

SPECIFICATION
FOR

INTERSECTION WIDENING PROJECT

STEEL POLE CONSTRUCTION

CITY OF AUBURN ELECTRIC DEPARTMENT

**AUBURN ELECTRIC
5066 Co. Rd. 29
Auburn, Indiana 46706**

Prepared February 25, 2019 by:



5524 North County Line Road
Auburn, Indiana 46706
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A handwritten signature in black ink that reads "Mark Christiansen".

**MARK CHRISTIANSEN
PROFESSIONAL ENGINEER
P.E. NO. 10302588**

Intersection widening project – Steel pole construction

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SECTION 1 - PROJECT DESCRIPTION

The City of Auburn is widening the intersection of Auburn Drive and Wayne Street. This project involves reconstructing an existing distribution line to accommodate the intersection widening project. Some of the existing wood distribution poles will be removed and relocated using steel pole construction. Auburn Electric plans to perform all the overhead line reconstruction work, but requests a contractor excavate, construct steel reinforced concrete foundations and install the self-supported steel pole structures. The OWNER-supplied steel poles will require large cast in place concrete foundations with OWNER-supplied anchor bolts.

The work in this Contract generally consists of providing all equipment, labor, and all non-OWNER-supplied materials to install the self-supported steel pole structures. The contractor shall work closely with Auburn Electric personnel and other contractors on site before and during the construction process.

SECTION 2 – GENERAL CONDITIONS

1.0 INSTRUCTION TO BIDDERS

- A. OWNER: Auburn Electric
5506 County Road 29
Auburn, IN 46706

Project: Intersection Widening - Steel Pole Construction

- B. Pre-Bid: Bidders are encouraged to attend a Pre-bid meeting, which will convene at

Auburn Electric
5506 County Road 29
Auburn, IN 46706

10:00 AM EST on Friday April 12, 2019

An onsite route review will be made after the meeting

- C. Due Date: The OWNER will receive and open "Sealed Proposals"

At: Auburn Electric
5506 County Road 29
Auburn, IN 46706
Attn: Mr. Rob Higgins, OSP Manager

No later than **10:00 AM EST on Tuesday April 23, 2019** for the supply of equipment, labor, supervision and construction required by the Contract Documents included herein.

Bids shall be marked with the bidder's name and the words:

"Bid for the Intersection widening project - steel pole construction"

1.1 INVITATION TO BID

- A. Please submit your proposal for furnishing of all supervision, labor and other incidentals necessary or convenient to the successful completion of the Project and the carrying out of all *duties and obligations imposed by the Contract Documents enclosed herewith*. *The Proposal* shall include full completion of the Bid Form accompanying the Bid Documents.
- B. Auburn Electric reserves the right, at its sole discretion, to reject any or all proposals which may be submitted in response to this invitation, and Auburn Electric shall be under no obligation to state reasons for such rejection. It is to be expressly understood by each Bidder that no liability will be incurred by Auburn Electric by reason of the rejection of or failure to accept the Bidder's proposal; and until acceptance by Auburn Electric by such Bidder's proposal, and the execution of a definitive agreement with such Bidder embodying its proposal, no contract between Auburn Electric and such Bidder exists.

- C. The following are attached hereto and form the Documents:
 - 1. One copy of Section 2, Paragraph 1 Instruction to Bidders.
 - 2. One copy of Section 2, Paragraph 2 Bid Form.
 - 3. One copy of Section 2, Paragraph 3 Description of the Work.
 - 4. One copy of Section 2, Paragraph 4 Contractual Issues.
 - 5. One copy of Section 2, Paragraph 5 Agreement Details.
 - 6. Non-Collusion Affidavit
- D. Drawings showing location of the construction which are part of the Bidding Documents are available at Auburn Electric 5066 Co. Rd. 29, Auburn, IN 46706.

1.2 PROPOSAL

- A. The proposal, as submitted, shall consist of one original and two copies of the Bid Form contained herein, along with 3 copies of the Unit Price Fill-in Sheet. The Bid Form must be fully completed in ink, or typewritten, with the signature in longhand.
- B. The Bidder shall submit completed Bid Form and shall deposit a certified check or bid bond of not less than five (5) percent of the maximum amount of the bid all in accordance with the Indiana State Statutes. The successful Bidder shall furnish a performance bond equal to one hundred (100) percent of the bid.
- C. The proposal shall be mailed in mailing envelopes or hand delivered to the following address:

Auburn Electric
5506 County Road 29
Auburn, IN 46706
Attn: Mr. Rob Higgins, OSP Manager
- D. The proposal data submitted in the Bid Form when resolved by mutual agreement between the OWNER and the successful Bidder shall constitute the Bid Form of the Contract Documents, paragraph 5.2.

2.0 BID FORM

Name of Bidder: _____

Address: _____

Telephone: _____

OWNER: _____

Superintendent: _____

Project: _____

To: Owner

We hereby submit our proposal for furnishing all supervision, labor, equipment and other incidentals necessary or convenient to the successful completion of the Project and carrying out all the duties and obligations imposed by the Drawings and other Documents enclosed or referenced herein.

2.1 TOTAL BID PRICE

- A. Having carefully considered the Instructions to Bidders, any special Conditions of the Contract, the General Conditions of the Contract, the Technical Specification and the Drawings, and having examined the site and/or construction site plans and reviewed all conditions affecting the work, the undersigned proposes to furnish all labor, supervision, equipment and other incidentals called for by the Specifications, for the compensation stated in the Schedule of Prices, paragraph 2.2.
- B. The Bidder is advised that it is the intent of the Contract to complete all phases of the work defined in the Contract Documents, and minor omission in regard to details to the contrary notwithstanding.
- C. It is the intent of this Contract that the work be performed for the price stated herein and that such price shall not be subject to escalation.

2.2 SCHEDULE OF PRICES

The Bidder proposes to do the work herein described for the bid price shown in Paragraph 2.2.C.

A. Proposed Terms of Payment

Construction - The construction payment conditions shall be as defined by the Contract.

B. Alternates

- 1. The Bidder may, in addition to its Basic Bid, propose Alternate Construction, or Substitute Materials, which shall be attached hereto if, in its judgment, such Alternate Construction or Substitute Materials will be better and will more economically serve the OWNER's requirements. Alternate bids shall be submitted in the same form and manner as the Basic Bid (a complete filled in Bid Form must be submitted for each Bid).
- 2. All proposed Alternates and Substitutions are subject to the OWNER's Engineer's written approval.

C. Bid Price

Bid Price \$ _____ **Note: Must match total on the Unit Price Fill-in Sheet.**

D. Performance Bond

The Bidder states that the premium of the required Performance Bond in accordance with Paragraph 4.16.G., shall not exceed five (5) percent of the Contract amount. This premium shall be included in the Bid Price.

2.3 INFORMATION REQUIRED WITH PROPOSAL

A. General

- 1. The Bidder declares that he is fully prepared and has the necessary capital to begin work promptly and to conduct it as required. The Bidder refers to the following persons who are competent to advise as to his financial standing: (Bidder may attach extra sheets.)

Name	Address
_____	_____
_____	_____

Description	Age
_____	_____
_____	_____

B. Authorized Signatures

List names of the Bidder's employees (and their corporate titles) who are authorized to sign Contracts binding on the Bidder for not less than the Bidder's total price as stated herein.

Name	Address
_____	_____
_____	_____
_____	_____

C. Bidder's Proposed Construction Schedule

Bidders number of workdays to complete this Contract _____
(Bidder to Specify)

D. Proposed Construction Staff

The Bidder declares that the Job Superintendent he proposes to assign to this work is

_____ who has been engaged in work of a similar character to that covered by this Proposal for _____ years and that he has been in charge of similar construction on the following projects. List previous three projects.

Nature of Work	Location	Employed By/Phone
_____	_____	_____
_____	_____	_____
_____	_____	_____

E. Construction

In order to meet the required project completion date indicated above, the Bidder shall maintain its proposed Construction Schedule, which shall be attached hereto as Paragraph 2.7. When accepted with or without mutually agreed modifications by the OWNER, the proposed Construction Schedule of the successful Bidder shall become binding for its performance under the Contract.

2.4 EXCEPTIONS

The Bidder shall state hereby, (_____ yes, _____ no), that its proposal complies with the Specifications and Documents enclosed or referenced herein. If Exceptions are taken, they shall be appended hereto. The Bidder's printed terms and conditions shall not be considered an Exception unless specifically restated as above.

2.5 ADDENDA

The Bidder represents that this proposal includes provisions for the following Addenda. If none is included, it is so stated.

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

No Addenda included _____

2.6 ACCEPTANCE

The undersigned, authorized Bidder's representative, agrees to sign an Agreement, for the construction covered by this proposal, provided that he is notified of its acceptance within ten (10) days after the due date of the proposal.

Name of Bidder:

By: _____ Title: _____

In the Presence of: _____ Date: _____

Note:

The completed original of this Bid Form and machine reproductions, as required by Paragraph 1.2, Proposal, are required for submission.

The Bidder shall state that the following Proposal Documents are or are not attached:

	<u>Attachments:</u>	<u>Are</u> / <u>Are Not</u>
2.7	BIDDER'S PROPOSED CONSTRUCTION SCHEDULES	___ ___
2.8	BIDDER'S PROPOSED EXCEPTIONS	___ ___
2.9	BIDDER'S PROPOSED ALTERNATES	___ ___
2.10	BIDDER'S PROPOSED SUBSTITUTES	___ ___
2.11	OTHER ATTACHMENTS FINANCIAL STATEMENT	___ ___
2.12	NON-COLLUSION AFFIDAVIT	___ ___

3.0 WORK

3.1 DESCRIPTION OF THE WORK

A. General

The work to be performed under this Contract by the Contractor consists of the complete supply of supervision, labor and construction equipment along with other incidentals necessary or convenient to the successful completion of the work described by the drawings and specifications.

The work in this Contract generally consists of providing all equipment, labor, and all non-OWNER- supplied materials to install the self-supported steel pole structures located in Auburn, Indiana.

The OWNER-supplied steel poles will require large cast in place concrete foundations with OWNER-supplied anchor bolts.

B. Errors, Omissions and Interferences

1. The absence of required information on the Construction Drawings along with work orders shall be brought to the attention of the OWNER's Representative and the work shall proceed only when such information has been supplied or otherwise resolved.
2. All construction Drawings along with the work order information shall be field checked by the Contractor prior to execution of the work.
3. Unanticipated underground obstructions, structures, utilities, or other unusual structures, utilities or other unusual interferences shall be immediately reported to the OWNER's Representative.

3.2 WORKMANSHIP AND EXPEDITION WORK

- A. All parts of the construction shall be installed in a neat, workmanlike manner, and all damaged or defective work shall be promptly removed and replaced by the Contractor at his own expense.
- B. The Contractor shall be responsible for the promptness of execution of the various parts of the work and shall employ at all times sufficient number of workmen skilled and experienced in their lines of work.

3.3 LABOR AND WAGES

- A. All labor required shall be employed by the Contractor in his own name and shall be his employees. The contractor shall assume full responsibility for the progress of the work.

The Contractor shall remove any employee who, in the judgment of the OWNER, is not competent or is detrimental to the orderly progress of the job or is interfering with the OWNER's operation, except for employees of a Sub-Contractor approved pursuant to 4.12.

- B. The Contractor shall at all times abide by Indiana State Statute with regard to Wage and Labor.

3.4 MATERIALS – UNLOAD, STORE, AND HANDLE

- A. The Contractor shall be held accountable for all permanent material handled and to be installed by him or removed by him.
- B. The Contractor shall protect the material from all sources of damage. The Contractor shall replace any material that has been damaged while in his possession or control. This includes material left along highways or county roads in preparation for installation.
- C. The Contractor shall be held to replace at its expense all material lost while under its care, custody or control.

All Owner-supplied materials will be stored at: Grandstaff Substation
1202W. Ensley Ave.
Auburn, IN 46706

3.5 SITE WORK AND CLEAN-UP

- A. The Contractor at all times shall keep OWNER's premises free from accumulation of waste or excess material and rubbish by its employees or its work.
- B. The Contractor shall keep the state highway, streets, alley-ways and county roads free of debris, material and rubbish.
- C. The OWNER's Representative may, after two (2) days written notice to the contractor, hire clean-up to be done and back charge the Contractor for the cost.

4.0 CONTRACTUAL ISSUES

DEFINITIONS

- A. The "OWNER" shall mean Auburn Electric, Auburn, Indiana.
- B. The "OWNER's Representative" shall mean: The OWNER's duly authorized Representative on the job.
- C. The "OWNER's Engineer" shall mean:
 - Mr. Mark Christiansen, P.E.
 - Spectrum Engineering Corporation
 - 5524 County Line Road
 - Auburn, Indiana 46706
 - Phone: (260) 627-8888
 - Fax: (260) 627-8102
 - e-mail: machristiansen@spectrumeng.com
- D. The "Contractor" ("Bidder", "Vendor", "Manufacturer", or Fabricator") shall mean the party furnishing the construction labor, equipment, materials and/or services.
- E. The term "Materials Man" (or "Material Supplier") shall mean any person, including a corporation, who furnishes materials or supplies to the Contractor for use in the work required by this Contract.
- F. "Written Notice" shall be deemed to have been duly served if delivered in person to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended, or if delivered at, or sent by registered mail to the last business address known to him who gives the notice, or to the Contractor's Superintendent at the site.
- G. The term "Work" of the contractor, includes supervision, labor, or all, and the furnishing of the use of construction equipment, facilities, tools and other incidentals necessary to complete the Contract.
- H. The Contracting Parties are the "OWNER" and the "Contractor".
- I. The "Plant Site" (or "Construction Site") shall mean the project site as defined in Section 2, Bid Form.
- J. The "OWNER", the "Contractor", the "OWNER's Representative", the "OWNER's Engineer", and the "Contractor's Superintendent" are those defined as such in this Agreement. They are treated herein as if each were a singular number.

4.1 CONTRACT AMOUNT

- A. The Contractor agrees to furnish all labor, tools, and equipment for performing all work contemplated and embraced under the Contract; and for completing the work in accordance with the Drawings and Specifications for a firm bid price for the work as stated in Section 2, Bid Form, a part of this Document.
- B. The bid price therein stated shall include the furnishing of all necessary temporary construction, supervision, field and office overhead and expense, insurance, taxes, workmen's compensation insurance, Social Security contributions, and the Contractor's profit.

- C. The bid price shall constitute the entire compensation of the Contractor, except for such items of extra work as may be authorized by the OWNER in writing after the Contract is signed.
- D. The work shall not be considered complete until all necessary work, including cleanup, has been completed to the OWNER's satisfaction.
- E. It is the intent of this Contract that the work is performed for the price stated herein and that such price shall not be subject to escalation.
- F. For the OWNER's accounting purposes, evidence of the hours worked on the various components or activities shall be provided to the OWNER's Representative.
- G. The Contractor's Superintendents, Vendor's Service Representatives, Clerks, Timekeepers, and Storekeepers shall be considered as part of the Contractor's Supervision.

4.2 METHODS OF PAYMENT

A. Equipment and Material

Any additional material not covered by the original contract, provided by Contractor will be specified by change order and payment will be as in Paragraph 4.3.B.

B. Construction

1. At the end of each calendar month, the Contractor shall prepare and submit an estimate setting forth the amount due and in the proportion that the month bears to the total estimated quantities and amounts payable under the Contract.
2. After approval by the OWNER's Representative, this monthly estimate shall be presented to the OWNER for Payment. Ninety percent (90%) of the amount of such monthly estimates shall then be paid the Contractor. The remaining ten percent (10%) shall be retained by the OWNER and shall be paid to the Contractor together with any other monies due him within forty-five (45) days after the completion of the entire contract and final acceptance by the OWNER.
3. Final acceptance by the OWNER will take place within ten (10) days from the time the Contractor gives written notice to the OWNER of the completion of the work, provided that the acceptance procedures, as defined by paragraph 4.21.G., have been completed to the OWNER's satisfaction.
4. The payment of any estimate prior to final acceptance of the work by the OWNER shall in no way constitute an acknowledgment of the acceptance of the work, nor in any way prejudice or affect the obligation of the Contractor, at its expense, to repair, correct, renew, or replace any defects or imperfections in the construction or in the strength or quality of the materials used in or about the construction under Contract, nor any damage due or attributable to such defects, which defects, imperfections, or damage shall have been discovered before the final inspection and acceptance of the work.

4.3 PAYMENTS WITHHELD

- A. The OWNER may, at his discretion, withhold monies due the Contractor in amounts exceeding the ten percent (10%) before mentioned on account of:
 - 1. Claims filed or reasonable evidence indicating the probable filing of claims.
 - 2. Failure of the Contractor to make payment to the Subcontractors for materials or for labor.
- B. When the causes for the retention are removed, payment shall be made of any amounts withheld because of them.

4.4 OVERTIME

- A. The Contractor is responsible for maintaining the progress of work to schedules agreed upon by the parties and overtime costs necessary to achieve such schedules will not be reimbursed by the OWNER, however, if overtime is necessary to accelerate the work to accommodate Customers' requirements at the request of the OWNER, or is necessary to overcome delays caused by no fault of the Contractor, or its Subcontractors, the OWNER will reimburse the Contractor for such costs. Overtime billable costs reimbursed by the OWNER will include only the premium time and associated payroll taxes paid to the Contractor's employees. The OWNER shall not be required to pay for overtime worked by Contractor's supervision and no overhead burden, fee, or other similar charge shall be included in overtime costs to be reimbursed by the OWNER.

4.5 OTHER CHARGES

- A. The OWNER shall not be responsible for charges for any work performed by the Contractor for any other Contractor, Subcontractor, Equipment Manufacturer, or Supplier whether engaged by the OWNER or otherwise.
- B. The Contractor shall take the whole responsibility for the work and should any unforeseen difficulty arise from bad weather, high water, or from any other cause involving a greater expenditure of money than expected at the time of bidding, he shall proceed with the work without indemnity for such loss.

