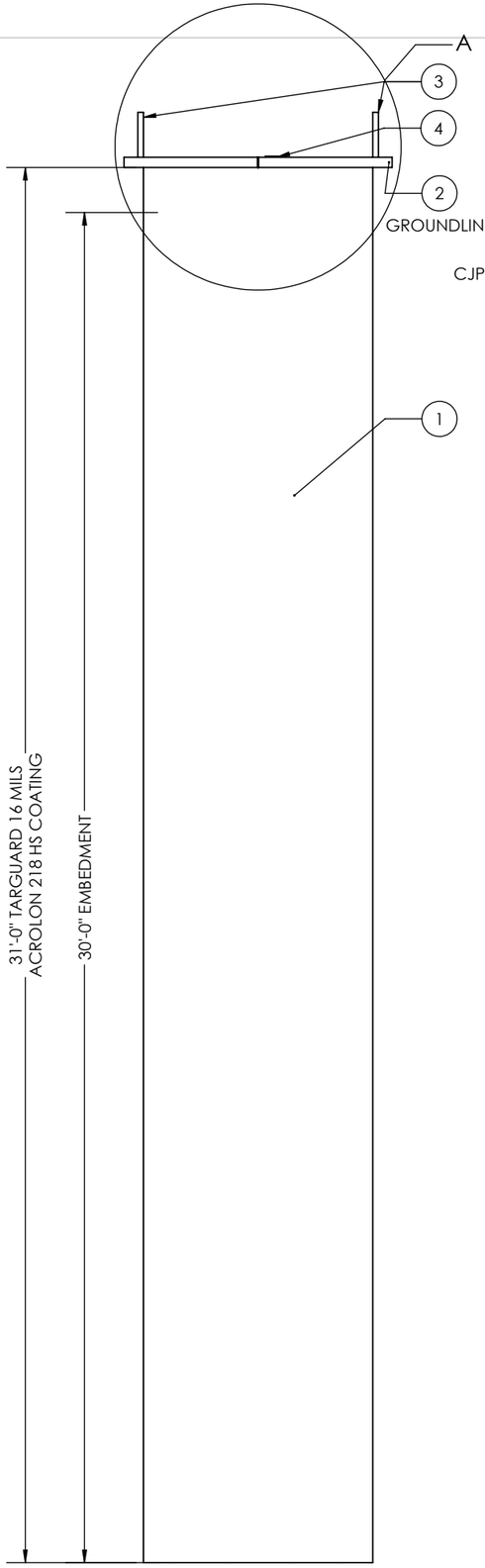
CAISSON WEIGHT: 9778 LBS
(INCLUDES 6% FOR GALVANIZING)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T3101	61.2" x 61.2" x 0.375" x 31'- 0"	A572 Gr.65	1
2	9338-2005	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	1

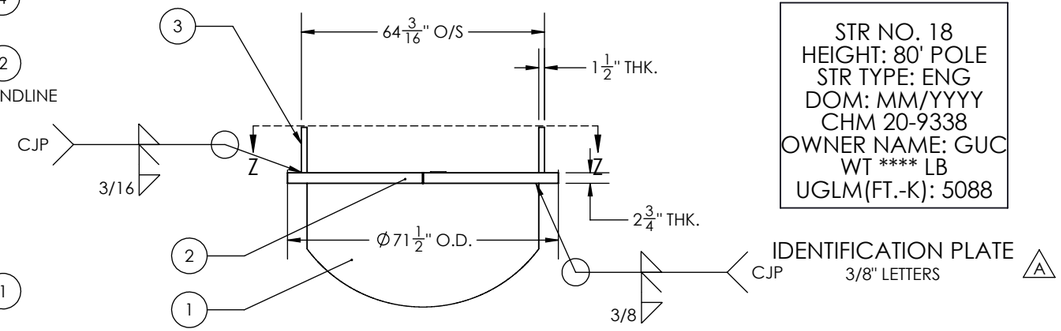
STR NO. 18
HEIGHT: 80' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 5088

APPLICABLE CODES
WELDING: AWS D1.1

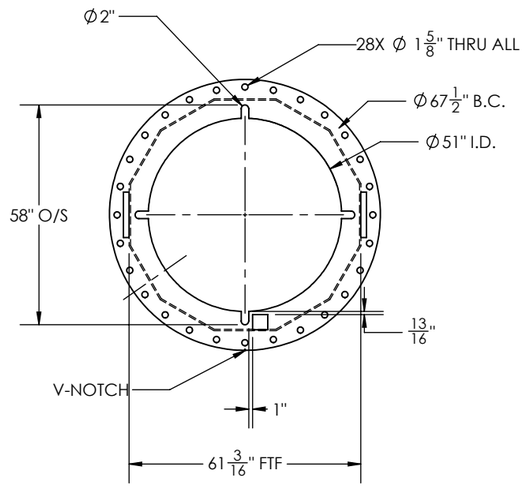
GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.



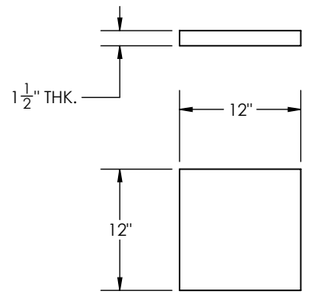
FRONT VIEW
(FLAT 6)



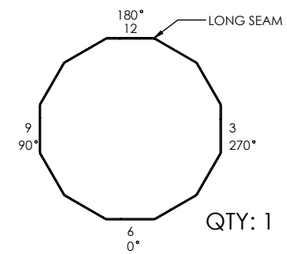
DETAIL A



SECTION Z-Z



A DRIVING EAR DETAIL



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

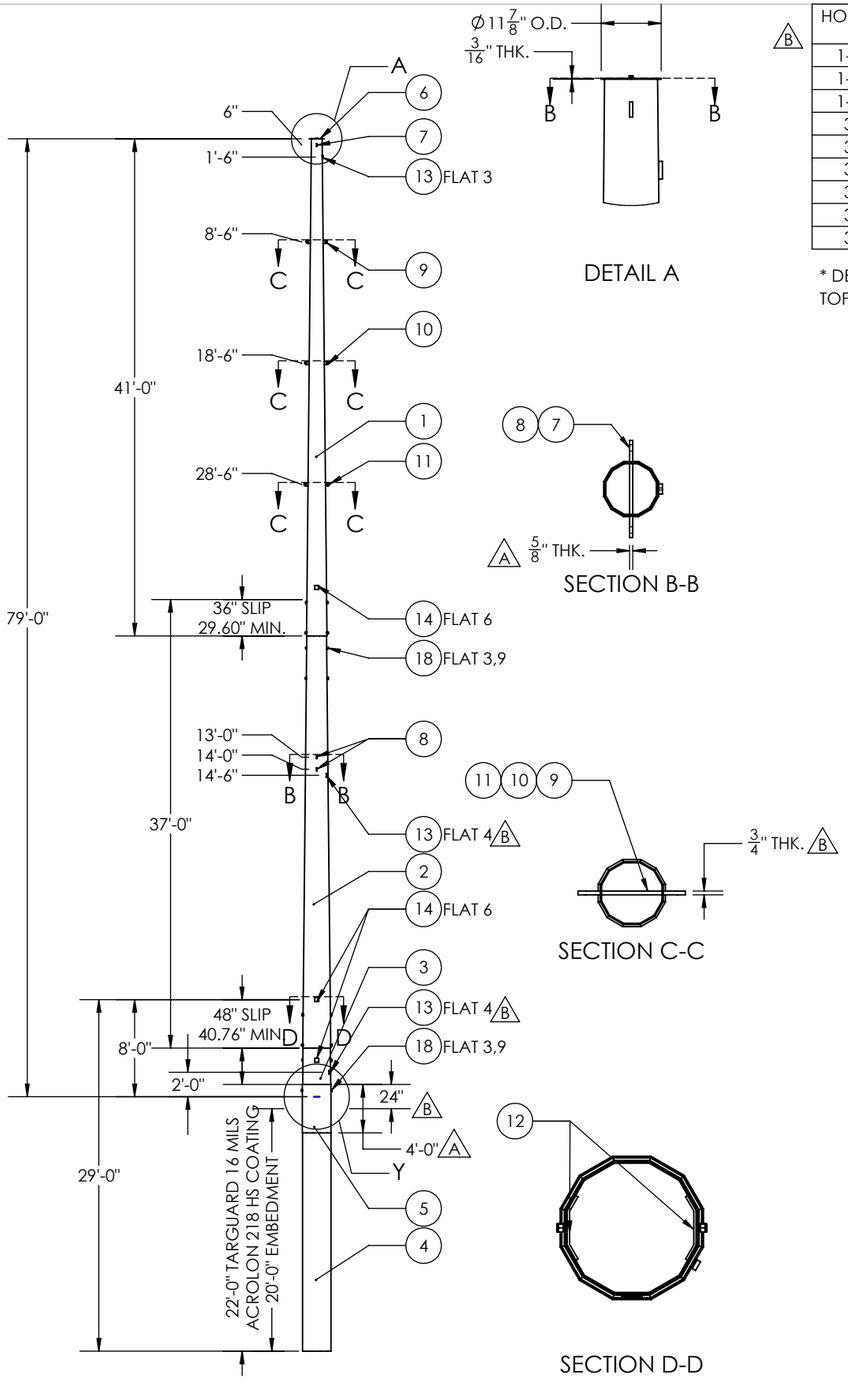
KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 15 of 26 | REV. A

GREENVILLE SUGGS
80' POLE
STR NO. 18



B HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1-1/4"	9'-4"	6,12	0°,180°
1-1/4"	19'-4"	6,12	0°,180°
1-1/4"	29'-4"	6,12	0°,180°
3/4"	* 38'-0"	6,12	0°,180°
3/4"	* 38'-5"	6,12	0°,180°
3/4"	41'-6" (3'-6")	6,12	0°,180°
3/4"	41'-11" (3'-11")	6,12	0°,180°
3/4"	45'-0" (7'-0")	6,12	0°,180°
3/4"	45'-5" (7'-5")	6,12	0°,180°

* DENOTES FIELD DRILL
TOP OF SHAFT DIMENSIONS IN PARENTHESIS

TOP SHAFT WEIGHT: 1864 LBS
BOT SHAFT WEIGHT: 2562 LBS
CAISSON WEIGHT: 2313 LBS
(INCLUDES 6% FOR GALVANIZING)

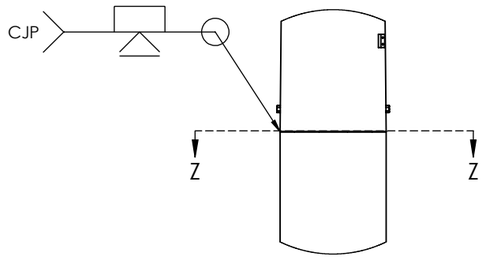
STR NO. 21,24
HEIGHT: 80'
STR TYPE: S-10.0
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 850

B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

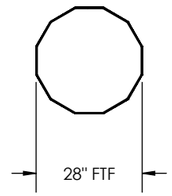
B ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T3201	20.23" x 10.5" x 0.25" x 41'- 0"	A572 Gr.65	1
2	9338-T3301	27.68" x 18.89" x 0.25" x 37'- 0"	A572 Gr.65	1
3	9338-T3401	28" x 26.1" x 0.25" x 8'- 0"	A572 Gr.65	1
4	9338-T3501	28" x 28" x 0.25" x 21'- 0"	A572 Gr.65	1
5	9338-T5101	28.375" x 28.375" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2208	TOP PLATE	A36	1
7	9338-3004	POLE VANG T1	A572 Gr.50	1
8	9338-3028	POLE VANG T1	A572 Gr.50	2
9	9338-3108	POLE VANG T2	A572 Gr.50	1
10	9338-3113	POLE VANG T2	A572 Gr.50	1
11	9338-3116	POLE VANG T2	A572 Gr.50	1
12	9338-3904	DRIVING EARS	A572 Gr.50	2
13	9338-1900	NEMA PAD	SS	3
14	9338-2301	IDENTIFICATION TAG	A36	3
15	-	TOP PLATE STRIP	A36	1
16	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
17	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
18	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16
19	9338-3142	POLE VANG T2	A572 Gr.50	1

APPLICABLE CODES
WELDING: AWS D1.1

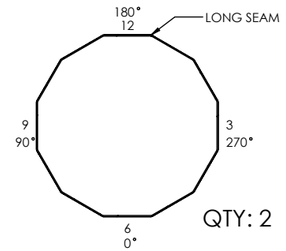
GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



DETAIL Y



SECTION Z-Z



QTY: 2

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
TM

700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

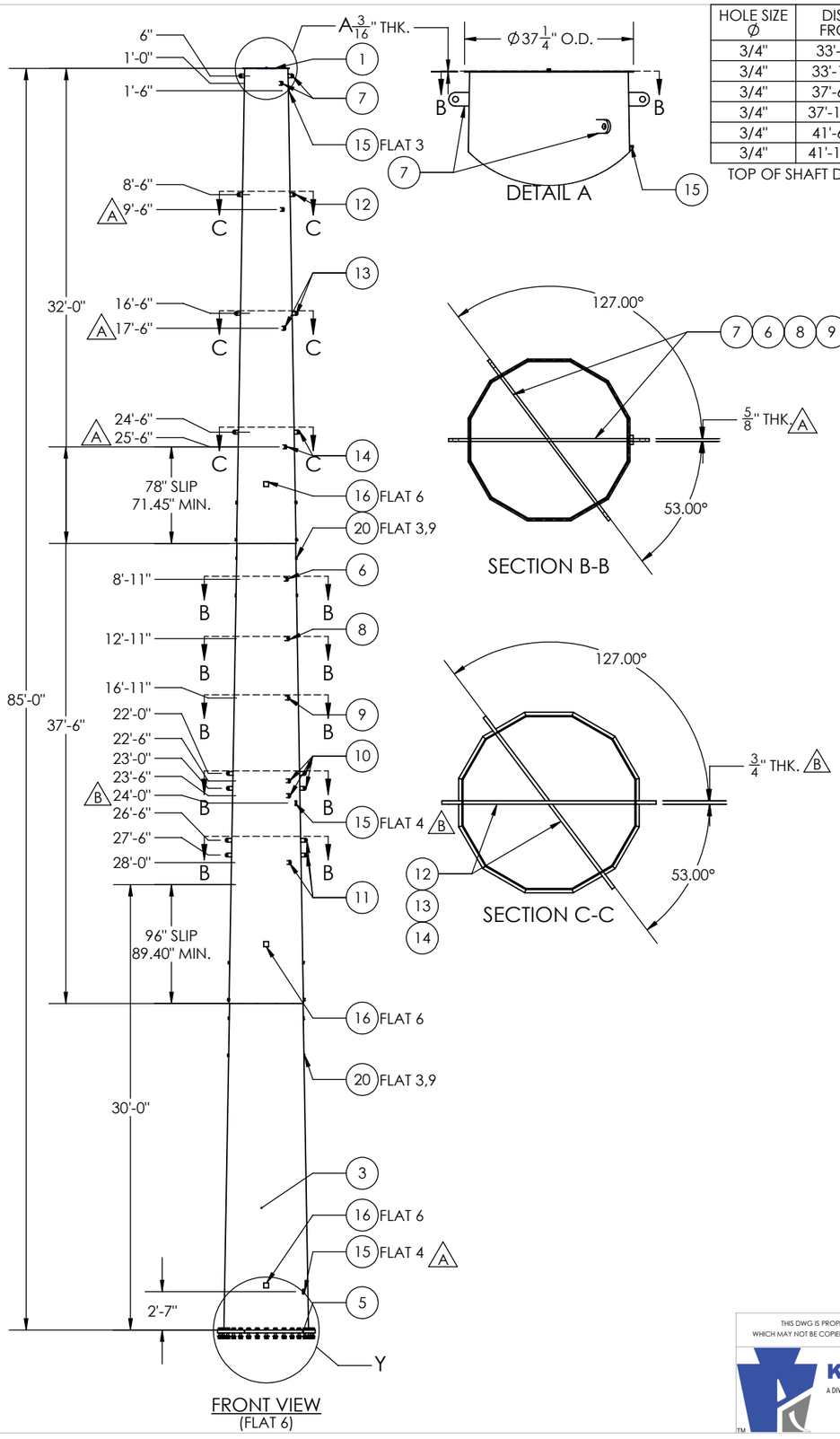
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 16 of 26 | REV. B

GREENVILLE SUGGS
80' S-10.0
STR NO. 21,24



HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
3/4"	33'-6" (9'-0")	6,12	0°,180°
3/4"	33'-11" (9'-5")	6,12	0°,180°
3/4"	37'-6" (13'-0")	6,12	0°,180°
3/4"	37'-11" (13'-5")	6,12	0°,180°
3/4"	41'-6" (17'-0")	6,12	0°,180°
3/4"	41'-11" (17'-5")	6,12	0°,180°

TOP OF SHAFT DIMENSIONS IN PARENTHESIS

TOP SHAFT WEIGHT: 4159 LBS
MID SHAFT WEIGHT: 7523 LBS
BOT SHAFT WEIGHT: 9725 LBS
(INCLUDES 6% FOR GALVANIZING)

B

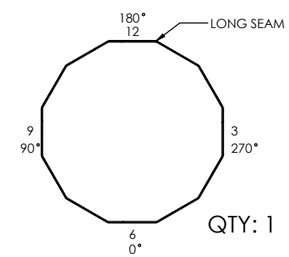
STR NO. 22
HEIGHT: 85' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 5805

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T3601	48.13" x 35" x 0.25" x 32'- 0"	A572 Gr.65	1
2	9338-T3701	60.22" x 44.84" x 0.3125" x 37'- 6"	A572 Gr.65	1
3	9338-T3801	68.5" x 56.19" x 0.375" x 30'- 0"	A572 Gr.65	1
4	9338-2209	TOP PLATE	A36	1
5	9338-2006	BASE PLATE	A572 Gr.50	1
6	9338-3082	POLE VANG T1	A572 Gr.50	1
7	9338-3054	POLE VANG T1	A572 Gr.50	2
8	9338-3088	POLE VANG T1	A572 Gr.50	1
9	9338-3090	POLE VANG T1	A572 Gr.50	1
10	9338-3094	POLE VANG T1	A572 Gr.50	4
11	9338-3098	POLE VANG T1	A572 Gr.50	3
12	9338-3160	POLE VANG T2	A572 Gr.50	2
13	9338-3168	POLE VANG T2	A572 Gr.50	2
14	9338-3174	POLE VANG T2	A572 Gr.50	2
15	9338-1900	NEMA PAD	SS	3
16	9338-2301	IDENTIFICATION TAG	A36	4
17	-	TOP PLATE STRIP	A36	1
18	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
19	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
20	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16
21	HHBOLT 1.5000-6x7.25x2.25-C	HEX BOLT, HEAVY	A325	32
22	Regular FW 1.5	FLAT WASHER	F436	64
23	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	32
26	9338-3142	POLE VANG T2	A572 Gr.50	4

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338
PART NO. -
DWG NO. 20-9338 MAIN SHEET: 17 of 26
REV. B

GREENVILLE SUGGS
85' POLE
STR NO. 22

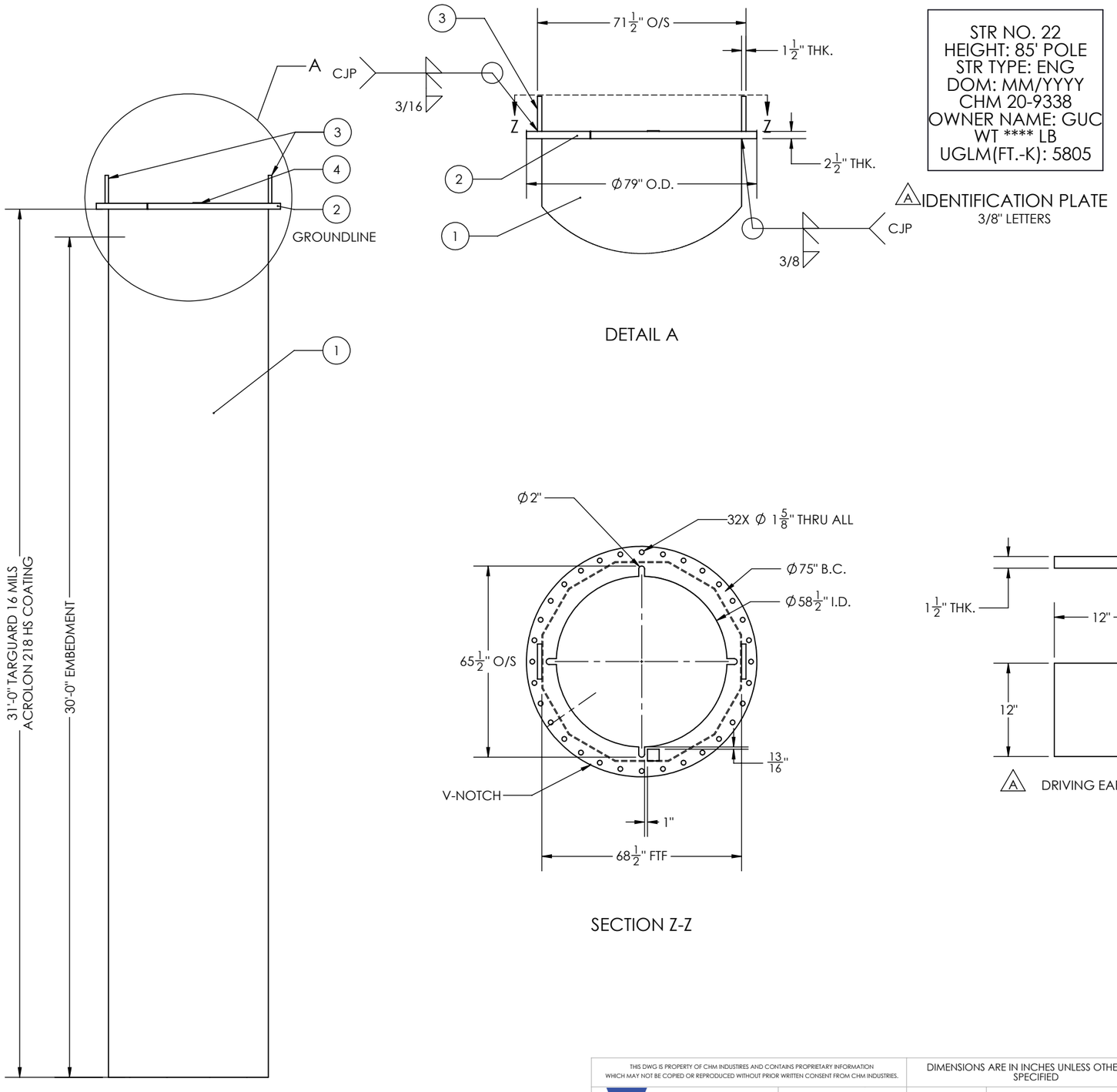
CAISSON WEIGHT: 10798 LBS
(INCLUDES 6% FOR GALVANIZING)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T3901	68.5" x 68.5" x 0.375" x 31'- 0"	A572 Gr.65	1
2	9338-2006	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	1

STR NO. 22
HEIGHT: 85' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 5805

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.

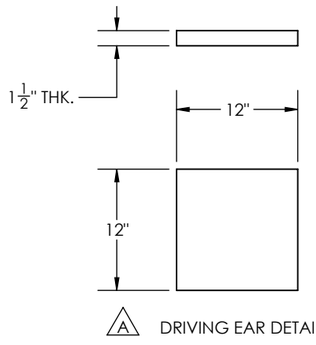


FRONT VIEW
(FLAT 6)

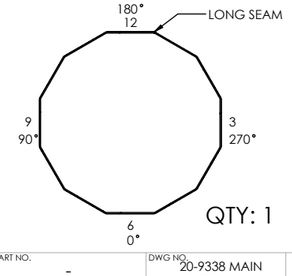
DETAIL A

A IDENTIFICATION PLATE
3/8" LETTERS

SECTION Z-Z



A DRIVING EAR DETAIL



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.

700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

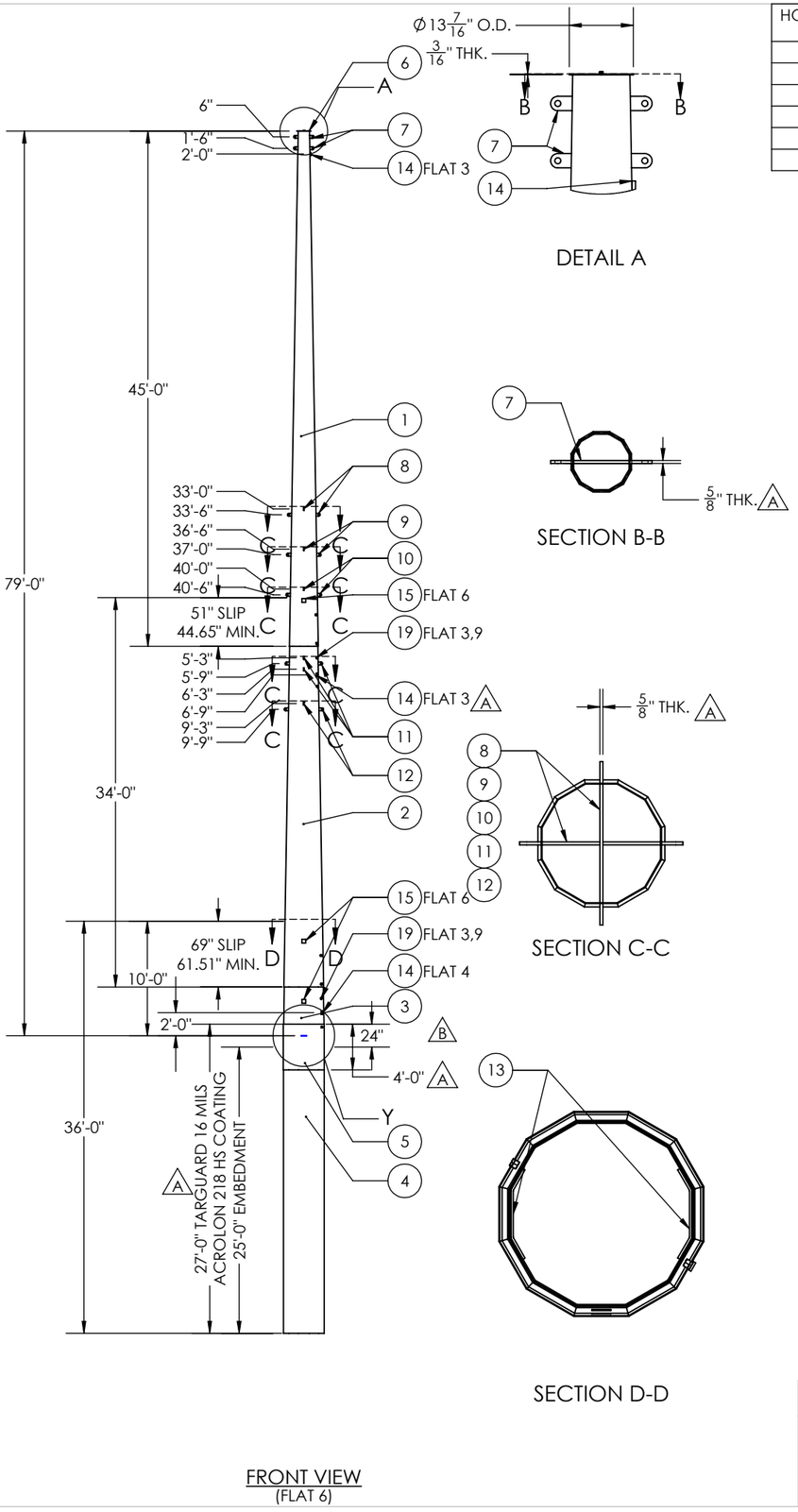
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS
B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO.	PART NO.	DWG NO.	REV.
20-9338	-	20-9338 MAIN SHEET: 18 of 26	A

GREENVILLE SUGGS
85' POLE
STR NO. 22



DETAIL A

SECTION B-B

SECTION C-C

SECTION D-D

FRONT VIEW
(FLAT 6)

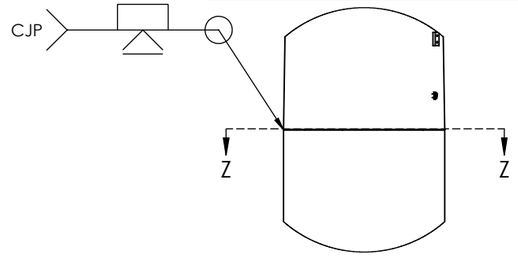
HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	8'-0"	3,9	90°,270°
1"	9'-0"	3,9	90°,270°
1"	16'-0"	3,9	90°,270°
1"	17'-0"	3,9	90°,270°
1"	24'-0"	3,9	90°,270°
1"	25'-0"	3,9	90°,270°

TOP SHAFT WEIGHT: 2223 LBS
BOT SHAFT WEIGHT: 4455 LBS
CAISSON WEIGHT: 5446 LBS
(INCLUDES 6% FOR GALVANIZING) B

STR NO. 23
HEIGHT: 80' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 2323

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

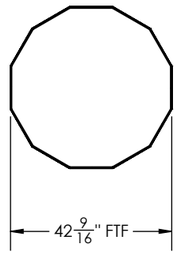
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T4001	30.14" x 12" x 0.1875" x 45'- 0"	A572 Gr.65	1
2	9338-T4101	41.64" x 27.93" x 0.3125" x 34'- 0"	A572 Gr.65	1
3	9338-T4201	42.6" x 38.57" x 0.3125" x 10'- 0"	A572 Gr.65	1
4	9338-T4301	42.6" x 42.6" x 0.3125" x 26'- 0"	A572 Gr.65	1
5	9338-T5201	42.975" x 42.975" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2210	TOP PLATE	A36	1
7	9338-3008	POLE VANG T1	A572 Gr.50	2
8	9338-3034	POLE VANG T1	A572 Gr.50	2
9	9338-3038	POLE VANG T1	A572 Gr.50	2
10	9338-3040	POLE VANG T1	A572 Gr.50	2
11	9338-3044	POLE VANG T1	A572 Gr.50	3
12	9338-3048	POLE VANG T1	A572 Gr.50	2
13	9338-3905	DRIVING EARS	A572 Gr.50	2
14	9338-1900	NEMA PAD	SS	3
15	9338-2301	IDENTIFICATION TAG	A36	3
16	-	TOP PLATE STRIP	A36	1
17	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
18	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
19	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16
20	9338-3142	POLE VANG T2	A572 Gr.50	2