4.6 CHANGES OR EXTRA WORK

- A. In order that the work may be completed in a satisfactory manner, the OWNER reserves the right to alter the plans, extend or shorten the extent of the work, add such incidental work as may be necessary for the satisfactory completion of the work, deduct or cancel any of the unit or bid price items and increase or decrease the quantities of work to be performed. Such changes shall not be considered a waiver of any condition of the Contract nor to invalidate any of the provisions thereof.
- B. If the Contractor claims that any instructions or Drawings given it after execution of the Contract involves extra cost, it may present written notice thereof immediately and adjustment will be made, if approved, according to the procedure outlined.

- C. The OWNER may, without invalidating the contract, make any changes by altering, adding to, or reducing the extent of the work and the Contract price shall be adjusted accordingly. No major change shall be made except by written order of the OWNER's Representative and no claims for compensation for extra work shall be valid except as based upon such written order. The value of such extra work or change shall be determined at the option of the OWNER by one of the following methods:
1. By prices named in the Contract or subsequently agreed upon.
 2. By acceptance of a lump sum quotation from the Contractor.
 3. The payment for such items of extra work shall be made in the same manner as provided for the regular items in Paragraph 4.3.
 4. The Contractor shall make good, at its expense, any defective work performed under the provisions of this section of the Contract in the same manner as for regular items of work in the Contract.

4.7 MODIFICATION OR AMENDMENT OF AGREEMENT

- A. This Document with Appendices referenced to herein and together with any written amendments hereto which may be agreed to mutually by the parties constitute the entire understanding and agreement between the parties with respect to the work to be performed hereunder and supersede all previous negotiations, commitments, writings and Agreements with respect to the subject matter thereof. No waivers, alterations or amendments of any of the provisions hereof shall be binding unless in writing signed by the duly authorized representatives of the parties hereto.

4.8 DELAYS

- A. The Contractor shall not be liable to the OWNER for delay in the completion of the Contract if the delay is due to any cause beyond its control, such as an act of God, war, act of government, fire, flood, strike, or sabotage, and in case of such delay the time of performance shall be extended for a period equal to the time lost by reason of the delay. The Contractor shall make every effort to keep such delays at a minimum. The Contractor shall give notice in writing to the OWNER of the cause and probable duration of any such delay within a reasonable time after learning of the delay or that a delay is imminent.
- B. The OWNER shall not be held liable for delays in acceptance of the work if the delay is due to any cause beyond its control, such as an act of God, war, act of government, fire, flood, strike, or sabotage, and in case of such delay the time of performance shall be extended for a period equal to the time lost by reason of the delay.

4.9 CANCELLATION OR POSTPONEMENT BY THE OWNER

- A. Without Fault of the Contractor

The OWNER shall have the right to cancel this Contract or postpone completion of the work at any time upon giving written notice to the Contractor.

B. Contractor's Default

1. If the Contractor shall be adjudged bankrupt, or shall become insolvent, or in case it shall fail or refuse to supply properly skilled workmen in adequate numbers, or adequate construction equipment or materials, or in case the Contractor shall fail or refuse to make prompt payment to its Subcontractors, or for materials, or for labor, or in case it shall, in the judgment of the OWNER, otherwise fail or refuse to perform this Contract in any substantial respect, then the OWNER may, without prejudice to any other right or remedy, terminate the Contract and the Contractor's right thereunder and take possession of the premises. The Contractor, if requested to do so, upon receipt of written notice of such termination, shall immediately remove its employees, representatives, tools, equipment, and other property from the OWNER's premises. If the Contractor shall fail to accept such removal within a reasonable period, (a maximum of thirty [30] days) they shall be removed by the OWNER at the Contractor's expense. In the event of such termination, the OWNER shall reimburse the Contractor for all work performed in accordance with the Contract, such reimbursement to be for the percentage of the work completed at the prices established herein; subject, however, to proper deductions for defective work, damage or cost sustained by the OWNER by reason of the Contractor's default or failure to perform.
2. If the Contractor shall neglect to prosecute the work expeditiously or fails to perform any provisions of the Contract, the OWNER may, after three (3) days written notice to the Contractor, without prejudice to the OWNER's right, make good such deficiencies, the costs thereof shall be deducted from payments then due or are to become due the Contractor.
3. In the event, in the judgment of the OWNER, the Contractor becomes incapacitated prior to the completion of his work under this Contract, it is hereby agreed between the parties that, in order to expedite the continuous progress of the work, the OWNER shall have the right to take over any or all of the Contractor's equipment, construction plant, tools, etc., and any or all of the Contractor's employees, without interference from the Contractor's work under this Contract, but without prejudice to the Contractor's right to receive payment as provided in the Contract, except for proper deduction for the Contractor's supervision and any other items covered by this Contract which have been terminated by the above emergency.

4.10 ASSIGNMENT OF CONTRACT

The Contractor shall not assign the responsibilities of this Contract, either as a whole or in part, nor assign any monies due or to become due to it hereunder, without previous written consent of the OWNER.

4.11 SUBCONTRACTORS

No part of the work shall be sublet by the Contractor to another Contractor except with the previous written approval of the OWNER. In case such subletting is approved, the Contractor shall assume full responsibility to the OWNER for the acts or omissions of person directly employed by the Subcontractor, and shall make good any damage sustained by the OWNER for any failure by said Subcontractor to perform.

4.12 MECHANIC LIENS

The Contractor hereby waives all right to claim, place or maintain any lien or other encumbrance including Mechanic's liens upon the site of the work or the premises, buildings or facilities of the OWNER and undertakes to maintain said properties free and clear of Mechanic's Liens filed by its officers, agents, employees, Subcontractors, or Equipment Suppliers.

The Contractor further agrees that it will execute, deliver, and file any necessary forms required to establish valid lien waivers on behalf of the Contractor, and Equipment Suppliers.

4.13 STRIKES, RIOTS, ETC.

Neither the OWNER nor the Contractor shall be liable, either to the other, for loss, damage, or delay resulting from causes beyond their reasonable control or caused by fire, strike, civil or military authority, insurrection or riot, embargoes, or unavoidable delays in transportation. The application of this article shall not limit or modify the articles entitled "Contract Amount" contained herein.

4.14 DISPUTES AND ARBITRATION

Any question in dispute between the parties to the Contract involving determination of amount due either party hereunder or amount of damage for nonperformance of this Contract which cannot be amicably settled shall be submitted to arbitration upon request by either party. Such arbitration shall be in the manner provided for by the laws, rules, and regulations of the American Arbitration Association, which laws, rules and regulations are incorporated herein by reference as if fully set forth and the parties expressly agree to such manner of arbitration and to abide by each and every provision thereof.

4.15 INDEMNITY AND INSURANCE

- A. The Contractor shall carry the following coverage and hold the OWNER and the OWNER's Engineer harmless from the following occurrences, keeping in mind that the Contractor may be engaged in rigging, assembling, and testing activities on the OWNER's property. **All insurance coverage's must clearly define the name, address, and telephone number of the insuring company PLUS the same information for the agent PLUS proof that the insurance company and the agent are licensed to do business in the State of Indiana.**
- B. The Contractor, for itself, its successors and assigns, agrees to indemnify and save the OWNER, its successors, assigns, employees, agents and representatives, harmless from and against any and all claims, demands, damages, actions or causes of action, together with any and all losses, costs or expenses in connection therewith, or relating thereto, including reasonable attorney's fees, asserted by any person or persons for personal injuries, death or property damages, arising or in any manner growing out of the work performed under this Contract. The Contractor itself, its successors and assigns, agrees to indemnify the OWNER, its successors assigns, employees, agents and representatives, against whom any such claims or demands, damages, causes of action, fines or penalties may be asserted by virtue of any of the acts or omissions of Contractor, any of its Subcontractors, agents or representatives, in connection with, or in any manner growing out of the work performed or to be performed under this Contract.

C. The Contractor shall maintain such insurance as will protect the Contractor, OWNER and OWNER's Engineer from claims under Workmen's Compensation Acts and other acts and from all claims for damages, for personal injury, including death, and claims for property damage which may arise from operations under this Contract whether such operations be conducted by the Contractor, Contractor's Subcontractor, or by anyone directly or indirectly employed by either of them. The Contractor shall name the OWNER and the OWNER's Engineer as co-insured under all insurance policies covering risks related to field activities on this project. As a minimum of insurance protection, the Contractor shall, at its sole expense, secure and maintain in force (and shall cause his Subcontractors to secure and maintain in force) during the performance of said work or operations, policies of insurance of the following types:

1. Workmen's Compensation Insurance with statutory limits of liability under the laws of the State of Indiana.
2. Contractors Public Liability Insurance with minimum limits \$2,000,000 liability injury; \$4,000,000 group; and \$2,000,000 property damage for this project.

D. Each policy, by endorsement, shall include the following cancellation or change clause:

"This insurance will not be cancelled by this Insurance Company nor any change made in this policy which restricts or reduces the insurance provided, or changes the name of the insured, without first giving ten (10) days' notice in writing to the OWNER, as evidenced by receipt of certified or registered letter."

E. A Certificate of Insurance must be filed with, and approved by, the OWNER prior to the commencement of said work on the OWNER's premises, and this certificate must state that an endorsement has been attached to the policy adding to it the above cancellation and change clause. The OWNER shall reserve the right to approve the carrier.

F. The Contractor shall also save the OWNER harmless from unemployment compensation charges and payroll taxes relating to the Seller's employees.

G. Performance Bond

The Contractor shall furnish a bond guaranteeing the faithful performance of the Contract and the Payment of all obligations arising thereunder in such form and penal sum as the OWNER may prescribe and with such sureties as the OWNER may approve. The bond must clearly define the name, address, telephone number, and fax number of the insuring company PLUS the same information for the agent PLUS proof that the insurance company and the agent are licensed to do business in the State of Indiana. The Contractor shall guarantee to the OWNER that the premium on this bond shall not exceed five percent (5%) of the Contract Amount. Any performance bond charges in excess of the guaranteed percentage shall be borne by the Contractor.

4.16 RIGGING, BLOCKING AND SCAFFOLDING

The OWNER shall not be held liable for any damage to persons or property consequent upon the use, misuse or failure of any rigging, blocking, scaffolding, or ladders given to, or loaned to it by the OWNER. The acceptance for use of such blocking, scaffolding, or ladders by the Contractor shall be construed to mean that it undertakes to be in responsible charge of such equipment and accepts all responsibility for any claims or damages whatsoever resulting from the use or failure of such apparatus, whether such damage be to its own employees or property or to the employees or property of another contractor or of the OWNER.

4.17 EQUAL OPPORTUNITY

A. During the performance of the Contract, the Contractor agrees as follows:

1. The Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, age, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, color, age, sex or national origin.

The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2. The Contractor shall, 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, creed, color, age, sex or national origin.
3. The Contractor shall comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.
4. The Contractor shall furnish all information and reports required by Executive Order 11246, of September 24, 1965, as amended, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records and accounts by the OWNER and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.
5. 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 contracts in accordance with procedures authorized in executive Order 11246, of September 24, 1965, as amended, and such other sanctions maybe imposed and remedies invoked as provided in Executive Order 11246, of September 24, 1965, as amended, or by rule, regulations, or order of the Secretary of Labor, or as otherwise provided by law.
6. The Contractor shall include the provisions of Paragraphs 1 thru 6 in every Subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246, or September 24, 1965, as amended, so that such provisions will be binding upon each Supplier. The Contractor shall take such action with respect to any Purchase Order as the OWNER may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a Supplier as a result of such direction by the OWNER, the Contractor may request the OWNER to enter into such litigation to protect the interests of the OWNER.

- B. Contractor compliance with equal opportunity provisions shall also include compliance with Federal and State requirements for an affirmative action programs the same shall be made generally applicable to all construction industry Contractors engaged on the OWNER's work involving the project site. Such an affirmative action program will include, but not necessarily be limited to, the following:
 - 1. Establishment of mutually acceptable goals for minority work force proportions to the total work force proportions in various skills and levels of supervision.
 - 2. Establishment and maintenance of hiring practices and activities which are mutually acceptable as representing good faith efforts to fulfill established minority hiring goals.
 - 3. Establishment and maintenance of reporting procedures and activities to the OWNER and government agencies which are mutually acceptable and which meet State and Federal requirements relating to reporting and documentation procedures required for affirmative action programs.

4.18 LAW COMPLIANCE

- A. The Contractor shall comply with the provisions of the Federal Fair Labor Standards Act and with all other applicable Federal, State and local laws, rules, regulations, and ordinances in the design, manufacture, sale, pricing, delivery and erection of the materials, equipment and apparatus including all laws prohibiting discrimination in employment.
- B. The OWNER and all Construction Contractors and Subcontractors and others working at the project site are required to observe all applicable provisions of the Williams-Steiger Occupational Safety and Health Act of 1970 as amended. Therefore, it is a condition of this Contract that:
 - 1. If acting as an Equipment Supplier hereunder, the Contractor shall inform itself of all of the requirements contained in the aforesaid Occupational Safety and Health Act, and shall incorporate all necessary features, configurations, materials, design details, safety devices or other considerations into equipment supplied by it to permit compliance by the OWNER with the aforesaid act when such equipment has been installed and put into service.
 - 2. If acting as a Contractor, or Erector and/or Installer hereunder, the Contractor shall inform itself and its Subcontractors of all of the requirements contained in the aforesaid Occupational Safety and Health Act, and each shall abide by all such requirements and implement all necessary procedures in the conduct of the work to insure compliance with the aforesaid act. The Contractor shall designate a responsible member of its organization at the site whose duty will be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor to the OWNER's Representative.

4.19 TAXES

The bid price specified shall include all Federal, State, Municipal or other governmental subdivision taxes and assessments which were effective on or prior to the date of this Contract, except the State of Indiana sales or use taxes on the permanent materials which are installed as plant structures or equipment, which will be paid by the OWNER. The State of Indiana sales or use taxes shall be included only for that portion of the value of the Contract which is represented by the non-permanent materials contained herein as priced in accordance with the appropriate Paragraphs of the Bid Form.

Such Contract Prices shall also include all Contractor contributions for unemployment compensation, health and welfare, old age benefits, or other purposes, now or hereafter effective during the term of this Contract and the OWNER shall not be liable for any additional charges therefore.

4.20 INSPECTION

A. All materials and each part or detail of the work shall be subject at all times to inspection by the OWNER's Representative and/or Engineer. Such inspection may include plant, or shop inspection, and material furnished by the OWNER. The OWNER's Representative and OWNER's Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

B. Conformity with Drawings and Specifications

All work performed shall conform with the lines, grades, cross sections, dimensions and material requirements, including tolerances, shown on the drawings as well as the detailed work order sheets.

C. In the event the OWNER's Representative or Engineer finds the materials used do not conform with the Drawings and work order sheets or have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced, or otherwise corrected, by and at the expense of the Contractor.

D. During any of the various phases of construction, the OWNER's Representative may require the Contractor to exhibit additional evidence that work was carried out in accordance with the Drawings and work order sheets.

E. If evidence indicates that these requirements were not met, the Contractor shall bear the cost of this investigation as well as the uncovering or removing, and the replacing of the covering or making good the parts removed.

F. If the additional evidence substantiates that the Drawings and work order sheet requirements were met, the cost of this additional investigation shall be borne by the OWNER.

G. Acceptance of the Work

The Contractor shall notify the OWNER's Representative when all or portions of the work are ready for acceptance by the OWNER. When the conditions of the work require that special tests and/or inspections be made prior to acceptance the Contractor shall give notice to the OWNER sufficiently in advance of work completion that it will be possible for the OWNER's Representative to schedule and arrange for such tests and/or inspections. Tests and/or inspections and reports thereon shall be made promptly by the OWNER following receipt of notice by the Contractor.

Upon completion of the requisite tests and/or inspections, the OWNER shall review the results and reports of same. If the OWNER finds that the tests and/or inspections reveal compliance by the contractor with the conditions of the Contract, the OWNER shall approve same and such action shall constitute acceptance or partial acceptance of the Contractor's work by the OWNER as the case may be.

If the OWNER finds that the tests and/or inspections indicate that the work has not been satisfactorily completed by the Contractor, the OWNER shall provide the Contractor with written notice of non-acceptance of the work as it then stands stating in what way the Contractor has failed to comply with the conditions of the Contract.

When the Contractor has remedied the OWNER's objections to the work, it shall notify the OWNER and the procedures outlined in the preceding two paragraphs shall be repeated.

4.21 STORAGE

Material or Equipment on which delivery is postponed by the OWNER may be placed in storage by the Contractor for the OWNER's accounts and reasonable charges therefore, and expenses in connection therewith, shall be paid by the OWNER but if, in the Contractor's opinion, it is unable to obtain, or continue such storage, the OWNER will, on request, provide or arrange for suitable storage facilities and assume all costs and risks in connection therewith.

4.22 INSTALLATION OF OWNER'S EQUIPMENT

Machinery or equipment to be erected by the OWNER's forces, or by others, shall be installed at the OWNER's convenience and the Contractor shall cooperate to the fullest extent with the OWNER's forces or with others engaged in this work. Such work will be executed by the OWNER's forces, or by others, with a minimum of interruption and obstruction of the Contractor's work and the operations shall in general be conducted to the mutual advantage of the parties. Additional cost resulting from delaying such work for the convenience of the Contractor shall be paid by the Contractor.

4.23 CONFIDENTIALITY

All Plans, Diagrams, Drawings, Specifications, and the like furnished to the Contractor pursuant to this Agreement are the sole and separate property of the OWNER. The Contractor shall take all reasonable precautions to protect the confidentiality thereof and shall not disclose the contents thereof without the prior written consent of the OWNER.

4.24 PATENTS

The Contractor shall settle or defend at its sole expense and shall pay any costs and damages awarded in the suits or proceedings brought against the OWNER or the OWNER's Vendor based on any claim that the sale or use of the equipment, or any part thereof, furnished under this Contract constitutes infringement of any patent. In case the equipment or any part thereof furnished under this Contract is held to constitute infringement and its use is enjoined in any suits or proceedings, the Contractor shall, at its sole expense, either procure for the OWNER the right to continue using said equipment or part thereof, or replace the same with non-infringing equipment, or modify it so it becomes non-infringing.