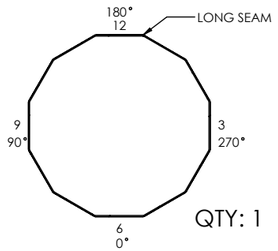
DETAIL Y

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



SECTION Z-Z



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

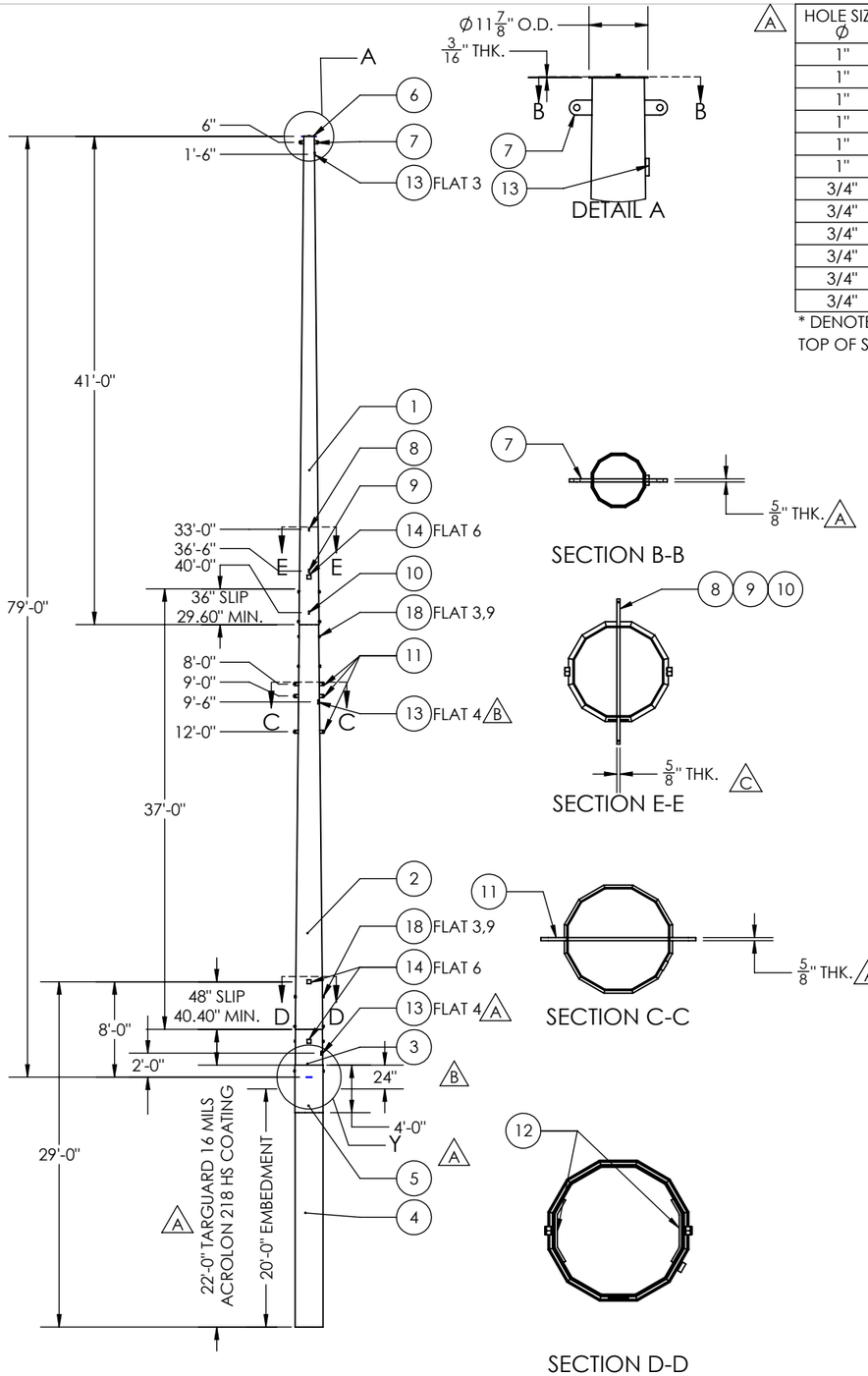
	BY	DATE
CREATED	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 19 of 26 | REV. B

GREENVILLE SUGGS
80' POLE
STR NO. 23

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM



FRONT VIEW
(FLAT 6)

A HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	8'-0"	3,9	90°,270°
1"	9'-0"	3,9	90°,270°
1"	16'-0"	3,9	90°,270°
1"	17'-0"	3,9	90°,270°
1"	24'-0"	3,9	90°,270°
1"	25'-0"	3,9	90°,270°
3/4"	33'-0"	3,9	90°,270°
3/4"	33'-5"	3,9	90°,270°
3/4"	36'-6"	3,9	90°,270°
3/4"	36'-11"	3,9	90°,270°
3/4"	* 40'-0" (2'-0")	3,9	90°,270°
3/4"	* 40'-5" (2'-5")	3,9	90°,270°

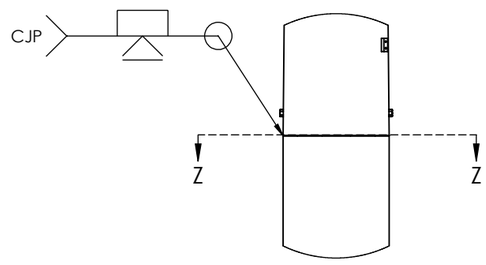
* DENOTES FIELD DRILL
TOP OF SHAFT DIMENSIONS IN PARENTHESIS

TOP SHAFT WEIGHT: 1820 LBS
BOT SHAFT WEIGHT: 2582 LBS
CAISSON WEIGHT: 2313 LBS
(INCLUDES 6% FOR GALVANIZING)

STR NO. 25
HEIGHT: 80'
STR TYPE: S-10.0
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 850

B IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

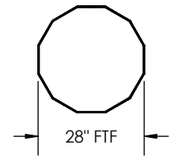
B ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T3202	20.23" x 10.5" x 0.25" x 41'- 0"	A572 Gr.65	1
2	9338-T3302	27.68" x 18.89" x 0.25" x 37'- 0"	A572 Gr.65	1
3	9338-T3401	28" x 26.1" x 0.25" x 8'- 0"	A572 Gr.65	1
4	9338-T3501	28" x 28" x 0.25" x 21'- 0"	A572 Gr.65	1
5	9338-T5101	28.375" x 28.375" x 0.1875" x 4'- 0"	A572 Gr.65	1
6	9338-2208	TOP PLATE	A36	1
7	9338-3005	POLE VANG T1	A572 Gr.50	1
8	9338-3021	POLE VANG T1	A572 Gr.50	1
9	9338-3022	POLE VANG T1	A572 Gr.50	1
10	9338-3024	POLE VANG T1	A572 Gr.50	1
11	9338-3028	POLE VANG T1	A572 Gr.50	3
12	9338-3904	DRIVING EARS	A572 Gr.50	2
13	9338-1900	NEMA PAD	SS	3
14	9338-2301	IDENTIFICATION TAG	A36	3
15	-	TOP PLATE STRIP	A36	1
16	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
17	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
18	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	16



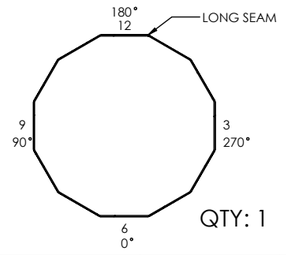
DETAIL Y

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



SECTION Z-Z



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

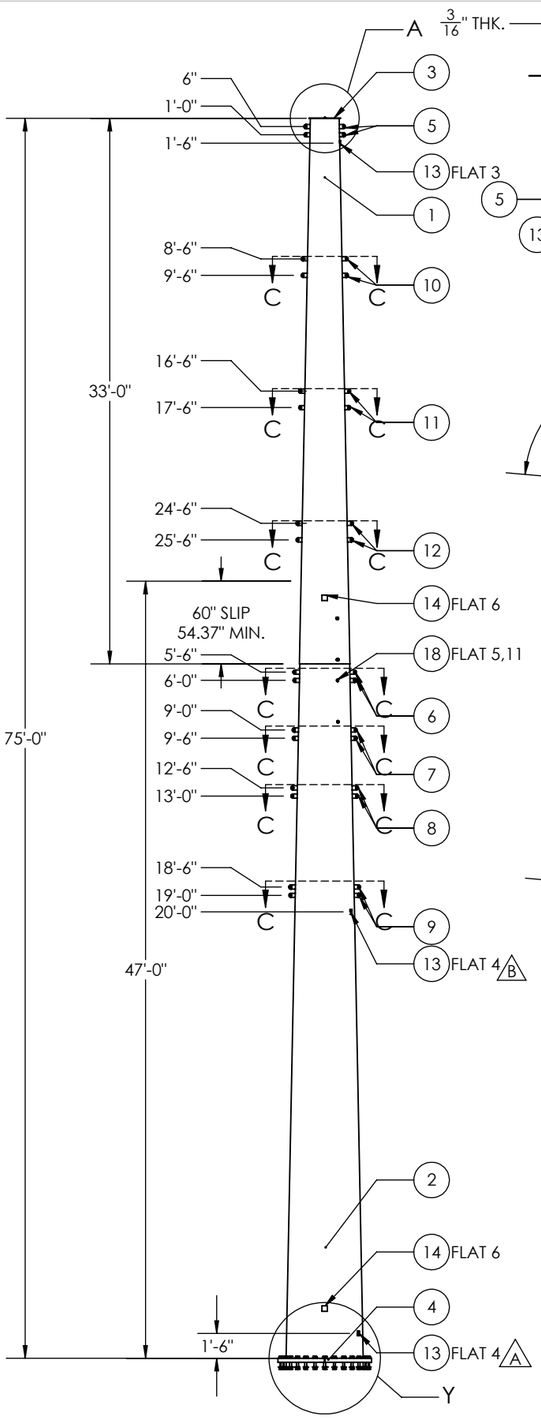
SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV.:	CAD	09/18/2020

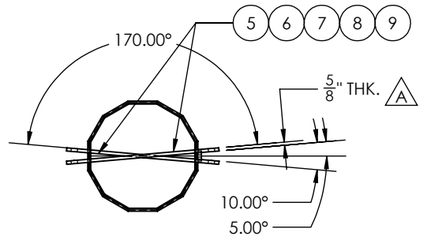
THIRD ANGLE PROJECTION

JOB NO. 20-9338
PART NO. -
DWG NO. 20-9338 MAIN SHEET: 20 of 26
REV. B

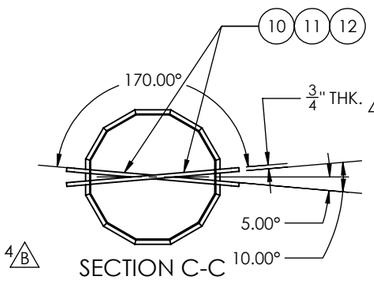
GREENVILLE SUGGS
80' S-10.0
STR NO. 25



DETAIL A



SECTION B-B



SECTION C-C

FRONT VIEW
(FLAT 6)

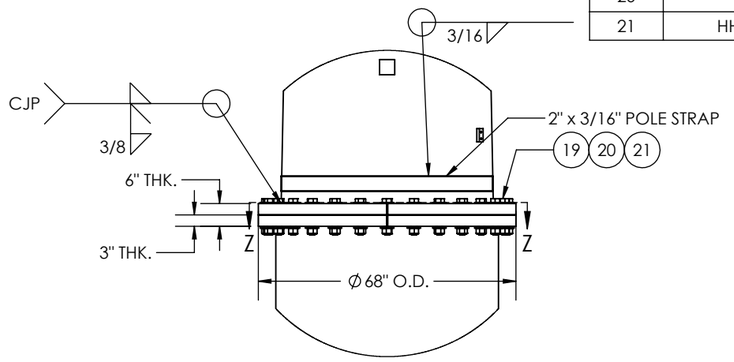
HOLE SIZE Ø	DISTANCE FROM TOP	FLAT	ANGLE
1"	10'-0"	6,12	0°,180°
1"	11'-0"	6,12	0°,180°
1"	18'-0"	6,12	0°,180°
1"	19'-0"	6,12	0°,180°
1"	26'-0"	6,12	0°,180°
1"	27'-0"	6,12	0°,180°

TOP SHAFT WEIGHT: 2269 LBS
BOT SHAFT WEIGHT: 11099 LBS
(INCLUDES 6% FOR GALVANIZING) B

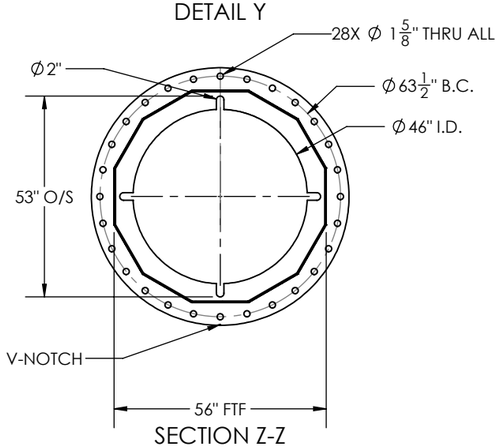
STR NO. 30
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 4557

A IDENTIFICATION PLATE
3/8" LETTERS
5' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T4401	36.62" x 21" x 0.1875" x 33'- 0"	A572 Gr.65	1
2	9338-T4501	56" x 33.75" x 0.375" x 47'- 0"	A572 Gr.65	1
3	9338-2211	TOP PLATE	A36	1
4	9338-2007	BASE PLATE	A572 Gr.50	1
5	9338-3026	POLE VANG T1	A572 Gr.50	2
6	9338-3058	POLE VANG T1	A572 Gr.50	2
7	9338-3060	POLE VANG T1	A572 Gr.50	2
8	9338-3064	POLE VANG T1	A572 Gr.50	2
9	9338-3070	POLE VANG T1	A572 Gr.50	2
10	9338-3134	POLE VANG T2	A572 Gr.50	2
11	9338-3141	POLE VANG T2	A572 Gr.50	2
12	9338-3149	POLE VANG T2	A572 Gr.50	2
13	9338-1900	NEMA PAD	SS	3
14	9338-2301	IDENTIFICATION TAG	A36	3
15	-	TOP PLATE STRIP	A36	1
16	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
17	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1
18	HHNUT 1.0000-8-D-N	1" JACKING NUT	A563	8
19	HHBOLT 1.5000-6x8.5x2.25-C	HEX BOLT, HEAVY	A325	28
20	Regular FW 1.5	FLAT WASHER	F436	56
21	HHNUT 1.5000-6-B-N	ANCO LOCK NUT	A563	28



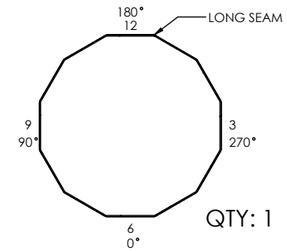
DETAIL Y



SECTION Z-Z

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 21 of 26 | REV. B

GREENVILLE SUGGS
75' POLE
STR NO. 30

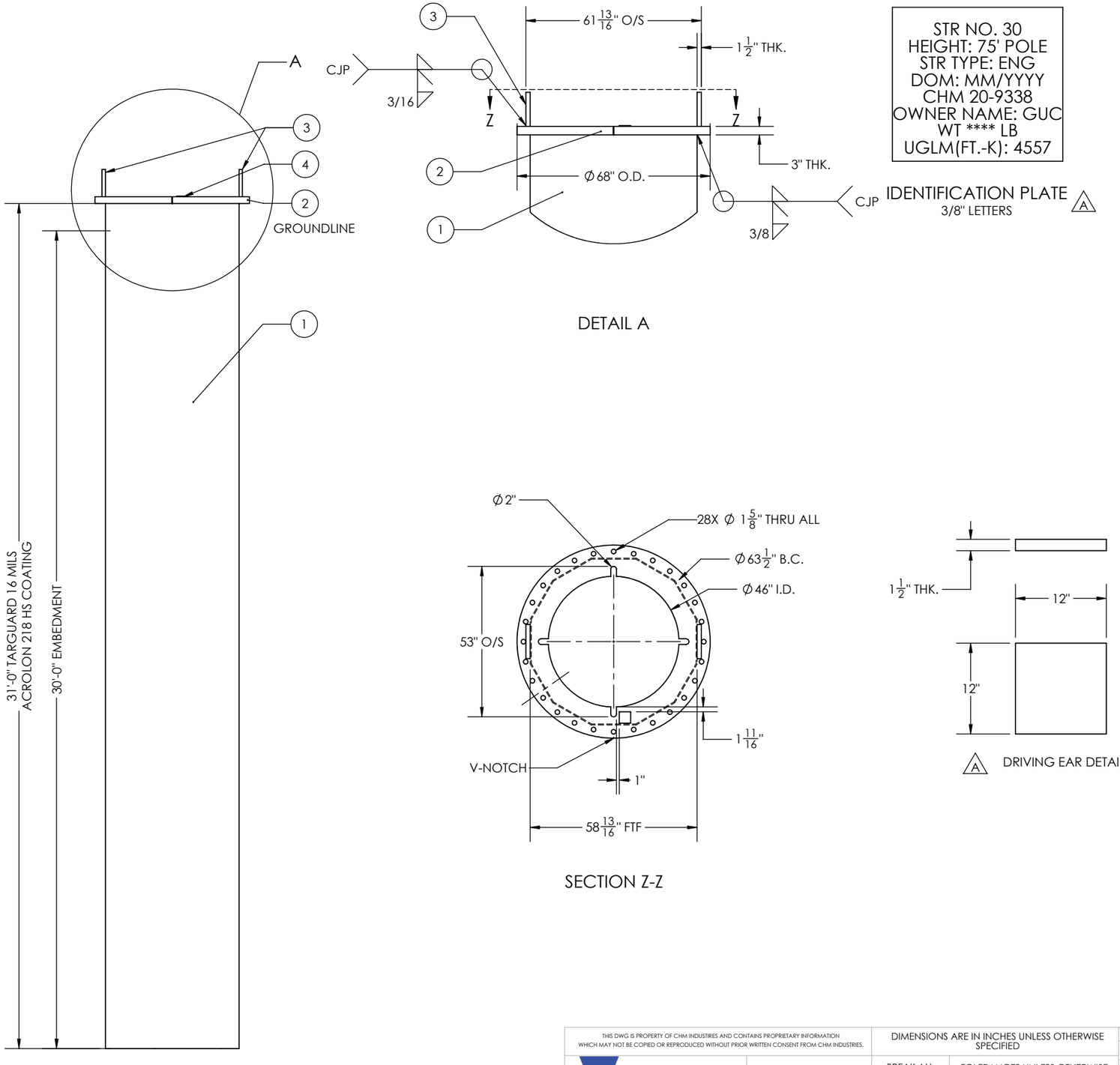
CAISSON WEIGHT: 9595 LBS
(INCLUDES 6% FOR GALVANIZING)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T5301	58.8" x 58.8" x 0.375" x 31'- 0"	A572 Gr.65	1
2	9338-2007	BASE PLATE	A572 Gr.50	1
3	9338-3600	DRIVING EAR	A572 Gr.50	2
4	9338-2301	IDENTIFICATION TAG	A36	3

APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 12 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.
4. BOLT HOLES ON BASEPLATE SHALL NOT HAVE TARGUARD OR ACROLON COATING IN THE HOLES.

STR NO. 30
HEIGHT: 75' POLE
STR TYPE: ENG
DOM: MM/YYYY
CHM 20-9338
OWNER NAME: GUC
WT **** LB
UGLM(FT.-K): 4557

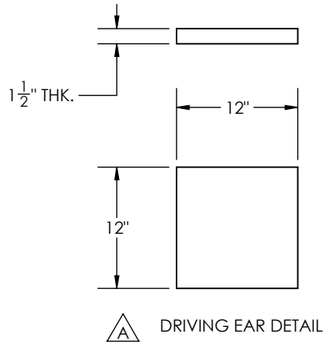


DETAIL A

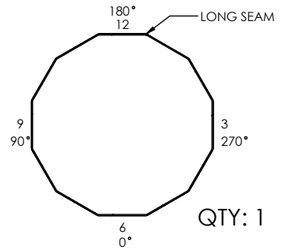
IDENTIFICATION PLATE (A)
3/8" LETTERS

FRONT VIEW
(FLAT 6)

SECTION Z-Z



(A) DRIVING EAR DETAIL



QTY: 1

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

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682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015, REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL:
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

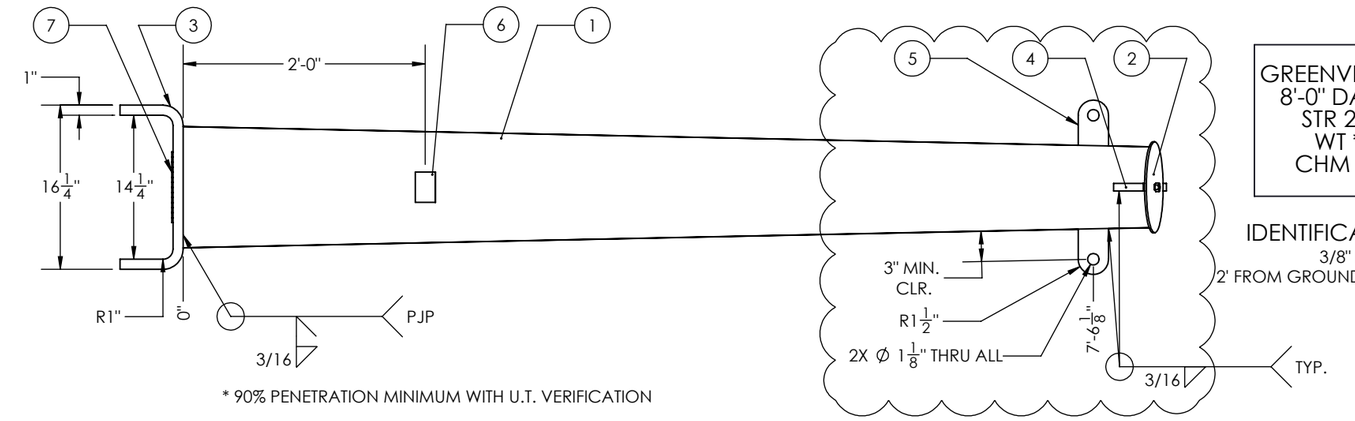
	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. - | DWG NO. 20-9338 MAIN SHEET: 22 of 26 | REV. B

GREENVILLE SUGGS
75' POLE
STR NO. 30

SHAFT WEIGHT: 299 LBS
(INCLUDES 6% FOR GALVANIZING)



* 90% PENETRATION MINIMUM WITH U.T. VERIFICATION

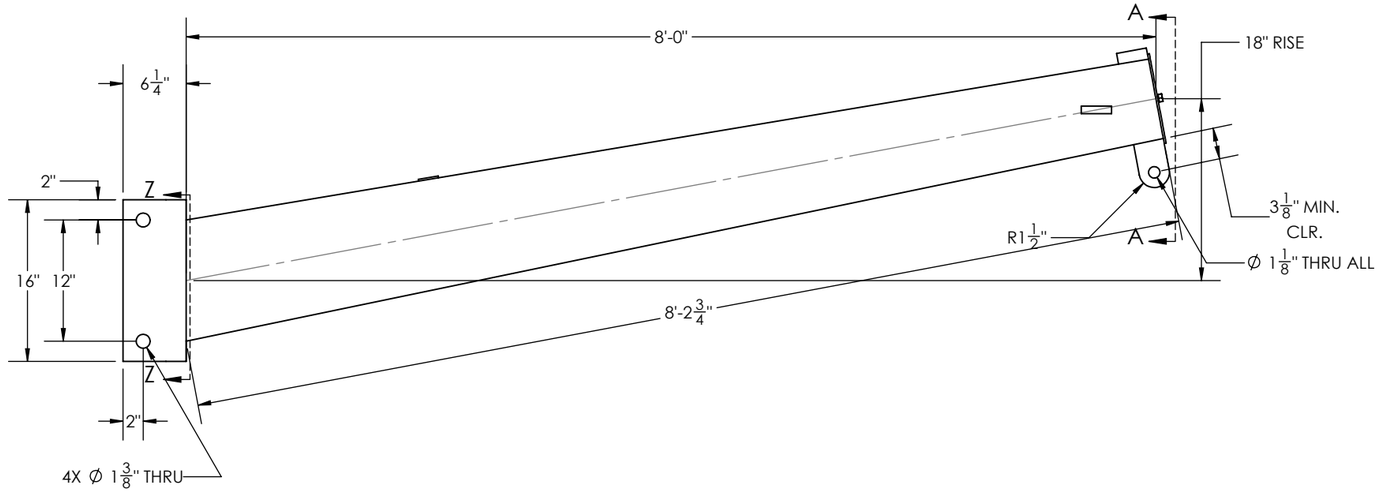
GREENVILLE SUGGS
8'-0" DAVIT ARM
STR 2,4 ARM
WT **** LB
CHM 20-9338

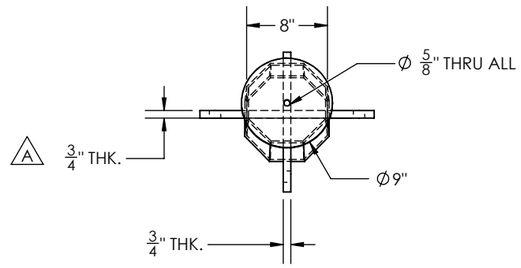
IDENTIFICATION PLATE
3/8" LETTERS
2' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T9001	12" x 8" x 0.1875" x 8'-2 3/4"	A572 Gr.65	1
2	9338-4200	ARM END CAP	A36	1
3	9338-4100	ARM CONNECTION BRACKET	A572 Gr.50	1
4	9338-4309	ARM VANG T1	A572 Gr.50	1
5	9338-4310	ARM VANG T2	A572 Gr.50	1
6	9338-2301	IDENTIFICATION PLATE	A36	1
7	9338-3601	EXPANDED METAL	A36	1
8	-	TOP PLATE STRIP	A36	1
9	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
10	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1

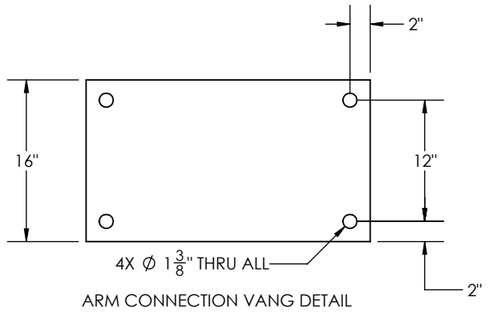
APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 8 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.

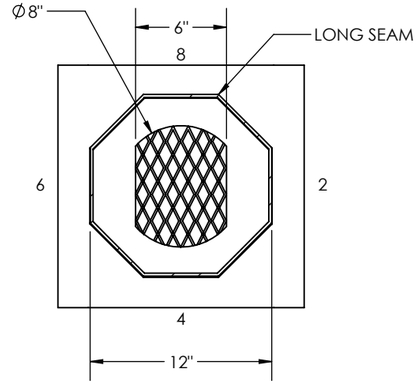




SECTION A-A



ARM CONNECTION VANG DETAIL



SECTION Z-Z

QTY: 12

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

SPECIFICATIONS
MATERIAL: -
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. 9338-4900 | DWG NO. 20-9338 MAIN SHEET: 23 of 26 | REV. A

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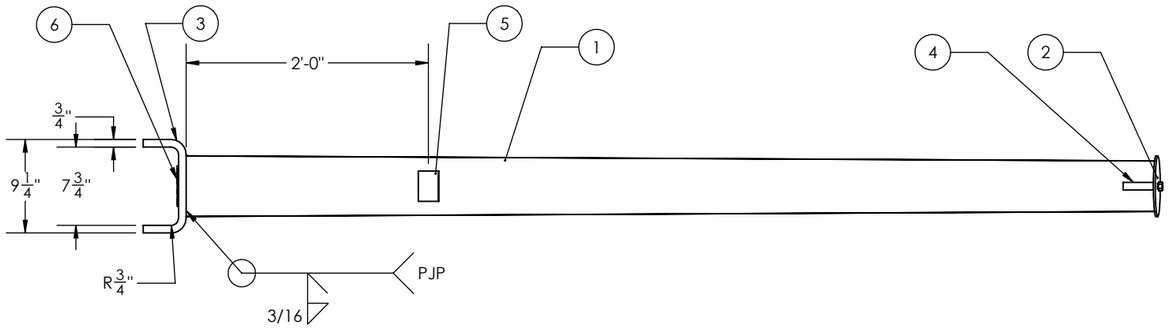
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

GREENVILLE SUGGS
8'-0" DAVIT ARM
STR 2,4 ARM



* 90% PENETRATION MINIMUM WITH U.T. VERIFICATION

SHAFT WEIGHT: 121 LBS
(INCLUDES 6% FOR GALVANIZING)

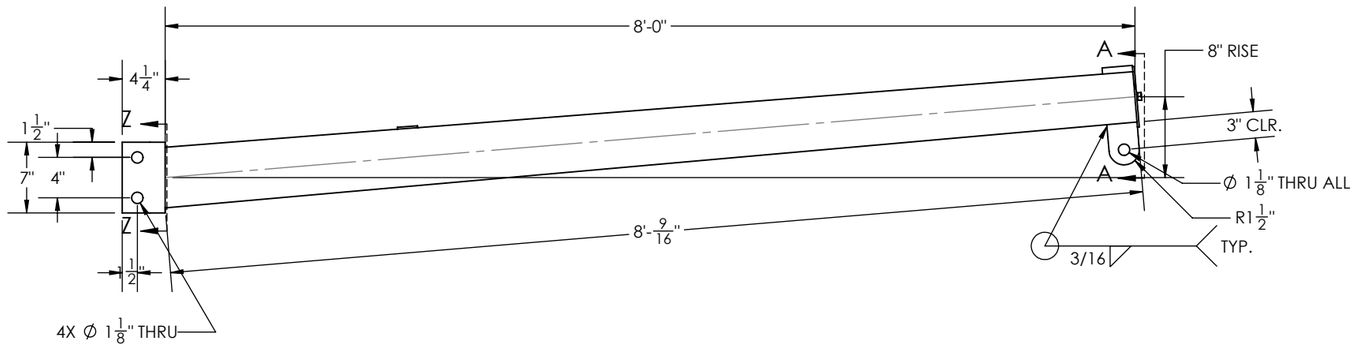
GREENVILLE SUGGS
8'-0" DAVIT ARM
STR 3 ARM
WT **** LB
CHM 20-9338

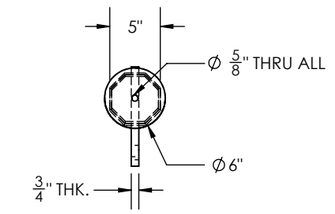
IDENTIFICATION PLATE
3/8" LETTERS
2' FROM GROUND OR SHAFT BOTTOM

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-T9002	6" x 5" x 0.1875" x 8'-9/16"	A572 Gr.65	1
2	9338-4201	ARM END CAP	A36	1
3	9338-4101	ARM CONNECTION BRACKET	A572 Gr.50	1
4	9338-4301	ARM VANG T1	A572 Gr.50	1
5	9338-2301	IDENTIFICATION PLATE	A36	1
6	9338-3601	EXPANDED METAL	A36	1
7	-	TOP PLATE STRIP	A36	1
8	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
9	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1

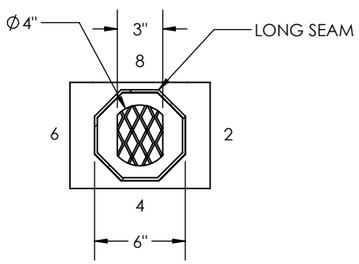
APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 8 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.