4.25 ROYALTIES

The Contractor warrants that no royalty payments are included in the price of items of which the OWNER has use rights.

4.26 ACCEPTANCE OF CONTRACT

The Contractor may accept this Contract only by, promptly after its receipt, dating and signing the copy provided for acceptance and returning it. Acceptance is expressly limited to the terms of this offer.

5.0 AGREEMENT DETAILS

AGREEMENT

- A. This Agreement made as of the _____ day of _____ in the year two thousand and ____ by and between Auburn Electric, Auburn, Indiana, a municipality organized and existing under the laws of the State of Indiana hereinafter called the OWNER, and _____, a Corporation organized and existing under the laws of the State of _____ and duly authorized to do business in the State of Indiana hereinafter called the Contractor.
- B. WITNESSETH, that the Contractor and the OWNER for the consideration hereinafter named, agree as follows:
- C. Subject to the provisions hereof, the Contractor agrees to provide the complete supply of equipment, supervision, labor, construction equipment and other incidentals necessary or convenient to the successful completion of modifications to the OWNER's electrical system in DeKalb County in the State of Indiana.

This construction shall be performed in accordance with the Contract Documents.

5.1 EXTENT OF CONTRACT

A. Governing Law

The Law of the State of Indiana shall govern the rights and duties of the parties.

B. Contract Documents

The "Contract Documents" include only the following documents:

1. This Construction Agreement.
2. The Bid Form and mutually executed and approved written changes to any of the Documents listed herewith.
3. The description of the construction and the Drawings showing location of such construction listed herein and approved revisions thereof.
4. The Special Conditions of the Contract.
5. The General Conditions of the Contract.
6. OWNER's Purchase Order for contract identification and record purposes only.

C. Interpretations

In the event of ambiguity or conflict between or among the Documents, the Documents shall govern or take precedence in the order they are listed above. The Description shall govern the Drawings with respect to materials, equipment and methods. It is therefore understood and agreed between the parties hereto that in the case of any difference, conflict, or ambiguity between the Contractor's Proposal, subsequent revisions hereto and this Contract, this Contract shall govern.

D. Independent Contractor Status

The Contractor shall perform the work and services required by this Contract with its own equipment and according to its own means and methods, in strict compliance with the plans and specifications.

5.2 TIME PERFORMANCE/LIQUIDATED DAMAGES

A. The materials, equipment, labor and services covered by this Contract constitute modifications to the OWNER's Electric System. Because the construction schedules of other Contracts are based on the work being completed at the time and place specified in this Contract, time is of the essence.

B. Liquidated Damages

The OWNER and Contractor recognize that time is of the essence in this agreement. The OWNER and Contractor also recognize the delays, expenses, and difficulties involved in proving in a legal or arbitration proceeding the actual loss that would be suffered by Auburn Electric if the work is not completed on time. Therefore, instead of requiring any such proof, OWNER and Contractor agree that liquidated damages will be paid by the Contractor for delays. Contractor shall pay OWNER **One-hundred fifty dollars (\$150.00) for each day** that elapses after the completion dates specified in this project for the work to be done under this Contract.

OWNER reserves the right to grant extensions due to conditions beyond the control of the OWNER or Contractor.

This Contractor is required to work closely with Auburn Electric personnel and other contractors for the completion of the project. Because of this required coordination with others, milestone completion dates for the contractor to meet are as noted (all dates are for calendar year 2019 unless otherwise noted):

5/27 – 5/31	Mobilize on site
6/3 – 6/12	Excavate and install steel pole concrete foundations
7/15 – 7/24	Install steel poles
7/24 – 7/26	Clean-up site and De-mobilize

PROJECT SCHEDULE

<u>PROJECT NUMBER</u>	<u>ESTIMATED STARTING DATE</u>	<u>COMPLETION DATE</u>
Contractor to specify	Contractor to specify	Contractor to specify
_____	_____	_____

5.3 CONTRACT PRICE

In consideration whereof, the OWNER agrees to pay the Contractor, in accordance with paragraph 2.2, Schedule of Prices, Section 2, Bid Form, of the Contract Document.

5.4 SIGNATURES

In witness whereof, the parties to this Agreement have set their hands and seals on the day and year herein before first mentioned.

OWNER:

Auburn Electric
Auburn, Indiana

ATTEST:

_____ Title

Contractor:

By: _____

Title: _____

ATTEST:

_____ Title

6.0 NON-COLLUSION AFFIDAVIT

State of Indiana)
) SS:
DeKalb County)

_____ being first duly
(Name of Affiant)

Sworn, deposes and says: That the Affiant is _____,
(Office of Affiant)

of _____,
(Firm submitting bid)

making the forgoing proposals or bids; that such bids are genuine and not collusive; such bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to put in a sham bid, or that such other person shall refrain from bidding and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the State of Indiana or any person or persons interested in the proposed lease; and that all statements contained in said proposal are true; and further, that such bidder has not, directly or indirectly submitted this bid, or the contents thereof, or divulged information or data relative thereto to any association or to any member or agent thereof,

(Signature of Affiant)

Sworn to and subscribed before me this _____ day of _____, 20_____

(Signature of Notary Public)

Notary Public in and for: _____ County, _____

My Commission expires

SECTION 3 – TECHNICAL SPECIFICATIONS

SECTION 01010 - PROJECT REQUIREMENTS

PART 1 GENERAL

1.1 Scope of the Project

The Site Work, Grounding & Drainage scope of project shall include:

All labor and all non-OWNER-supplied material to prepare the site and nearby area to accept the new self-supporting steel pole structures. The work will require the Contractor to perform the following general tasks. This is not a detailed work guide, and should in no way be construed as an all-inclusive list of work to be performed.

1. Order all Non-Owner-Supplied material as required.
2. Contact Indiana Holey Moley, Auburn Electric, and all other applicable utilities a minimum of forty-eight (48) hours prior to beginning excavation so that existing utilities can be located and marked.
3. Excavate for the steel pole concrete foundations, haul spoils.
4. Construct steel pole concrete foundations.
5. Backfill around foundations, compact, slope and shape topsoil.
6. Install and frame steel poles.
7. Repair all areas affected by the construction, including asphalt cleaning and seeding/straw application where necessary to return surface finishes to original condition.
8. Refer to the Work Procedure at the end of this Section for more details.

1.2 OWNER's Operations Manager

The OWNER's Operation Manager is:

Mr. Robert Higgins, OSP Manager
Auburn Electric
Auburn, IN 46706
Tel: (260) 925-8232 X1309
Fax: (260) 925-8274
Email: rwhiggins@ci.auburn.in.us.us

1.3 OWNER's Engineer

The OWNER's Engineer for this project is:

Mr. Mark Christiansen, P.E.
Spectrum Engineering Corporation
5524 County Line Road
Auburn, Indiana 46706
Phone: (260) 627-8888
Fax: (260) 627-8102
e-mail: machristiansen@spectrumeng.com

Inquiries may be directed to:

Mr. Bryan Steury
Spectrum Engineering Corporation
5524 County Line Road
Auburn, Indiana 46706
Phone: (260) 627-8888
Fax: (260) 627-8102
EMAIL: blsteury@spectrumeng.com

1.4 Commencement and Completion of the Work

- A. Work on the project must be completed no later than See Paragraph 5.2.B. This assumes that the Notice of Award is given by April 25, 2019.

1.5 Jobsite Visits

- A. Any Bidder wishing to make on-site job visits to inspect and verify conditions shall contact Mr. Robert Higgins, at the number(s) listed above, to make arrangements.

1.6 Payment

- A. Refer to Section 2 General Conditions, Section 4.2 Methods of Payment.

1.7 Contractor's Use of the Premises

- A. The Contractor shall have one foreman present on site where work is taking place. This foreman will be responsible for communicating to the OWNER (through a single representative) the daily progress of work.
 - 1. Use of premises for work and storage shall be limited to allow for OWNER's occupancy.
 - 2. Access to the project area shall be coordinated with the OWNER's Superintendent.
- B. Assume full responsibility for protection and safekeeping of products stored on premises.
- C. See Section 01500 Temporary Facilities for storage.

1.8 Contractor Parking

- A. Contractor employee parking will be limited to the areas designated by the Project Manager.

1.9 OWNER's Occupancy

- A. Suitable means of ingress and egress shall be maintained to these areas at all times.
- B. Cooperate with OWNER in all construction operations to minimize conflict and to facilitate OWNER's usage.

If a dispute over time of use or interruption of use of the facilities develops, the OWNER's requirements shall take precedence.

1.10 Protection

- A. Existing Property:
 - 1. Protect existing property from damage during the work required by these Contract Documents. Any damage done to existing property shall be repaired satisfactorily to the approval of the Superintendent and/or OWNER.
 - 2. Existing property includes, but shall not be limited to, buildings, sidewalks, curbs, lawns, grass and shrubs.
- B. Work in Progress:
 - 1. In the event of temporary suspension of work for inclement weather or for any other reasons, the Contractor shall protect all work and materials against damage or injury. If damage or injury results from failure to protect, such work and materials shall be removed and replaced at no additional cost to the OWNER.
- C. Utilities:
 - 1. All existing water and gas pipe, sewers, drains, electrical ducts and other duly authorized structures shall be properly supported and protected by and at the expense of the Contractor during the construction of work under or near them and so as not to interfere with their use. They shall be left in as good condition on completion of the work as when found by the Contractor.

1.11 "For Record" DRAWINGS

- A. The Contractor is responsible for keeping all project records and measurements as required to provide "For Record" plans back to the OWNER at the completion of this project.
- B. Certain control points and benchmarks are listed herein, or will be available from the OWNER. These points shall be used by the Contractor for this project to layout, construct, and prepare "For Record" plans. The Contractor shall locate the corners of Building(s) along with all **New and Existing** utilities within the site. The Contractor shall present all of this underground facilities information in a written description, including applicable sketches. All points located shall include a full description of the utility, the material of its construction, and the horizontal and vertical coordinates (X, Y, Z) from a readily observable aboveground permanent object (building corner, permanent fence post, etc).

Intersection Widening Project – Steel pole construction

Work Procedure

This work procedure is intended to give the Contractor an idea of how the work is to progress. It lists only major items, and in no way should be interpreted as an all- inclusive list of tasks to be completed. Refer to the drawings and technical specifications for specific information concerning this project. Each Contractor shall work closely with Auburn Electric personnel and other contractors on site before and during the construction process. The procedure is presented in general chronological order; although it is acknowledged that the sequence will vary significantly as the project unfolds. In addition, it is expected and required that many steps will overlap and be taking place concurrently.

GEN = GENERAL CONSTRUCTION CONTRACTOR; AE = AUBURN ELECTRIC; O = OTHERS

SITE WORK CONSTRUCTION

- AE* ➤ Purchase and furnish Steel pole cage bolt assemblies and steel pole structures.
- AE* ➤ Remove existing overhead distribution conductors and communications cables that would interfere with the installation of the steel poles.
- O* ➤ Owners Engineer to stake new steel pole locations.
- GEN* ➤ Excavate as required for steel pole foundations. Place rebar cages and anchor bolts in new excavations. Form and place concrete as directed in drawings. Backfill around foundations, compact, and clean/repair surrounding area to match the as-found condition.
- GEN* ➤ Unload Steel Poles near respective foundations.
- GEN* ➤ Assemble, frame, and install Steel Poles.
- GEN* ➤ Clean-up, seed/straw affected areas as required, clean affected asphalt areas, and de-mobilize.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance - control of installation.
- B. Tolerances
- C. References.
- D. Inspecting and testing laboratory services.
- E. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

- NOT USED -

1.3 QUALITY ASSURANCE – CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.

1.4 TOLERANCES

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

- B. Conform to reference standard by date of issue current on date of Contract Documents, date for receiving Bids, date of OWNER-Contractor Agreement when there are no Bids, date specified in the individual specification sections, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Engineer shall not be altered from the Contract Documents by mention of inference otherwise in any reference document.

1.6 INSPECTING AND TESTING LABORATORY SERVICES

- A. OWNER will appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer or the OWNER.
- C. Inspecting, testing, and source quality control may occur on or off the project site.
- D. Reports will be submitted by the independent firm to the Engineer, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. The Contractor shall cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
- F. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- G. Testing or inspecting does not relieve Contractor to perform Work to contract requirements.
- H. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspecting or testing charges from the contract sum/price.

NOTE – Any previous agreement between the OWNER and Contractor with regard to testing services shall take precedence over this specification.

PART 2 PRODUCTS

- NOT USED -

PART 3 EXECUTION

- NOT USED -

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES

PART 1 GENERAL

1.1 DESCRIPTION

- A. Temporary Electrical Power.
 - 1. To be provided by Contractor.
 - 2. Contractor to furnish, install, and maintain a temporary wiring system for construction power and light as required for work under this contract.
- B. Temporary Telephone:
 - 1. Contractor provide service if desired.
 - 2. Subcontractors provide service they require.
 - 3. OWNER's telephone shall not be available for use, except for emergency.
- C. Temporary Water:
 - 1. None Available.
- D. Sanitary Facilities:
 - 1. Portable toilets, to be provided by Contractor.
- E. Temporary Construction: Enclosures, barricades, stairs, ramps, scaffolds, etc.
- F. Field Offices and Storage Sheds.
- G. Site protection fence.

1.2 COSTS OF TEMPORARY UTILITIES

- A. Temporary Electrical Power:
 - 1. Make all necessary arrangements.
 - 2. Pay for setting, distributing, maintaining, and removing temporary facilities.
- B. Temporary Water:
 - 1. Pay costs for installing, maintaining, and removing pipe and equipment for temporary water service, as required.
- C. Telephone:
 - 1. Pay costs for installing, maintaining, and removing temporary service.
 - 2. Pay for local telephone service.
 - 3. Persons making toll calls pay charges.

PART 2 PRODUCTS

2.1 CONTROLS

- A. Materials may be new or used, adequate in capacity for purpose intended without creating unsafe conditions or code violations.
- B. Enclosures:
 - 1. Dust proof barriers as required at occupied areas.
 - 2. Lockable doors to provide for security and safety.
 - 3. Provide security at all openings to prevent unauthorized access.
- C. Site protection fence:
 - 1. Provide plastic or steel fence in area of exterior construction.
 - 2. Limits of area shall be as shown on the Drawings or determined by the Project Manager.
- D. Field Office and Storage Sheds:
 - 1. As Contractor deems necessary.
 - 2. Placement subject to OWNER's approval.

PART 3 EXECUTION

3.1 GENERAL

- A. Install work in neat orderly manner, structurally sound.
- B. Locate services to avoid interference with traffic, work and storage areas, material handling equipment and cranes.
- C. Maintain to provide continuous service.
- D. Modify service, as work progress requires.

3.2 PROTECTION

- A. Safety: Maintain lights and barricades on all obstructions and hazards during construction period in conformance to federal and local laws and codes.
- B. Fire Protection:
 - 1. Provide multi-purpose dry chemical extinguishers as required.
 - 2. Provide and maintain such temporary extinguishers and protective devices as may be required by insurance carriers, OSHA, and in particular Section 2-2 and other sections of the Life Safety Code (NFPA 101) as they may pertain to this project.

3.3 REMOVAL AND CLEANING

- A. Remove all temporary structures and materials completely upon completion of construction.
- B. Remove debris and clean area.
- C. Repair all damage and restore to finish condition.
- D. Seed and straw any affected areas.

END OF SECTION

SECTION 02010 - SUBSURFACE CONDITIONS

PART 1 GENERAL

1.1 UNDERGROUND FACILITIES

- A. Contractor shall visit the site and be acquainted with all underground cables, piping, and obstructions.
- B. Care shall be taken during excavation to avoid damage to existing underground equipment. Hand dig where necessary to avoid damage to existing facilities.
- C. The Contractor shall be responsible for damage to existing OWNER's or other Utility's equipment which has been correctly located by the OWNER and/or Utility, if, in the Project Manager's opinion, the damage could have been avoided by using due care.

1.2 SOIL BORING RESULTS

- A. A subsurface investigation and analysis will be performed by others.
- B. Contact the OWNER for the results, report, and analysis.

1.3 SOIL ANALYSIS

As a result of excavation required for installation of Steel Pole Foundations, earth needs to be excavated and disposed of. The owner will provide a site to dispose excavated materials at this address: Auburn City Dump, 1131 W. Auburn Drive, Auburn, IN 46706

- A. The Contractor shall be responsible for grading the site to drain and maintain excavations free of water. This would include providing, operating, and maintaining pumping equipment. Additionally, the Contractor shall protect the site from puddles or running water and provide water barriers as required to protect the site from soil erosion. Contractor should refer to Section 02205 density compaction requirements.**

PART 2 PRODUCTS

- NOT USED -

PART 3 EXECUTION

- NOT USED -

END OF SECTION

SECTION 02205 - SOIL MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Soil materials

1.2 RELATED SECTIONS

- A. Section 02207 - Aggregate Materials.
- B. Section 02222 - Excavating
- C. Section 02223 – Backfilling
- D. Section 02225 – Trenching

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. ENGINEERED BACKFILL

1. All engineered backfill, to be used in bringing the site back to rough grade, shall conform to the Indiana Department of Transportation specification for Backfill. Fill shall be formed of satisfactory materials placed in successive horizontal layers of not more than eight (8) inches of loose depth for the full width of the cross section.
2. Material used for backfill shall be free from large frozen lumps, wood, or other extraneous organic material, and shall consist of suitable sand, gravel, crushed stone, slag, or other OWNER-approved material.
3. The compacted backfill shall obtain the required 95% dry density compaction in accordance with ASTM D1557.
4. Refer to Soil Exploration to be provided to the selected contractor.

B. FILL MATERIAL

1. All fill material shall be subject to the approval of the OWNER's Representative. For approval of fill material, notify the OWNER at least four working days in advance of intention to import material, designate the proposed borrow area, and permit the OWNER to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.

PART 3 EXECUTION

3.1 STOCKPILING

- A. The Project Manager or OWNER's Representative shall provide an on-site location for stockpiling materials.
- B. Excavated materials may be stockpiled on site in sufficient quantities to meet project requirements. These excavated materials must meet requirements of backfill as outlined in Section 02223 of this Specification.
- C. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile; leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.
- B. Remove excess excavated material from site. The Project Manager or OWNER's Representative shall provide a Disposal location.