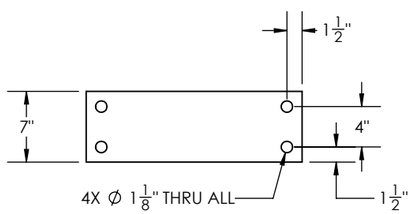




SECTION A-A



SECTION Z-Z



ARM CONNECTION VANG DETAIL

QTY: 6

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682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL: -
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV	CAD	09/15/2020

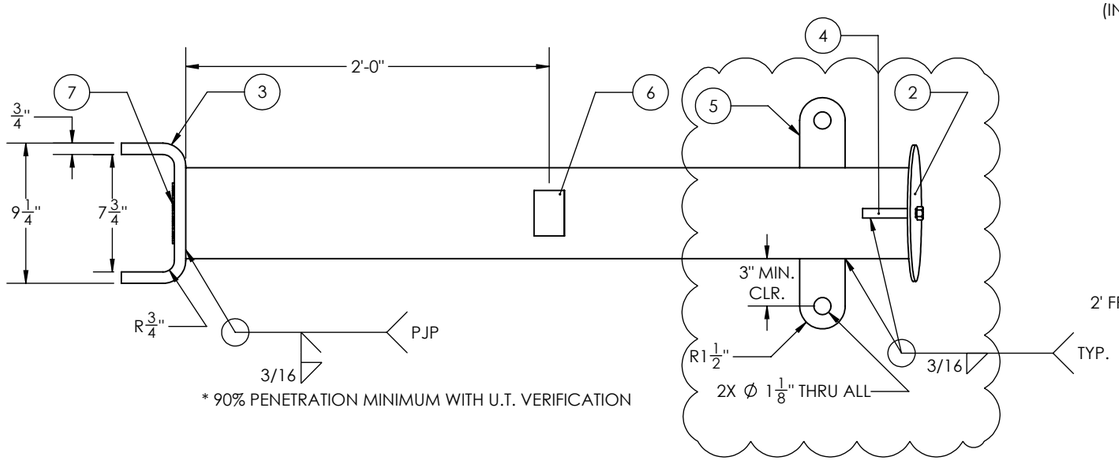
THIRD ANGLE PROJECTION

JOB NO. 20-9338 | PART NO. 9338-4901 | DWG NO. 20-9338 MAIN SHEET: 24 of 26 | REV.

GREENVILLE SUGGS
8'-0" DAVIT ARM
STR 3 ARM

SHAFT WEIGHT: 90 LBS
(INCLUDES 6% FOR GALVANIZING)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	9338-4000	6" x 6" x 0.1875" x 4'- 0"	A500 Gr.C	1
2	9338-4200	ARM END CAP	A36	1
3	9338-4102	ARM CONNECTION BRACKET	A572 Gr.50	1
4	9338-4305	ARM VANG T1	A572 Gr.50	1
5	9338-4311	ARM VANG T2	A572 Gr.50	1
6	9338-2301	IDENTIFICATION PLATE	A36	1
7	9338-3601	EXPANDED METAL	A36	1
8	-	TOP PLATE STRIP	A36	1
9	HBOLT 0.5000-13x1.5x1.25-N	TOP PLATE, HEX BOLT	SS	1
10	HNUT 0.5000-13-D-N	TOP PLATE, HEX NUT	A563	1



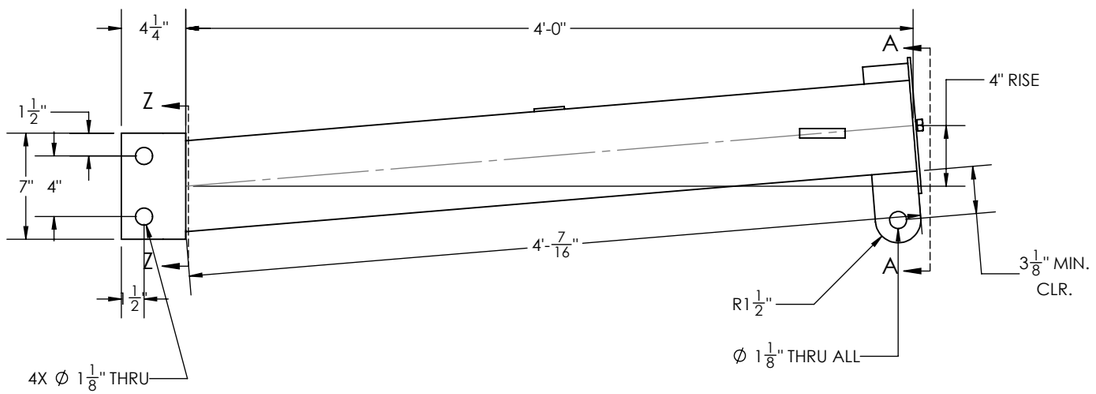
* 90% PENETRATION MINIMUM WITH U.T. VERIFICATION

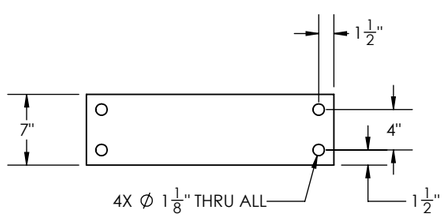
GREENVILLE SUGGS
4'-0" OHGW ARM
STR 2,3,4 ARM
WT **** LB
CHM 20-9338

IDENTIFICATION PLATE
3/8" LETTERS
2' FROM GROUND OR SHAFT BOTTOM

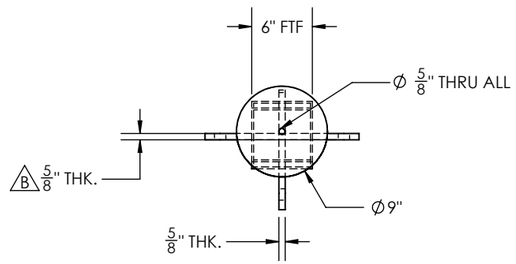
APPLICABLE CODES
WELDING: AWS D1.1

GENERAL NOTES:
1. SHAFT DIMENSIONS ARE 4 SIDED MEASURED FLAT TO FLAT.
2. FINISH HOT DIP GALVANIZED.
3. ALL FULL PENETRATION WELDS TO BE UT INSPECTED.

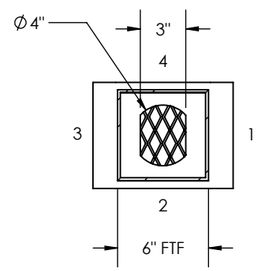




ARM CONNECTION VANG DETAIL



SECTION A-A



SECTION Z-Z

QTY: 6

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

SPECIFICATIONS
MATERIAL: -
FINISH: GALVANIZED
SCALE: NTS B
DO NOT SCALE DRAWING

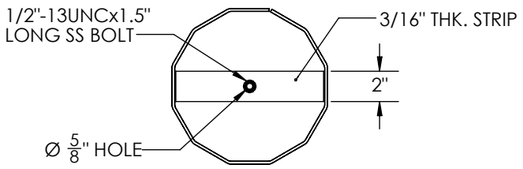
	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

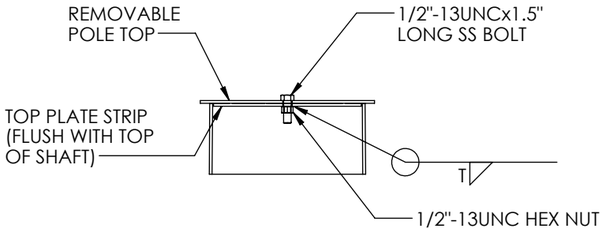
KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

JOB NO. 20-9338 | PART NO. 9338-4902 | DWG NO. 20-9338 MAIN SHEET: 25 of 26 | REV. B

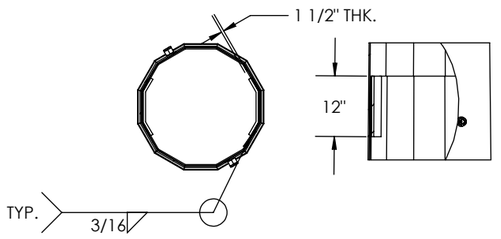
GREENVILLE SUGGS
4'-0" OHGW ARM
STR 2,3,4 ARM



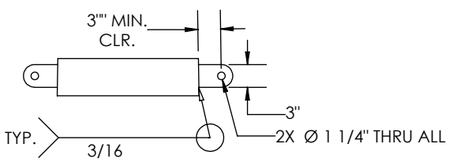
TOP VIEW



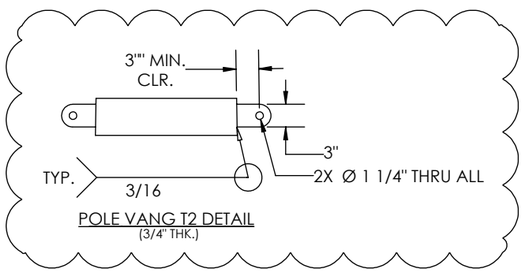
POLE TOP
(*TO SHIP ASSEMBLED)



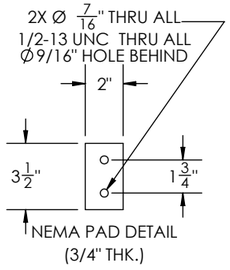
DRIVING EAR
DETAIL FOR SLIP JOINTS



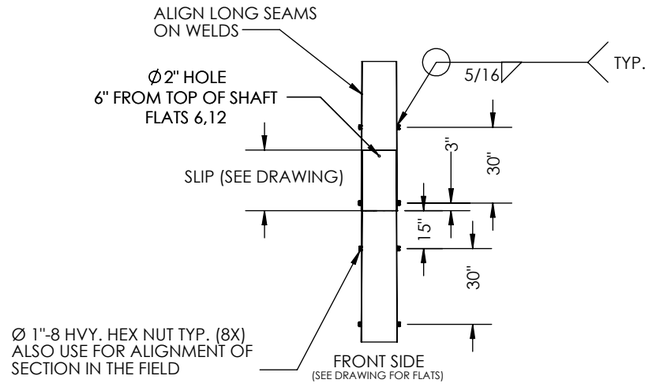
POLE VANG T2 DETAIL
(3/4" THK.)



POLE VANG T2 DETAIL
(3/4" THK.)



NEMA PAD DETAIL
(3/4" THK.)



JACKING NUTS

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

SPECIFICATIONS
MATERIAL:
FINISH:
SCALE: NTS B
DO NOT SCALE DRAWING

	BY	DATE
CREATED:	CAD	08/24/2020
CHK'D:	JDT	08/27/2020
LAST REV:	CAD	09/15/2020

THIRD ANGLE PROJECTION

KEYSTONE
A DIVISION OF CHM INDUSTRIES, INC.
700 E. MCLEROY, SUITE A
SAGINAW, TEXAS 76179
682.286.0046 PH
682.286.0086 FX
CHMINDUSTRIES.COM

BREAK ALL SHARP EDGES .005/.015. REMOVE ALL BURRS AND CHIPS

TOLERANCES UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCE : ±1/16
ANGULAR : ±0.5°

JOB NO. 20-9338 | PART NO. | DWG NO. 20-9338 MAIN SHEET: 26 of 26 | REV. B

GREENVILLE SUGGS
DETAIL

SUMMIT

UTILITY STRUCTURES

225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

(STRUCTURES DRAWING)

CUSTOMER : SUBSTATION ENTERPRISES
PROJECT : GUC - #20-26 SUGG PARKWAY SUBSTATION
FINISH : GALVANIZED
SUS JOB# : 001794

DRAWING INDEX

SH/NO.	STR# / STR# TYPE	SHEET NO		REV	DATE	DESCRIPTION	UNIT BLACK WT.	GALV. WT.
1		COVER SHEET		2	08-31-2020	DRAWING INDEX	NA	NA
2		SUS-01A		0	07-24-2020	SUS GUIDELINES	NA	NA
3		SUS-01B		0	07-24-2020	SUS GUIDELINES	NA	NA
4	H-FRAME	1794E-01		2	08-31-2020	93'-3", H-FRAME	-	-
5		1794SA-01		0	07-24-2020	53'-0" POLE TOP ASSEMBLY	4878.78	5171.51
6		1794SA-02		1	08-31-2020	40'-3" POLE BTM ASSEMBLY	6333.89	6713.93
7		1794SA-03		0	07-24-2020	53'-0" POLE TOP ASSEMBLY	4878.78	5171.51
8		1794SA-04		1	08-31-2020	40'-3" POLE BTM ASSEMBLY	6333.89	6713.93
9		1794XARM-01		1	08-10-2020	29'-11" CROSS ARM ASSEMBLY	707.46	749.51
10		1794XARM-02		1	08-10-2020	29'-3" CROSS ARM ASSEMBLY	853.79	905.02
11		1794XARM-03		1	08-10-2020	29'-3" CROSS ARM ASSEMBLY	751.36	796.45
12		1794MAST-01		0	07-24-2020	5'-0" MAST ASSEMBLY	44.91	47.61
13		1794PD-01	SHEET 1 OF 3	2	08-31-2020	PARTS DRAWING	-	-
14		1794PD-01	SHEET 2 OF 3	0	07-24-2020	PARTS DRAWING	-	-
15		1794PD-01	SHEET 3 OF 3	2	08-31-2020	PARTS DRAWING	-	-

SHIP LOOSE ITEMS

ITEM	PART NUMBER	DESCRIPTION	MATERIAL	QTY	UNIT WT.	EXTENDED WT.
1	BOLT063275-G	5/8"Ø X 2 3/4" LG H.S.BOLT (GALVANIZED)	A325-TYPE1	16	.36	5.70
2	WASHER063-G	5/8"Ø FLAT WASHER (GALVANIZED)	F436-TYPE1	16	.05	.79
3	BOLT100400-G	1"Ø X 4" LG H.S.BOLT (GALVANIZED)	A325-TYPE1	24	1.33	31.83
4	BOLT100475-G	1"Ø X 4 3/4" LG H.S.BOLT (GALVANIZED)	A325-TYPE1	96	1.49	143.39
5	NUT100-G	1"Ø HEAVY HEX NUT (GALVANIZED)	A563-DH	120	.47	56.32
6	NUT100-PN-G	1"Ø PALNUT (GALVANIZED)	A563-DH	120	.05	6.43
7	WASHER100-G	1"Ø FLAT WASHER (GALVANIZED)	F436-TYPE1	120	.04	5.16

TOTAL WT. = 249.62 lbs

SHOP ASSEMBLE BEFORE SHIPPING

ITEM	PART#	DESCRIPTION	MATERIAL	QTY
1	1794PIPE-01	2"Ø X 5'-4" SCH.80 PIPE	A500	4
2	NUT063-G	5/8"Ø H.H NUT (GALVANIZED)	A563-DH	16

TOTAL ESTIMATED BLACK WT.= 49950.00 lbs

REV	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2	08-31-20	REVISED SHEETS# 1794E-01, SA-02, SA-04 & PD-01 (1 OF 3), PD-01 (3 OF 3)	KS	NC
1	08-10-20	REVISED SHEETS# 1794E-01, XARM-01, XARM-02, XARM-03 & PD-01 (1 OF 3), PD-01 (3 OF 3)	KS	NC

REV-02 | FOR APPROVAL (09-10-2020) | SUS JOB# 001794

GUIDELINES FOR CONTRACTOR:

1. THE GUIDELINES GIVEN IN THIS COVER NOTE ARE GENERAL AND INTENDED TO BE A HELPFUL INSTRUCTION FOR ASSEMBLING AND ERECTING TRANSMISSION AND SUBSTATION STRUCTURES PROVIDED BY SUMMIT UTILITY STRUCTURES LLC (SUS). OWNER'S SPECIFICATIONS AND STRUCTURAL DRAWINGS MUST BE USED IN CONJUNCTION WITH THIS STRUCTURE SET. ANY DISCREPANCIES OR CONFLICTS BETWEEN THESE DRAWINGS AND OWNER'S DRAWINGS MUST BE RESOLVED IMMEDIATELY.
2. IT SHALL BE THE DUTY OF CONTRACTOR FOR INITIATING, SUPERVISING AND MAINTAINING ALL SAFETY MEASURES AND PRECAUTIONS PROGRAMS PER LOCAL, STATE AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS TYPE OF WORK.
3. IT SHALL BE THE PRIMARY RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE WORKERS, PUBLIC, AND THE STRUCTURE AND ITS COMPONENT PARTS DURING INSTALLATION AND ASSEMBLY.
4. THE CONTRACTOR SHOULD REVIEW THE SITE DRAWINGS PROVIDED BY THE OWNER AND STRUCTURE DRAWINGS FROM SUMMIT UTILITY STRUCTURES AND CONFIRM IF THERE IS ANY CONFLICTING INFORMATION FOR THE LOCATION OR ORIENTATION OF STRUCTURE/FOUNDATION WELL AHEAD OF ANY INSTALLATION IN THE FIELD.
5. EACH STRUCTURAL COMPONENT IS MARKED WITH AN ID TAG FOR THE DETAILS OF STRUCTURE NUMBERS, AND ANY HARDWARE'S OR PARTS THAT ARE NOT WELDED WITH THE PROVIDED FINAL ASSEMBLIES ARE MARKED AND SORTED ON PALLETS OR IN PLASTIC CONTAINERS. IT IS THE DUTY OF CONTRACTOR OR ERECTOR TO CONTACT SUMMIT UTILITY STRUCTURES IMMEDIATELY IF THEY FEEL THERE IS ANY SHORTAGE.
6. THE CONTRACTOR SHALL PERFORM MODERATE AMOUNTS OF REAMING, CUTTING, CHIPPING OR RE-TAPPING AS REQUIRED TO ALLOW PROPER FIT-UP OF THE STRUCTURAL MEMBERS. ANY ERRORS RELATED TO FABRICATION WHICH RESTRICT THE PROPER FIT UP OF MEMBERS SHOULD BE IMMEDIATELY REPORTED TO SUMMIT UTILITY STRUCTURES LLC. AT THAT TIME, THE ERROR WILL BE CORRECTED OR SUMMIT UTILITY STRUCTURES WILL PROVIDE DIRECTION AS TO THE PROPER MEANS TO CORRECT THE PROBLEM. WORK PERFORMED BY THE CONTRACTOR IN THE FIELD SHALL NOT BE ELIGIBLE FOR BACKCHARGES UNLESS APPROVED IN WRITING BY SUMMIT UTILITY STRUCTURES **PRIOR** TO THE WORK BEING PERFORMED. SUMMIT UTILITY STRUCTURES SHALL NOT ACCEPT ANY BACKCHARGES WITHOUT THIS PRIOR AUTHORIZATION.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE AT ALL TIMES DURING ERECTION AND SHALL DESIGN AND INSTALL ANY AND ALL ADDITIONAL TEMPORARY BRACING OR GUYING REQUIRED TO MEET LOADING IMPOSED DURING ERECTION.
8. CONTRACTOR AND OWNER SHALL AT ALL TIMES BE RESPONSIBLE TO ELIMINATE AEOLIAN VIBRATION OF THE STRUCTURES OR ARMS. THIS PHENOMENON TYPICALLY OCCURS WHEN STRUCTURES AND/OR ARMS ARE INSTALLED PRIOR TO THE LINE BEING STRUNG. IT IS RECOMMENDED THAT WEIGHTS BE HUNG FROM ALL ARMS WHICH WILL NOT BE STRUNG IMMEDIATELY TO PREVENT AEOLIAN VIBRATION. POLES WHICH WILL NOT BE STRUNG IMMEDIATELY SHOULD BE BACKGUYED.
9. MANUFACTURING RESERVES THE RIGHT TO INCREASE BASE PLATE MATERIAL THICKNESS BY 1/2", LOWER SHAFT THICKNESS WHICH WILL NOT EFFECT SLIP JOINTS BY 1/4", AND TO UTILIZE CIRCUMFERENTIAL WELDS WHERE NEEDED TO FACILITATE FABRICATION OPERATIONS. BOLT LENGTHS MAY BE INCREASED BY 1/4" BASED ON AVAILABILITY OF SIZES FROM BOLT MANUFACTURERS. END USER WILL BE NOTIFIED OF THESE CHANGES IF IT WILL AFFECT THE ERRECTION OF THR STRUCTURE.

INSTALLATION (EXCERPTS FROM AISC FOR JOINT USING ASTM A325 OR A490 BOLTS, NOVEMBER 1984)

A. FASTENER TENSION

FASTENERS SHALL BE TIGHTENED IN PROPERLY ALIGNED HOLES TO PROVIDE, WHEN ALL FASTENERS IN THE JOINT ARE TIGHT, AT LEAST THE MINIMUM TENSION SHOWN IN TABLE 1 FOR THE SIZE AND GRADE OF FASTENER USED.
THREADED BOLTS SHALL BE TIGHTENED BY METHODS DESCRIBED IN SUB SECTIONS (C), (D) OR (E). IF REQUIRED BECAUSE OF BOLT ENTERING AND WRENCH OPERATION CLEARANCES, TIGHTENING BY EITHER PROCEDURE DESCRIBED IN SECTIONS (C), (D) OR (E) MAY BE DONE BY TURNING THE BOLT WHILE THE NUT IS PREVENTED FROM ROTATING.

NOMINAL BOLT SIZE, (INCHES)	MINIMUM FASTENER TENSION * (KIPS)
1/2"	12
5/8"	19
3/4"	28
7/8"	39
1"	51
1 1/8"	56
1 1/4"	71
1 3/8"	85
1 1/2"	103

TABLE 1 FASTENER TENSIONS (A325 BOLTS)

* EQUAL TO 70% OF SPECIFIED MINIMUM TENSILE STRENGTHS OF BOLTS, ROUNDED OFF TO NEAREST KIP.

IMPACT WRENCHES, IF USED, SHALL BE OF ADEQUATE CAPACITY AND SUFFICIENTLY SUPPLIED WITH AIR TO PERFORM THE REQUIRED TIGHTENING OF EACH BOLT IN APPROXIMATELY 10 SECONDS.

B. NONE

C. TURN-OF-NUT-TIGHTENING

WHEN THE TURN-OF-NUT METHOD IS USED TO PROVIDE THE BOLT TENSION SPECIFIED IN SUBSECTION (A), THERE SHALL FIRST BE ENOUGH BOLTS BROUGHT TO A "SNUG TIGHT" CONDITION TO INSURE THAT THE PARTS OF JOINTS ARE BROUGHT INTO GOOD CONTACT WITH EACH OTHER. SNUG TIGHT IS DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH. FOLLOWING THIS INITIAL OPERATION, BOLT SHALL BE PLACED IN ANY REMAINING HOLES IN THE CONNECTION AND BROUGHT TO SNUG TIGHTNESS. ALL BOLTS IN THE CONNECTION SHALL THEN BE TIGHTENED ADDITIONALLY BY THE APPLICABLE AMOUNT OF NUT ROTATION SPECIFIED IN TABLE 2, WITH TIGHTENING PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT TO ITS FREE EDGES. DURING THIS OAPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH.

BOLT LENGTH (AS MEASURED FROM NOT MORE THAN UNDER SIDE OF HEAD TO EXTREME TO BOLT AXIS (BEVELED END OF POINT)	NUT ROTATION	ONE FACE NORMAL TO BOLT AXIS AND OTHER SLOPPED NOT MORE THAN 1:20(BEVELED WASHER NOT USED)	BOTH FACES SLOPED 1:20 FROM NORMAL WASHER NOT USED)
UP TO AND INCLUDING 4 DIAMETERS	1/3 TURN	1/2 TURN	2/3 TURN
OVER 4 DIAMETERS BUT NOT EXCEEDING 8 DIAMETERS	1/2 TURN	2/3 TURN	5/6 TURN
OVER 8 DIAMETERS BUT NOT EXCEEDING BUT NOT EXCEEDING 12 DIAMETERS **	2/3 TURN	5/6 TURN	1 TURN

TABLE 2 NUT ROTATION * FROM SNUG TIGHT CONDITION

* NUT ROTATION IS RELATIVE TO BOLT, REGARDLESS OF THE ELEMENT (NUT OR BOLT BEING TURNED. FOR BOLTS INSTALLED BY ½ TURN AND LESS, THE TOLERANCE SHOULD BE PLUS OR MINUS 30 DEG. FOR BOLTS INSTALLED BY 2/3 TURN AND MORE, THE TOLERANCE SHOULD BE PLUS OR MINUS 45 DEG.
** NO RESEARCH WORK HAS BEEN PERFORMED BY THE COUNCIL TO ESTABLISH TURN OF NUT PROCEDURE WHEN BOLT LENGTHS EXCEED 12 DIAMETERS. THEREFORE THE REQUIRED ROTATION MUST BE DETERMINED BY ACTUAL TESTS IN A SUITABLE TENSION DEVICE STIMULATING THE ACTUAL LOAD CONDITIONS.

D. CALIBRATED WRENCH TIGHTENING

WHEN CALIBRATED WRENCHES ARE USED, THEY SHOULD BE SET TO PROVIDE A TENSION AT LEAST 5% IN EXCESS OF THE MINIMUM BOLT TENSION SPECIFIED IN SUBSECTION (A). THE WRENCHES SHALL BE CALIBRATED AT LEAST ONCE EACH WORKING DAY FOR EACH BOLT DIAMETER BEING INSTALLED.
WRENCHES SHALL BE RECALIBRATED WHEN SIGNIFICANT CHANGES ARE MADE IN THE EQUIPMENT OR WHEN A SIGNIFICANT DIFFERENCE IS NOTED IN THE SURFACE CONDITION OF THE BOLTS, NUTS, OR WASHERS. CALIBRATION SHALL BE ACCOMPLISHED BY TIGHTENING, IN A DEVICE CAPABLE OF INDICATING

SUMMIT UTILITY STRUCTURES
2027 South 12th Street,Building 504
Allentown, Pa 18103

NO	DATE	DESCRIPTION		COMPL BY	CHKD BY
4					
3					
2					
1					
0					

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DRAWING TITLE
SUS GUIDELINES

SHEET NO. 1 OF 2
REV NO. 0

FOR APPROVAL (09-10-2020)

SUS-01A

ACTUAL BOLT TENSION, THREE TYPICAL BOLTS OF EACH DIAMETER FROM THE BOLTS BEING INSTALLED.
WHEN ADJUSTING THE WRENCHES TO PROVIDE THE REQUIRED TENSION, IT SHALL BE VERIFIED DURING ACTUAL INSTALLATION IN THE ASSEMBLED STEELWORK THAT THE CALIBRATION SELECTED DOES NOT PRODUCE A NUT OR BOLT HEAD ROTATION FROM SNUG TIGHT GREATER THAN THAT PERMITTED IN TABLE 2. IF MANUAL TORQUE WRENCHES ARE USED, NUTS SHALL BE IN TIGHTENING MOTION WHEN TORQUE IS MEASURED.
WHEN USING CALIBRATED WRENCHES TO INSTALL SEVERAL BOLTS IN A SINGLE CONNECTION, THE WRENCH SHALL BE RETURNED TO "TOUCH UP BOLTS PREVIOUSLY TIGHTENED, WHICH MAY HAVE BEEN LOOSEN BY THE TIGHTENING OF SUBSEQUENT BOLTS, UNTIL ALL ARE TIGHTENED TO THE PRESCRIBED AMOUNT.

E. TIGHTENING BY USE OF A DIRECT TENSION INDICATOR

TIGHTENING BY THE MEANS IS PERMITTED PROVIDED IT CAN BE DEMONSTRATED BY AN ACCURATE DIRECT MEASUREMENT PROCEDURE THAT THE BOLT HAS BEEN TIGHTENED IN ACCORDANCE WITH TABLE 1.

F. REUSE

GALVANIZED A325 BOLTS SHALL NOT BE REUSED. OTHER A325 BOLTS MAY BE REUSED IF APPROVED BY THE ENGINEER RESPONSIBLE.
RE-TIGHTENING PREVIOUSLY TIGHTENED BOLTS WHICH MAY HAVE BEEN LOOSENED BY THE TIGHTENING OF ADJACENT BOLTS SHALL NOT BE CONSIDERED AS A REUSE.

FOUNDATION INSTALLATION

1. ANCHOR BOLTS MUST BE INSTALLED A SET AMOUNT OF TIME BEFORE LOADS ARE APPLIED TO THEM BY THE STRUCTURE. THIS AMOUNT OF TIME IS DETERMINED BY THE ENGINEER OF RECORD FOR THE FOUNDATIONS, TYPICALLY 28 DAYS. THIS IS THE TIMEFRAME DURING WHICH THE CONCRETE WILL DEVELOP ITS FULL DESIGN STRENGTH AND FULL DESIGN BOND ON THE ANCHOR BOLTS.
2. THE TOP ANCHOR BOLT TEMPLATE WILL BE SUPPLIED WITH ALIGNMENT MARKS. PLEASE REFER THE SUMMIT UTILITY STRUCTURES DRAWINGS FOR THE PLACEMENT OF NOTCHES WITH REFERENCE TO WIRE DIRECTIONS. SUMMIT UTILITY STRUCTURES WILL IN NO WAY BE RESPONSIBLE FOR DAMAGES, RE-WORK, DELAYS, ADAPTERS, EXTRA LABOR OR ANY OTHER CHARGES, PENALTIES OR EXTRA COSTS WHATSOEVER RELATED TO THE INCORRECT PLACEMENT OF ANCHOR BOLTS OR FAILURE TO ALIGN THE ANCHOR BOLTS WITH THE LINE DESIGN.
3. THE NUTS AND THREADED PORTION OF THE BOLTS SHOULD BE CHECKED TO ENSURE THAT THE NUT CAN BE TURNED UP OR DOWN THE FULL LENGTH OF THREAD.
   IF ANY DAMAGE IN TEMPLATE OR THREAD FOUND CONTACT SUMMIT UTILITY STRUCTURES IMMEDIATELY.
4. ANCHOR BOLTS SHALL BE PLACED VERTICALLY AND PROPERLY ORIENTED WHILE PLACING CONCRETE AND CARE SHOULD BE TAKEN TO AVOID ANY DAMAGES TO THE NUTS AND THREADED PORTION OF THE BOLTS FROM CONCRETE SPLATTED DURING POURING. DUCT TAPE CAN BE USED TO PROTECT THE THREADS DURING CONCRETE PLACEMENT.
5. THE GAP BETWEEN THE TOP OF CONCRETE FOUNDATION AND THE BOTTOM OF BASE PLATE SHALL NOT BE GREATER THAN 2 NUT HEIGHTS AS REQUIRED FOR LEVELLING THE BASE PLATE.
6. BEFORE POURING CONCRETE, ANCHOR BOLT CAGES MUST BE CHECKED TO ENSURE ANCHOR BOLT CAGE IS ROUND. IMPROPER HANDLING OF ANCHOR BOLT CAGES CAN RESULT IN THE DISTORTION OF THE CAGE. IF DISTORTION IS GREAT ENOUGH, THE BASE PLATE MAY NOT FIT OVER THE DISTORTED ANCHOR BOLTS. SUS WILL IN NO WAY BE RESPONSIBLE FOR ANY COSTS, FEES, BACK CHARGES OR ANY OTHER KIND OF FINANCIAL DAMAGES DUE TO ANCHOR BOLT DISTORTION OR IMPROPER HANDLING OF ANCHOR BOLT CAGES.
   THE TOP ANCHOR BOLT TEMPLATE MUST BE SAVED ON-SITE AND INTACT AFTER IT HAS BEEN REMOVED FROM THE COMPLETE FOUNDATION UNTIL SUCH TIME AS THE STEEL POLE HAS BEEN SUCCESSFULLY ERECTED. IF THERE IS AN ISSUE WITH SETTING THE STRUCTURE ON THE ANCHOR BOLTS, COMPARING THE ANCHOR BOLT TEMPLATE TO THE BASE PLATE OF THE STRUCTURE IS A QUICK AND EASY METHOD TO IDENTIFY THE PROBLEM. SUS WILL IN NO WAY BE RESPONSIBLE FOR ANY COSTS, FEES, BACK CHARGES OR ANY OTHER KIND OF FINANCIAL DAMAGES DUE TO ANCHOR BOLT FIT-UP ISSUES IF THE TOP TEMPLATE HAS BEEN DISCARDED.

UNLOADING, HANDLING AND STORAGE OF STRUCTURES AND ITS COMPONENTS

1. UNLOADING, HANDLING AND STORAGE OF STRUCTURES AND ITS COMPONENTS MUST BE DONE IN A MANNER TO AVOID ANY SCRATCHING, DENTING OR DEFORMING OF THE STRUCTURES, ESPECIALLY AT THE ENDS. DROPPING OF SECTIONS OR DRAGGING THEM ALONG THE GROUND MUST BE AVOIDED. SUS SHALL NOT BE RESPONSIBLE FOR \DAMAGE TO THE STRUCTURES OR SECTIONS DUE TO IMPROPER HANDLING.
2. STRUCTURE COMPONENTS SHALL BE STORED OFF GROUND IN SUCH A MANNER SO THAT AIR CAN FLOW BELOW THE SECTIONS.
3. CONTRACTOR SHALL CHECK EACH PARTS IDENTIFICATION MARKS AND THEIR REQUIRED ORDER OF ASSEMBLY. COMPONENTS SHOULD BE STORED IN A WAY TO ALLOW EASY ACCESS FOR INSPECTIONS AND IDENTIFICATION.

SLIP JOINT ASSEMBLY

1. MINIMUM JACKING FORCE THAT IS MENTIONED ON THE SUMMIT UTILITY STRUCTURES DRAWINGS SHOULD BE DEVELOPED BY THE AVAILABLE JACKING DEVICES.
   JACKING DEVICES SHALL BE A HYDRAULIC JACKING DEVICE. CHAIN "COME-ALONG'S" ARE NOT ACCEPTABLE.
2. FEMALE TUBE SECTIONS SHOULD BE ALIGNED AND ITS LARGE END SLIPPED OVER THE SMALL END OF THE MALE TUBE SECTIONS.
3. THE LONGITUDINAL SEAM WELDS MUST BE ALIGNED THE FULL LENGTH OF THE STRUCTURE.
4. THE STRUCTURE TUBE SECTIONS SHOULD BE WORKED UP AND DOWN TO HELP BRING THE SECTIONS TOGETHER. THE ALIGNMENT AND PULLING FORCE MUST BE EVEN AND STEADY. THE SLIP JOINT SHOULD BE PULLED UNTIL THE APPLICATION OF ADDITIONAL PULLING PRESSURE PRODUCES NO MOVEMENT AND MEET THE MINIMUM JACKING FORCE INDICATED ON THE ERECTION DRAWINGS. THE MINIMUM AND MAXIMUM SLIP LENGTH SHOULD BE WITHIN THE RANGES GIVEN ON THE ERECTION DRAWING. CONTRACTOR IS URGED TO MARK LOWER SECTION WITH CHALK SHOWING THE MINIMUM SLIP AND DESIGN SLIP LENGTHS. MINIMUM SLIP LENGTH IS 1.5 TIMES THE INSIDE UPPER SECTION DIAMETER. DESIGN SLIP JOINT LENGTH IS SHOWN ON THE STRUCTURE DRAWINGS.
5. THE JACKING FORCE SHOULD BE APPLIED UNTIL THE JOINT IS TIGHT AND MEETS MINIMUM JACKING FORCES INDICATED ON THE ERECTION DRAWINGS.
6. GAPS SHOULD BE SMALLER THAN ¼". GAPS ARE LIKELY TO OCCUR AT THE BENDS OF THE STRUCTURE TUBE SECTION AND WHERE THE SEAM WELD IS LOCATED.
7. FAILURE TO MEET THE CRITERIA ESTABLISHED IN THIS SECTION MAY VOID THE SUMMIT UTILITY STRUCTURES MANUFACTURING WARRANTY.
8. LUBRICANT IN THE FORM OF SOAPY WATER SHOULD BE APPLIED TO THE SLIP JOINT PRIOR TO MATING OF THE SECTIONS. IT IS NOT RECOMMENDED THAT GREASE OR ANY KIND OF PETROLEUM BASED LUBRICANT BE USED AS THIS HAS A TENDENCY TO STAIN THE STRUCTURE FINISH. THE CONTRACTOR WILL ASSUME ALL RESPONSIBILITY FOR ANY STAINS.
9. IF A PROPER FIT SPLICE IS NOT ACHIEVED AFTER THIS PROCEDURE, CONTRACTOR SHOULD CONTACT SUMMIT UTILITY STRUCTURES.

ANCHOR BOLT NUT TIGHTENING

CONFIRM WITH PROJECT ENGINEER-OF-RECORD IF STRUCTURE IS TO BE RAKED ON ANCHOR BOLTS OR INSTALLED PLUMB. AFTER THE STRUCTURE IS PLUMBED OR RAKED, SNUG UP THE ENTIRE BOTTOM ANCHOR BOLT LEVELLING NUTS UNTIL THEY ARE IN FIRM CONTACT WITH THE BOTTOM OF THE BASE PLATE. DO NOT OVER TIGHTEN THE BOTTOM HEAVY HEX LEVELING NUTS OR THE STRUCTURE WILL BE MOVED OUT OF PLUMB. BRING ALL TOP ANCHOR BOLT NUTS DOWN TO SNUG TIGHT CONDITION ON THE TOP OF BASE PLATE.
FULLY TIGHTEN EACH TOP ANCHOR BOLT NUTS USING THE FULL EFFORT OF A SINGLE MAN ON A FOUR-FOOT WRENCH- APPROXIMATELY 600 FT-LBS OF TORQUE. ANCHOR BOLT HEAVY HEX NUTS SHOULD BE TIGHTENED IN ALTERNATING FASHION WORKING DIAGONALLY BACK AND FORTH UNTIL ALL NUTS HAVE BEEN SECURED.
CHECK ALL BOTTOM HEAVY HEX LEVELLING NUTS TO ENSURE THAT THEY HAVE NOT BEEN LOOSENED IN THE PROCESS. ANY HEX NUTS THAT HAVE BEEN LOOSENED SHOULD BE TIGHTENED AGAIN. THE FINAL OPERATION SHOULD BE CHECKING THE STRUCTURE FOR PLUMB IN TWO DIRECTIONS AT 90 DEGREES AND RETIGHTENING ALL ANCHOR BOLT NUTS TOP AND BOTTOM AS NECESSARY OR CONFIRMING THAT THE CORRECT RAKE DISTANCE AND DIRECTION HAS BEEN MAINTAINED.

PREVENTING WIND INDUCED VIBRATIONS

ARMS THAT ARE TO BE INSTALLED WITHOUT CONDUCTOR OR EQUIPMENT NEED PREVENTIVE MEASURES TO AVOID WIND INDUCED VIBRATION. THE FOLLOWING METHODS MAY BE USED:
1. SUSPENDING TEMPORARY WEIGHTS (5% TO 15% OF MEMBER WEIGHT IS RECOMMENDED) SUCH AS INSULATORS FROM THE ARMS.
2. USING DAMPING DEVICES SUCH AS STOCKBRIDGE TYPE MAY BE EFFECTIVE.
   CONTRACTOR AND/OR UTILITY ARE RESPONSIBLE TO ENSURE THAT THE ARMS DO NOT EXPERIENCE WIND-INDUCED VIBRATION. SUS WILL IN NO WAY BE RESPONSIBLE FOR ANY COSTS, FEES, BACK CHARGES OR ANY OTHER KIND OF FINANCIAL DAMAGES DUE TO WIND-INDUCED VIBRATION. REPLACEMENT OF ARMS DAMAGED BY WIND-INDUCED VIBRATION SHALL BE AT CONTRACTOR'S OR UTILITY'S COST.

INSPECTION
ONCE THE STRUCTURE IS TOTALLY ASSEMBLED, THE STRUCTURE SHOULD BE THOROUGHLY INSPECTED. REPAIR ANY DAMAGE TO THE GALVANIZED SURFACE OF THE STRUCTURE THAT MAY HAVE OCCURRED DURING SHIPPING, UNLOADING, JACKING OR ERECTION. ZINC-RICH PAINT, HOT-STICK GALVANIZING OR METALLIZING CAN BE USED FOR THE REPAIR.
DO NOT WELD ON A STRUCTURE OR ITS COMPONENT PARTS UNLESS WRITTEN PERMISSION IS RECEIVED FROM SUMMIT UTILITY STRUCTURES. UNAUTHORIZED WELDING WILL VOID WARRANTY.

SUMMIT UTILITY STRUCTURES
2027 South 12th Street,Building 504
Allentown, Pa 18103

NO	DATE	DESCRIPTION		COMPL BY	CHKD BY
4					
3					
2					
1					
0					

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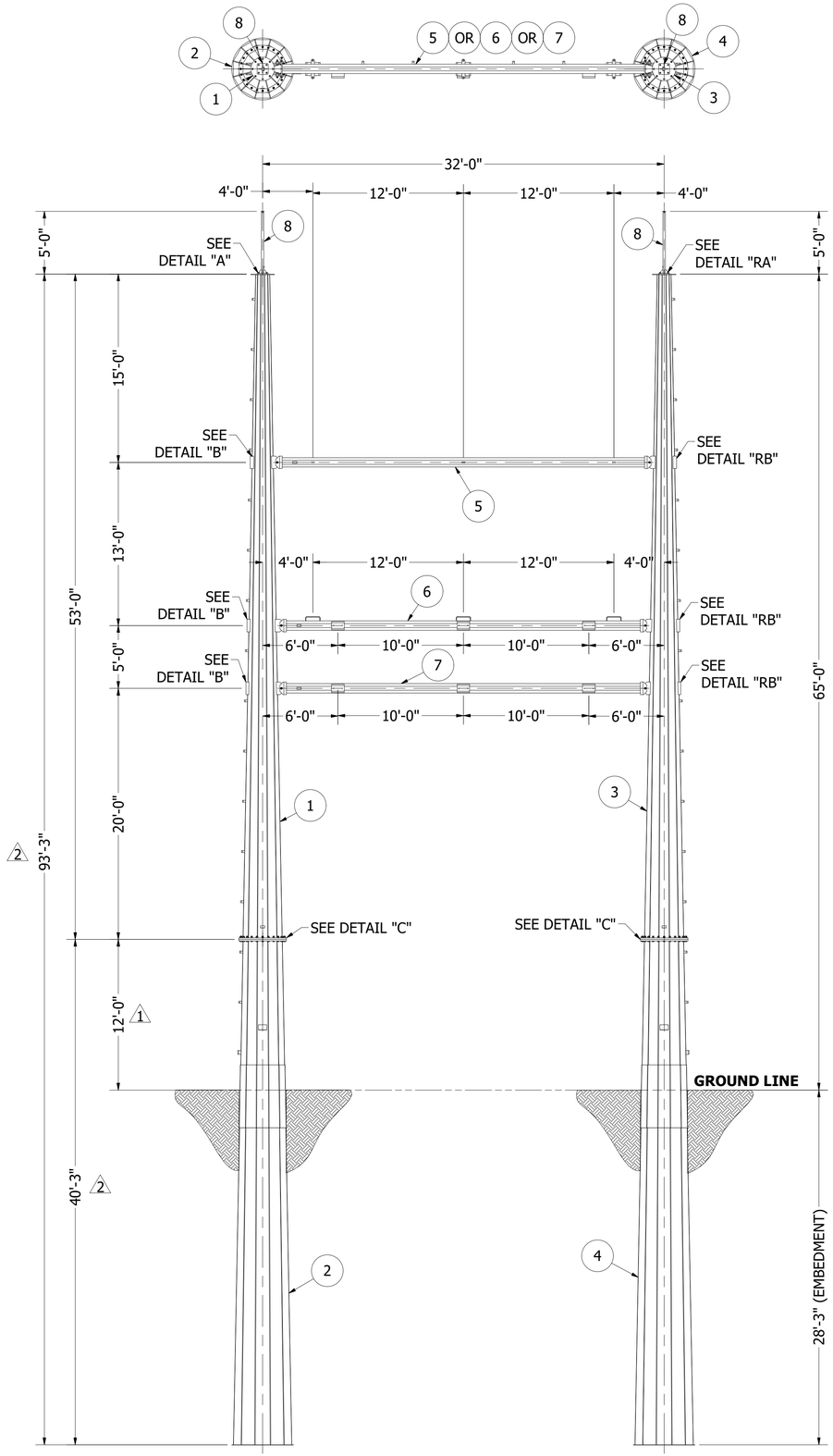
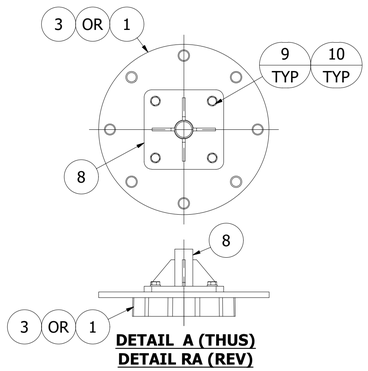
DRAWING TITLE
SUS GUIDELINES

SHEET NO. 2 OF 2
REV NO. 0

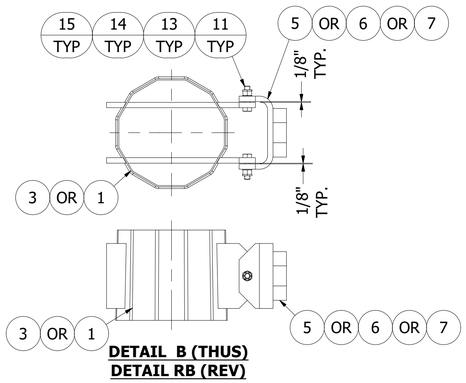
FOR APPROVAL (09-10-2020)

SUS-01B

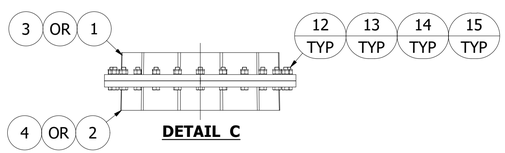




DETAIL A (THUS)
DETAIL RA (REV)



DETAIL B (THUS)
DETAIL RB (REV)



DETAIL C

BILL OF MATERIAL

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1794SA-01	53'-0" POLE TOP ASSEMBLY	1794SA-01	GALVANIZED	4878.77	4878.77
△2 2	1	1794SA-02	40'-3" POLE BTM ASSEMBLY	1794SA-02	GALVANIZED	6333.89	6333.89
3	1	1794SA-03	53'-0" POLE TOP ASSEMBLY	1794SA-03	GALVANIZED	4878.77	4878.77
△2 4	1	1794SA-04	40'-3" POLE BTM ASSEMBLY	1794SA-04	GALVANIZED	6333.89	6333.89
5	1	1794XARM-01	29'-11" CROSS ARM ASSY.	1794XARM-01	GALVANIZED	707.45	707.45
6	1	1794XARM-02	29'-3" CROSS ARM ASSEMBLY	1794XARM-02	GALVANIZED	853.79	853.79
7	1	1794XARM-03	29'-3" CROSS ARM ASSEMBLY	1794XARM-03	GALVANIZED	751.36	751.36
8	2	1794MAST-01	5'-0" MAST ASSEMBLY	1794MAST-01	GALVANIZED	44.90	89.81

SHIPPED LOOSE BILL OF MATERIAL

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
9	8	BOLT063275-G	5/8"Ø X 2 3/4" LG H.S.BOLT (GALVANIZED)	NA	A325-TYPE1	0.36	2.85
10	8	WASHER063-G	5/8"Ø FLAT WASHER (GALVANIZED)	NA	F436-TYPE1	0.05	0.39
11	12	BOLT100400-G	1"Ø X 4" LG H.S.BOLT (GALVANIZED)	NA	A325-TYPE1	1.33	15.92
12	48	BOLT100475-G	1"Ø X 4 3/4" LG H.S.BOLT (GALVANIZED)	NA	A325-TYPE1	1.49	71.69
13	60	NUT100-G	1"Ø HEAVY HEX NUT (GALVANIZED)	NA	A563-DH	0.47	28.16
14	60	NUT100-PN-G	1"Ø PALNUT (GALVANIZED)	NA	A563-DH	0.05	3.22
15	60	WASHER100-G	1"Ø FLAT WASHER (GALVANIZED)	NA	F436-TYPE1	0.04	2.58

QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY, (2) REQUIRED.

TOTAL BLACK WEIGHT = 24952.54 LBS
TOTAL GALVANIZED WEIGHT = 26449.69 LBS

STRUCTURE/LINE# SUMMARY LIST		
ASSY#	STR TYPE	QTY
1794E-01	H-FRAME	2

NOTES:-

1. ALL STEEL POLE COMPONENTS, EXCEPT GROUNDING PLATE SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
2. ALL BOLTS, NUTS, WASHERS AND PALNUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2	08-31-20	REVISED AS PER EDC.	KS	NC
1	08-10-20	REVISED AS PER COMMENTS.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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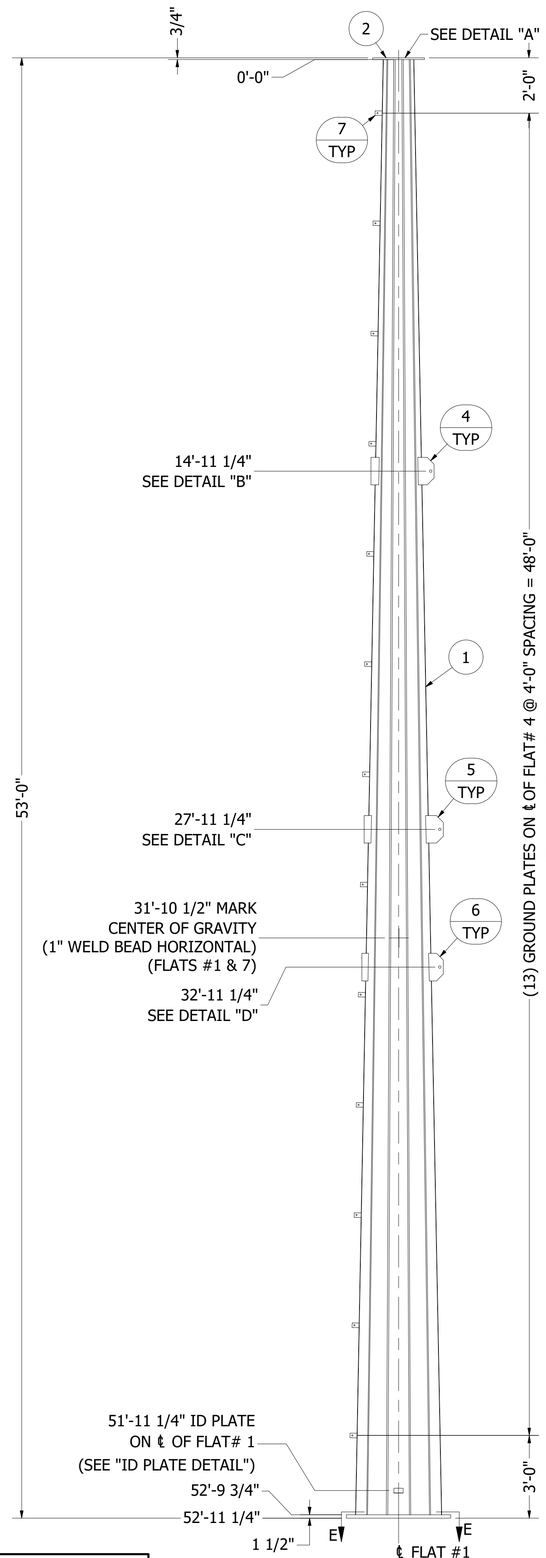
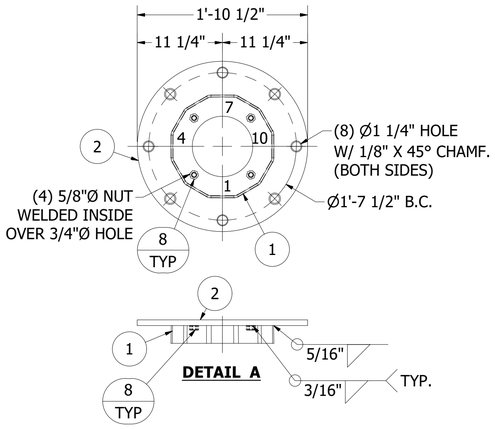
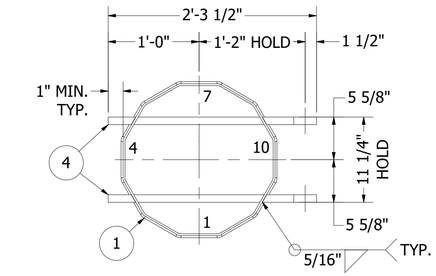
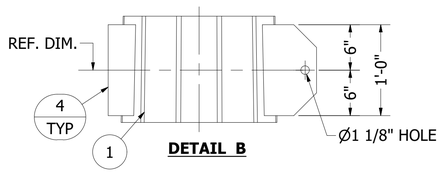
REF. DRAWING	FK-2132-SV
DATE	07-24-2020
	93'-3", H-FRAME STR# SEE CHART
DRAWN BY / CHK'D. BY / APP'D. BY	KS / NC / RKC
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685
DRAWING NO.	1794E-01
SHEET NO.	
REV. NO.	2

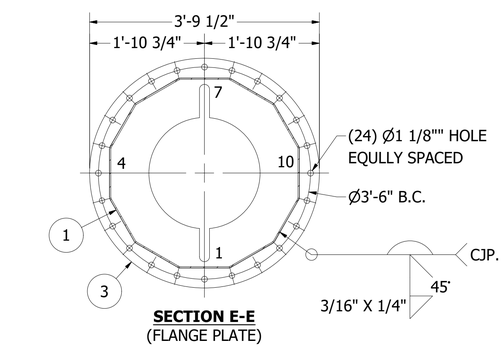
1794E-01

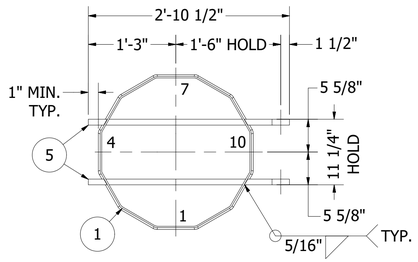


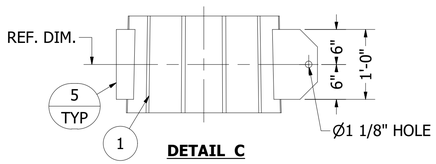


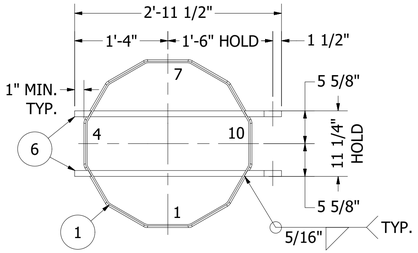


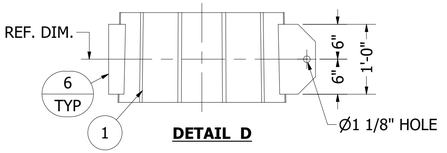


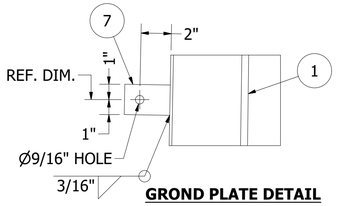


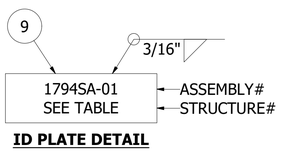












BILL OF MATERIAL TAPER: 0.45500 in/ft

ITEM	QTY	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT WT.	NET WT.
1	1	1794SH-01	POLY-12, 1/4" X 13 1/2" X 37 5/8" X 52'-9 3/4"	NA	A572-65	3644.53	3644.53
2	1	1794TR-01	TOP RING 3/4" X 1'-10 1/2" O.D.	1794PD-01	A572-65	71.18	71.18
3	1	1794FP-01	FLANGE PLATE 1 1/2" X 3'-9 1/2" OD	1794PD-01	A572-50	508.37	508.37
4	2	1794PL-01	THRU PLATE 1" X 12" X 2'-3 1/2"	1794PD-01	A572-65	90.64	181.28
5	2	1794PL-02	THRU PLATE 1" X 12" X 2'-10 1/2"	1794PD-01	A572-65	114.43	228.86
6	2	1794PL-03	THRU PLATE 1" X 12" X 2'-11 1/2"	1794PD-01	A572-65	117.83	235.66
7	13	1794GP-02	GROUND PLATE 3/8" X 2" X 0-3" LG	1794PD-01	A572-65	0.61	7.95
8	4	NUT063-G	5/8"Ø H.H NUT (GALVANIZED)	NA	A563-DH	0.13	0.52
9	1	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	1794PD-01	S.S.	0.43	0.43

QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 4878.78 LBS
TOTAL GALV WEIGHT = 5171.51 LBS

STRUCTURE/LINE# SUMMARY LIST		
ASSY#	STR TYPE	QTY
1794SA-01	H-FRAME	2

NOTES:-

1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL BOLTS, NUTS, WASHERS AND PALNUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
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1				

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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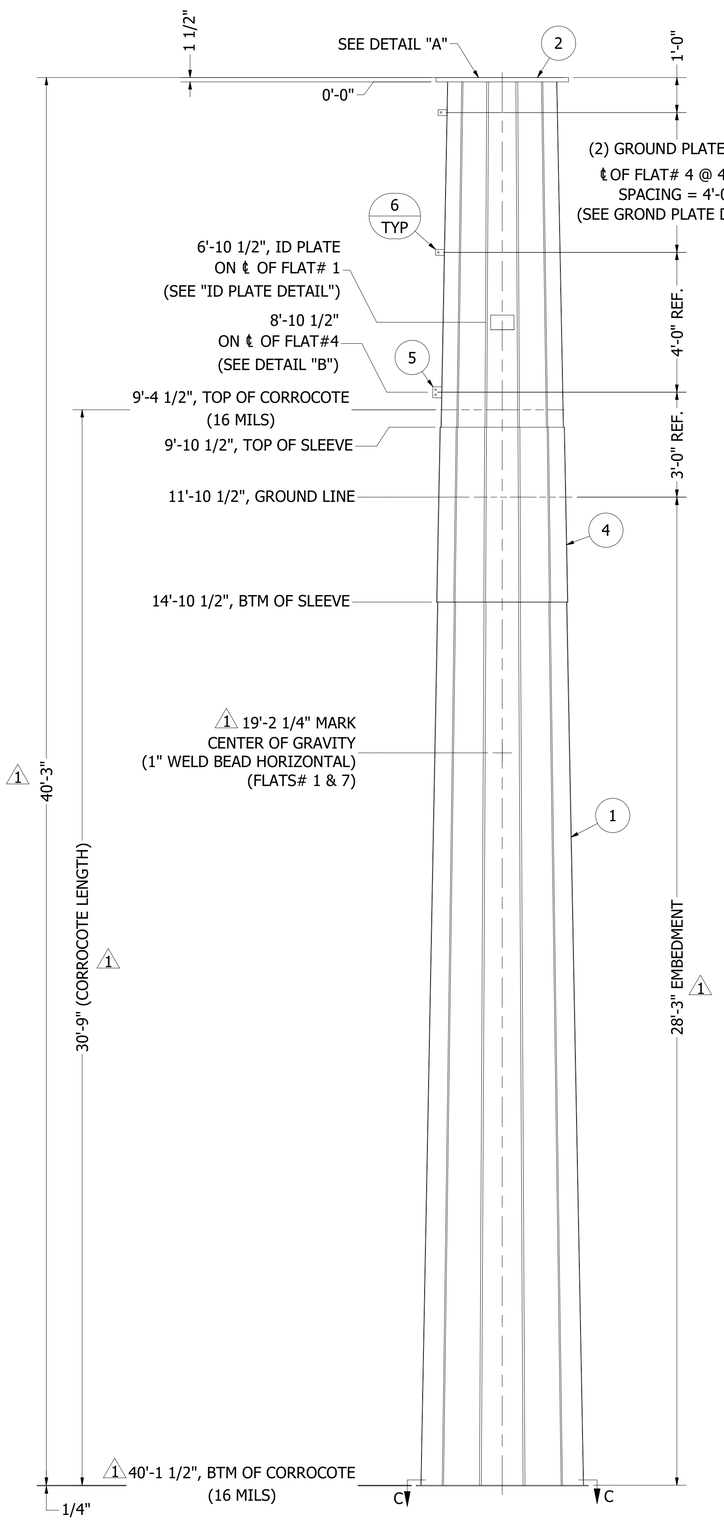
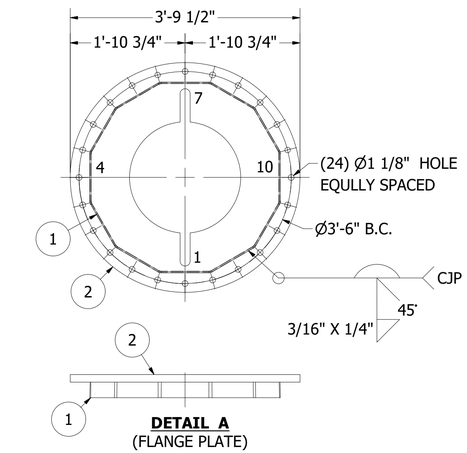
REF. DRAWING	FK-2132-SV
DATE	07-24-2020
DRAWN BY	KS
CHK'D. BY	NC
APP'D. BY	RKC
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685
DRAWING NO.	1794SA-01
SHEET NO.	
REV. NO.	0

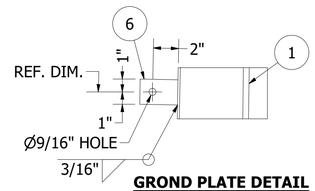
53'-0" POLE TOP ASSEMBLY
STR# SEE CHART

1794SA-01

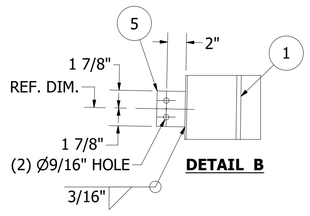




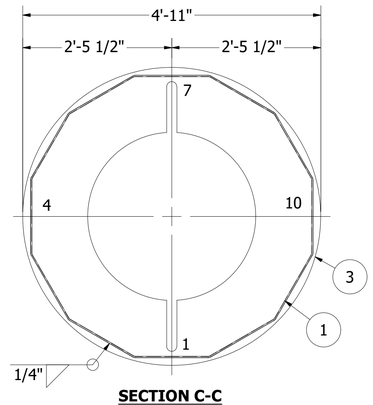
DETAIL A
(FLANGE PLATE)



GROND PLATE DETAIL



DETAIL B



SECTION C-C
(BEARING PLATE)

BILL OF MATERIAL TAPER: 0.45500 in/ft

	ITEM	QTY	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1	1794SH-02	POLY-12, 1/4" X 37 5/8" X 55 15/16" X 40'-1 1/2"	NA	A572-65	5095.71	5095.71
	2	1	1794FP-01	FLANGE PLATE 1 1/2" X 3'-9 1/2" OD	1794PD-01	A572-50	508.37	508.37
1	3	1	1794BP-01	BEARING PLATE 1/4" X 4'-11" O.D.	1794PD-01	A572-65	129.28	129.28
	4	1	1794GS-01	GROUND SLEEVE 1/4" X 42 13/16" X 45 1/16" X 5'-0"	NA	A572-65	596.00	596.00
	5	1	1794GP-01	GROUND PLATE 3/8" X 3" X 0-3 3/4" LG	1794PD-01	A572-65	1.14	1.14
	6	2	1794GP-02	GROUND PLATE 3/8" X 2" X 0-3" LG	1794PD-01	A572-65	0.61	1.22
	7	1	ID-C58	IDENTIFICATION PLATE 3/16" X 5" X 0'-8"	1794PD-01	S.S.	2.17	2.17

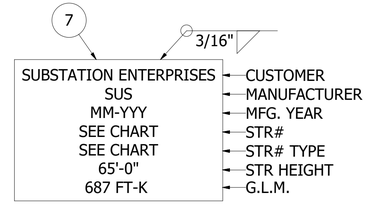
QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 6333.89 LBS
TOTAL GALV WEIGHT = 6713.93 LBS

STRUCTURE/LINE# SUMMARY LIST		
ASSY#	**STR TYPE**	**QTY**
1794SA-02	H-FRAME	2

NOTES:-

1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL BOLTS, NUTS, WASHERS AND PALNUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.