END OF SECTION

SECTION 02207 - AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aggregate materials.

1.2 RELATED SECTIONS

- A. Section 02205 - Soil Materials.
- B. Section 02222 - Excavating.
- C. Section 02223 - Backfilling.
- D. Section 02225 – Trenching.

1.3 REFERENCES

- NOT USED -

PART 2 PRODUCTS

2.1 MATERIALS

- A. Coarse Aggregate Crushed Limestone, per Indiana Department of Transportation, size 73, for backfill around wooden poles.

2.2 SOURCE QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400.
- B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 STOCKPILING

- A. Stockpile materials on site at locations designated by the Project Manager or OWNER's Representative.
- B. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, seed per Section 02223; leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 02211 - ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of topsoil and subsoil.
- B. Cutting, grading, filling, rough contouring, and compacting appropriate areas for asphalt drive access.

1.2 RELATED SECTIONS

- A. Section 01400 – Quality Control.
- B. Section 02010 – Subsurface Conditions.
- C. Section 02205 – Soil Materials.
- D. Section 02207 – Aggregate Materials.
- E. Section 02222 – Excavating.
- F. Section 02223 – Backfilling.
- G. Section 02225 – Trenching.

1.3 REFERENCES

- A. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- C. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
- D. ASTM D2419 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- E. ASTM D2434 - Test Method for Permeability of Granular Soils (Constant Head).
- F. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C136, ASTM D2419, ASTM D2434, Indiana Department of Transportation standards. Maintain one copy onsite.

1.5 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Refer to Sections 02205 and 02207 for soil and aggregate materials.
- B. Refer to Section 02223 for geo-textile materials.
- C. All other materials, not specifically described but required for a complete and proper installation, shall be as selected by the Contractor subject to the approval of the Project Manager or the OWNER's Representative.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 02010.
- B. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain from damage.
- D. Notify the Project Manager or OWNER's representative of the need to remove and/or relocate utilities.
- E. Protect above and below grade utilities that remain.
- F. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- G. Protect benchmarks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.
- B. Do not excavate wet subsoil.
- C. When excavating through roots, perform work by hand and cut roots with sharp axe.
- D. Stockpile in area designated on site to depth not exceeding 8 feet (2.51 m) and protect from erosion. Remove from site subsoil not being reused.
- E. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing.
- F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.4 FILLING

- A. Install Work in accordance with Indiana Department of Transportation standards.
- B. Fill areas to contours and elevations with unfrozen materials.
- C. Place fill material on continuous layers and compact in accordance with the schedule at end of this section.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from building minimum two (2) inches in ten (10) feet, unless noted otherwise.
- F. Make grade changes gradual. Blend slope into level areas.
- G. Remove surplus fill materials from site.

3.5 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus one (1) inch from required elevation.

3.6 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Assurance: Field inspection and testing.
- B. Testing: In accordance with ASTM D1557.
- C. If tests indicate Work does not meet specified requirements, Contractor shall remove Work, replace, and retest at his expense.

3.7 SCHEDULES

Structural Fill underneath roadway: In accordance with Section 02205.
Compact to minimum 100 percent of maximum density.

Structural Fill in and around substation: In accordance with Section 02205.
Compact to minimum 95 percent of maximum density.

Pervious Structural Fill under roadway: In accordance with Section 02207.
Compact to minimum 100 percent of maximum density.

Previous Structural Fill in and around substation: In accordance with Section 02207.
Compact to minimum 95 percent of maximum density.

Subsoil Fill:
Maximum six (6) inches compacted depth.
Compact to minimum 95 percent of maximum density.

END OF SECTION

SECTION 02222 - EXCAVATING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Excavating for site grading, foundations, and grounding.

1.2 RELATED SECTIONS

- A. Section 02205 - Soil Material.
- B. Section 02207 - Aggregate Material
- C. Section 02223 - Backfilling.

1.3 MEASUREMENT AND PAYMENT

- A. The Contractor shall be responsible for all excavation required.
- B. Over Excavating: Payment will not be made for over excavated work nor for replacement materials, unless the Project Manager or OWNER's Representative authorizes in writing such work.

1.4 FIELD MEASUREMENTS

- A. Refer to Drawings for reference elevations. The Project Manager or OWNER's Representative will mark the reference point prior to start of construction.
- B. Elevations of new foundations are per the drawings.
- C. Setting and establishing finish elevations and lines shall be the responsibility of the Contractor. Carefully preserve all data and monuments set by the OWNER and Contractor and, if displaced or lost, immediately replace to the approval of the OWNER and at no additional cost to the OWNER.

1.5 PROTECTION

- A. All excavations, if left open and unattended, shall be protected by fencing to prevent unauthorized or accidental entry.

PART 2 PRODUCTS

- NOT USED -

PART 3 EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Hand dig to locate existing utilities that must be crossed or connected to. The Contractor, at the Contractor's expense, shall repair damage to existing utilities that have been properly marked by the OWNER of the utility.
- C. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities that are to remain.

3.2 EXCAVATING

- A. Salvage and stockpile, within the OWNER-designated area, existing excavated material that is to be reused. Refer to Sections 02205 and 02207 for stockpiling details.
- B. The Contractor will be responsible for removal of all excavated material that is not to be reused and extraneous debris (broken concrete, metal, wood, or trash). The OWNER will provide a site for disposal.
- C. Excavate subsoil where necessary to reach rough grade to accommodate structure foundations.
- D. The exposed subgrade shall be proof rolled with heavy trucks or equipment to determine if any pockets of soft materials remain. The Project Manager or OWNER's Representative shall approve the equipment for said use. These pockets shall be excavated, backfilled with engineered backfill, and compacted.
- E. The Contractor shall use care to not damage newly installed ground grid material and shall repair any damage caused by the Contractor.
- F. Grade top perimeter of excavations to prevent surface water from draining into excavation.
- G. Hand trim excavations that are to receive foundations and remove loose matter.
- H. Remove lumped subsoil, and rock or rubble from site.
- I. Notify Engineer of unexpected subsurface conditions and discontinue effected Work in area until notified to resume work.

3.3 DEWATERING

- A. The site final grade has been designed to minimize any groundwater interference. However, dewatering may be required during the course of the project.
- B. Provide and maintain at all times during construction, ample means and devices with which to remove promptly and dispose of all water from every source entering the excavations or other parts of the Work.
- C. Dewater by means that will ensure dry excavations and the preservation of the final lines and grades of bottoms of excavations. Where necessary, construct ditches and temporary sump pits with pumps to maintain dewatering.

3.4 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01400.
- B. Provide for visual inspection of bearing surfaces by the Project Manager or OWNER's Representative.
- C. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests, and approvals.

3.5 PROTECTION

- A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect workers and public from falling into excavated areas.
- D. Use all reasonable means necessary to control dust on and near the work. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of work on the site.

END OF SECTION

SECTION 02223 - BACKFILLING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Backfilling requirements

1.2 RELATED SECTIONS

- A. Section 02205 - Soil Materials.
- B. Section 02207 - Aggregate Materials.
- C. Section 02222 - Excavating.
- D. Section 02225 – Trenching.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Refer to Sections 02205 and 02207 for soil and aggregate materials.
- B. All other materials, not specifically described but required for a complete and proper installation, shall be as selected by the Contractor subject to the approval of the Project Manager or OWNER's Representative.

2.2 GEO-TEXTILE MATERIAL

- A. For use as separation layer between engineered backfill and final grade surface stone, if required.

2.3 EROSION CONTROL BLANKETS

- A. For use along drainage routes to prevent erosion of newly planted grass seed.
- B. Temporary Protection, Straw-filled, Photodegradable, Light Top Netting, Medium Bottom Netting, 10-12 month life span, 0.7 lbs / sq yd, 8' x 67.5' rolls.
- C. Greenfix America WS072 or OWNER-Approved Equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify sub drainage and waterproofing installation has been inspected.
- B. Backfilling prior to approvals:

Do not allow or cause any of the work performed or installed to be covered up or enclosed prior to all required inspections, tests, and approvals.

Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the OWNER.

After the work has been completely tested, inspected, and approved, make all repairs and replacements necessary to restore the work to condition in which it was found at the time of uncovering, all at no additional cost to the OWNER.

3.2 PREPARATION

- A. Cut out soft areas of sub-grade not capable of suitable compaction. Backfill with Granular fill and compact to density equal to or greater than requirements for subsequent fill material. (Minimum compaction of 95% maximum dry density).

3.3 BACKFILLING

- A. Granular Fill: Place and compact materials in continuous layers not exceeding (eight) 8 inches compacted depth, unless compacting with hand-operated equipment. Hand-operated compacting equipment shall compact materials in continuous layers not exceeding (four) 4 inches.
- B. Employ a placement method that does not disturb or damage other work.
- C. Avoid damage to copper grounding, conduits, and drainage pipes.
- D. Maintain optimum moisture content of backfill materials to attain required compaction density.
- E. Remove surplus backfill materials from site.
- F. Leave fill material stockpile areas free of excess fill materials.

3.4 ESTIMATED QUANTITIES

Not Used.

3.5 FINAL FINISH AND SEEDING

- A. The Contractor shall be responsible for spreading topsoil and seeding all areas that have been denuded as a result of construction or ingress and egress of the site.
- B. Any topsoil salvaged from the original stripping of the site shall be evenly spread over the rough grade, to a minimum depth of two (2) inches.
- C. All areas shall be seeded using a Contractor's Mix of:
 - 50% Perennial Ryegrass
 - 45% Annual Ryegrass
 - 5% 85/80 Kentucky Bluegrass
- E. The seed should be spread at a rate of 5-7 lbs/1000 square feet. The seed shall be well raked into the soil to assure germination. Areas where germination fails shall be reseeded at the Contractor's expense.
- F. Along foundations, any grades steep enough to be subject to erosion, immediately following seeding, the Contractor shall install erosion control blankets over the seeded area. Follow Manufacturer's directions for installing and fastening into soil.
- D. Entire seeded area to have straw applied. It is the contractor's responsibility to maintain straw coverage over entire site to aid in the grass seed germination. Water as required to insure germination.
- E. Any Rip Rap Limestone installed in and around the site shall be a minimum of a 12 inch layer installed over a weed barrier fabric.

3.8 TOLERANCES

- A. Where matching existing undisturbed sub-grade and final grade, the top surface of the backfill shall be flush with adjoining sub-grade and final grade.
- B. Where new grade elevations are being established, sub-grade backfill shall be installed to a tolerance of one (1) inch.
- C. Where new grade elevations are being established, final grade backfill shall be installed to a tolerance of one (1) inch. However; proper slopes shall be maintained, without localized low areas, which will collect water.

3.9 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.10 PROTECTION OF FINISHED WORK

- A. It is the responsibility of the Contractor to protect finished work at all times during construction.

END OF SECTION

SECTION 03100 - CONCRETE FORMWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Section 03200: Concrete Reinforcement
- B. Section 03300: Cast-In-Place Concrete:
- C. Supply of concrete accessories for placement by this section.
- D. Drainage Hardware

1.3 RELATED SECTIONS

- A. Section 03200 - Concrete Reinforcement.
- B. Section 03300 - Cast-in-Place Concrete.

1.4 REFERENCES

- A. ACI 347 - Recommended Practice for Concrete Formwork.
- B. ACI 306R - Cold Weather Concreting.

1.5 DESIGN REQUIREMENTS

- A. Design and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 347 301 318.
- B. Maintain one copy of each document on site.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for design, fabrication, erection, and removal of formwork.

1.8 FIELD SAMPLES

- A. Refer to Section 03300, Paragraphs 1.7 A through F for concrete sampling procedure.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site in a manner consistent with the manufacturers' recommendations.
- B. Location of Contractor-stored material on the site should be coordinated with the OWNER.

1.10 COORDINATION

- A. Coordinate work with the OWNER.
- B. Coordinate this Section with other Sections of work that require attachment of components to formwork.
- C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Project Manager or OWNER's Representative before proceeding.

PART 2 PRODUCTS

2.1 FORM MATERIALS

- A. Form Materials: At the discretion of the Contractor.

2.2 PREFABRICATED FORMS

- A. Preformed Steel Forms: Minimum sixteen (16) gauge matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- B. Insulated forms may be required to comply with ACI 306R.

2.3 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, galvanized metal, adjustable length, with waterproofing washer, free of defects that could leave holes larger than one (1) inch in concrete surface.
- B. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
- C. Chamfer Strips: one (1) inch by one (1) inch – to be placed in forms to bevel above grade edges and corners.
- D. Control joint strips, one-half inch (½") quarter-round for providing crack control in concrete retaining walls.

2.4 ANCHOR BOLTS

- A. Anchor bolts shall be fabricated from ASTM A325 steel rods and shall be complete with heavy hexagon nuts and leveling nuts. Exposed portion of anchor bolts shall be galvanized to ASTM A153.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.2 EARTH FORMS

- A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.3 ERECTION - FORMWORK

- A. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to over stressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.
- E. Obtain approval before framing openings in structural members that are not indicated on Drawings.

3.4 APPLICATION – FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Locate and set in place items which will be cast directly into concrete. Fasten embedded items securely in proper position before placing concrete.
- B. Coordinate with work of other sections in forming and placing openings, slots, ringlets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- C. Install Drainage Hardware and Forms in the transformer foundation form. Use care that precise slopes are maintained to assure proper drainage.
- D. Use templates for placing anchor bolts. The embedded section of the bolt shall be free of oil and other deleterious substances that would adversely affect the bond between bolt and concrete. After pouring, all concrete adhering to anchor bolts shall be removed.
- E. Place chamfer strips as required for beveling all edges and corners that will be exposed above grade after final grade work is complete.

3.6 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior.
- D. During cold weather:
Remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.7 FORMWORK AND TOLERANCES

- A. Horizontal distances between centers of foundations shall not vary more than plus or minus one-fourth inch (1/4") which shall not be accumulated for measurements between more than two (2) foundations.
- B. Elevation of foundations shall be true planes within plus or minus one-fourth inch (1/4").

3.8 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

3.9 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

END OF SECTION

SECTION 03200 - CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel bars, wire fabric, and accessories for cast-in-place concrete.

1.2 RELATED SECTIONS

- A. Section 03100 - Concrete Formwork.
- B. Section 03300 - Cast-in-Place Concrete.

1.3 REFERENCES

- A. ACI SP-66 - American Concrete Institute - Detailing Manual.
- B. ANSI/ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
- C. ASTM A706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
- D. CRSI - Concrete Reinforcing Steel Institute - Manual of Practice.
- E. CRSI - Placing Reinforcing Bars.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with CRSI - Manual of Standard Practice ACI SP-66.
- B. Maintain one copy of each document on site.

1.5 COORDINATION

- A. Coordinate work with the Project Manager or OWNER's Representative.
- B. Coordinate with placement of formwork, formed openings and other Work.
- C. Notify OWNER, Project Manager or OWNER's Representative before placing concrete so that reinforcing may be inspected.

PART 2 PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615, sixty (60) ksi yield grade; deformed billet steel bars, unfinished in accordance with ASTM A767, Class II.
- B. Welded Steel Wire Fabric: ASTM A815, ASTM A497 Deformed Type; in flat sheets; unfinished in accordance with ASTM D884 Class A finish.
- C. Steel shapes, plates and flat bars shall conform to the requirements of ASTM A36.

2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum sixteen (16) gauge annealed type.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

2.3 FABRICATION

- A. Locate reinforcing splices not indicated on drawings, at point of minimum stress. Review location of splices with Project Manager or OWNER's Representative.
- B. Provide minimum of thirty (30) diameters overlap for full development of reinforcing bar strength.
- C. Reinforcing bars shall be firmly and accurately secured in the positions shown on the Drawings. Required wire ties, chairs and temporary supports shall be furnished and installed by the Contractor.
- D. Where reinforcing bars interfere with other embedded items, the bars shall be shifted or bent, but only with the knowledge of and acceptance by the Project Manager or OWNER's Representative. Other methods of eliminating interferences may be required to maintain structural integrity.
- E. The Contractor shall provide reinforcing assemblies with such additional temporary bracing as is required to maintain the integrity and shape of the assembly during handling and installation. Said temporary bracing shall be removed from the assembly prior to placement of the concrete. If during handling or installation, the reinforcing assembly is damaged or distorted, the Project Manager or OWNER's Representative shall be the sole judge as to whether the assembly shall be repaired or replaced.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Accommodate placement of formed openings.
- C. Maintain minimum concrete cover around reinforcing as shown on the Drawings.
- D. After approval of the excavation by the Project Manager or OWNER's Representative, the reinforcing assemblies shall immediately be set in place. The assemblies shall be supported by some positive method to prevent slumping downward. Suitable spacers shall be used to insure proper spacing inside the excavation or form. Spacers shall be pre-cast concrete blocks or other non-deteriorating material.

3.2 FIELD QUALITY CONTROL

- A. The Project Manager or OWNER's Representative will perform Field inspection on an as needed basis.

END OF SECTION

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-place concrete foundations and structures.

1.2 RELATED SECTIONS

- A. Section 03100 - Concrete Formwork: Formwork and accessories.
- B. Section 03200 - Concrete Reinforcement.

1.3 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- C. ACI 306R - Cold Weather Concreting.
- D. ACI 308 - Standard Practice for Curing Concrete.
- E. ACI 318 - Building Code Requirements for Reinforced Concrete.
- F. ASTM C33 - Concrete Aggregates.
- G. ASTM C94 - Ready-Mixed Concrete.
- H. ASTM C150 - Portland Cement.
- I. ASTM C260 - Air Entraining Admixtures for Concrete.
- J. ASTM C330 - Light Weight Aggregates For Structural Concrete.
- K. ASTM C494 - Chemicals Admixtures for Concrete.