ID PLATE DETAIL
(SEE NOTE 1)

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1	08-31-20	REVISED AS PER EDC.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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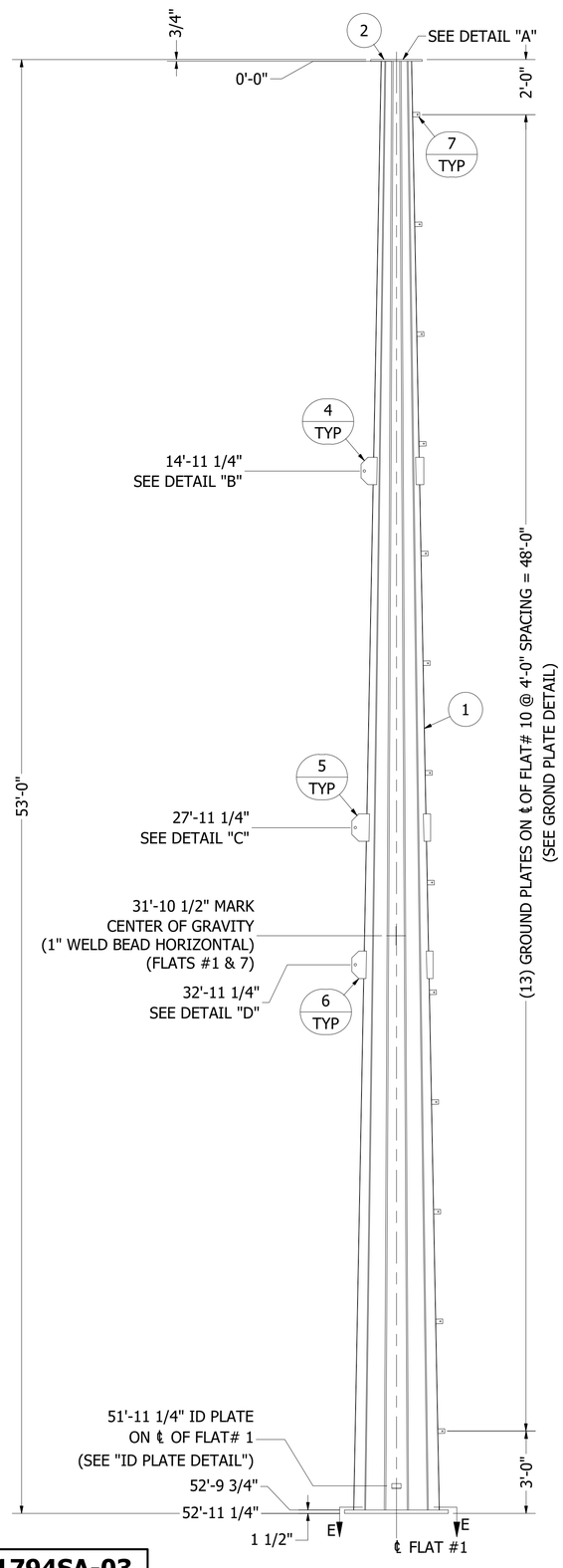
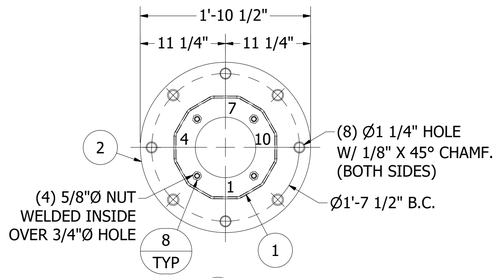
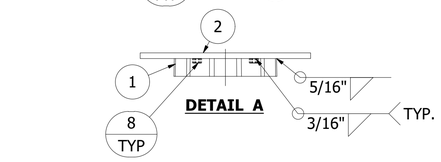
REF. DRAWING	FK-2132-SV		
DATE 07-24-2020			40'-3" POLE BTM ASSEMBLY STR# SEE CHART
DRAWN BY KS	CHK'D. BY NC	APP'D. BY RKC	
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685		

DRAWING NO.	SHEET NO.	REV. NO.
1794SA-02		1

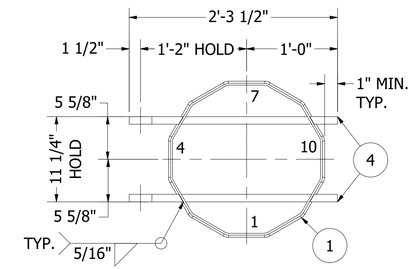
1794SA-02

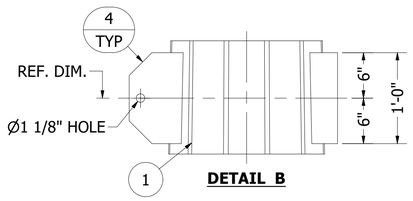




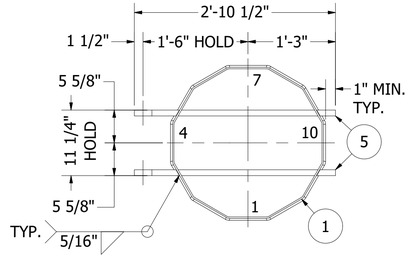


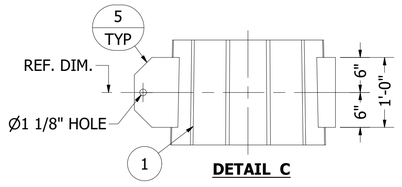
DETAIL A



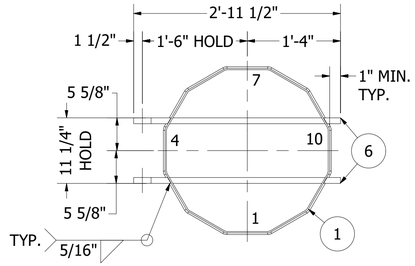


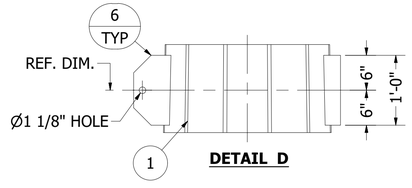
DETAIL B



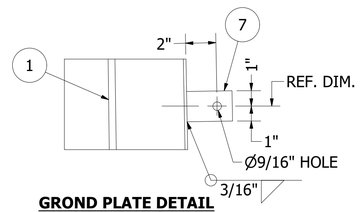


DETAIL C

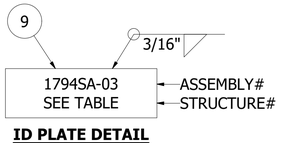




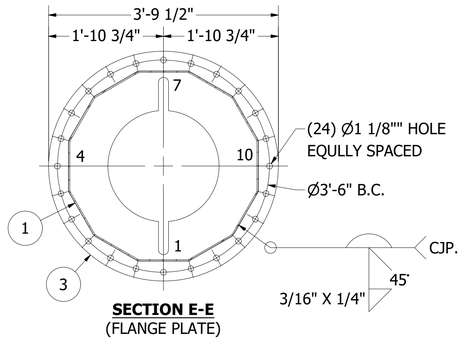
DETAIL D



GROND PLATE DETAIL



ID PLATE DETAIL



SECTION E-E
(FLANGE PLATE)

BILL OF MATERIAL TAPER: 0.45500 in/ft

ITEM	QTY	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT WT.	NET WT.
1	1	1794SH-01	POLY-12, 1/4" X 13 1/2" X 37 5/8" X 52'-9 3/4"	NA	A572-65	3644.53	3644.53
2	1	1794TR-01	TOP RING 3/4" X 1'-10 1/2" O.D.	1794PD-01	A572-65	71.18	71.18
3	1	1794FP-01	FLANGE PLATE 1 1/2" X 3'-9 1/2" OD	1794PD-01	A572-50	508.37	508.37
4	2	1794PL-01	THRU PLATE 1" X 12" X 2'-3 1/2"	1794PD-01	A572-65	90.64	181.28
5	2	1794PL-02	THRU PLATE 1" X 12" X 2'-10 1/2"	1794PD-01	A572-65	114.43	228.86
6	2	1794PL-03	THRU PLATE 1" X 12" X 2'-11 1/2"	1794PD-01	A572-65	117.83	235.66
7	13	1794GP-02	GROUND PLATE 3/8" X 2" X 0-3" LG	1794PD-01	A572-65	0.61	7.95
8	4	NUT063-G	5/8"Ø H.H NUT (GALVANIZED)	NA	A563-DH	0.13	0.52
9	1	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	1794PD-01	S.S.	0.43	0.43

QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 4878.78 LBS
TOTAL GALV WEIGHT = 5171.51 LBS

STRUCTURE/LINE# SUMMARY LIST		
ASSY#	STR TYPE	QTY
1794SA-03	H-FRAME	2

NOTES:-

1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL BOLTS, NUTS, WASHERS AND PALNUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1				

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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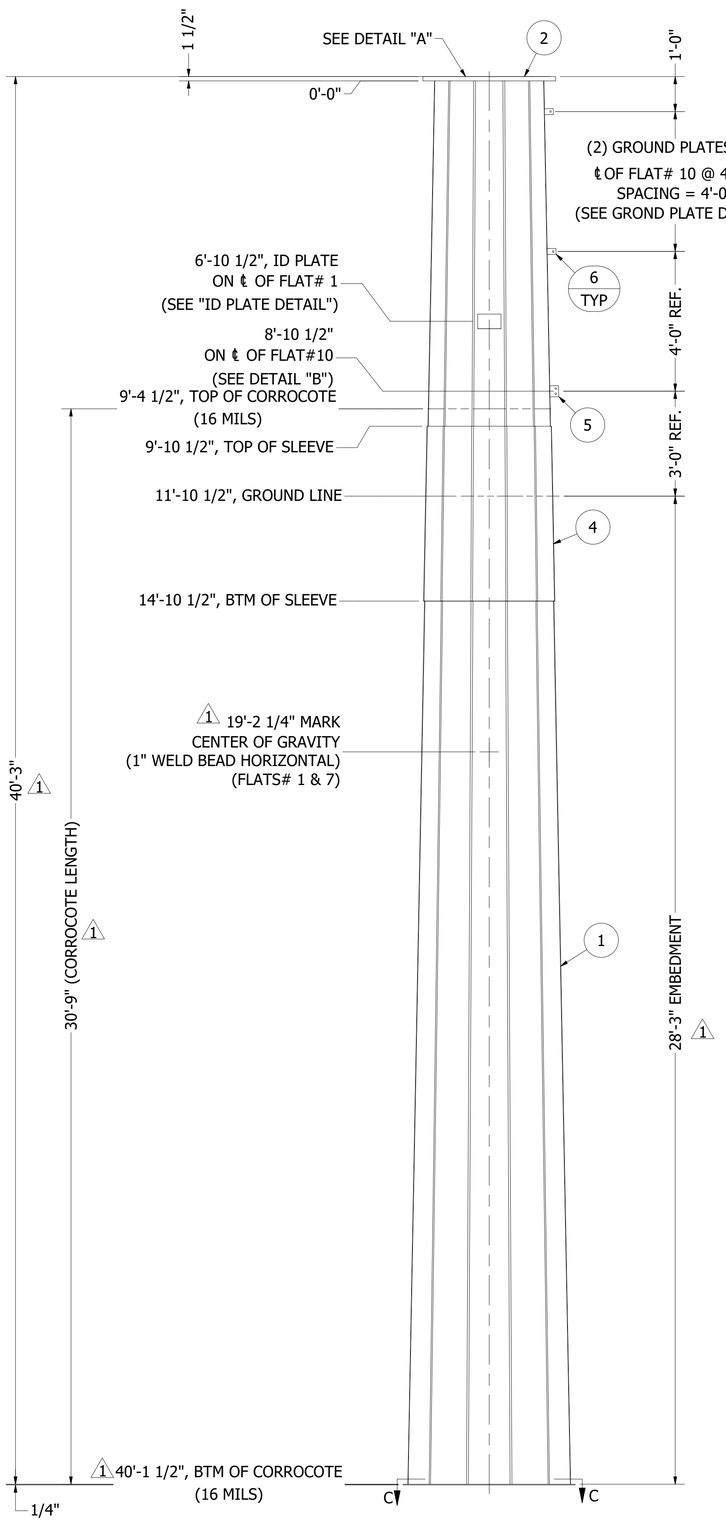
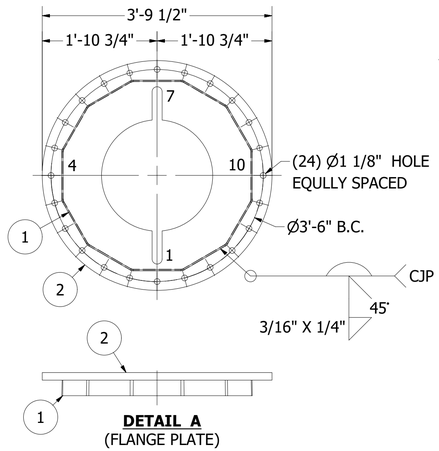
REF. DRAWING	FK-2132-SV
DATE	07-24-2020
DRAWN BY	KS
CHK'D. BY	NC
APP'D. BY	RKC
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685
DRAWING NO.	1794SA-03
SHEET NO.	
REV. NO.	0

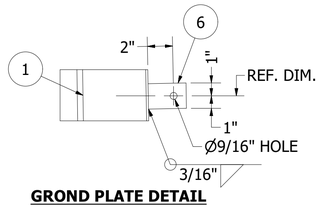
53'-0" POLE TOP ASSEMBLY
STR# SEE CHART

1794SA-03

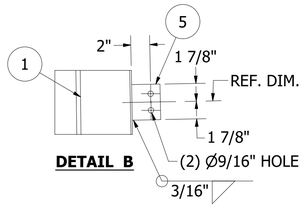




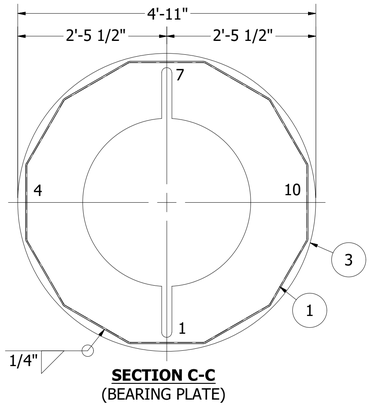
DETAIL A
(FLANGE PLATE)



GROND PLATE DETAIL



DETAIL B



SECTION C-C
(BEARING PLATE)

BILL OF MATERIAL TAPER: 0.45500 in/ft

ITEM	QTY	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1794SH-02	POLY-12, 1/4" X 37 5/8" X 55 15/16" X 40'-1 1/2"	NA	A572-65	5095.71	5095.71
2	1	1794FP-01	FLANGE PLATE 1 1/2" X 3'-9 1/2" OD	1794PD-01	A572-50	508.37	508.37
3	1	1794BP-01	BEARING PLATE 1/4" X 4'-11" O.D.	1794PD-01	A572-65	129.28	129.28
4	1	1794GS-01	GROUND SLEEVE 1/4" X 42 13/16" X 45 1/16" X 5'-0"	NA	A572-65	596.00	596.00
5	1	1794GP-01	GROUND PLATE 3/8" X 3" X 0-3 3/4" LG	1794PD-01	A572-65	1.14	1.14
6	2	1794GP-02	GROUND PLATE 3/8" X 2" X 0-3" LG	1794PD-01	A572-65	0.61	1.22
7	1	ID-C58	IDENTIFICATION PLATE 3/16" X 5" X 0'-8"	1794PD-01	S.S.	2.17	2.17

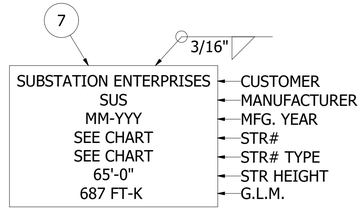
QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 6333.89 LBS
TOTAL GALV WEIGHT = 6713.93 LBS

STRUCTURE/LINE# SUMMARY LIST		
ASSY#	STR TYPE	QTY
1794SA-04	H-FRAME	2

NOTES:-

1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL BOLTS, NUTS, WASHERS AND PALNUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.



ID PLATE DETAIL
(SEE NOTE 1)

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1	08-31-20	REVISED AS PER EDC.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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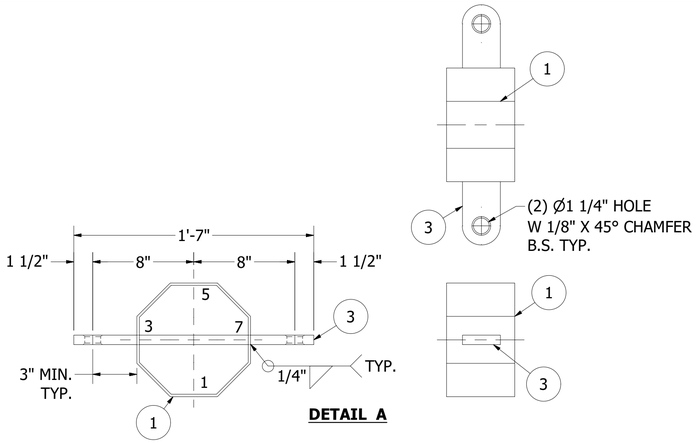
REF. DRAWING	FK-2132-SV
DATE	07-24-2020
DRAWN BY	KS
CHK'D. BY	NC
APP'D. BY	RKC
	40'-3" POLE BTM ASSEMBLY STR# SEE CHART
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685
DRAWING NO.	1794SA-04
SHEET NO.	
REV. NO.	1

1794SA-04



DETAIL A

BILL OF MATERIAL							
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1794ARM-01	POLY-8, 3/16" X 9" X 9" X 28'-10 1/2"	NA	A572-65	537.37	537.37
2	2	1794BRKT-01	BRACKET 1" X 12" X 1'-10 5/16"	1794PD-01	A572-65	68.12	136.24
3	3	1794VANG-01	VANG 3/4" X 3" X 1'-7" LG	1794PD-01	A572-65	11.14	33.42
4	1	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	1794PD-01	S.S.	0.43	0.43

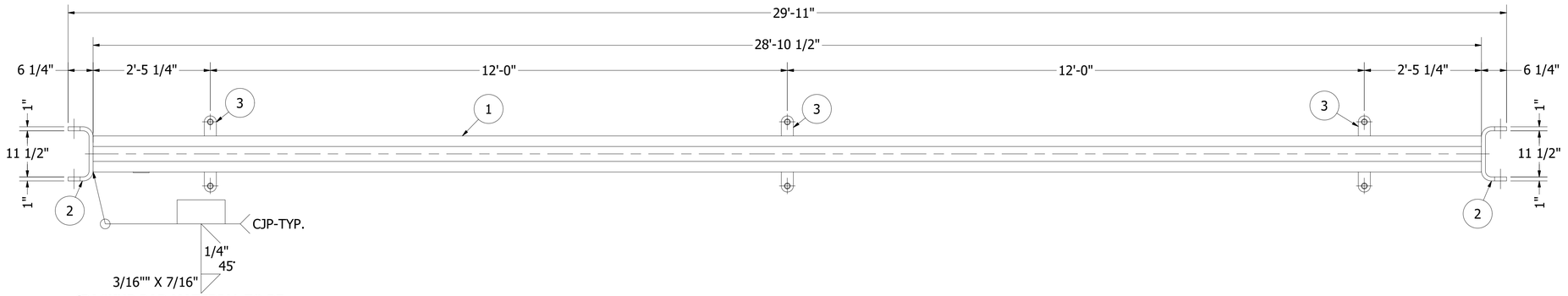
QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 707.46 lbs
TOTAL GALV WEIGHT = 749.91 lbs

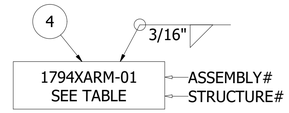
STRUCTURE/LINE# SUMMARY LIST		
ASSY#	STR TYPE	QTY
1794XARM-01	H-FRAME	2

NOTES:-

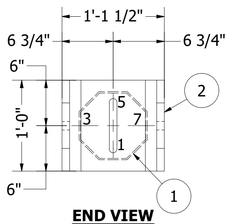
1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
4. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.



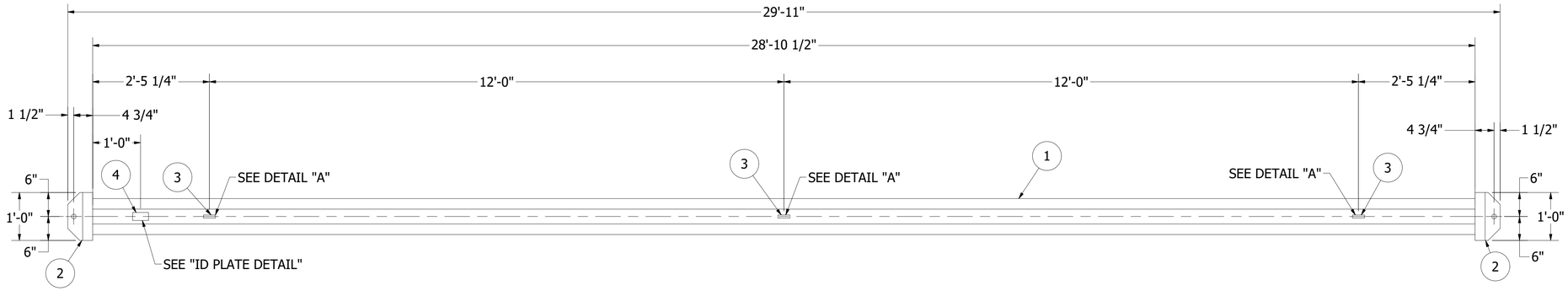
(BACKUP BAR MATERIAL TO BE COMPATIBLE WITH BASE MATERIAL)

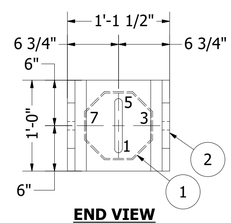


ID PLATE DETAIL



END VIEW





END VIEW

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1	08-10-20	REVISED AS PER COMMENTS.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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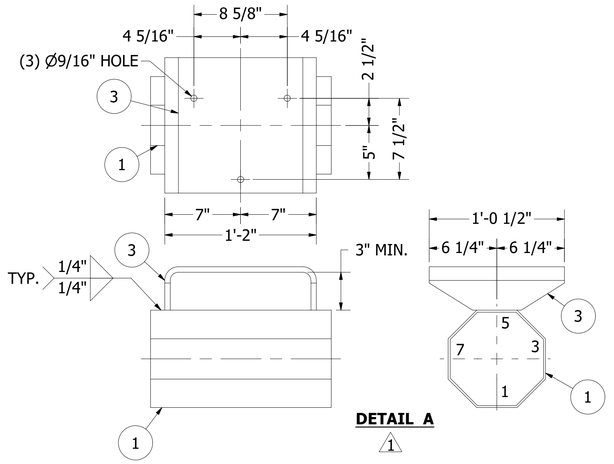
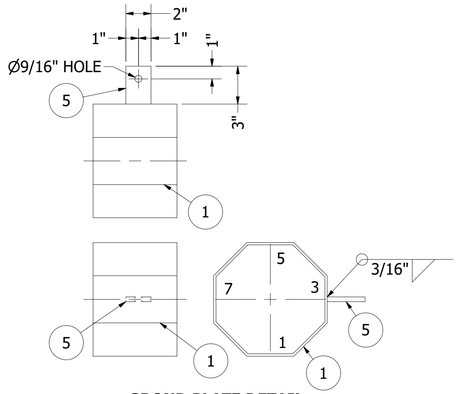
REF. DRAWING	NA		
DATE	07-24-2020		29'-11" CROSS ARM ASSY. STR# SEE CHART
DRAWN BY	CHK'D. BY	APP'D. BY	
KS	NC	RKC	
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685		
DRAWING NO.	SHEET NO.	REV. NO.	
1794XARM-01		1	



DETAIL A



GROND PLATE DETAIL

△1

BILL OF MATERIAL

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1794ARM-02	POLY-8, 3/16" X 9" X 9" X 28'-2 1/2"	NA	A572-65	524.96	524.96
2	2	1794BRKT-01	BRACKET 1" X 12" X 1'-10 5/16"	1794PD-01	A572-65	68.12	136.24
3	3	1794BRKT-02	BRACKET 1/2" X 12 1/2" X 1'-8 1/8"	1794PD-01	A572-65	32.72	98.15
4	3	1794BRKT-03	BRACKET 1/2" X 12" X 1'-5 5/8"	1794PD-01	A572-65	29.91	89.73
5	7	1794GP-02	GROUND PLATE 3/8" X 2" X 0-3" LG	1794PD-01	A572-65	0.61	4.28
6	1	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	1794PD-01	S.S.	0.43	0.43

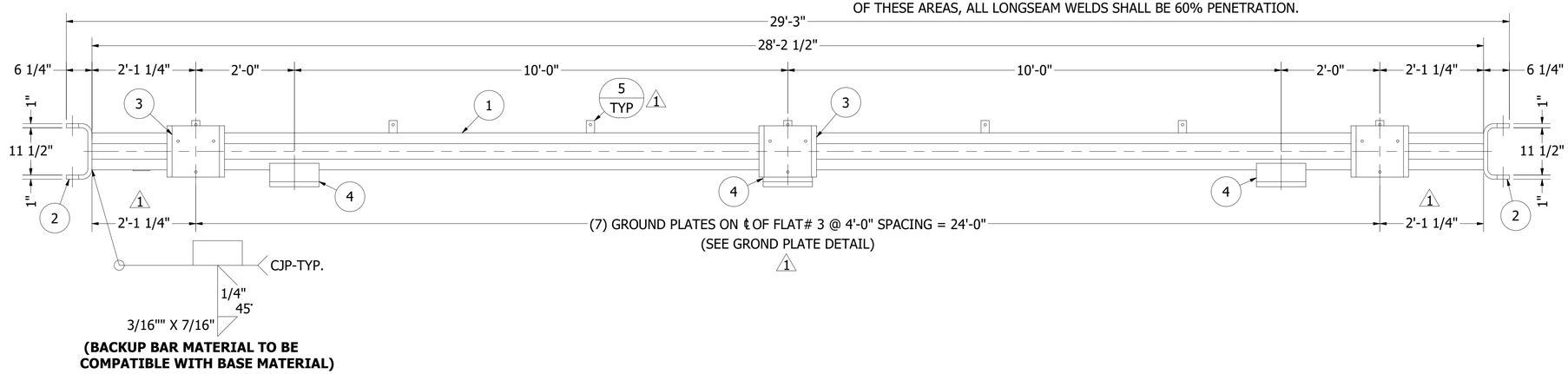
QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 853.79 lbs
TOTAL GALV WEIGHT = 905.02 lbs

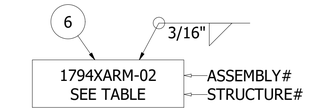
STRUCTURE/LINE# SUMMARY LIST		
ASSY#	STR TYPE	QTY
1794XARM-02	H-FRAME	2

NOTES:-

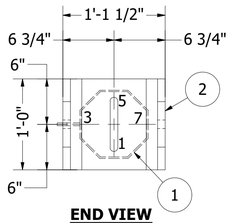
1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
4. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.



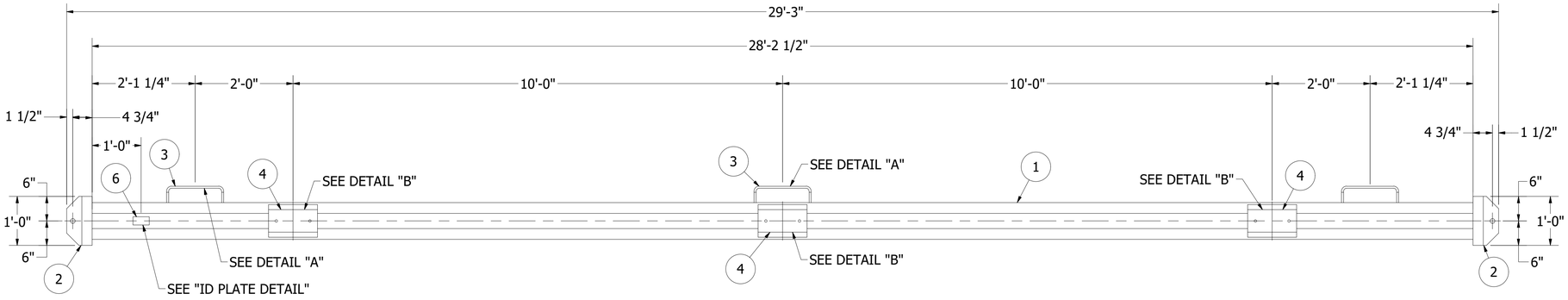
(BACKUP BAR MATERIAL TO BE COMPATIBLE WITH BASE MATERIAL)

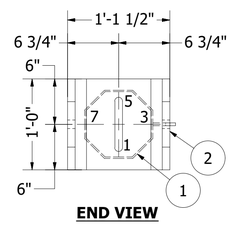


ID PLATE DETAIL



END VIEW





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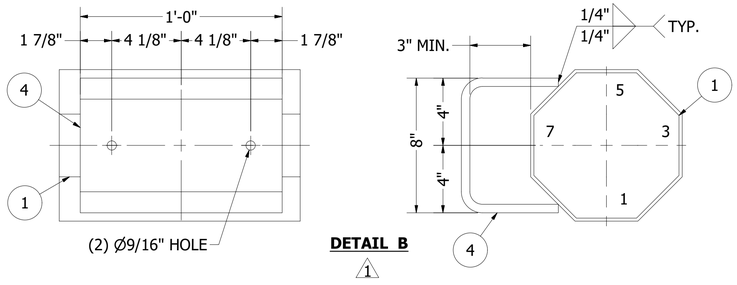

DETAIL B

△1

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1	08-10-20	REVISED AS PER COMMENTS.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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REF. DRAWING	NA
DATE	07-24-2020
DRAWN BY	KS
CHK'D. BY	NC
APP'D. BY	RKC
	29'-3" CROSS ARM ASSEMBLY STR# SEE CHART
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685
DRAWING NO.	1794XARM-02
SHEET NO.	
REV. NO.	1

1794XARM-02

BILL OF MATERIAL

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1794ARM-02	POLY-8, 3/16" X 9" X 9" X 28'-2 1/2"	NA	A572-65	524.96	524.96
2	2	1794BRKT-01	BRACKET 1" X 12" X 1'-10 5/16"	1794PD-01	A572-65	68.12	136.24
3	3	1794BRKT-03	BRACKET 1/2" X 12" X 1'-5 5/8"	1794PD-01	A572-65	29.91	89.73
4	1	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	1794PD-01	S.S.	0.43	0.43

△1

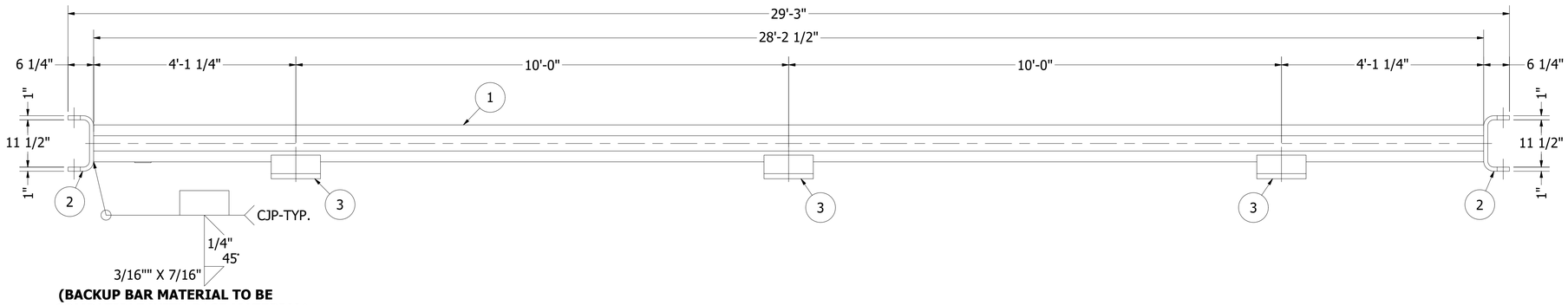
QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (2) REQUIRED.

TOTAL BLACK WEIGHT = 751.36 lbs
TOTAL GALV WEIGHT = 796.45 lbs

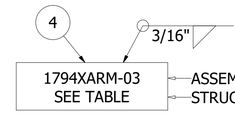
STRUCTURE/LINE# SUMMARY LIST		
ASSY#	**STR TYPE**	**QTY**
1794XARM-03	H-FRAME	2

NOTES:-

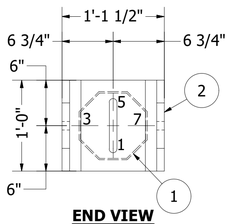
1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
4. LONGSEAM WELDS SHALL BE 100% PENETRATION WITHIN THE ENTIRE FEMALE SLIP JOINT LENGTH PLUS 6 INCHES. LONGSEAM WELDS SHALL ALSO BE 100% PENETRATION WITHIN 6 INCHES OF ALL CIRCUMFERENTIAL WELDS. OUTSIDE OF THESE AREAS, ALL LONGSEAM WELDS SHALL BE 60% PENETRATION.



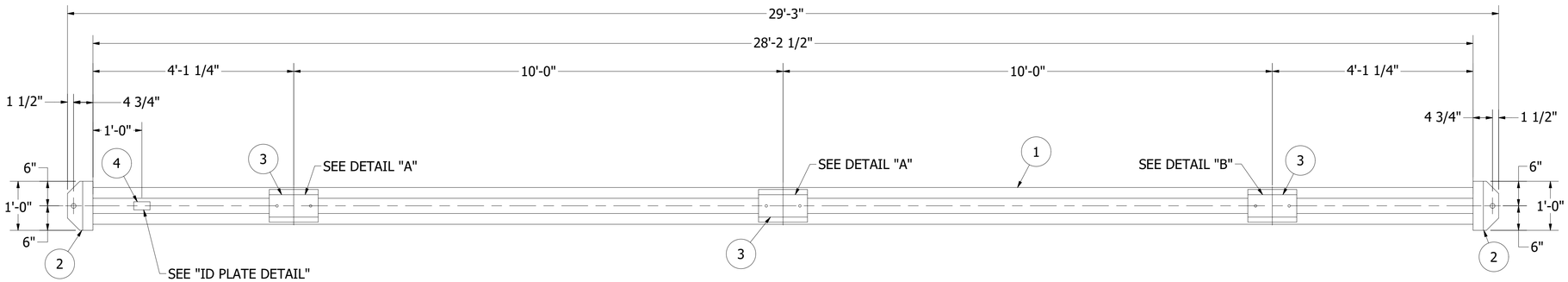
(BACKUP BAR MATERIAL TO BE COMPATIBLE WITH BASE MATERIAL)

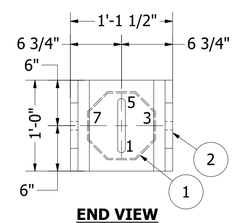


ID PLATE DETAIL

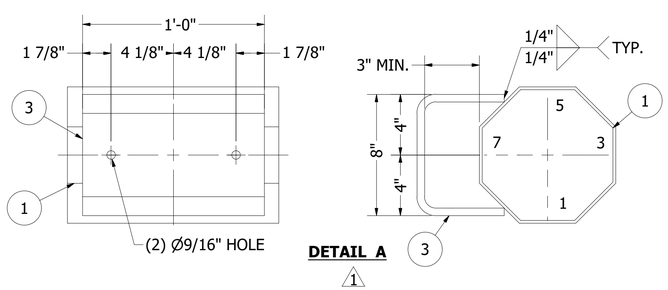


END VIEW





END VIEW



DETAIL A
△1

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1	08-10-20	REVISED AS PER COMMENTS.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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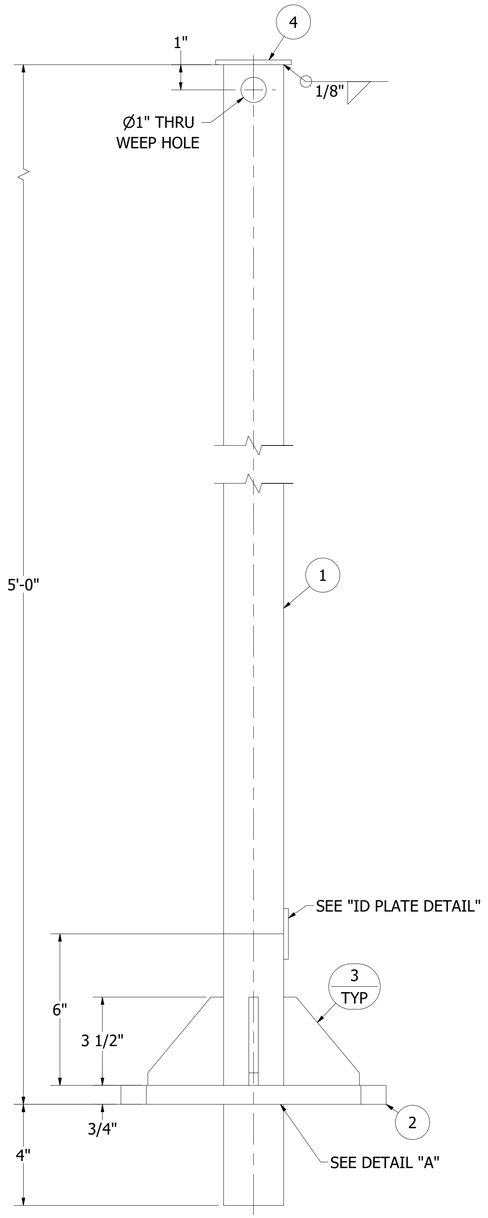
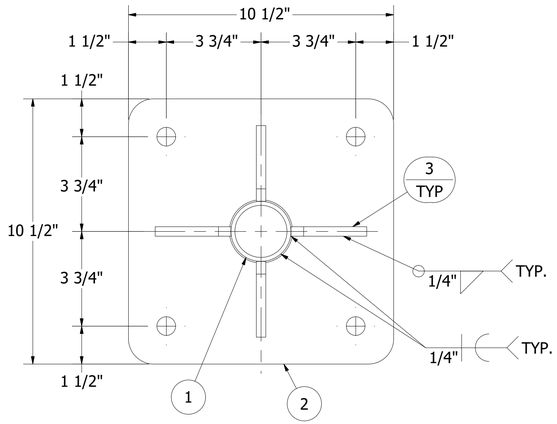
REF. DRAWING	NA
DATE	07-24-2020
DRAWN BY	KS
CHK'D. BY	NC
APP'D. BY	RKC
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685

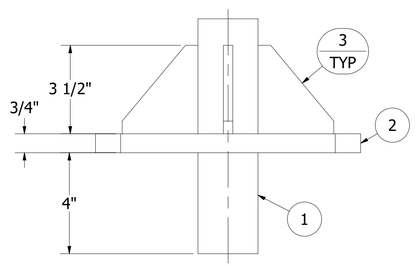
29'-3" CROSS ARM ASSEMBLY
STR# SEE CHART

DRAWING NO.	SHEET NO.	REV. NO.
1794XARM-03		1

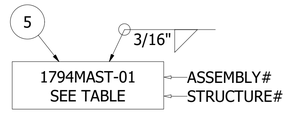
1794XARM-03







DETAIL A



ID PLATE DETAIL

BILL OF MATERIAL

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	DWG NO.	MATERIAL	UNIT BLACK WT.	EXTENDED BLACK WT.
1	1	1794PIPE-01	2"Ø X 5'-4" SCH.80 PIPE	NA	A500	19.41	19.41
2	1	1794PL-04	PLATE 3/4" X 10 1/2" X 0'-10 1/2"	1794PD-01	A572-65	21.82	21.82
3	4	1794STIFF-01	STIFFENER 3/8" X 3" X 0'-3 1/2"	1794PD-01	A572-65	0.72	2.87
4	1	1794MPC-01	3/16" X 3"Ø O.D. CAP PLATE	1794PD-01	A572-65	0.38	0.38
5	1	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	1794PD-01	S.S.	0.43	0.43

QUANTITIES IN BILL OF MATERIAL FOR (1) ASSEMBLY ONLY. (4) REQUIRED.

TOTAL BLACK WEIGHT = 44.91 lbs
TOTAL GALV WEIGHT = 47.61 lbs

STRUCTURE/LINE# SUMMARY LIST		
ASSY#	**STR TYPE**	**QTY**
1794MAST-01	H-FRAME	4

NOTES:-

1. IDENTIFICATION TAG SHALL BE MARKED WITH 1/2 INCH HIGH LETTERS.
2. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWSC CODE AWS D1.1.
3. ALL STEEL POLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1				

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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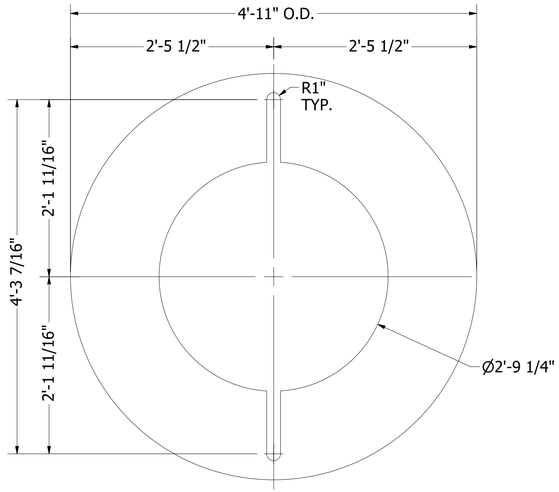
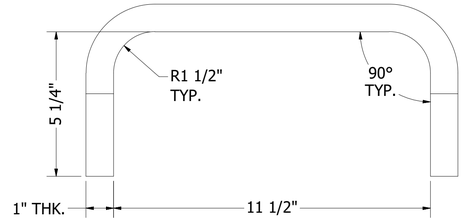
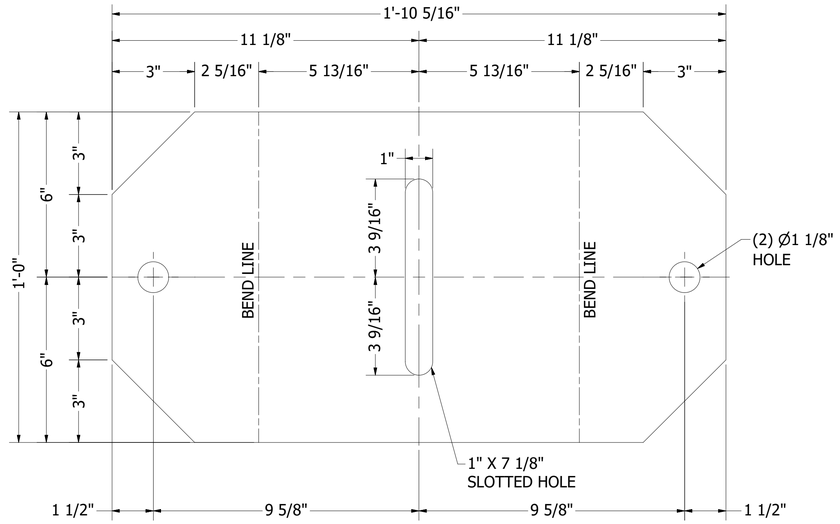
REF. DRAWING	NA
DATE	07-24-2020
5'-0" MAST ASSEMBLY STR# SEE CHART	
DRAWN BY: KS	CHK'D. BY: NC
APP'D. BY: RKC	
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685
DRAWING NO.	1794MAST-01
SHEET NO.	
REV. NO.	0

1794MAST-01

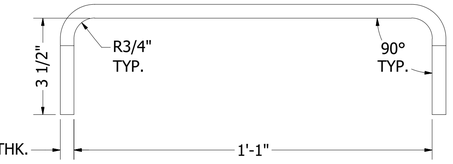


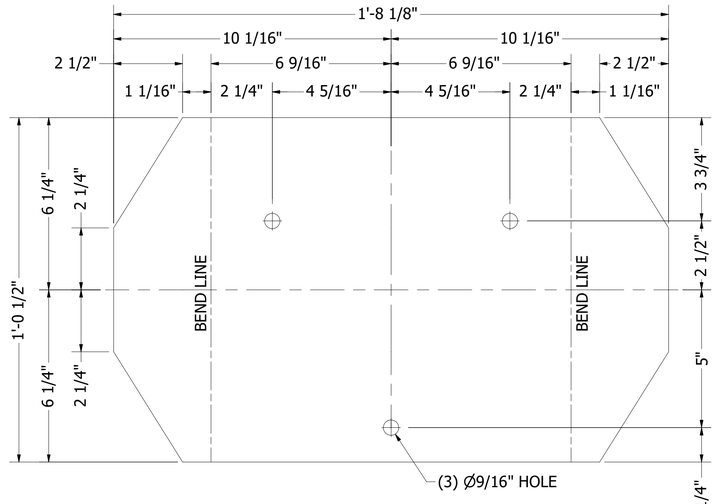
1794BP-01
(1/4" THK.)
2



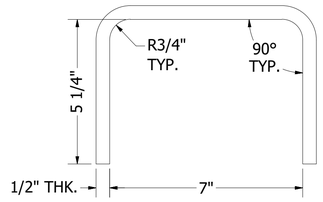


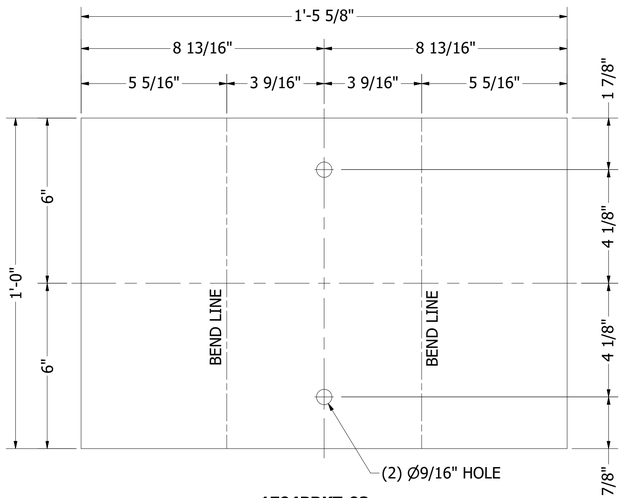
1794BRKT-01
(1" THK.)



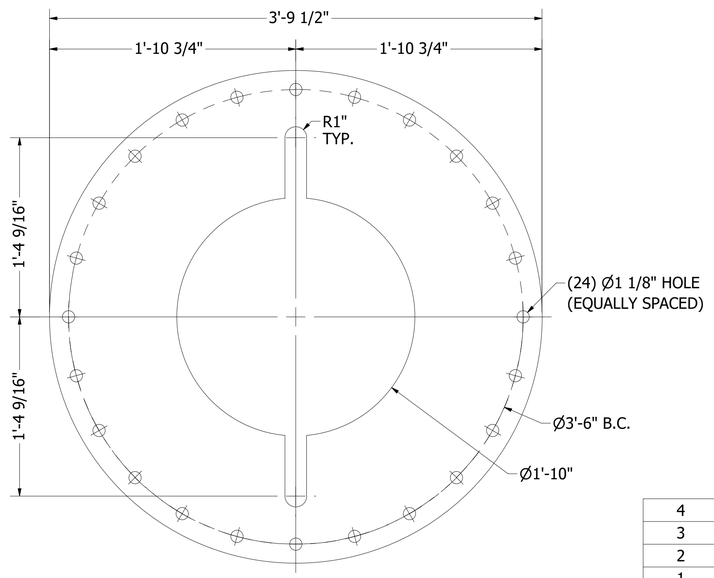


1794BRKT-02
(1/2" THK.)
1

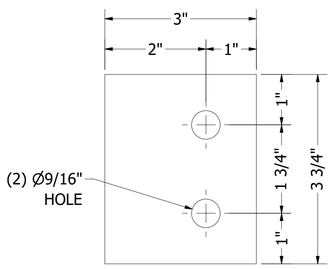




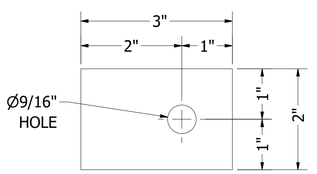
1794BRKT-03
(1/2" THK.)
1



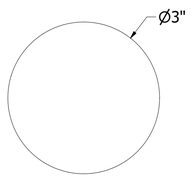
1794FP-01
(1 1/2" THK.)



1794GP-01
(3/8" THK.)



1794GP-02
(3/8" THK.)



1794MPC-01
(3/16" THK.)

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2	08-31-20	REVISED AS PER EDC.	KS	NC
1	08-10-20	REVISED AS PER COMMENTS.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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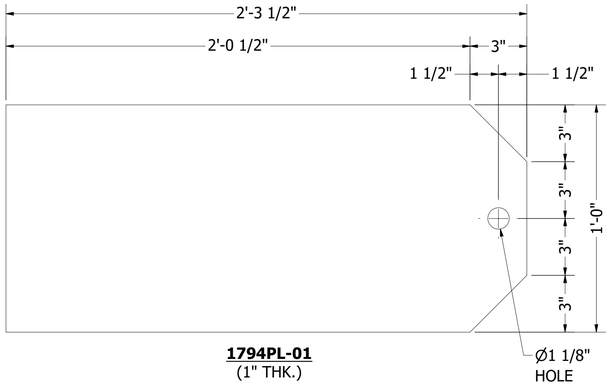
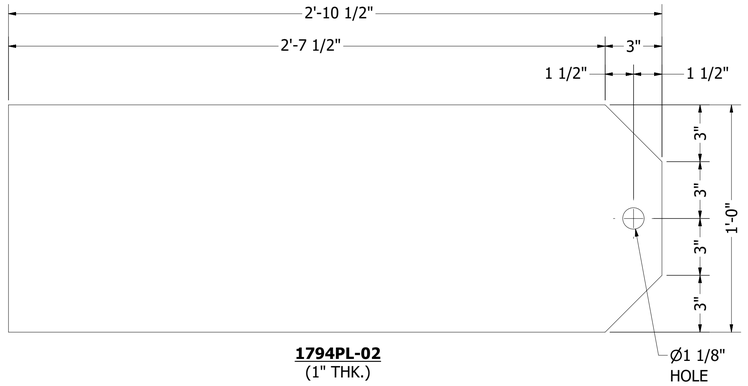
REF. DRAWING	NA		
DATE	07-24-2020		PARTS DETAIL
DRAWN BY: KS	CHK'D. BY: NC	APP'D. BY: RKC	
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685		
DRAWING NO.	SHEET NO.	REV. NO.	
1794PD-01	1 OF 3	2	

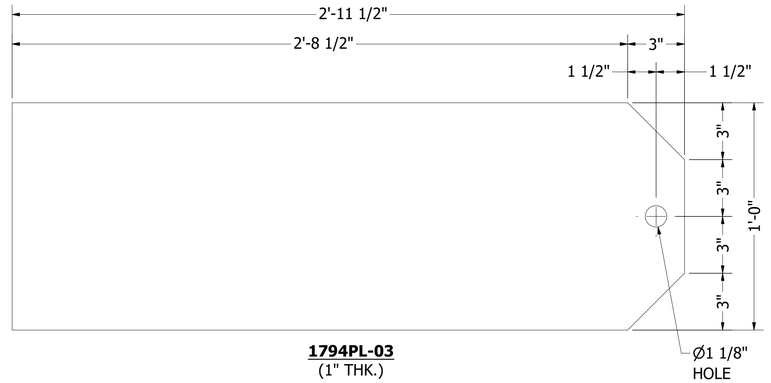
1794PD-01



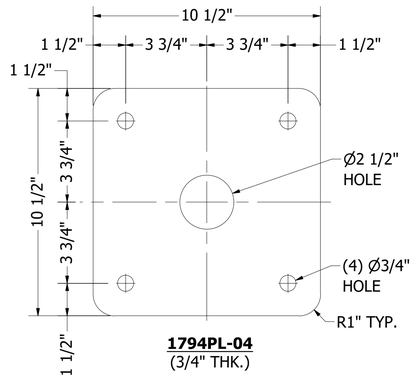
1794PL-01
(1" THK.)



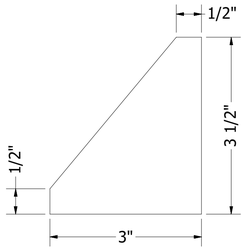
1794PL-02
(1" THK.)



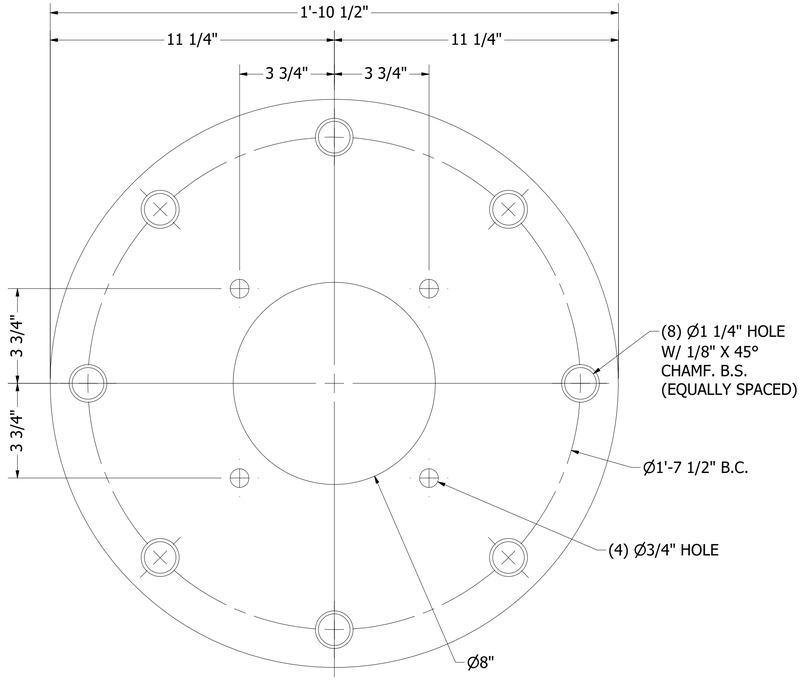
1794PL-03
(1" THK.)



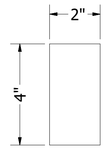
1794PL-04
(3/4" THK.)



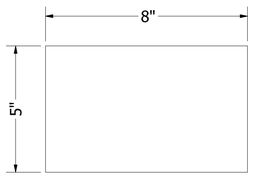
1794STIFF-01
(3/8" THK.)



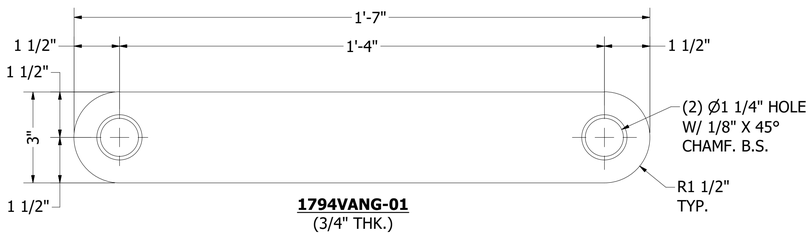
1794TR-01
(3/4" THK.)



ID-C24
(3/16" THK.)



ID-C58
(3/16" THK.)



1794VANG-01
(3/4" THK.)