1.4 SUBMITTALS

- A. Submit Certificate of Concrete Mix Design to the Project Manager or OWNER's Representative for pre-installation approval.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit As-Built Drawings to Project Manager or OWNER's Representative after project completion.
- B. Accurately record any and all discrepancies between Project Drawings and as-built conditions. Record measurements on field drawings, to be submitted to Project Manager or OWNER's Representative for incorporation onto Record Drawings.
- C. Accurately record actual locations of embedded utilities and components that are concealed from view. Use visible, above grade, landmarks as references. Measure to an accuracy of one (1) inch.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Acquire cement and aggregate from same source for all work.
- C. Conform to ACI 306R when concreting during cold weather.

1.7 FIELD SAMPLES

- A. The Contractor shall take two (2) sample cylinders from every delivered load of concrete.
- B. Sampling Procedure:
 - Fill cylinder one-third (1/3) full.
 - Plunge a section of #4 rebar completely into concrete sample, bottoming out on bottom of cylinder.
Repeat ten (10) times.
 - Fill cylinder another one-third (1/3) full, for a total of two-thirds (2/3) full.
 - Plunge a section of #4 rebar completely into concrete sample, bottoming out on bottom of cylinder.
Repeat ten (10) times.
 - Fill cylinder another one-third (1/3) full, to completely fill cylinder, with enough excess to make up for settlement during final mixing.
 - Plunge a section of #4 rebar completely into concrete sample, bottoming out on bottom of cylinder.
Repeat ten (10) times.
 - Screed off the excess concrete so that concrete is level with top of cylinder.
- C. The Contractor shall supply the sampling cylinders. Each cylinder shall be clearly labeled as to date and time of sampling, delivery ID or truck number, and the final destination of the represented concrete load.
- D. The sampling cylinders shall remain on site under conditions as similar as possible to the final placement of the load from which the samples came.
- E. The OWNER shall be responsible for performing break testing of the concrete samples.
- F. The Contractor shall perform a slump test on every delivered load of concrete. The results shall be recorded, along with the time and date of sampling and the final destination of the represented concrete load.

1.8 COORDINATION

Coordinate work as required.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean and not detrimental to concrete.

2.2 ADMIXTURES

- A. Air Entrainment: ASTM C260.

2.3 CONCRETE MIX

- A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.
- B. Select proportions for normal weight concrete in accordance with ACI 301 Method 3.
- C. Provide concrete to the following criteria:

Foundations: Compressive Strength (28 day) = 4500 psi; w/minimum of 611 lbs of Portland cement and no fly ash (or as directed by drawings).

Exposure Category F, Class F2 – Concrete exposed to freezing-and-thawing cycles and in continuous contact with moisture

Slump - 6 inches, plus or minus 1 inch

- D. Cold Weather Placement

During cold weather placement, the Contractor shall use super plasticizer admixture at the direction of the Project Manager or OWNER's Representative. No glycol or other additives shall be used.

2.4 CONCRETE SEALER

- A. Concrete Sealer to be applied as soon as concrete has begun to set.
- B. Sealer to comply with ASTM-C-309
- C. Sonneborn Kure-N-Seal or Project Manager (OWNER's Representative) approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304, ACI 301, and ACI 318.
- B. Notify Project Manager or OWNER's Representative a minimum of twenty-four (24) hours prior to commencement of operations.

- C. Ensure reinforcement, inserts and embedded parts, are not disturbed during concrete placement.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Do not interrupt successive placement; do not permit cold joints to occur.
- F. Cold Weather Placement
 - During cold weather placement, the Contractor shall:
 1. Cover finished foundations with insulating blankets during curing.
 2. Conform to ACI 306R.
- G. Take concrete samples as directed in Part One of this Section.

3.4 WATERSTOPS

- A. Install waterstops at any and all joints in the cast-in-place concrete.

Refer to manufacturer's instructions for installation procedure, including application of sealants and adhesives.

3.5 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed with smooth rubbed finish.
- B. Steel trowel surfaces that are scheduled to be exposed.

Any corners or edges that will be exposed above final grade shall have a one (1) inch chamfer applied, if not already completed during forming.

3.6 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and physical damage.
- B. Apply Concrete Sealer after sufficient time has elapsed to prevent accidental marring. Sealer may be applied with roller or garden sprayer, in a continuous uniform film. Apply at rate prescribed by Manufacturer, typically 200-400 square feet per gallon.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- D. Contractor will be responsible for any freeze damage to concrete surface and shall replace damaged items at his expense.

3.7 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed in accordance with ACI 301.
- B. Provide free access to Work and cooperate with Project Manager and OWNER's Representative.
- C. Tests of cement and aggregates may be performed to ensure conformance with specified requirements. See Paragraphs 1.7.

3.8 PATCHING

- A. Allow Project Manager or OWNER's Representative to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Project Manager or OWNER's Representative upon discovery.
- C. Patch imperfections as directed.

3.9 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. The Project Manager or OWNER's Representative shall determine necessity of repair or replacement of defective concrete.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Project Manager or OWNER's Representative for each individual area.

3.10 ATTACHMENTS AND BACKFILLING

- A. Do not set or attach fence post brackets, support channels, or steel structures onto concrete foundations until concrete has cured a minimum of fourteen (14) days.

END OF SECTION

SECTION 4 – ENGINEERING SPECIFICATIONS

A. LOCAL CONDITIONS

The Contractor must check all local conditions affecting the work and shall make a thorough examination of the route of the line, plans, specifications, and premises in order to be entirely familiar with the details and construction of the installation.

B. WORKMANSHIP

All work shall be executed in a neat and skillful manner as specified or detailed in these specifications and/or drawings as listed herein and in accordance with best construction practice.

C. DRAWINGS

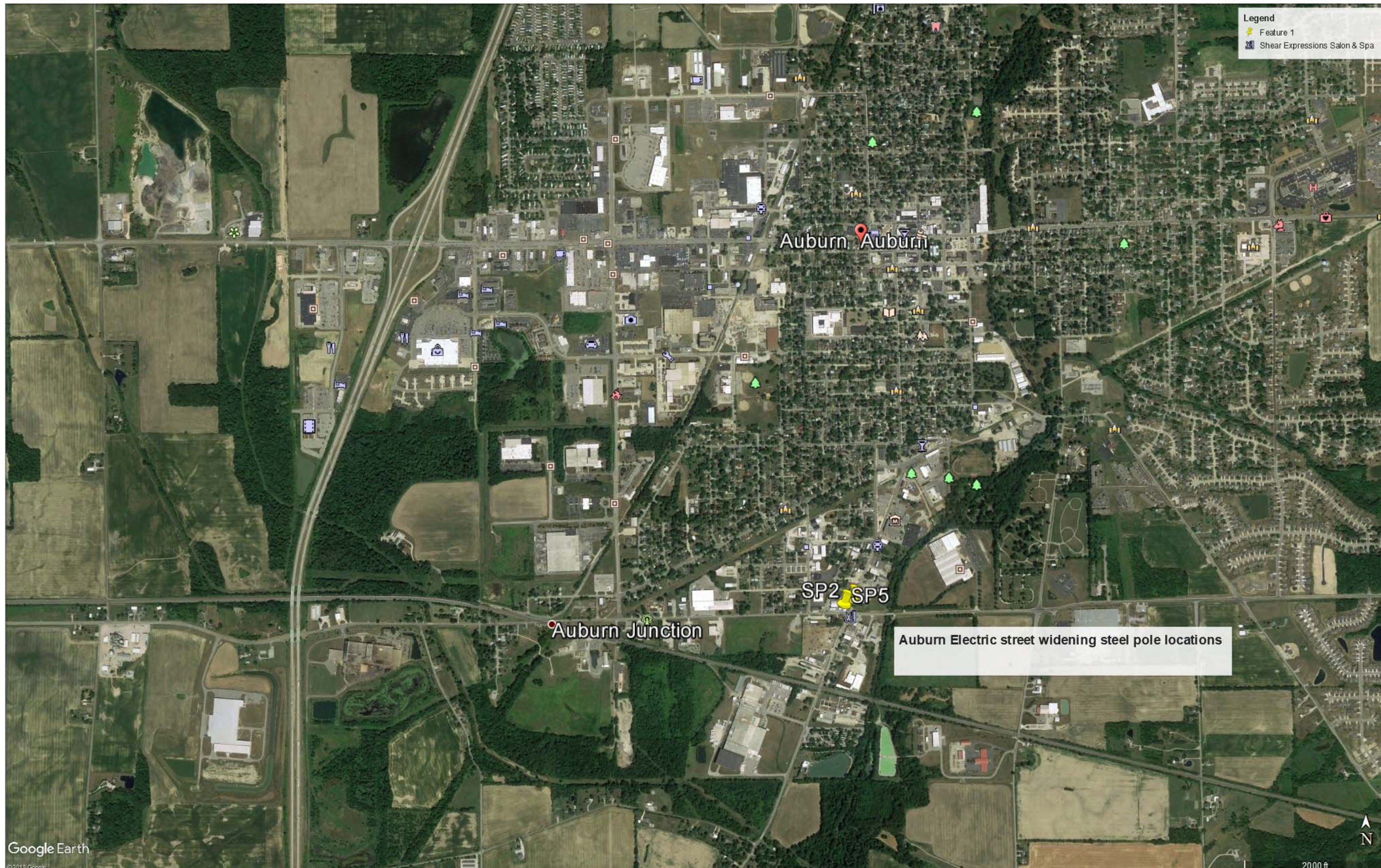
1. The character of the line, location of the line, and details of various structures are shown on drawings listed herein. These plans and drawings are intended to be complete and final and shall be followed as closely as possible.
2. Dimensions as shown on drawings are not guaranteed and Contractor should check their accuracy before proceeding with the work.

D. WORKMAN'S SAFETY

The Owner has implemented an ongoing workman safety program for all line work to be performed on the Owner's electrical system. The workman safety program is based on the latest revisions of the APPA and IOWA regulations for electrical safety. The contractor must adhere to the safety practices outlined in the Owner's safety program. The Owner shall give access to the safety manuals for review during regular business hours.

END OF SECTION

SECTION 5 - MAPS



Legend
Feature 1
Shear Expressions Salon & Spa

Auburn Auburn

Auburn Junction

SP2 SP5

Auburn Electric street widening steel pole locations



Legend

Feature 1

Shear Expressions Salon & Spa

Auburn Electric street widening steel pole locations

Auburn Drive

Wayne Street

SP2

SP5



SECTION 6 – DRAWINGS

SEAL

SIGNATURE:

DATE:

ISSUED

PRELIMINARY
EXCEPT AS NOTED
FOR BID ONLY
FOR INFORMATION
FOR APPROVAL
FOR CONSTRUCTION
FOR RECORD

JOB NO. 100-0493

DATE: 09/21/2018

DRAWN BY: KAP

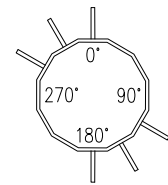
CHECKED BY: BLS

REVISION -

SCALE: 1/4" = 1'-0"

DRAWING NO. S301

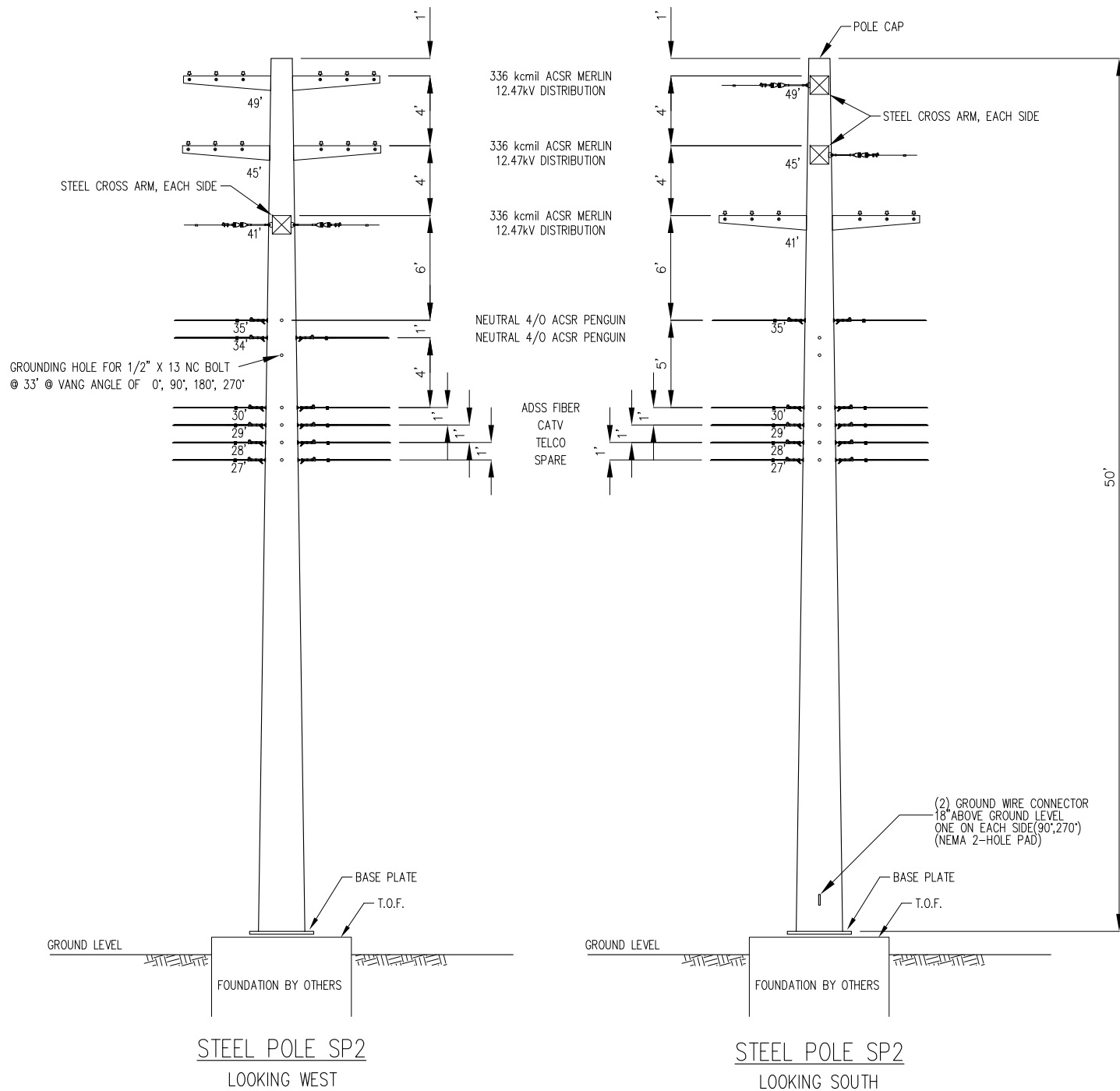
STEEL POLE SP2



CONDUCTOR	SPAN LENGTH	MAX. TENSION NESC HEAVY	ATTACHMENT HEIGHT ABOVE BASE PLATE	VANG ANGLE	CONDUCTOR PULL OFF ANGLE
NEUTRAL 4/O ACSR PENGUIN	164'	3173	34'	30°	21°
ADSS FIBER	164'	1190	30'	30°	21°
CATV	164'	1190	29'	30°	21°
TELCO	164'	1190	28'	30°	21°
SPARE	164'	1190	27'	30°	21°
NEUTRAL 4/O ACSR PENGUIN	228'	3173	34'	210°	201°
ADSS FIBER	228'	1190	30'	210°	201°
CATV	228'	1190	29'	210°	201°
TELCO	228'	1190	28'	210°	201°
SPARE	228'	1190	27'	210°	201°
336 ACSR MERLIN	132'	3298	45'	240°	236°
NEUTRAL 4/O ACSR PENGUIN	132'	3173	35'	240°	236°
ADSS FIBER	132'	1190	30'	270°	236°
CATV	132'	1190	29'	270°	236°
TELCO	132'	1190	28'	270°	236°
SPARE	132'	1190	27'	270°	236°
NEUTRAL 4/O ACSR PENGUIN	207'	3173	35'	90°	100°
ADSS FIBER	207'	1190	30'	90°	100°
CATV	207'	1190	29'	90°	100°
TELCO	207'	1190	28'	90°	100°
SPARE	207'	1190	27'	90°	100°

OTHER ATTACHMENTS

ITEM	ATTACHMENT HEIGHT ABOVE BASE PLATE	ATTACHMENT ANGLE	NOTES
5' ARM	49'	0°	CONDUCTOR PULL OFF ANGLE OF 100° WITH A SPAN OF 207'. SEE DWG S300, DETAIL NO. 5.
5' ARM	49'	180°	
5' ARM	45'	150°	CONDUCTOR PULL OFF ANGLE OF 236° WITH A SPAN OF 132'. SEE DWG S300, DETAIL NO. 5.
5' ARM	45'	330°	
5' ARM	41'	120°	CONDUCTOR PULL OFF ANGLES OF 201° WITH A SPAN OF 228' AND 21° WITH A SPAN OF 164'. SEE DWG S300, DETAIL NO. 5.
5' ARM	41'	300°	
NEUTRAL	34'	120°	SEE DWG S300, DETAIL NO. 1.
ADSS FIBER	30'	120°	SEE DWG S300, DETAIL NO. 4.
CATV	29'	120°	
TELCO	28'	120°	
SPARE	27'	120°	
LIGHT BRACKET	34'	180°	SEE DWG S300, DETAIL NO. 3.

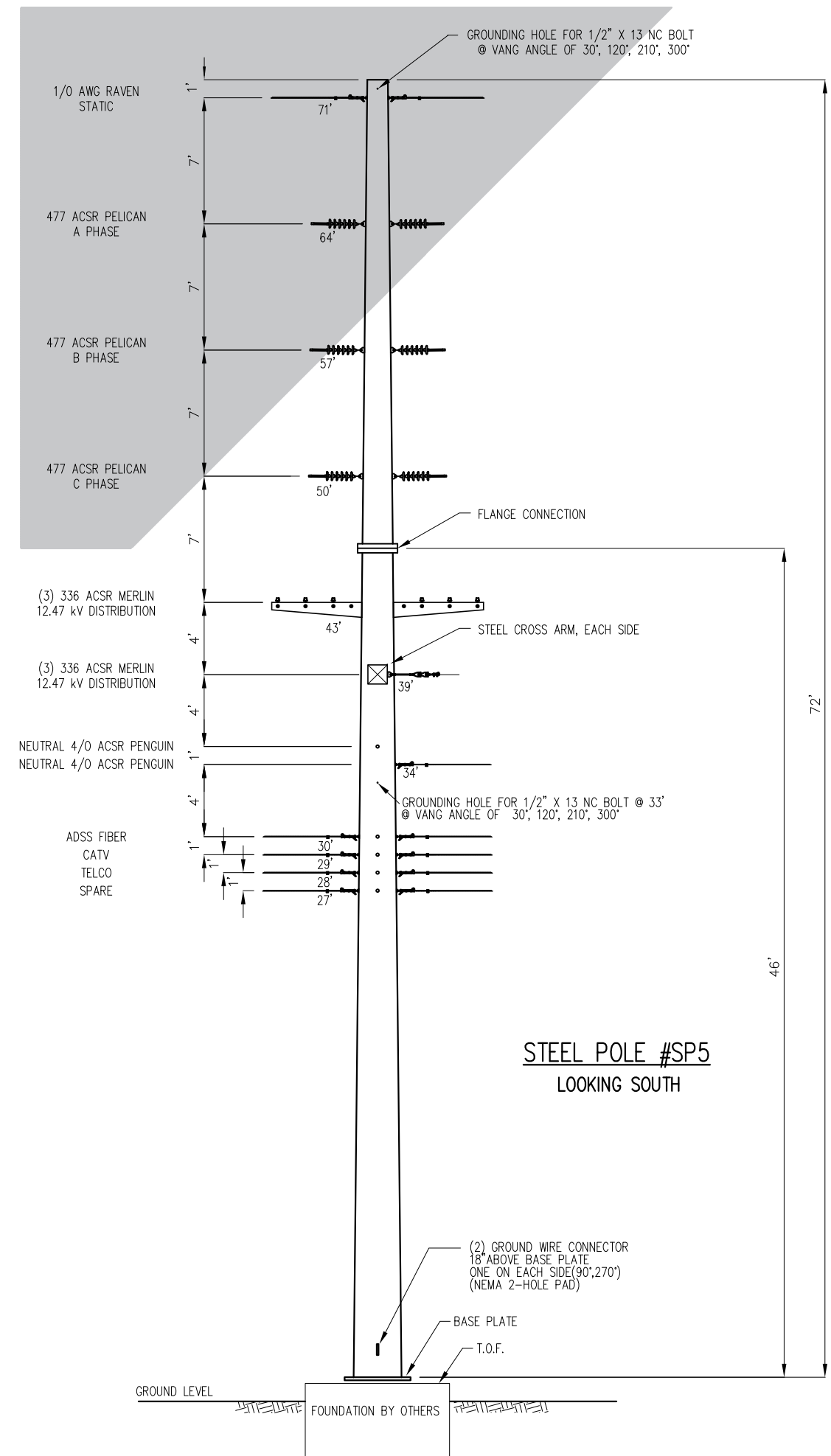


STEEL POLE SP2
LOOKING WEST

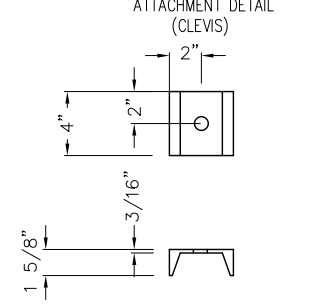
STEEL POLE SP2
LOOKING SOUTH

STEEL POLE #SP5					
CONDUCTOR	SPAN LENGTH	MAX. TENSION NESC HEAVY	ATTACHMENT HEIGHT ABOVE BASE PLATE	VANG ANGLE	CONDUCTOR PULL OFF ANGLE
STATIC 1/0 ACSR RAVEN	199'	1971	71'	270°	270°
477 ACSR PELICAN	199'	4484	64'	270°	270°
477 ACSR PELICAN	199'	4484	57'	270°	270°
477 ACSR PELICAN	199'	4484	50'	270°	270°
NEUTRAL 4/0 ACSR PENGUIN	199'	3173	34'	270°	270°
ADSS FIBER	199'	1190	30'	270°	270°
CATV	199'	1190	29'	270°	270°
TELCO	199'	1190	28'	270°	270°
SPARE	199'	1190	27'	270°	270°
STATIC 1/0 ACSR RAVEN	314'	1971	71'	90°	83°
477 ACSR PELICAN	314'	4484	64'	90°	83°
477 ACSR PELICAN	314'	4484	57'	90°	83°
477 ACSR PELICAN	314'	4484	50'	90°	83°
ADSS FIBER	145'	1190	30'	90°	90°
CATV	145'	1190	29'	90°	90°
TELCO	145'	1190	28'	90°	90°
SPARE	145'	1190	27'	90°	90°
NEUTRAL 4/0 ACSR PENGUIN	132'	3173	35'	60°	56°
ADSS FIBER	132'	1190	30'	60°	56°
CATV	132'	1190	29'	60°	56°
TELCO	132'	1190	28'	60°	56°
SPARE	132'	1190	27'	60°	56°
OTHER ATTACHMENTS					
ITEM	ATTACHMENT HEIGHT	ATTACHMENT ANGLE	ATTACHMENT NOTES		
5' ARM	43'	150°	Conductor pull off angles of 56° with a span of 132'. See DWG. S300, DETAIL No. 5.		
5' ARM	43'	330°			
5' ARM	39'	0°	Conductor pull off angle of 270° with a span of 199'. See DWG. S300, DETAIL No. 5.		
5' ARM	39'	180°			
HORIZONTAL POST INSULATOR	64'	0°	SEE DWG. S300, DETAIL NO. 2		
HORIZONTAL POST INSULATOR	57'	0°			
HORIZONTAL POST INSULATOR	50'	0°			

- NOTES:
- INITIAL INSTALLATION WILL BE DISTRIBUTION ONLY (BOTTOM SECTION OF POLE). TRANSMISSION (TOP SECTION OF POLE) MAY OR MAY NOT BE ADDED LATER. POLE AND FOUNDATION DESIGN NEEDS TO SUPPORT BOTH CONFIGURATIONS.
 - A POLE CAP PLATE WILL BE REQUIRED FOR BOTH POLE SECTIONS.

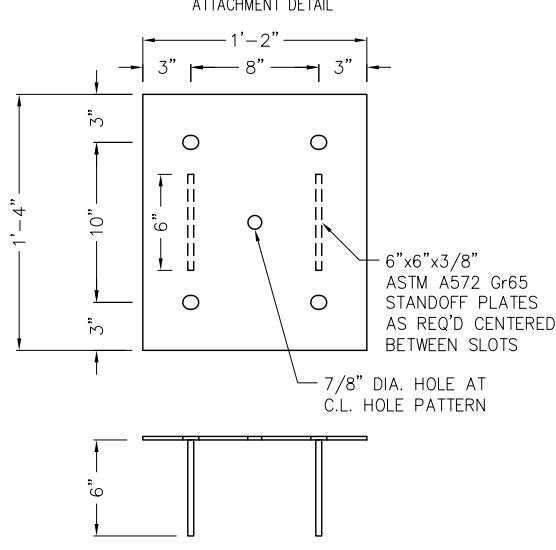


DETAIL No.1 - NEUTRAL



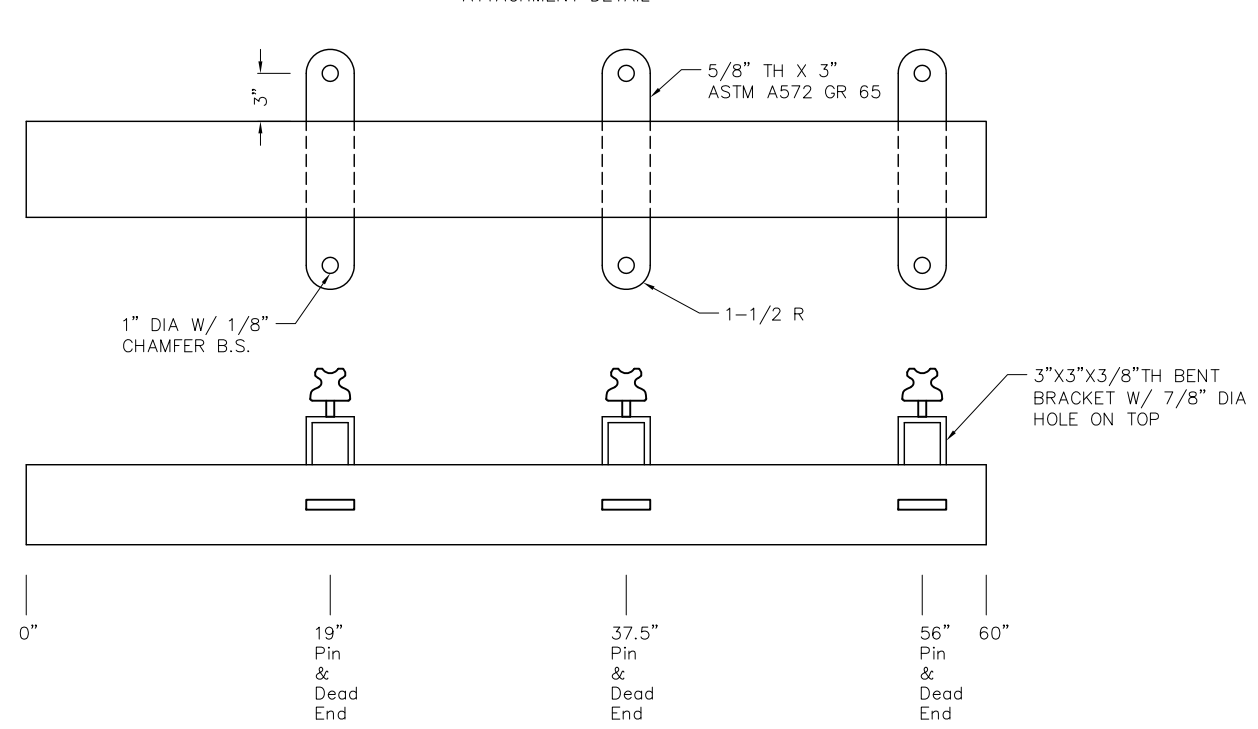
CHANNEL STEEL
 C4 x 5.4 W/ (1) 3/4" Ø HOLE
 SCALE: 1" = 1'

DETAIL No.2 - 69kV LINE POST INSULATOR

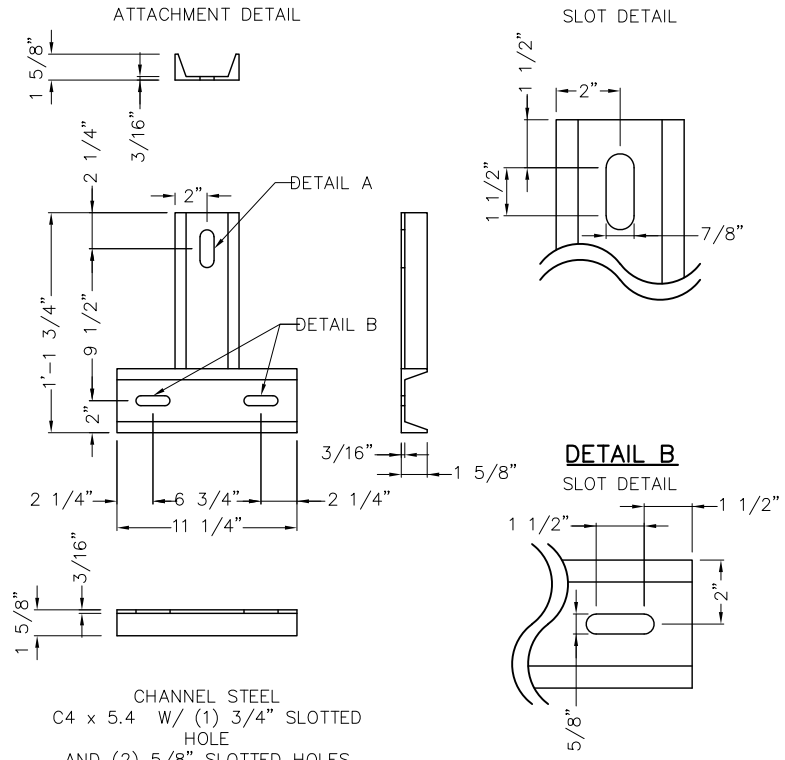


CHANNEL STEEL
 W/ (4) 7/8" x 1" SLOT
 SCALE: 1" = 1'

DETAIL No.5 - TYPICAL 5' DEADEND CROSS ARM

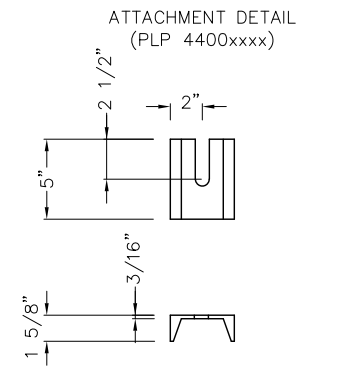


DETAIL No.3 - LIGHT BRACKET



CHANNEL STEEL
 C4 x 5.4 W/ (1) 3/4" SLOTTED HOLE
 AND (2) 5/8" SLOTTED HOLES

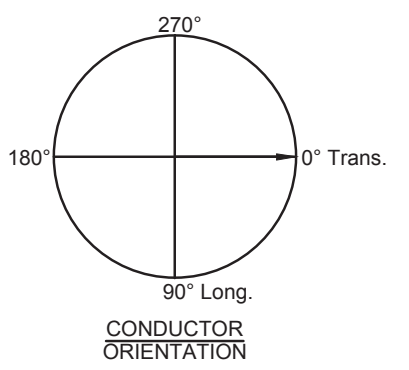
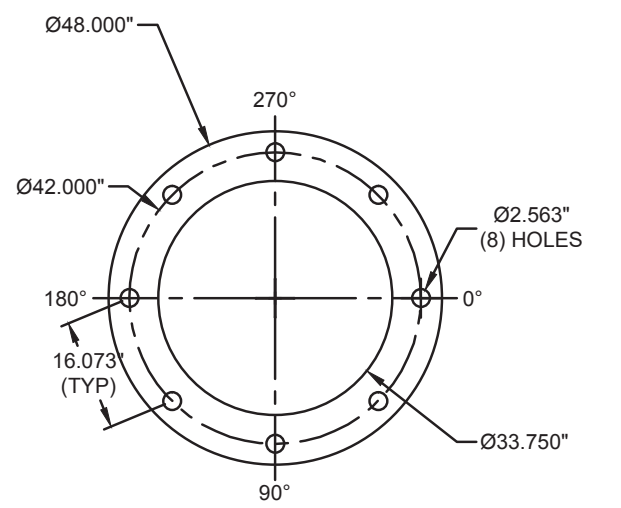
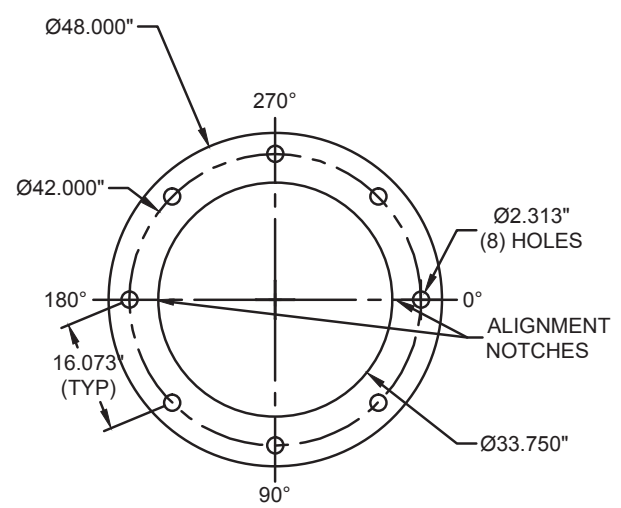
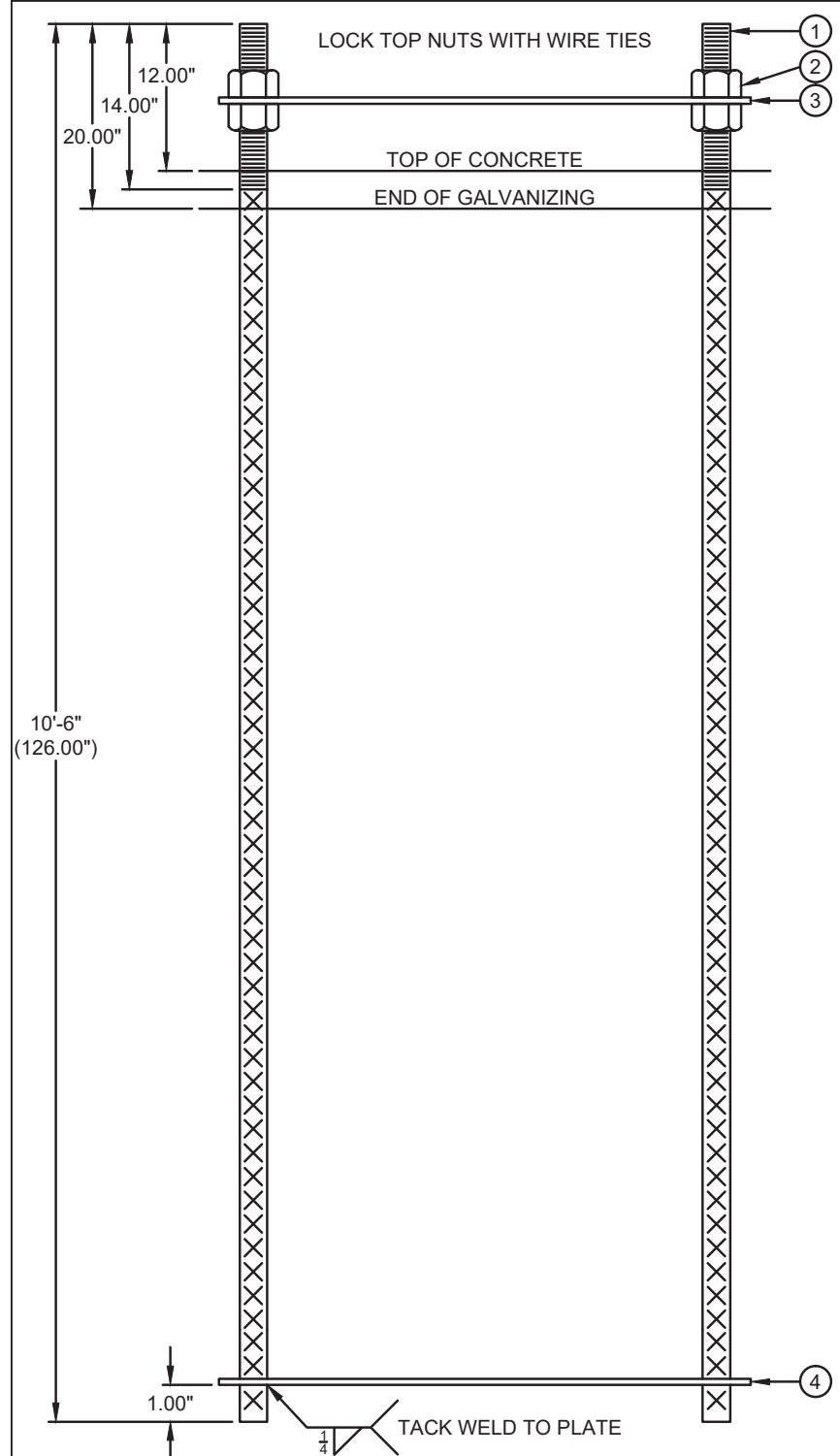
DETAIL No.4 - ADSS TANGENT SUPPORT



CHANNEL STEEL
 C4 x 5.4 W/ (1) 3/4" Ø SLOT

NOTES:

1. Design Cross arm to support (2) 336 ACSR Merlin Conductor Dead End Attachments at full tension (3298 lbs. ea.) and (3) places for Pin Insulators.
2. Cross arm to be designed such that Dead End may be attached to each side.