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2				
1				

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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REF. DRAWING	NA		
DATE	07-24-2020		PARTS DETAIL
DRAWN BY: KS	CHK'D. BY: NC	APP'D. BY: RKC	
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685		
DRAWING NO. 1794PD-01	SHEET NO. 2 OF 3	REV. NO. 0	

1794PD-01

BILL OF MATERIAL

	ITEM	PART NUMBER	DESCRIPTION	MATERIAL	THK	UNIT WT.	NET WT.	QTY
2	1	1794BP-01	BEARING PLATE 1/4" X 4'-11" O.D.	A572-65	1/4"	129.28	517.11	4
	2	1794BRKT-01	BRACKET 1" X 12" X 1'-10 5/16"	A572-65	1"	68.12	817.42	12
1	3	1794BRKT-02	BRACKET 1/2" X 12 1/2" X 1'-8 1/8"	A572-65	1/2"	32.72	196.30	6
1	4	1794BRKT-03	BRACKET 1/2" X 12" X 1'-5 5/8"	A572-65	1/2"	29.91	358.92	12
	5	1794FP-01	FLANGE PLATE 1 1/2" X 3'-9 1/2" OD	A572-50	1 1/2"	508.37	4066.93	8
	6	1794GP-01	GROUND PLATE 3/8" X 3" X 0-3 3/4" LG	A572-65	3/8"	1.14	4.57	4
1	7	1794GP-02	GROUND PLATE 3/8" X 2" X 0-3" LG	A572-65	3/8"	.61	45.26	74
	8	1794MPC-01	3/16" X 3"Ø O.D. CAP PLATE	A572-65	3/16"	.38	1.50	4
	9	1794PL-01	THRU PLATE 1" X 12" X 2'-3 1/2"	A572-65	1"	90.64	725.10	8
	10	1794PL-02	THRU PLATE 1" X 12" X 2'-10 1/2"	A572-65	1"	114.43	915.44	8
	11	1794PL-03	THRU PLATE 1" X 12" X 2'-11 1/2"	A572-65	1"	117.83	942.63	8
	12	1794PL-04	PLATE 3/4" X 10 1/2" X 0'-10 1/2"	A572-65	3/4"	21.82	87.28	4
	13	1794STIFF-01	STIFFENER 3/8" X 3" X 0'-3 1/2"	A572-65	3/8"	.72	11.47	16
	14	1794TR-01	TOP RING 3/4" X 1'-10 1/2" O.D.	A572-65	3/4"	71.18	284.70	4
	15	1794VANG-01	VANG 3/4" X 3" X 1'-7" LG	A572-65	3/4"	11.14	66.84	6
	16	ID-C24	IDENTIFICATION TAG 3/16" X 2" X 0'-4"	S.S.	3/16"	.43	6.07	14
	17	ID-C58	IDENTIFICATION PLATE 3/16" X 5" X 0'-8"	S.S.	3/16"	2.17	8.67	4

TOTAL WT. = 9056.21 lbs

NO	DATE	DESCRIPTION	COMPL BY	CHKD BY
4				
3				
2	08-31-20	REVISED AS PER EDC.	KS	NC
1	08-10-20	REVISED AS PER COMMENTS.	KS	NC

FOR APPROVAL (09-10-2020)

SUMMIT UTILITY STRUCTURES
225 KIWANIS BLVD.
WEST HAZLETON, PA 18202

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REF. DRAWING	NA		
DATE	07-24-2020		PARTS DETAIL
DRAWN BY: KS	CHK'D. BY: NC	APP'D. BY: RKC	
PROJECT	GUC - #20-26 SUGG PARKWAY SUBSTATION SUBSTATION ENTERPRISES SUS# 001794, PO# 31869-5685		
DRAWING NO.	SHEET NO.	REV. NO.	
1794PD-01	3 OF 3	2	

Appendix E: Sag-Tension Charts

Greenville Utilities Commission
Substation H-Frames - Structures 1 & 2

Span Geometry and Properties
  Span Horizontal Projection 164 (ft)
  Span Vertical Projection 10 (ft)
  Sagging Wire Temperature 60 (deg F)
  Sagging Wire Condition 'Initial'
  Sagging Method 'Autosag'
  Sagging Wire to Automatic Sagging Tension Limits
  Sagging Horizontal Component of Tension 2269.4 (lbs)
  Sagging Mid Span Sag 1.76944 (ft) (equivalent to input sagging tension)

Cable Data Report
  Name and description: narcissus_aac.wir 1272 kcmil 61/0 Strands NARCISSUS AAC
  Cable model: Nonlinear cable model (separate polynomials for initial and creep behavior for inner and outer materials).
  Cross section area 0.999000 (in^2)
  Weight per unit length 1.192 (lbs/ft)
  Outside diameter 1.3 (in)
  Ultimate tension 22000 (lbs)

Stringing Chart Report

Note: Temperature and condition above are program supplied defaults used for automatic sagging.
Weather case for final after creep 60 Deg F, Equivalent to 14.6 (deg F) temperature increase
Weather cases for final after load:
  'NESC Medium District Loading (250B)'
  'NESC Extreme Wind (250C)'
  'NESC Concurrent Ice and Wind (250D)' (controlling case), Equivalent to 17.4 (deg F) temperature increase
  'Extreme Ice'
Results below for condition 'Initial RS'
Calculations assume equal attachment height elevations

Span Length	Mid Span Sag 20 F	Mid Span Sag 30 F	Mid Span Sag 40 F	Mid Span Sag 50 F	Mid Span Sag 60 F	Mid Span Sag 70 F	Mid Span Sag 80 F	Mid Span Sag 90 F	Mid Span Sag 100 F
(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)
100-0	0-4	0-5	0-6	0-7	0-8	0-9	0-10	0-11	1-0
110-0	0-5	0-6	0-7	0-8	0-10	0-11	1-0	1-1	1-2
120-0	0-6	0-7	0-8	0-10	0-11	1-1	1-2	1-4	1-5
130-0	0-7	0-9	0-10	1-0	1-1	1-3	1-5	1-7	1-8
140-0	0-8	0-10	1-0	1-1	1-3	1-6	1-8	1-9	1-11
150-0	0-10	0-11	1-1	1-3	1-6	1-8	1-10	2-1	2-3
160-0	0-11	1-1	1-3	1-6	1-8	1-11	2-2	2-4	2-7
170-0	1-1	1-3	1-5	1-8	1-11	2-2	2-5	2-8	2-10
180-0	1-2	1-4	1-7	1-10	2-2	2-5	2-8	3-0	3-3
190-0	1-4	1-6	1-9	2-1	2-4	2-8	3-0	3-4	3-7
200-0	1-5	1-8	2-0	2-3	2-8	3-0	3-4	3-8	4-0
210-0	1-7	1-10	2-2	2-6	2-11	3-3	3-8	4-0	4-5
220-0	1-9	2-0	2-5	2-9	3-2	3-7	4-0	4-5	4-10
230-0	1-11	2-3	2-7	3-0	3-6	3-11	4-5	4-10	5-3
240-0	2-1	2-5	2-10	3-4	3-9	4-3	4-9	5-3	5-9
250-0	2-3	2-7	3-1	3-7	4-1	4-8	5-2	5-9	6-3
260-0	2-5	2-10	3-4	3-10	4-5	5-0	5-7	6-2	6-9
270-0	2-8	3-1	3-7	4-2	4-9	5-5	6-1	6-8	7-3
280-0	2-10	3-3	3-10	4-6	5-2	5-10	6-6	7-2	7-9
290-0	3-0	3-6	4-2	4-10	5-6	6-3	7-0	7-8	8-4
300-0	3-3	3-9	4-5	5-2	5-11	6-8	7-6	8-3	8-11
310-0	3-6	4-0	4-9	5-6	6-4	7-2	8-0	8-9	9-7
320-0	3-8	4-4	5-0	5-10	6-9	7-8	8-6	9-4	10-2
330-0	3-11	4-7	5-4	6-3	7-2	8-1	9-1	9-11	10-10
340-0	4-2	4-10	5-8	6-7	7-7	8-7	9-7	10-7	11-6
350-0	4-5	5-2	6-0	7-0	8-1	9-2	10-2	11-2	12-2
360-0	4-8	5-5	6-4	7-5	8-6	9-8	10-9	11-10	12-11
370-0	4-11	5-9	6-9	7-10	9-0	10-2	11-5	12-6	13-7
380-0	5-2	6-1	7-1	8-3	9-6	10-9	12-0	13-2	14-4
390-0	5-6	6-5	7-6	8-8	10-0	11-4	12-8	13-11	15-2

Horiz Tension 20 F (lbs)	Horiz Tension 30 F (lbs)	Horiz Tension 40 F (lbs)	Horiz Tension 50 F (lbs)	Horiz Tension 60 F (lbs)	Horiz Tension 70 F (lbs)	Horiz Tension 80 F (lbs)	Horiz Tension 90 F (lbs)	Horiz Tension 100 F (lbs)
4133	3550	3036	2608	2269	2002	1794	1632	1501

Greenville Utilities Commission
1272 AAC Narcissus

Span Geometry and Properties
Span Horizontal Projection 250 (ft)
Span Vertical Projection 0 (ft)
Sagging Wire Temperature 60 (deg F)
Sagging Wire Condition 'Initial'
Sagging Method 'Autosag'
Sagging Wire to Automatic Sagging Tension Limits
Sagging Horizontal Component of Tension 4325.6 (lbs)
Sagging Mid Span Sag 2.15309 (ft) (equivalent to input sagging tension)

Cable Data Report
Name and description: narcissus_aac.wir 1272 kcmil 61/0 Strands NARCISSUS AAC - Adapted from 1970's Publicly Available Data
Cable model: Nonlinear cable model (separate polynomials for initial and creep behavior for inner and outer materials).
Cross section area 0.999000 (in^2)
Weight per unit length 1.192 (lbs/ft)
Outside diameter 1.3 (in)
Ultimate tension 22000 (lbs)

Stringing Chart Report

Note: Temperature and condition above are program supplied defaults used for automatic sagging.
Weather case for final after creep 60 Deg F, Equivalent to 28.7 (deg F) temperature increase
Weather cases for final after load:
'NESC Medium District Loading (250B)'
'NESC Extreme Wind (250C)'
'NESC Concurrent Ice and Wind (250D)' (controlling case), Equivalent to 27.2 (deg F) temperature increase
'Extreme Ice'
Results below for condition 'Initial RS'
Calculations assume equal attachment height elevations

Span Length (ft)	Mid Span Sag 20 F (ft)	Mid Span Sag 30 F (ft)	Mid Span Sag 40 F (ft)	Mid Span Sag 50 F (ft)	Mid Span Sag 60 F (ft)	Mid Span Sag 70 F (ft)	Mid Span Sag 80 F (ft)	Mid Span Sag 90 F (ft)	Mid Span Sag 100 F (ft)
100.0	0.23	0.25	0.28	0.31	0.34	0.39	0.43	0.48	0.53
110.0	0.27	0.30	0.33	0.37	0.42	0.47	0.52	0.58	0.64
120.0	0.33	0.36	0.40	0.44	0.50	0.56	0.62	0.69	0.76
130.0	0.38	0.42	0.47	0.52	0.58	0.65	0.73	0.81	0.90
140.0	0.44	0.49	0.54	0.60	0.68	0.76	0.85	0.94	1.04
150.0	0.51	0.56	0.62	0.69	0.78	0.87	0.97	1.08	1.19
160.0	0.58	0.64	0.71	0.79	0.88	0.99	1.11	1.23	1.36
170.0	0.65	0.72	0.80	0.89	1.00	1.12	1.25	1.39	1.53
180.0	0.73	0.81	0.89	1.00	1.12	1.25	1.40	1.56	1.72
190.0	0.82	0.90	1.00	1.11	1.24	1.40	1.56	1.73	1.91
200.0	0.90	0.99	1.10	1.23	1.38	1.55	1.73	1.92	2.12
210.0	1.00	1.10	1.22	1.36	1.52	1.71	1.91	2.12	2.34
220.0	1.09	1.20	1.33	1.49	1.67	1.87	2.09	2.32	2.56
230.0	1.20	1.32	1.46	1.63	1.82	2.05	2.29	2.54	2.80
240.0	1.30	1.43	1.59	1.77	1.98	2.23	2.49	2.77	3.05
250.0	1.41	1.55	1.72	1.92	2.15	2.42	2.70	3.00	3.31
260.0	1.53	1.68	1.86	2.08	2.33	2.61	2.92	3.25	3.58
270.0	1.65	1.81	2.01	2.24	2.51	2.82	3.15	3.50	3.86
280.0	1.77	1.95	2.16	2.41	2.70	3.03	3.39	3.77	4.16
290.0	1.90	2.09	2.32	2.59	2.90	3.25	3.63	4.04	4.46
300.0	2.03	2.24	2.48	2.77	3.10	3.48	3.89	4.32	4.77
310.0	2.17	2.39	2.65	2.96	3.31	3.72	4.15	4.62	5.09
320.0	2.31	2.55	2.82	3.15	3.53	3.96	4.42	4.92	5.43
330.0	2.46	2.71	3.00	3.35	3.75	4.21	4.71	5.23	5.77
340.0	2.61	2.87	3.19	3.56	3.98	4.47	4.99	5.55	6.13
350.0	2.77	3.05	3.38	3.77	4.22	4.74	5.29	5.88	6.49
360.0	2.93	3.22	3.57	3.99	4.46	5.01	5.60	6.23	6.87
370.0	3.09	3.40	3.78	4.21	4.72	5.29	5.92	6.58	7.26
380.0	3.26	3.59	3.98	4.44	4.97	5.59	6.24	6.94	7.66
390.0	3.44	3.78	4.19	4.68	5.24	5.88	6.57	7.31	8.06

Horiz Tension 20 F (lbs)	Horiz Tension 30 F (lbs)	Horiz Tension 40 F (lbs)	Horiz Tension 50 F (lbs)	Horiz Tension 60 F (lbs)	Horiz Tension 70 F (lbs)	Horiz Tension 80 F (lbs)	Horiz Tension 90 F (lbs)	Horiz Tension 100 F (lbs)
6594	5994	5404	4844	4326	3853	3450	3103	2812

Greenville Utilities Commission
795 AAC Arbutus

Span Geometry and Properties
Span Horizontal Projection 250 (ft)
Span Vertical Projection 0 (ft)
Sagging Wire Temperature 60 (deg F)
Sagging Wire Condition 'Initial'
Sagging Method 'Autosag'
Sagging Wire to Automatic Sagging Tension Limits
Sagging Horizontal Component of Tension 2785.6 (lbs)
Sagging Mid Span Sag 2.08962 (ft) (equivalent to input sagging tension)

Cable Data Report
Name and description: arbutus_aac.wir 795 kcmil 37/0 Strands ARBUTUS AAC - Adapted from 1970's Publicly Available Data
Cable model: Nonlinear cable model (separate polynomials for initial and creep behavior for inner and outer materials).
Cross section area 0.624500 (in^2)
Weight per unit length 0.745 (lbs/ft)
Outside diameter 1.026 (in)
Ultimate tension 13900 (lbs)

Stringing Chart Report

Note: Temperature and condition above are program supplied defaults used for automatic sagging.
Weather case for final after creep 60 Deg F, Equivalent to 29.7 (deg F) temperature increase
Weather cases for final after load:
'NESC Medium District Loading (250B)'
'NESC Extreme Wind (250C)'
'NESC Concurrent Ice and Wind (250D)' (controlling case), Equivalent to 27.2 (deg F) temperature increase
'Extreme Ice'
Results below for condition 'Initial RS'
Calculations assume equal attachment height elevations

Span Length (ft)	Mid Span Sag 20 F (ft)	Mid Span Sag 30 F (ft)	Mid Span Sag 40 F (ft)	Mid Span Sag 50 F (ft)	Mid Span Sag 60 F (ft)	Mid Span Sag 70 F (ft)	Mid Span Sag 80 F (ft)	Mid Span Sag 90 F (ft)	Mid Span Sag 100 F (ft)
100.0	0.21	0.24	0.26	0.30	0.33	0.38	0.42	0.47	0.53
110.0	0.26	0.29	0.32	0.36	0.40	0.46	0.51	0.57	0.64
120.0	0.31	0.34	0.38	0.43	0.48	0.54	0.61	0.68	0.76
130.0	0.36	0.40	0.45	0.50	0.57	0.64	0.72	0.80	0.89
140.0	0.42	0.47	0.52	0.58	0.66	0.74	0.83	0.93	1.03
150.0	0.48	0.53	0.59	0.67	0.75	0.85	0.96	1.07	1.18
160.0	0.55	0.61	0.68	0.76	0.86	0.97	1.09	1.22	1.34
170.0	0.62	0.69	0.76	0.86	0.97	1.09	1.23	1.37	1.52
180.0	0.70	0.77	0.86	0.96	1.08	1.22	1.38	1.54	1.70
190.0	0.78	0.86	0.95	1.07	1.21	1.36	1.53	1.71	1.90
200.0	0.86	0.95	1.06	1.19	1.34	1.51	1.70	1.90	2.10
210.0	0.95	1.05	1.17	1.31	1.48	1.67	1.87	2.09	2.32
220.0	1.04	1.15	1.28	1.44	1.62	1.83	2.06	2.30	2.54
230.0	1.14	1.26	1.40	1.57	1.77	2.00	2.25	2.51	2.78
240.0	1.24	1.37	1.52	1.71	1.93	2.18	2.45	2.74	3.02
250.0	1.34	1.48	1.65	1.86	2.09	2.36	2.65	2.97	3.28
260.0	1.45	1.60	1.79	2.01	2.26	2.55	2.87	3.21	3.55
270.0	1.57	1.73	1.93	2.16	2.44	2.75	3.10	3.46	3.83
280.0	1.68	1.86	2.07	2.33	2.62	2.96	3.33	3.72	4.12
290.0	1.81	2.00	2.22	2.50	2.82	3.18	3.57	3.99	4.42
300.0	1.93	2.14	2.38	2.67	3.01	3.40	3.82	4.27	4.73
310.0	2.06	2.28	2.54	2.85	3.22	3.63	4.08	4.56	5.05
320.0	2.20	2.43	2.71	3.04	3.43	3.87	4.35	4.86	5.38
330.0	2.34	2.58	2.88	3.23	3.65	4.12	4.62	5.17	5.72
340.0	2.48	2.74	3.05	3.43	3.87	4.37	4.91	5.49	6.07
350.0	2.63	2.91	3.24	3.64	4.10	4.63	5.20	5.82	6.43
360.0	2.78	3.08	3.43	3.85	4.34	4.90	5.50	6.16	6.81
370.0	2.94	3.25	3.62	4.06	4.58	5.17	5.81	6.50	7.19
380.0	3.10	3.43	3.82	4.29	4.83	5.46	6.13	6.86	7.59
390.0	3.27	3.61	4.02	4.52	5.09	5.75	6.46	7.23	7.99

Horiz Tension 20 F (lbs)	Horiz Tension 30 F (lbs)	Horiz Tension 40 F (lbs)	Horiz Tension 50 F (lbs)	Horiz Tension 60 F (lbs)	Horiz Tension 70 F (lbs)	Horiz Tension 80 F (lbs)	Horiz Tension 90 F (lbs)	Horiz Tension 100 F (lbs)
4337	3924	3524	3138	2782	2465	2193	1961	1774

Greenville Utilities Commission
336 ACSR Merlin

Span Geometry and Properties
Span Horizontal Projection 250 (ft)
Span Vertical Projection 0 (ft)
Sagging Wire Temperature 60 (deg F)
Sagging Wire Condition 'Initial'
Sagging Method 'Autosag'
Sagging Wire to Automatic Sagging Tension Limits
Sagging Horizontal Component of Tension 1760.2 (lbs)
Sagging Mid Span Sag 1.62011 (ft) (equivalent to input sagging tension)

Cable Data Report
Name and description: merlin_acsr.wir 336.4 kcmil 18/1 Strands MERLIN ACSR - Adapted from 1970's Publicly Available Data
Cable model: Nonlinear cable model (separate polynomials for initial and creep behavior for inner and outer materials).
Cross section area 0.278900 (in^2)
Weight per unit length 0.365 (lbs/ft)
Outside diameter 0.684 (in)
Ultimate tension 8680 (lbs)

Stringing Chart Report

Note: Temperature and condition above are program supplied defaults used for automatic sagging.
Weather case for final after creep 60 Deg F, Equivalent to 29.4 (deg F) temperature increase
Weather cases for final after load:
'NESC Medium District Loading (250B)'
'NESC Extreme Wind (250C)'
'NESC Concurrent Ice and Wind (250D)' (controlling case), Equivalent to 37.8 (deg F) temperature increase
'Extreme Ice'
Results below for condition 'Initial RS'
Calculations assume equal attachment height elevations

Span Length (ft)	Mid Span Sag 20 F (ft)	Mid Span Sag 30 F (ft)	Mid Span Sag 40 F (ft)	Mid Span Sag 50 F (ft)	Mid Span Sag 60 F (ft)	Mid Span Sag 70 F (ft)	Mid Span Sag 80 F (ft)	Mid Span Sag 90 F (ft)	Mid Span Sag 100 F (ft)
100.0	0.17	0.19	0.21	0.23	0.26	0.29	0.33	0.38	0.42
110.0	0.21	0.23	0.25	0.28	0.31	0.35	0.40	0.46	0.51
120.0	0.25	0.27	0.30	0.33	0.37	0.42	0.48	0.54	0.61
130.0	0.29	0.32	0.35	0.39	0.44	0.50	0.56	0.64	0.72
140.0	0.34	0.37	0.41	0.45	0.51	0.57	0.65	0.74	0.83
150.0	0.39	0.43	0.47	0.52	0.58	0.66	0.75	0.85	0.95
160.0	0.44	0.48	0.53	0.59	0.66	0.75	0.85	0.96	1.08
170.0	0.50	0.55	0.60	0.67	0.75	0.85	0.96	1.09	1.22
180.0	0.56	0.61	0.68	0.75	0.84	0.95	1.08	1.22	1.37
190.0	0.63	0.68	0.75	0.84	0.94	1.06	1.20	1.36	1.53
200.0	0.69	0.76	0.83	0.93	1.04	1.17	1.33	1.51	1.69
210.0	0.77	0.84	0.92	1.02	1.14	1.29	1.47	1.66	1.87
220.0	0.84	0.92	1.01	1.12	1.26	1.42	1.61	1.82	2.05
230.0	0.92	1.00	1.10	1.22	1.37	1.55	1.76	1.99	2.24
240.0	1.00	1.09	1.20	1.33	1.49	1.69	1.91	2.17	2.44
250.0	1.09	1.18	1.30	1.45	1.62	1.83	2.08	2.35	2.65
260.0	1.17	1.28	1.41	1.56	1.75	1.98	2.25	2.55	2.86
270.0	1.27	1.38	1.52	1.69	1.89	2.14	2.42	2.75	3.09
280.0	1.36	1.49	1.63	1.81	2.03	2.30	2.60	2.95	3.32
290.0	1.46	1.59	1.75	1.95	2.18	2.46	2.79	3.17	3.56
300.0	1.56	1.70	1.88	2.08	2.34	2.64	2.99	3.39	3.81
310.0	1.67	1.82	2.00	2.22	2.49	2.82	3.19	3.62	4.07
320.0	1.78	1.94	2.13	2.37	2.66	3.00	3.40	3.86	4.34
330.0	1.89	2.06	2.27	2.52	2.83	3.19	3.62	4.10	4.61
340.0	2.01	2.19	2.41	2.68	3.00	3.39	3.84	4.35	4.90
350.0	2.13	2.32	2.55	2.84	3.18	3.59	4.07	4.61	5.19
360.0	2.25	2.45	2.70	3.00	3.36	3.80	4.31	4.88	5.49
370.0	2.38	2.59	2.85	3.17	3.55	4.01	4.55	5.16	5.80
380.0	2.51	2.74	3.01	3.34	3.75	4.23	4.80	5.44	6.12
390.0	2.64	2.88	3.17	3.52	3.95	4.46	5.05	5.73	6.44

Horiz Tension 20 F (lbs)	Horiz Tension 30 F (lbs)	Horiz Tension 40 F (lbs)	Horiz Tension 50 F (lbs)	Horiz Tension 60 F (lbs)	Horiz Tension 70 F (lbs)	Horiz Tension 80 F (lbs)	Horiz Tension 90 F (lbs)	Horiz Tension 100 F (lbs)
2627	2409	2189	1971	1758	1557	1373	1212	1077

Greenville Utilities Commission
7 #9 Alumoweld

Span Geometry and Properties
Span Horizontal Projection 250 (ft)
Span Vertical Projection 0 (ft)
Sagging Wire Temperature 60 (deg F)
Sagging Wire Condition 'Initial'
Sagging Method 'Autosag'
Sagging Wire to Automatic Sagging Tension Limits
Sagging Horizontal Component of Tension 819.3 (lbs)
Sagging Mid Span Sag 1.97975 (ft) (equivalent to input sagging tension)

Cable Data Report
Name and description: 7no_9_alumoweld.wir 7#9 Alumoweld 7 Strands Alumoweld - Adapted from 1970's Publicly Available Data
Cable model: Nonlinear cable model (separate polynomials for initial and creep behavior for inner and outer materials).
Cross section area 0.071980 (in^2)
Weight per unit length 0.2076 (lbs/ft)
Outside diameter 0.343 (in)
Ultimate tension 12630 (lbs)

Stringing Chart Report

Note: Temperature and condition above are program supplied defaults used for automatic sagging.
Weather case for final after creep 60 Deg F, Equivalent to 19.2 (deg F) temperature increase
Weather cases for final after load:
'NESC Medium District Loading (250B)'
'NESC Extreme Wind (250C)'
'NESC Concurrent Ice and Wind (250D)' (controlling case), Equivalent to 15.6 (deg F) temperature increase
'Extreme Ice'
Results below for condition 'Initial RS'
Calculations assume equal attachment height elevations

Span Length (ft)	Mid Span Sag 20 F (ft)	Mid Span Sag 30 F (ft)	Mid Span Sag 40 F (ft)	Mid Span Sag 50 F (ft)	Mid Span Sag 60 F (ft)	Mid Span Sag 70 F (ft)	Mid Span Sag 80 F (ft)	Mid Span Sag 90 F (ft)	Mid Span Sag 100 F (ft)
100.0	0.23	0.25	0.27	0.29	0.32	0.34	0.37	0.40	0.43
110.0	0.28	0.30	0.33	0.35	0.38	0.42	0.45	0.49	0.52
120.0	0.33	0.36	0.39	0.42	0.46	0.50	0.54	0.58	0.62
130.0	0.39	0.42	0.46	0.49	0.54	0.58	0.63	0.68	0.73
140.0	0.45	0.49	0.53	0.57	0.62	0.67	0.73	0.79	0.84
150.0	0.52	0.56	0.61	0.66	0.71	0.77	0.84	0.90	0.97
160.0	0.59	0.63	0.69	0.75	0.81	0.88	0.95	1.03	1.10
170.0	0.66	0.72	0.78	0.84	0.92	0.99	1.08	1.16	1.25
180.0	0.74	0.80	0.87	0.95	1.03	1.11	1.21	1.30	1.40
190.0	0.83	0.90	0.97	1.06	1.15	1.24	1.34	1.45	1.56
200.0	0.92	0.99	1.08	1.17	1.27	1.38	1.49	1.61	1.72
210.0	1.01	1.09	1.19	1.29	1.40	1.52	1.64	1.77	1.90
220.0	1.11	1.20	1.30	1.41	1.54	1.66	1.80	1.94	2.09
230.0	1.21	1.31	1.43	1.55	1.68	1.82	1.97	2.12	2.28
240.0	1.32	1.43	1.55	1.68	1.83	1.98	2.14	2.31	2.48
250.0	1.43	1.55	1.68	1.83	1.98	2.15	2.33	2.51	2.69
260.0	1.55	1.68	1.82	1.98	2.14	2.32	2.52	2.71	2.91
270.0	1.67	1.81	1.96	2.13	2.31	2.51	2.71	2.93	3.14
280.0	1.80	1.94	2.11	2.29	2.49	2.70	2.92	3.15	3.38
290.0	1.93	2.09	2.27	2.46	2.67	2.89	3.13	3.38	3.63
300.0	2.06	2.23	2.42	2.63	2.85	3.10	3.35	3.61	3.88
310.0	2.20	2.38	2.59	2.81	3.05	3.31	3.58	3.86	4.14
320.0	2.35	2.54	2.76	2.99	3.25	3.52	3.81	4.11	4.41
330.0	2.50	2.70	2.93	3.18	3.45	3.75	4.05	4.37	4.69
340.0	2.65	2.87	3.11	3.38	3.67	3.98	4.30	4.64	4.98
350.0	2.81	3.04	3.30	3.58	3.89	4.21	4.56	4.92	5.28
360.0	2.97	3.21	3.49	3.79	4.11	4.46	4.83	5.20	5.59
370.0	3.14	3.40	3.69	4.00	4.34	4.71	5.10	5.50	5.90
380.0	3.31	3.58	3.89	4.22	4.58	4.97	5.38	5.80	6.23
390.0	3.49	3.77	4.10	4.45	4.83	5.23	5.66	6.11	6.56

Horiz Tension 20 F (lbs)	Horiz Tension 30 F (lbs)	Horiz Tension 40 F (lbs)	Horiz Tension 50 F (lbs)	Horiz Tension 60 F (lbs)	Horiz Tension 70 F (lbs)	Horiz Tension 80 F (lbs)	Horiz Tension 90 F (lbs)	Horiz Tension 100 F (lbs)
1132	1046	963	888	818	755	697	647	602

Appendix F: Soil Boring Data

Geotechnical Engineering Report

Sugg Parkway Substation
Greenville, Pitt County, NC
October 15, 2019
Terracon Project No. 72195082

Prepared for:
Greenville Utilities Commission
Greenville, NC

Prepared by:
Terracon Consultants, Inc.
Winterville, NC

October 15, 2019

Greenville Utilities Commission
PO Box 1847
Greenville, NC 27835

Attn: Mr. Ken Wade – Substation and Controls Engineer
P: (252) 551-1570
E: wadekr@guc.com

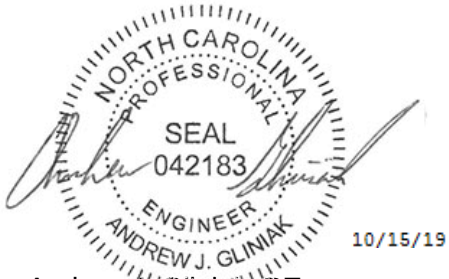
Re: Geotechnical Engineering Report
Sugg Parkway Substation
Sugg Parkway and Old Creek Road
Greenville, Pitt County, NC
Terracon Project No. 72195082

Dear Mr. Wade:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P72195082 dated September 6, 2019. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.



Seth A. Bowman
Staff Professional
Geotechnical Services

Andrew J. Gliniak, PE
Geotechnical Project Engineer
Registered NC 042183

Reviewed by: Kevin Sohrabnia, PE

REPORT TOPICS

INTRODUCTION 1
SITE CONDITIONS 1
PROJECT DESCRIPTION 2
GEOTECHNICAL CHARACTERIZATION 2
GEOTECHNICAL OVERVIEW 3
EARTHWORK 4
SUBSTATION MAT FOUNDATIONS 7
DRILLED PIER FOUNDATIONS 8
SEISMIC CONSIDERATIONS 8
LIQUEFACTION 8
GENERAL COMMENTS 8
FIGURES 10

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES
SITE LOCATION AND EXPLORATION PLANS
EXPLORATION RESULTS
DESIGN SOIL PARAMETERS FOR DRILLED PIERS
SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	The project includes a new substation with associated above-ground power lines off Sugg parkway and Old Creek Road in Greenville, NC.
Geotechnical Characterization	The borings encountered very loose to medium dense sand underlain by denser sand. Groundwater is anticipated at a depth of 3 to 4 feet below the existing ground surface.
Earthwork	After stripping topsoil, the substation footprint should be densified in place using a medium weight vibratory roller. The purpose of the vibratory rolling is to densify the loose, near surface disturbed soils and potentially improve foundation support.
Substation Mat Foundations	Shallow foundations will be sufficient Allowable bearing pressure = 1,000 psf Expected settlements: < 1-inch total, < 1/2-inch differential
Pole Deep Foundations	The poles to be supported by drilled piers installed with the slurry method of drilling to help prevent blow out. Design parameters for the lateral resistance and end bearing capacity of drilled piers are presented in this report.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Geotechnical Engineering Report

Sugg Parkway Substation
Sugg Parkway and Old Creek Road
Greenville, Pitt County, NC

Terracon Project No. 72195082
October 15, 2019

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed substation and poles to be located at Sugg Parkway and Old Creek Road in Greenville, Pitt County, NC. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Foundation design and construction
- Seismic site classification per IBC

The geotechnical engineering Scope of Services for this project included the advancement of four test borings to a depth of approximately 30 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located along Sugg Parkway and Old Creek Road in Greenville, Pitt County, NC. Coordinates: 35.6523°N, 77.3334°W (approximate) See **Site Location**
Existing Improvements	Undeveloped fields near existing above-ground power lines.
Current Ground Cover	Grass and cultivated soils
Existing Topography	Relatively level

Item	Description
Geology	The subject site is located in the Coastal Plain Physiographic Province. The Coastal Plain soils consist mainly of marine sediments that were deposited during successive periods of fluctuating sea level and moving shoreline. The soils include sands, silts, and clays with irregular deposits of shells, which are typical of those lain down in a shallow sloping sea bottom. Recent alluvial sands, silts, and clays are typically present near rivers and creeks. According to USGS Mineral Resources On-Line Spatial Data based on the 1998 digital equivalent of the 1985 Geologic Map of North Carolina updated in 1998, the site is mapped within the Yorktown Formation and Duplin Formation, Undivided (Tertiary)

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	Email communication with requested boring locations on August 29, 2019.
Proposed Structures	The project includes a new substation with associated above-ground power lines off Sugg parkway and Old Creek Road in Greenville, NC.
Building Construction	Concrete drilled pier foundations or vibratory driven piles are anticipated for the power lines. Mat foundations for transformers and small equipment pads are assumed.
Maximum Loads	■ Substation: 15 to 100 kips (assumed) ■ Poles: 4,500 ft-kips overturning at the ground surface (assumed)
Grading/Slopes	Up to 2 feet of cut and/or fill placement
Estimated Start of Construction	Early 2020

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Looser Sand**	Very loose to loose Clayey Sand (SC) and Silty Clayey Sand (SC-SM)
2	**Loose to Medium Dense Sand**	Generally Silty Sand (SM) and Poorly Graded Sand (SP)
3	**Medium Dense to Dense Sand**	Poorly Graded Sand (SP), Clayey Sand (SC), Silty Sand (SM)

Groundwater

Groundwater was measured at depths of 3.5 to 4 feet during drilling using hollow stem augers. Based on the moisture condition of the soil samples, groundwater is anticipated at depths of 3 to 4 feet below the existing ground surface.

The groundwater level can change due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

The borings in the substation area encountered very loose to loose sand underlain by relatively denser sand. The borings along the proposed alignment encountered loose to medium dense sand underlain by relatively denser sand.

After stripping top soil, the substation footprint should be densified in place using a medium weight vibratory roller. The purpose of the vibratory rolling is to densify the loose, near surface disturbed soils and potentially improve foundation support.

We understand drilled piers are proposed as foundations for the poles. Shallow groundwater and sandy soils as encountered in the borings are conditions where caving of the sidewalls or “blow out” of the bottom can occur in the pier excavation. The “blow out” is caused by hydrostatic pressures causing water to flow upward into the excavation and lift soil from the bottom. Excavation for the piers utilizing slurry drilling techniques will reduce the potential blow out by counter-balancing the hydrostatic pressure.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork is anticipated to include site preparation, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations.

Site Preparation

Site preparation should begin with the complete removal of the surface vegetation and topsoil in the proposed substation area. Based on site observations during the drilling process, topsoil should be stripped up to a depth of approximately 3 inches. A Terracon representative should field verify the stripping depth during construction. Topsoil may be reused in areas of the site to be landscaped but should not be used for fill.

After stripping, the exposed subgrade soils in the substation footprint should be densified in place using a medium weight vibratory roller. The purpose of the vibratory rolling is to densify the exposed subgrade soils to potentially improve the foundation bearing soils. The roller should make at least six passes across the site, with the second set of three passes perpendicular to the first set of three passes. If water is brought to the surface by the vibratory rolling, the operation should be discontinued until the water subsides. Vibratory rolling should be completed during dry weather.

After the vibratory rolling, pore pressures should be allowed to dissipate for a minimum of 16 hours. After the waiting period, proofrolling should be performed on the exposed subgrade soils in areas to receive fill or at the subgrade elevation with a fully loaded, tandem-axle dump truck (20-ton minimum) or similar rubber-tired construction equipment. Proofrolling is recommended as a means of detecting areas of soft or unstable subgrade soils. The proofrolling should be performed during a period of dry weather to avoid degrading an otherwise suitable subgrade. The proofrolling operations should be observed by a representative of the geotechnical engineer. Subgrade soils that exhibit excessive rutting or deflection during proofrolling should be repaired as directed by the field representative. Typical repairs include overexcavation followed by replacement with either properly compacted fill or by a subgrade stabilization fabric in conjunction with a sand fill or crushed stone.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 5 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

Soil Type [1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Imported Soil	SC, SM, SP	All location and elevations.
On-Site Soils	SC, SM, SP	On site soils that meet these soil classifications are generally suitable for fill if properly moisture conditioned.

1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the geotechnical engineer for evaluation.

On-site near surface clays, if encountered, are not recommended for use as structural fill due to their high fines content and moisture sensitivity relative to sandy soils available. Near surface clay could be considered for use as general fill.

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as Structural fill
Minimum Compaction Requirements [1, 2]	95% of max. above and below foundations	92% of max.
Water Content Range [1]	-2% to +2% of optimum	As required to achieve min. compaction requirements

1. Fill should be tested for moisture content and compaction during placement. If in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the tests should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2. It is not necessary to achieve 95% compaction on the existing ground prior to placing fill or beginning construction. However, the subgrade should be evaluated by a representative of the geotechnical engineer prior to placing fill or beginning construction.

It is important to note that the use of rubber-tired traffic, such as lulls, may impact the prepared subgrade soils leading to re-grading. We recommend that the use of rubber-tired traffic be limited on the prepared subgrades or that the stabilized area be prepared for their travel.

Grading and Drainage

During construction, grades should be sloped to promote runoff away from the construction area. Final surrounding grades should be sloped away from the structure on all sides to prevent ponding of water.

Earthwork Construction Considerations

Shallow excavations for the proposed structures are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to construction.

The groundwater table could affect excavations, especially for the deeper excavations for utilities. A temporary dewatering system consisting of sumps with pumps could be necessary to achieve the anticipated depths of excavation. The actual dewatering system should be selected and designed by a specialty contractor.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas. One density and water content test should be performed for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SUBSTATION MAT FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for the substation mat foundations.

DESCRIPTION	VALUE
Maximum Net allowable bearing pressure	1,000 psf
The required embedment below lowest adjacent finished grade for frost protection and protective embedment [1]	12 inches
Modulus of subgrade reaction	8 pounds per square inch per inch (psi/in)
Estimated approximate total settlement [2]	Up to 1 inch
Estimated differential settlement [2]	Up to ½ inch
Ultimate coefficient of sliding friction	0.35
Uplift Resistance	Weight of foundation concrete.

1. For frost protection and to reduce effects of seasonal moisture variations in subgrade soils.
2. The actual magnitude of settlement that will occur beneath the foundations will depend upon the variations within the subsurface soil profile, the structural loading conditions and the quality of the foundation excavation. The estimated total and differential settlements listed assume that the foundation-related earthwork and the foundation design are completed in accordance with our recommendations.

Construction Considerations

The mat foundation subgrade should be free of water and loose soil prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Should the subgrade soils become excessively disturbed or saturated, the affected soil should be removed prior to placing concrete.

DRILLED PIER FOUNDATIONS

Drilled Pier Design Parameters

The upper 3 feet of surficial material should be ignored due to the potential effects of frost action and construction disturbance. To avoid a reduction in uplift and lateral resistance caused by variable soil depths and quality, we recommend that a minimum pier length be stated on the design drawings.

The poles are to be supported by drilled piers installed with the slurry method of drilling to help prevent blow out. Design parameters for the lateral resistance and end bearing capacity of drilled piers are presented in **Design Soil Parameters for Drilled Piers**.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification is D**. Subsurface explorations at this site were extended to a maximum depth of 30 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

LIQUEFACTION

Based on the results of the borings, liquefaction is not expected based on the relatively low level of ground motions associated with the design earthquake and density of the soils.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we

can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

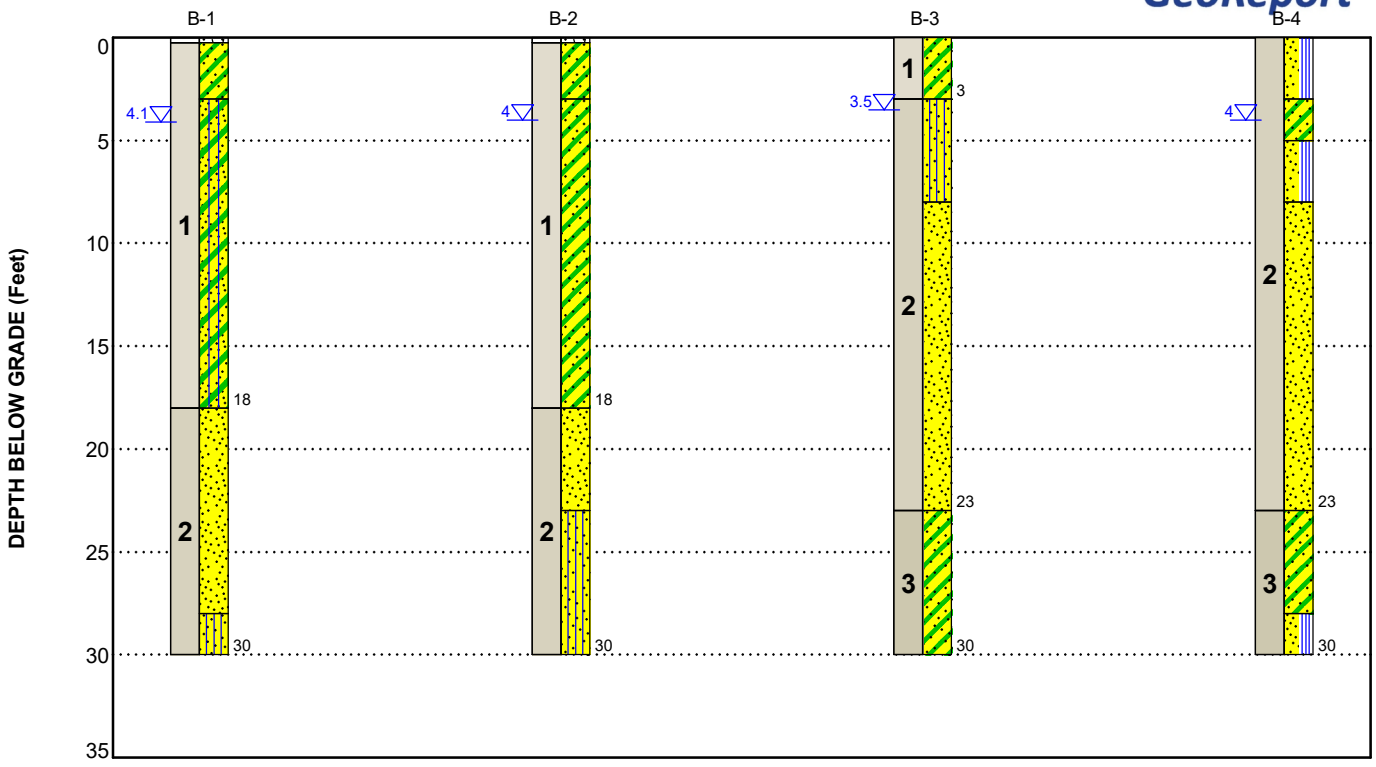
Contents:

GeoModel

Note: All attachments are one page unless noted above.

GEOMODEL

Sugg Parkway Substation ■ Greenville, NC
Terracon Project No. 72195082



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Looser Sand	Very loose to loose Clayey Sand (SC) and Silty Clayey Sand (SC-SM)
2	Loose to Medium Dense Sand	Generally Silty Sand (SM) and Poorly Graded Sand (SP)
3	Medium Dense to Dense Sand	Poorly Graded Sand (SP), Clayey Sand (SC), Silty Sand (SM)

LEGEND

- Topsoil
- Clayey Sand
- Silty Clayey Sand
- Poorly-graded Sand
- Silty Sand
- Poorly-graded Sand with Silt

▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Location
Two	30	New Substation and requested boring locations

Boring Layout and Elevations: Boring locations were marked in the field by the client. The location of the borings should be considered accurate only to the degree implied by the means and methods used to define it.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted rotary drill rig using hollow stem auger and mud rotary drilling techniques. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with soil cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Method of Determination of Water Content of Soil and Rock by Mass
- ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D2488 Standard Practice of Description and Identification of Soils (Visual Manual Method)
- ASTM D422 Standard Test Method for Particle Size Analysis of Soils
- ASTM D1140 Standard Test Methods for Determining the Amount of Material Finer than No. 200 Sieve in Soils by Washing
- ASTM D4318 Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

Sugg Parkway Substation ■ Greenville, NC
October 15, 2019 ■ Terracon Project No. 72195082

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: GREENVILLE NE, NC (1/1/1998) and GREENVILLE SE, NC (1/1/1998).

EXPLORATION PLAN

Sugg Parkway Substation ■ Greenville, NC
October 15, 2019 ■ Terracon Project No. 72195082

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Boring Logs (B-1 through B-4)
Grain Size Distribution
Atterberg Limits

Note: All attachments are one page unless noted above.

BORING LOG NO. B-1

PROJECT: Sugg Parkway Substation

CLIENT: Greenville Utilities Commission
Greenville, NC

SITE: Sugg Parkway and Old Creek Road
Greenville, NC

LOCATION See Exploration Plan

Latitude: 35.6523° Longitude: -77.3333°

MODEL LAYER	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1	0.3	**TOPSOIL**							
		CLAYEY SAND (SC), light brown and light gray, loose			X	3-3-3 N=6	19	26-15-11	34
	3.0	**SILTY CLAYEY SAND (SC-SM)**, trace organics, light brown, light gray, and gray, very loose to loose		▽	X	3-4-4 N=8	19		
			5		X	4-3-3 N=6			
					X	0-1-1 N=2	34	21-17-4	19
			10						
					X	1-2-1 N=3			
			15						
	18.0	**POORLY GRADED SAND (SP)**, gray, medium dense		▨	X	8-8-9 N=17	18		
2			20						
					X	6-5-7 N=12			
			25						
	28.0	**SILTY SAND (SM)**, gray, loose			X	5-4-5 N=9	29		
	30.0	***Boring Terminated at 30 Feet***	30						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *At completion of drilling*

▨ *Cave in depth*

Terracon
314 Beacon Dr
Winterville, NC

Boring Started: 09-20-2019 | Boring Completed: 09-20-2019

Drill Rig: Truck | Driller: RS

Project No.: 72195082

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 72195082 SUGG PARKWAY SUBSTATION; GREENVILLE, NC.GPJ TERRACON_DATATEMPLATE.GDT 10/15/19

BORING LOG NO. B-2

PROJECT: Sugg Parkway Substation

CLIENT: Greenville Utilities Commission
Greenville, NC

SITE: Sugg Parkway and Old Creek Road
Greenville, NC

LOCATION See Exploration Plan

Latitude: 35.6521° Longitude: -77.3334°

MODEL LAYER	DEPTH		WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1	0.3	**TOPSOIL**						
		CLAYEY SAND (SC), light brown and light gray, loose			2-3-3 N=6			
	3.0	**CLAYEY SAND (SC)**, light brown, light gray, and gray, very loose to loose	▽		3-3-4 N=7			
					4-4-3 N=7			
					1-1-2 N=3			
					2-2-2 N=4			
	18.0	**POORLY GRADED SAND (SP)**, gray, loose	▨		10-5-4 N=9			
2	23.0	**SILTY SAND (SM)**, gray, loose to medium dense			6-6-5 N=11			
	30.0				5-4-4 N=8			
		Boring Terminated at 30 Feet						

DEPTH (Ft.): 5, 10, 15, 20, 25, 30

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *At completion of drilling*

▨ *Cave in depth*

Terracon
314 Beacon Dr
Winterville, NC

Boring Started: 09-20-2019 | Boring Completed: 09-20-2019

Drill Rig: Truck | Driller: RS

Project No.: 72195082

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 72195082 SUGG PARKWAY SUBSTATION; GREENVILLE, NC.GPJ TERRACON_DATATEMPLATE.GDT 10/15/19

BORING LOG NO. B-3

PROJECT: Sugg Parkway Substation

CLIENT: Greenville Utilities Commission
Greenville, NC

SITE: Sugg Parkway and Old Creek Road
Greenville, NC

LOCATION See Exploration Plan

Latitude: 35.6511° Longitude: -77.332°

MODEL LAYER	GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.0	**CLAYEY SAND (SC)**, gray and tan, loose				0-3-3 N=6			
		3.0			▽					
			SILTY SAND (SM), gray and tan, medium dense	5			3-6-6 N=12			
							7-8-8 N=16			
		8.0								
2			**POORLY GRADED SAND (SP)**, light brown and tan, loose to medium dense	10			6-5-8 N=13			
				15			4-5-5 N=10			
				20			7-5-4 N=9			
		23.0								
3			**CLAYEY SAND (SC)**, trace shell fragments, dark gray, medium dense to dense	25			3-5-13 N=18			
		30.0		30			11-15-22 N=37			
			Boring Terminated at 30 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers to 8 feet followed by mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *On 9/21/19*

Terracon
314 Beacon Dr
Winterville, NC

Boring Started: 09-21-2019 | Boring Completed: 10-07-2019

Drill Rig: Truck | Driller: RS

Project No.: 72195082

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 72195082 SUGG PARKWAY SUBSTATION; GREENVILLE, NC.GPJ TERRACON_DATATEMPLATE.GDT 10/15/19

BORING LOG NO. B-4

PROJECT: Sugg Parkway Substation

CLIENT: Greenville Utilities Commission
Greenville, NC

SITE: Sugg Parkway and Old Creek Road
Greenville, NC

LOCATION See Exploration Plan

Latitude: 35.644° Longitude: -77.3381°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
2		**POORLY GRADED SAND WITH SILT (SP-SM)**, light brown and tan, loose				3-3-4 N=7	7		
		3.0 **CLAYEY SAND (SC)**, light gray with brown and tan, loose		▽		3-4-5 N=9	13		
		5.0 **POORLY GRADED SAND WITH SILT (SP-SM)**, reddish brown and tan, medium dense	5			6-6-5 N=11	18		
		8.0 **POORLY GRADED SAND (SP)**, gray and tan, medium dense				5-5-7 N=12	24	NP	2
			10			4-4-6 N=10	25		
			15			6-6-5 N=11	22		
			20			4-6-10 N=16	20		
3		23.0 **CLAYEY SAND (SC)**, trace shell fragments, dark gray, medium dense	25			10-12-18 N=30	22		
		28.0 **POORLY GRADED SAND WITH SILT (SP-SM)**, trace shell fragments, dark gray, dense	30						
		30.0 ***Boring Terminated at 30 Feet***							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers to 8 feet followed by mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *On 9/21/19*

Terracon
314 Beacon Dr
Winterville, NC

Boring Started: 09-21-2019 | Boring Completed: 10-07-2019

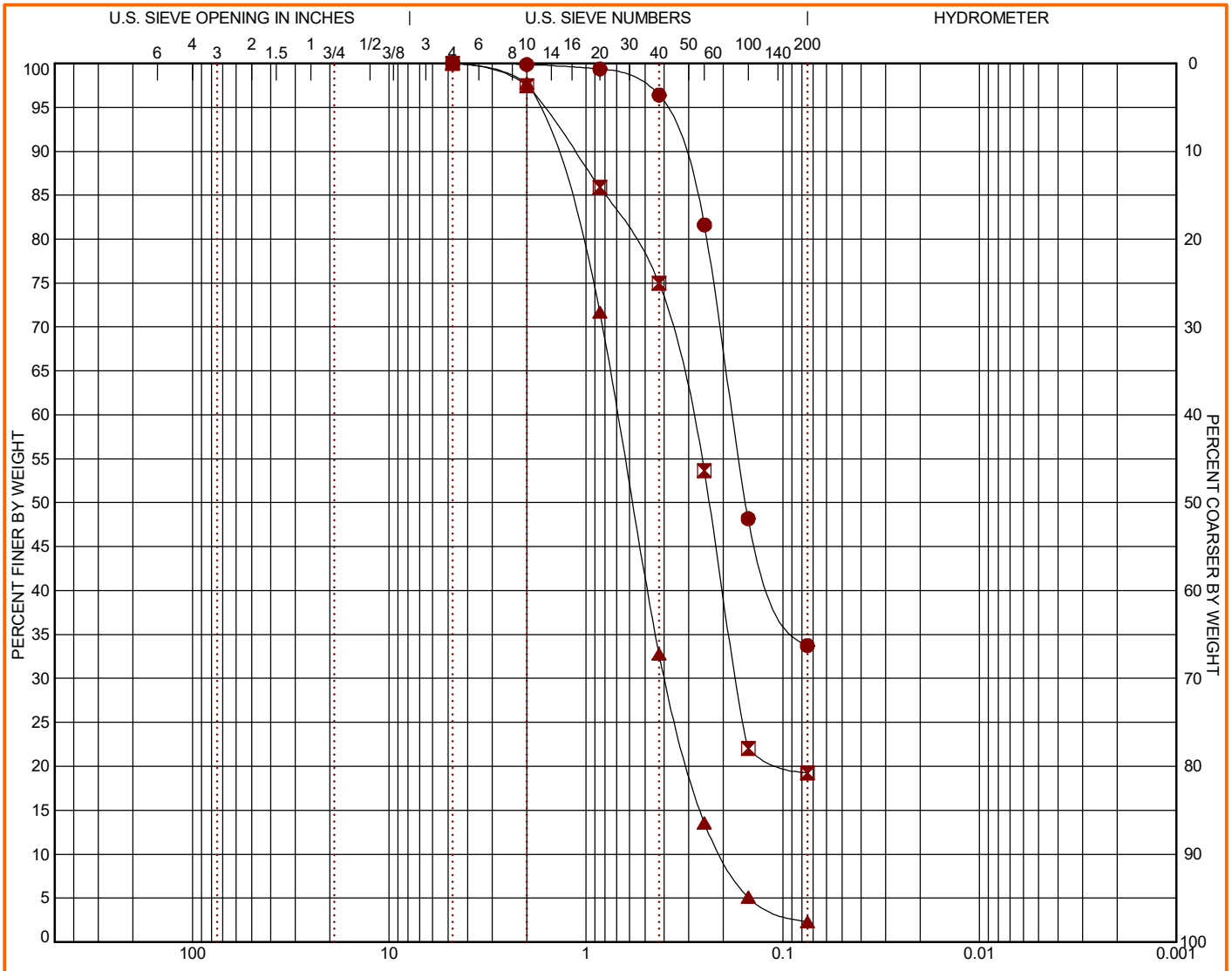
Drill Rig: Truck | Driller: RS

Project No.: 72195082

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 72195082 SUGG PARKWAY SUBSTATION; GREENVILLE, NC.GPJ TERRACON_DATATEMPLATE.GDT 10/15/19

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-1	1 - 2.5	0.0	0.0	66.3		33.7		SC
⊠	B-1	8.5 - 10	0.0	0.0	80.8		19.2		SC-SM
▲	B-4	8.5 - 10	0.0	0.0	97.7		2.3		SP

GRAIN SIZE	●	⊠	▲
D_{60}	0.18	0.293	0.69
D_{30}		0.171	0.394
D_{10}			0.202

COEFFICIENTS	●	⊠	▲
C_C			1.11
C_U			3.42

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0	#4	100.0	#4	100.0
#10	99.87	#10	97.46	#10	97.74
#20	99.36	#20	85.89	#20	71.69
#40	96.4	#40	74.96	#40	32.77
#60	81.62	#60	53.63	#60	13.54
#100	48.18	#100	22.01	#100	5.1
#200	33.73	#200	19.24	#200	2.29

SOIL DESCRIPTION	
●	CLAYEY SAND (SC)
⊠	SILTY, CLAYEY SAND (SC-SM)
▲	POORLY GRADED SAND (SP)

REMARKS	
●	
⊠	8.5 to 10 feet
▲	

PROJECT: Sugg Parkway Substation

PROJECT NUMBER: 72195082

SITE: Sugg Parkway and Old Creek Road
Greenville, NC

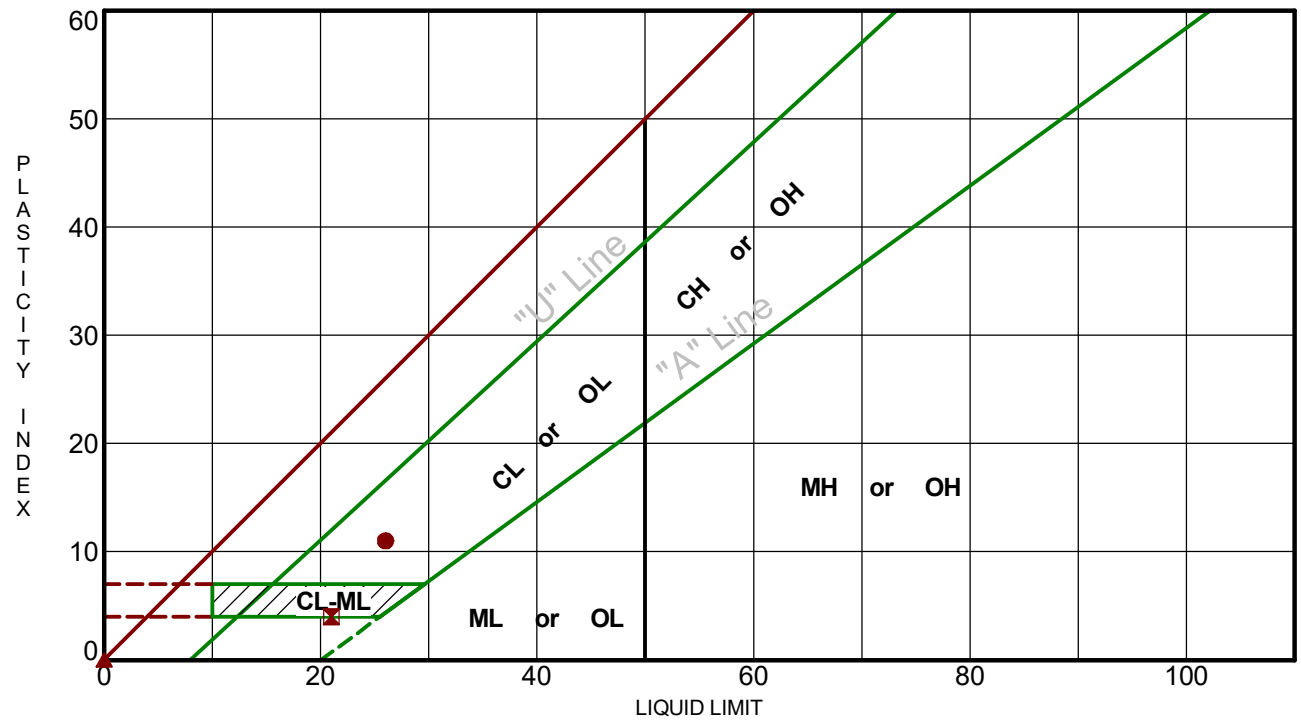
Terracon
314 Beacon Dr
Winterville, NC

CLIENT: Greenville Utilities Commission
Greenville, NC

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 72195082 SUGG PARKWAY SUBSTATION; GREENVILLE, NC.GPJ TERRACON_DATATEMPLATE.GDT 10/15/19

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth	LL	PL	PI	Fines	USCS	Description
●	B-1	1 - 2.5	26	15	11	33.7	SC	CLAYEY SAND
⊠	B-1	8.5 - 10	21	17	4	19.2	SC-SM	SILTY, CLAYEY SAND
▲	B-4	8.5 - 10	NP	NP	NP	2.3	SP	POORLY GRADED SAND

PROJECT: Sugg Parkway Substation

PROJECT NUMBER: 72195082

SITE: Sugg Parkway and Old Creek Road
Greenville, NC

Terracon
314 Beacon Dr
Winterville, NC

CLIENT: Greenville Utilities Commission
Greenville, NC

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS 72195082 SUGG PARKWAY SUBSTATION; GREENVILLE, NC.GPJ TERRACON_DATATEMPLATE.GDT 10/15/19

DESIGN SOIL PARAMETERS FOR DRILLED PIERS

LANDSCAPE Applicable to the following tables:

- The thickness of the bottom layer is undetermined due to the boring termination depth.
- Soil classifications are based on visual examination of soil samples.
- Soil parameters are ultimate values, appropriate safety factors should be applied by the designer.
- We have considered groundwater at a depth of 3 to 4 feet.
- The upper 3 feet of soil profile should be ignored due to surface disturbance and frost action.
- Only LRFD design values with a resistance factor (factored loads) have been provided for use with the design.
- The noted bearing pressure should be considered applicable to a depth 25 feet below the existing ground surface. this allows for 5 feet of data below the maximum tip depth of the shaft assuming shaft diameters of approximately 36 inches. Should it be necessary to extend the pile bottom below that depth or increase the diameter of the shaft at a depth of 25 feet, we recommend that a supplemental exploration be performed to collect deeper soil data.

Boring B-1

Layer (feet)		Soil Type (Clay/Sand)	Effective Unit Weight of Soil (pcf)	Cohesion (psf)	Coefficient of Horizontal Soil Stress (K)	Friction Angle (degrees)	LPile k-value (pci)	Factored Skin Friction (psf)	Factored End Bearing Pressure (psf)
Top	Bottom								
0	4	Sand	112	---	---	---	---	---	---
4	8	Sand	50.6	---	1.76	29	35	260	4,800
8	18	Sand	42.6	---	0.98	28	20	230	1,800
18	23	Sand	57.6	---	1.62	32	75	540	10,000
23	30	Sand	52.6	---	1.24	31	60	520	7,200

1. General notes applicable to the above values are included at the beginning of this section.

Boring B-2

Layer (feet)		Soil Type (Clay/Sand)	Effective Unit Weight of Soil (pcf)	Cohesion (psf)	Coefficient of Horizontal Soil Stress (K)	Friction Angle (degrees)	LPile k-value (pci)	Factored Skin Friction (psf)	Factored End Bearing Pressure (psf)
Top -	Bottom								
0	4	Sand	112	---	---	---	---	---	---
4	8	Sand	50.6	---	1.67	29	35	250	4,200
8	18	Sand	43.6	---	1.08	28	20	260	2,400
18	30	Sand	52.6	---	1.22	30	50	470	6,000

1. General notes applicable to the above values are included at the beginning of this section.

Boring B-3

Layer (feet)		Soil Type (Clay/Sand)	Effective Unit Weight of Soil (pcf)	Cohesion (psf)	Coefficient of Horizontal Soil Stress (K)	Friction Angle (degrees)	LPile k-value (pci)	Factored Skin Friction (psf)	Factored End Bearing Pressure (psf)
Top	Bottom								
0	3	Sand	112	---	---	---	---	---	---
3	13	Sand	53.6	---	2.80	31	60	340	7,800
13	23	Sand	52.6	---	2.08	30	50	420	6,000
23	28	Sand	57.6	---	1.35	32	75	620	10,000
28	30	Sand	67.6	---	1.47	35	100	890	10,000

1. General notes applicable to the above values are included at the beginning of this section.

Boring B-4

Layer (feet)		Soil Type (Clay/Sand)	Effective Unit Weight of Soil (pcf)	Cohesion (psf)	Coefficient of Horizontal Soil Stress (K)	Friction Angle (degrees)	LPile k-value (pci)	Factored Skin Friction (psf)	Factored End Bearing Pressure (psf)
Top	Bottom								
0	3	Sand	113	---	---	---	---	---	---
3	23	Sand	52.6	---	1.76	31	60	370	6,000
23	28	Sand	57.6	---	0.98	32	75	590	9,600
28	30	Sand	67.6	---	1.62	35	100	510	10,000

1. General notes applicable to the above values are included at the beginning of this section.

SUPPORTING INFORMATION

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Sugg Parkway Substation ■ Greenville, NC

Terracon Project No. 72195082

SAMPLING	WATER LEVEL	FIELD TESTS
Split Spoon	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL		RELATIVE PROPORTIONS OF FINES	
Descriptive Term(s) of other constituents	Percent of Dry Weight	**Descriptive Term(s) of other constituents**	**Percent of Dry Weight**
Trace	<15	Trace	<5
With	15-29	With	5-12
Modifier	>30	Modifier	>12

GRAIN SIZE TERMINOLOGY		PLASTICITY DESCRIPTION	
Major Component of Sample	**Particle Size**	**Term**	**Plasticity Index**
Boulders	Over 12 in. (300 mm)	Non-plastic	0
Cobbles	12 in. to 3 in. (300mm to 75mm)	Low	1 - 10
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)	Medium	11 - 30
Sand	#4 to #200 sieve (4.75mm to 0.075mm	High	> 30
Silt or Clay	Passing #200 sieve (0.075mm)		

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [$Cc<1$ or $Cc>3.0$] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [$Cc<1$ or $Cc>3.0$] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.