BILL OF MATERIALS*

Item	Qty	Part Number	Description	Specification	Unit Weight (lb)	Total Weight (lb)
1	8	NA	2.25" x 126" Anchor Bolt (#18J-ReBar)	A615-75	153.30	1,226
2	16	NA	2.25" HH Galvanized Nut	A194-2H	4.19	67
-	16	NA	4" Flat Washer	F436	0.56	9
3	1	9001	0.375" Top Plate	A36	93.72	94
4	1	9002	0.375" Bottom Plate	A36	92.90	93
					Total:	1,489

* - Quantities and weights are for a single assembly.

SHIP CAGED

Notes:

1. Refer to Sabre Tubular Structures' "Steel Pole Installation Recommended Methods" for information about assembly and installation of anchor bolt cages.
2. A minimum of two anchor bolt threads must be exposed above the top nut.
3. The distance from the bottom of the base plate to the top of the concrete foundation shall not be more than (2 x bolt diameter).
4. Tolerance for diameter of bolt pattern circles is $\pm 1/8"$.
5. Tolerance for diameter of bolt holes is $+1/16", -0"$.

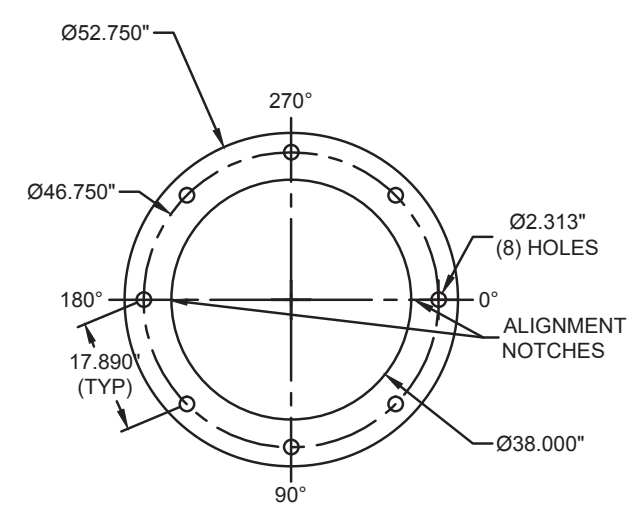
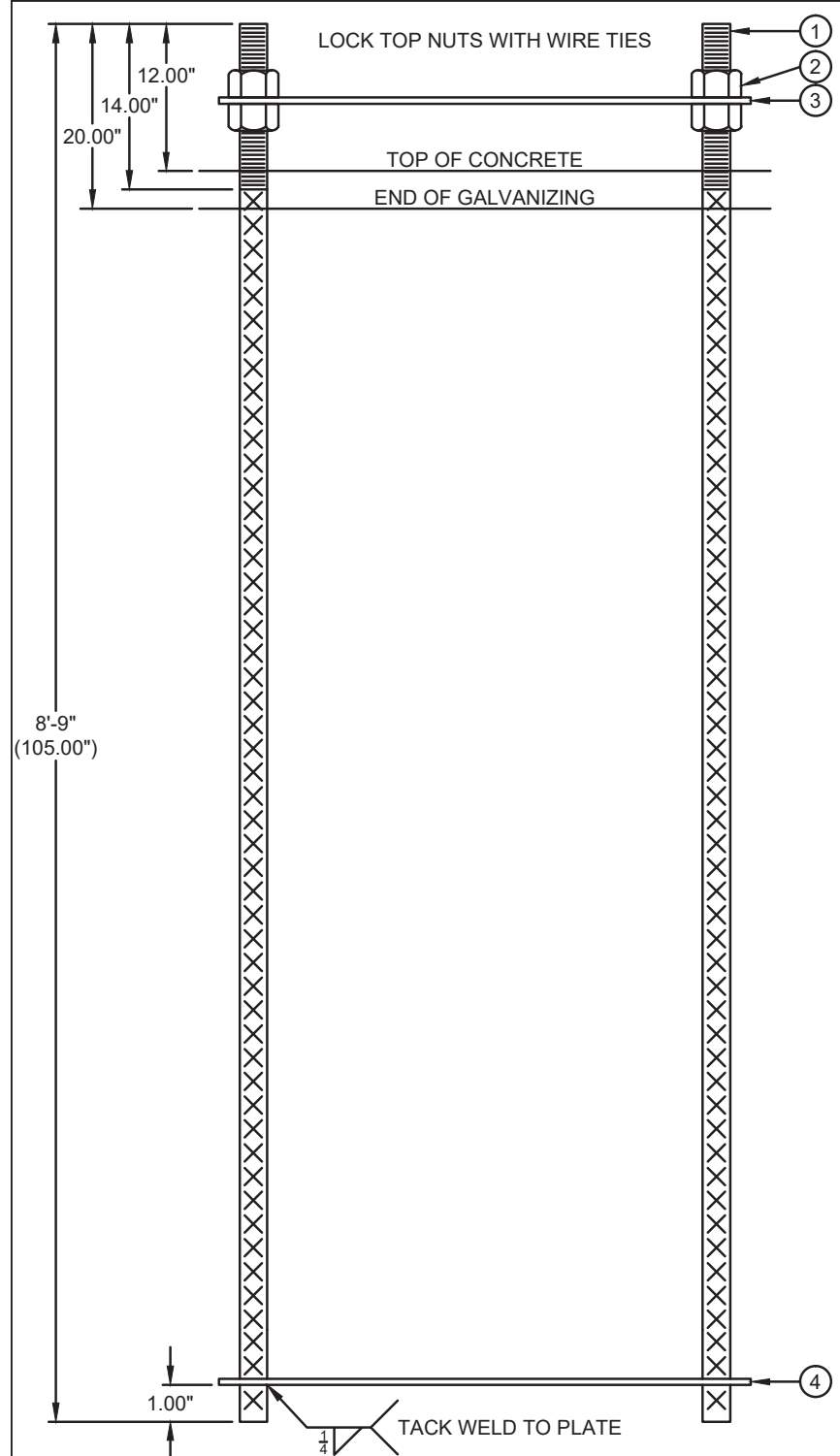
Assembly Quantity: 1

Customer: Auburn Electric Department			
Project: Steel Poles			
PO:			
Structure: STR# SP2 - 50FT			
Date: 10/12/18	Engineer: SG	Scale: N.T.S.	Drawing: 19-14626-001

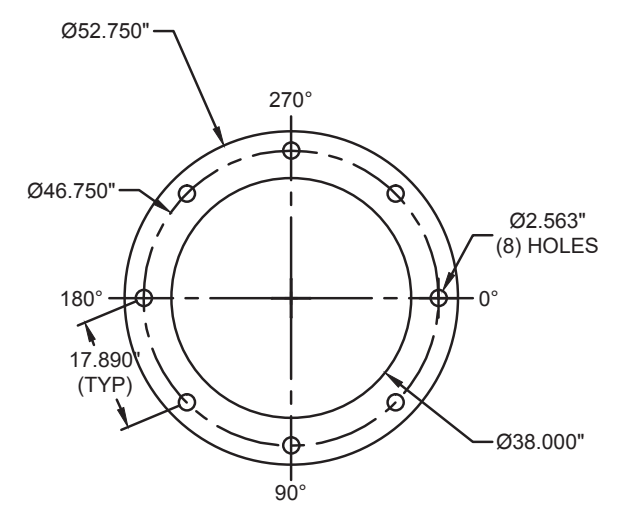


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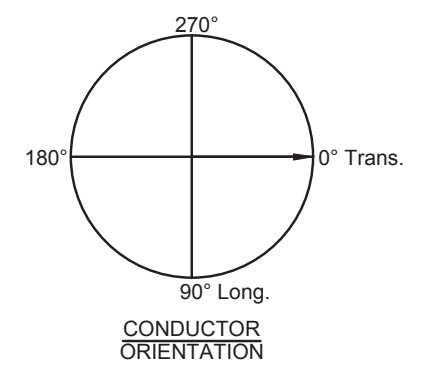
Revision	Page
0	1 of 1



TOP TEMPLATE



BOTTOM TEMPLATE



BILL OF MATERIALS*

Item	Qty	Part Number	Description	Specification	Unit Weight (lb)	Total Weight (lb)
1	8	NA	2.25" x 105" Anchor Bolt (#18J-ReBar)	A615-75	127.75	1,022
2	16	NA	2.25" HH Galvanized Nut	A194-2H	4.19	67
-	16	NA	4" Flat Washer	F436	0.56	9
3	1	9001	0.375" Top Plate	A36	108.22	108
4	1	9002	0.375" Bottom Plate	A36	107.41	107
					Total:	1,314

* - Quantities and weights are for a single assembly.

SHIP CAGED

Notes:

1. Refer to Sabre Tubular Structures' "Steel Pole Installation Recommended Methods" for information about assembly and installation of anchor bolt cages.
2. A minimum of two anchor bolt threads must be exposed above the top nut.
3. The distance from the bottom of the base plate to the top of the concrete foundation shall not be more than (2 x bolt diameter).
4. Tolerance for diameter of bolt pattern circles is $\pm 1/8"$.
5. Tolerance for diameter of bolt holes is $+1/16", -0"$.

Assembly Quantity: 1

Customer: Auburn Electric Department			
Project: Steel Poles			
PO:			
Structure: STR# SP5 - 46FT_Bottom Section			
Date: 10/12/18	Engineer: SG	Scale: N.T.S.	Drawing: 19-14626-102



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Revision	Page
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SOIL EXPLORATION

A SUBSURFACE SOIL INVESTIGATION WAS COMPLETED BY ALT & WITZIG ON FEBRUARY 21, 2019. A LATERAL ANALYSIS FOR THE PROPOSED DRILLED SHAFT FOUNDATIONS WAS COMPLETED BASED ON STRUCTURE REACTIONS PROVIDED BY SABRE/FWT STRUCTURES DATED OCTOBER 12, 2018.

BASED ON PILE ANALYSIS, RECOMMENDED SHAFT DIAMETERS AND DEPTHS OF EMBEDMENT WERE PROVIDED AS WERE FORCE DIAGRAMS FOR EACH SHAFT, WHICH WERE USED FOR STRUCTURAL DESIGN OF POLE FOUNDATIONS.

DESIGN LOADS

POWER POLE GOVERNING REACTIONS BY SABRE/FWT STRUCTURES

POLE	MOMENT	SHEAR	VERTICAL
#SP2	1573 FT-K	36.0 K	23.9 K
#SP5	1444 FT-K	34.4 K	21.3 K

NOTE: SP5 DESIGNED FOR REACTIONS AT 72 FT HEIGHT (FUTURE CONDITION)

GENERAL CONCRETE NOTES

REINFORCING STEEL SHALL BE ASTM-615, GRADE 60, DEFORMED BAR UNLESS OTHERWISE NOTED.

QUALITY ASSURANCE SHALL COMPLY WITH PROVISIONS OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS," ACI 305 "HOT WEATHER CONCRETING," ACI 306 "COLD WEATHER CONCRETING," ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE," AND CRSI "MANUAL OF STANDARD PRACTICE."

CONTRACTOR IS RESPONSIBLE FOR ALL QUANTITIES OF MATERIAL AND FOR PROVIDING REBAR BENDING DIAGRAM.

CHAMFER ALL EXPOSED EDGES OF CONCRETE 1" @ 45°.

MINIMUM CONCRETE COVER FOR REINFORCING BARS SHALL BE 3" UNLESS NOTED.

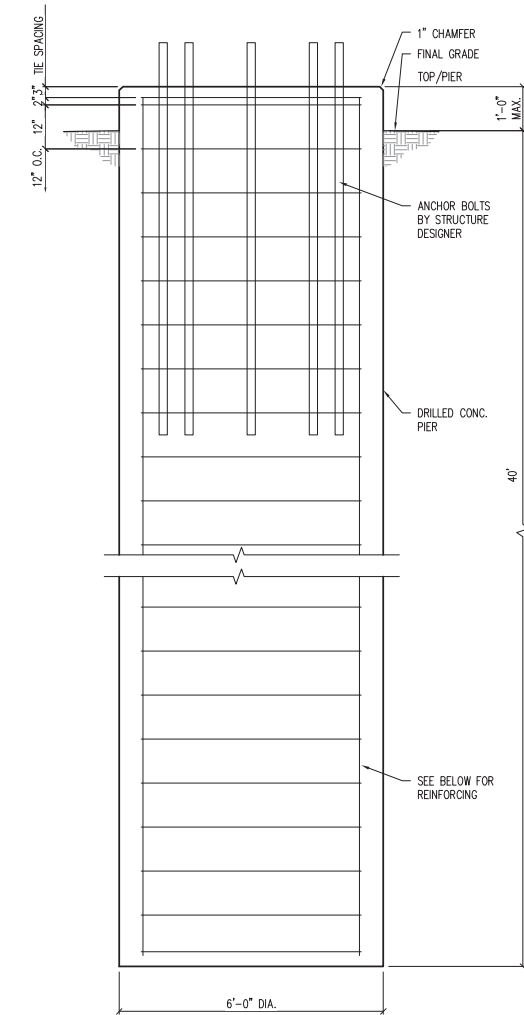
LAP LENGTH FOR REIN. BARS SHALL BE 50 BAR DIAMETERS (U.N.O.)

THE TOP OF ALL ANCHOR BOLTS SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153. REFERENCE SABRE/FWT DRAWINGS FOR LENGTH OF GALVANIZING.

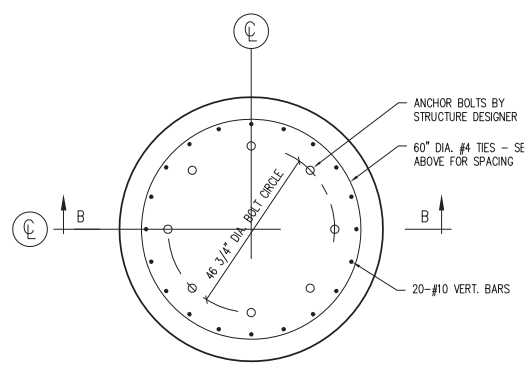
CONCRETE DESIGN MIX REQUIREMENTS					
LOCATION	28 DAY COMP. STRENGTH	MAX. SLUMP	MAX W/C RATIO	FINISH	ADMIXTURES
DRILLED PIERS	4500 PSI	6"	0.45	HAND RUBBED	AIR ENTRAINED TO 6% +/-1.5%

GENERAL STRUCTURAL NOTES

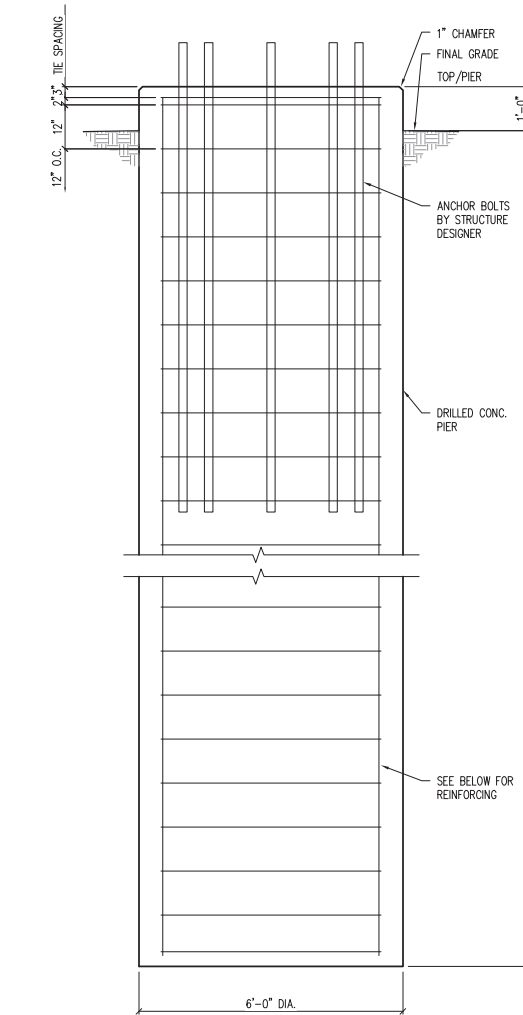
- TEMPORARY BRACING, GUY WIRES, SHORING, ETC., SHALL BE USED AS NECESSARY TO RESIST ALL LOADS TO WHICH THE STRUCTURE MAY BE SUBJECTED DURING CONSTRUCTION, INCLUDING EQUIPMENT AND ITS OPERATION IN ORDER TO PREVENT THE TEMPORARY LOADING FROM EXCEEDING THE DESIGN LOADS.
- FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO THE CONSTRUCTION AND FABRICATION OF ANY NEW STRUCTURAL MEMBERS.
- THE STRUCTURE SHALL NOT BE ERECTED UNTIL THE CONCRETE REACHES ITS FULL 28-DAY COMPRESSIVE STRENGTH AS EVIDENCED BY LABORATORY CYLINDER BREAKS.
- COORDINATE LIGHTNING PROTECTION REQUIREMENTS WITH POLE SUPPLIER.
- FOLLOW RECOMMENDATIONS INDICATED IN GEOTECHNICAL REPORT RELATED TO THE CONTROL OF WATER INTO THE EXCAVATION, CASING OF THE EXCAVATION, AND THE USE OF DRILLING MUD.
- REFERENCE ACI 336.1--LATEST EDITION, "SPECIFICATION FOR THE CONSTRUCTION OF DRILLED PIERS" FOR ADDITIONAL REQUIREMENTS.
- QUANTITY, DIAMETER, EMBEDMENT LENGTH, PROJECTION AND GRADE OF ANCHOR BOLTS SHALL BE PROVIDED BY THE STRUCTURE DESIGNER. THE QUANTITY, DIAMETER, EMBEDMENT LENGTH, AND PROJECTION SHOWN ON THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES.



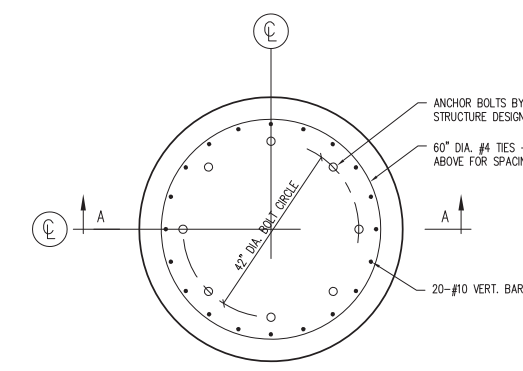
SECTION B-B



FOUNDATION POLE #SP5



SECTION A-A



FOUNDATION POLE #SP2

SEE ELECTRICAL PLANS FOR POLE LOCATIONS

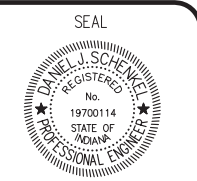


11020 Diebold Road, Fort Wayne, IN 46845
Ph: (260) 490-1025 Fax: (260) 490-1026
www.eri.com/consulting



OWNER AND LOCATION
AUBURN ELECTRIC
AUBURN, IN

TITLE
POLE FOUNDATIONS



SIGNATURE: *Daniel J. Schell*
DATE: 02/21/2019

ISSUED

PRELIMINARY
EXCEPT AS NOTED
FOR BID ONLY
FOR INFORMATION
FOR APPROVAL
FOR CONSTRUCTION
FOR RECORD

JOB NO. 100-0493
DATE: 02/21/2019
DRAWN BY: DJS
CHECKED BY: ADB
REVISION: -
SCALE: 1/2" = 1'-0"
DRAWING NO. C595



Alt & Witzig Engineering, Inc.

208 East Collins Dr. • Ft. Wayne, Indiana 46825
(260) 484-0813 • Fax (260) 482-9652

February 21, 2019

Engineering Resources, Inc.
11020 Diebold Road
Fort Wayne, IN 46845
ATTN: Mr. Dan Schenkel

Report of Subsurface Investigation and Geotechnical Recommendations

RE: Auburn Electric Transmission Poles
Alt & Witzig File No.: **19FW0008**

Dear Mr. Schenkel:

In compliance with your request, we have completed a subsurface investigation for the proposed 72-inch diameter drilled shaft foundations to support the new power pole structures in Auburn, Indiana.

Completed Field Activities

Structures SP-2 and SP-5 were investigated under our scope of work. Field investigations to determine the engineering characteristics of foundation materials included a reconnaissance of the project site, drilling an exploratory boring at each structure, performing standard penetration tests, and obtaining soil samples retained in the standard split-spoon sampler. The apparent groundwater level at the boring locations was also determined. Due to utility conflicts a boring was not able to be performed at the location of SP-5. Therefore, the subsurface parameters used are based upon the boring performed for SP-2 approximately 90 feet away.

Alt & Witzig Engineering staked the location of soil boring using the provided project plans in conjunction with Engineering Resources, Inc., Spectrum, and Auburn Electric personnel once the utilities had been located.

Drilling operations to complete the borings presented herein began and were completed on February 11, 2019. Boring locations were accessed with a truck mounted drilling unit.

Offices:

Cincinnati, Ohio • Columbus, Ohio
Indianapolis • Evansville • Ft. Wayne • Lafayette • South Bend, Indiana

***Subsurface Investigation and Foundation Engineering
Construction Materials Testing and Inspection
Environmental Services***

The soil borings were performed with a truck mounted drilling rig equipped with a rotary head. Conventional hollow-stem augers were used to advance the holes. Representative samples of the soil were obtained employing split-spoon sampling procedures in accordance with ASTM Procedure D-1586. The advancement of the borings was temporarily stopped at regular intervals in order to perform standard penetration tests in accordance with ASTM Procedure D-1586. The standard penetration test involves driving a split spoon soil sampler into the ground by dropping a 140-pound hammer, thirty (30) inches. The number of hammer drops required to advance the split-spoon sampler one (1) foot into the soil is defined as the standard penetration value. The soil samples retained in the split-spoon sampling device as a result of the penetration tests were obtained, classified, and labeled for further laboratory investigation.

Laboratory Investigation

A laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials at the site of the proposed pole structures. All phases of the laboratory investigation were conducted in general accordance with applicable ASTM Specifications. The laboratory testing program included:

- Visual classification of soils.
- Moisture content determination in accordance with ASTM D-2216.
- Samples of the cohesive soil were frequently tested in unconfined compression by use of a calibrated spring testing machine.
- A pocket penetrometer was used as an aid in determining the strength of the soil.

The values of the unconfined compressive strength as determined on soil samples from the split-spoon sampling must be considered approximate recognizing the manner in which they were obtained since the split-spoon sampling techniques provide a representative but somewhat disturbed soil sample.

Proposed Pole Structures

The project consists of proposed metal utility poles designed and used to carry wires for telephone and electricity. *Table 1* summarizes the height of each pole and the test boring that was drilled at each location.

Table 1: Summary of Proposed Pole Heights

Structure ID/Boring Number	Pole Height (feet)
Steel Pole #SP-2	50
Steel Pole #SP-5	72

All Pile Analysis

In compliance with your request, we have completed a lateral analysis for the proposed drilled shaft foundations as noted above. The loading conditions were provided by Engineering Resources, Inc and the subsurface model was generated based upon our soil borings.

CivilTech Software's *AllPile V7.12f* was utilized to model and analyze 72" diameter drilled concrete shafts. The program uses the COM 624p engine created by FHWA (same code utilized by LPILE) to analyze shafts under lateral loading. For our analysis it was assumed that the shaft would be installed in a free-head condition with the loads applied at the top of the shaft (base of the pole structure).

We varied the length of the drilled shaft until fixity was observed in the shaft and the resulting lateral soil pressure at the base was reduced to approximately 85% of the maximum. During our analysis we assumed the pier foundation would be installed one (1) foot above the ground surface and neglected the upper four (4) feet of soil due to effects of frost. Based upon our analysis the following shaft lengths were determined:

Table #2: Shaft Design Considerations

Structure ID	Minimum Shaft Depth*(feet)	Shaft Diameter (in)	Shear Loading (kip)	Axial Load (kip)	Moment (kip*feet)
Steel Pole #SP-2	45	72	36	23.9	1573
Steel Pole #SP-5	40	72	34.4	21.3	1444

**all depths indicated as depth below grade*

The results of our analysis are attached to this letter. Our analysis should not be considered a design, but rather a verification of the depth of embedment required for the loading conditions and shaft characteristics provided in this report. It should also be noted that our analysis for two separate poles was based upon the results of one boring near the location of SP-2 and approximately 90' from the location of SP-5.

Construction Considerations

Considering the presence of wet, granular soils as observed in the test boring, we anticipate that casing will be required. Furthermore, when caissons penetrate into these wet sand and gravels, a quick condition may occur, and difficulties will be encountered. Drilling mud may also be required in order to minimize the flow of water into the excavation. It will likely be necessary to utilize a tremmie pipe or sump pumps to remove the water from the shaft excavation.

The contractor should be provided with the *Boring Log* prior to final bidding.

Statement of Limitations

Our subsurface investigation was conducted in accordance with guidelines set forth in the scope of services and applicable industry standards.

An inherent limitation of any geotechnical engineering study is that conclusions must be drawn on the basis of data collected at a limited number of discrete locations. The geotechnical parameters provided in this report were developed from the information obtained from the test boring that depict subsurface conditions only at these specific locations and on the particular date indicated on the boring logs. Soil conditions at other locations may differ from conditions encountered at these boring locations and groundwater levels shall be expected to vary with time. The nature and extent of variations between the borings may not become evident until the course of construction.

We appreciate the opportunity to work with you on this project. Often, because of design and construction details that occur, questions arise concerning the soils conditions. If we can give further service in these matters, please contact us at your convenience.

Sincerely,



Jason R. Bennett, P.E.



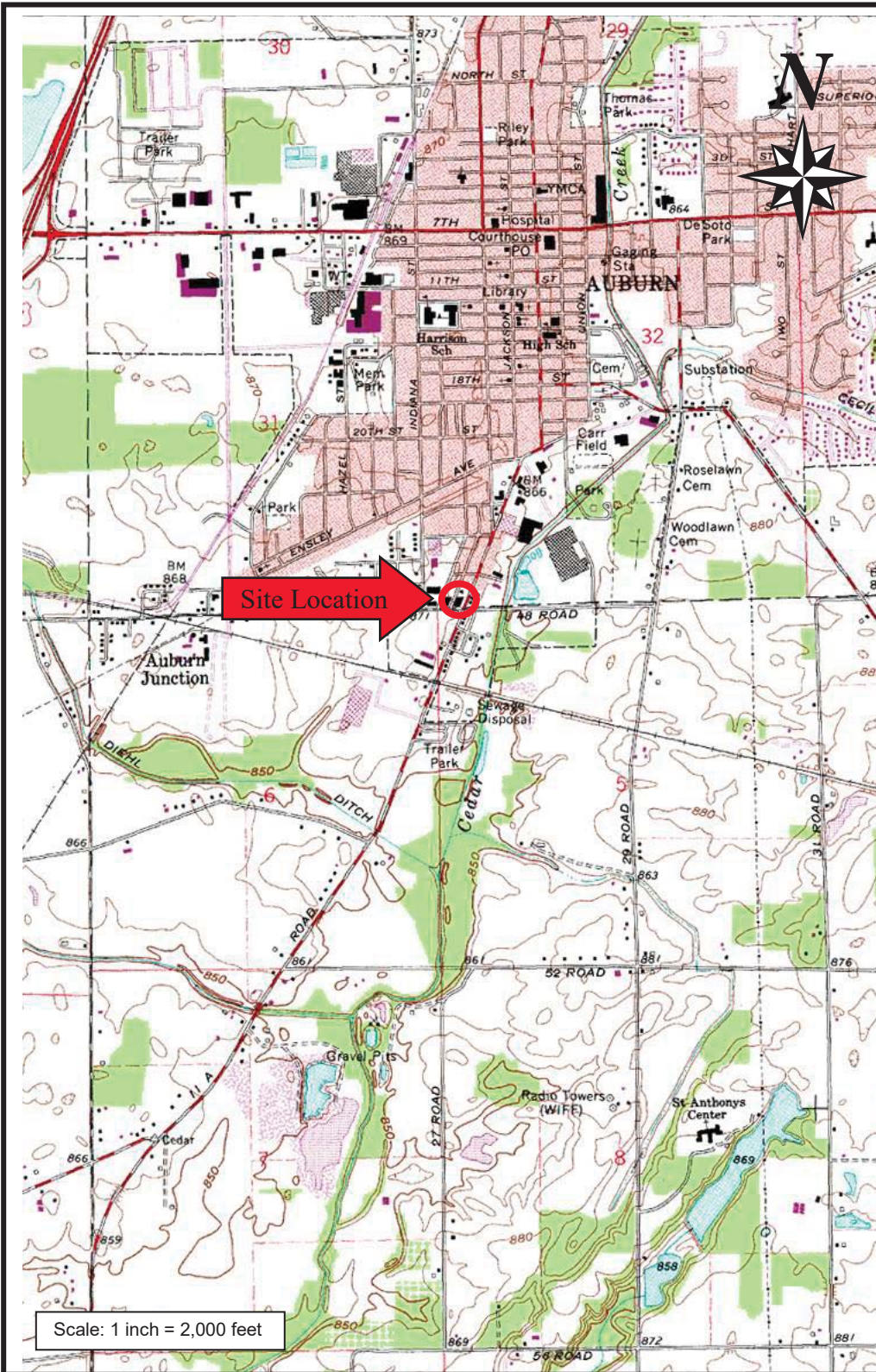
David C. Harness, P.E.



Attachments

- Site Location Plan
- Boring Location Plans
- Boring Log
- General Notes
- AllPile Results

SITE LOCATION MAP



USGS Topographic Map:
Auburn Quadrangle

Township: T 34 N.
Range: R 13 E.
Section: 32

Scale: 1 inch = 2,000 feet

PROJECT: Auburn Electric New Poles
LOCATION: Auburn, Indiana
CLIENT: Engineering Resources, Inc.
A&W File No.: 19FW0008

A
W Alt & Witzig Engineering Inc.
208 E. Collins Drive Fort Wayne, IN 46825
TEL (260) 484-08130 · FAX (260) 482-9652
www.altwitzig.com



BORING LOCATION PLAN

PROJECT: Auburn Electric New Poles
LOCATION: Auburn, Indiana
CLIENT: Engineering Resources, Inc.
A&W File No.: 19FW0008

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BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT Engineering Resources, Inc.
 PROJECT NAME Auburn Electric New Poles
 PROJECT LOCATION Auburn Drive

BORING # SP-2
 ALT & WITZIG FILE # 19FW0008

DRILLING and SAMPLING INFORMATION

Date Started 2/11/19 Hammer Wt. 140 lbs.
 Date Completed 2/11/19 Hammer Drop 30 in.
 Boring Method HSA Spoon Sampler OD 2 in.
 Driller D. McWherter Rig Type CME 55 Truck

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % Dry Unit Weight (pcf)	Remarks
	TOPSOIL	0.5		1	SS	X		7		1.0	27.1	
	Brown and Gray Sandy CLAY	5		2	SS	X		11	3.1	1.8	18.7	
		10.0		3	SS	X		4		0.3	21.0	
	Brown, Wet SAND with Gravel	15.0		4	SS	X	○	7				
		20		5	SS	X		12	3.0	1.5	11.4	
	Gray Silty Sandy CLAY	26.0		6	SS	X		7				
		30.0		7	SS	X		13	1.9	1.3	13.1	
	Gray Silty CLAY with Gravel	35.0		8	SS	X		10	2.3	1.8	18.9	
	Gray CLAY	40		9	SS	X		44				
		45		10	SS	X		20				
	Gray, Wet Fine SAND	50.0		11	SS	X		17				
		55.0		12	SS	X		53	5.2	4.5	8.0	

Sample Type
 SS - Driven Split Spoon
 ST - Pressed Shelby Tube
 CA - Continuous Flight Auger
 RC - Rock Core
 CU - Cuttings
 CT - Continuous Tube

Groundwater
 ○ During Drilling 9.0 ft.
 ∇ At Completion ft.

Boring Method
 HSA - Hollow Stem Augers
 CFA - Continuous Flight Augers
 DC - Driving Casing
 MD - Mud Drilling



BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT Engineering Resources, Inc.
 PROJECT NAME Auburn Electric New Poles
 PROJECT LOCATION Auburn Drive

BORING # SP-2
 ALT & WITZIG FILE # 19FW0008

DRILLING and SAMPLING INFORMATION

Date Started 2/11/19 Hammer Wt. 140 lbs.
 Date Completed 2/11/19 Hammer Drop 30 in.
 Boring Method HSA Spoon Sampler OD 2 in.
 Driller D. McWherter Rig Type CME 55 Truck

TEST DATA







STRATA ELEV.	SOIL CLASSIFICATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % Dry Unit Weight (pcf)	Remarks
	Gray, Moist SAND and GRAVEL with a Trace of Clay			13	SS			50				
			60	14	SS			28				
			65	16	SS			76				
			70	15	SS			84				
	End of Boring at 71 feet	71.0										

Sample Type
 SS - Driven Split Spoon
 ST - Pressed Shelby Tube
 CA - Continuous Flight Auger
 RC - Rock Core
 CU - Cuttings
 CT - Continuous Tube

Groundwater
 ○ During Drilling 9.0 ft.
 ∇ At Completion ft.

Boring Method
 HSA - Hollow Stem Augers
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 DC - Driving Casing
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MATERIAL GRAPHICS LEGEND

 CL: USCS Low Plasticity Clay	 CL-ML: USCS Low Plasticity Silty Clay	 CL: USCS Low Plasticity Sandy Clay
 SP: USCS Poorly-graded Sand	 SP-GP: USCS Poorly-graded Gravelly Sand	 TOPSOIL

SOIL PROPERTY SYMBOLS

N: *Standard "N" penetration value. Blows per foot of a 140-lb hammer falling 30" on a 2" O.D. split-spoon.*
 Qu: *Unconfined Compressive Strength, tsf* PP: *Pocket Penetrometer, tsf*
 LL: *Liquid Limit, %* PL: *Plastic Limit, %* PI: *Plasticity Index, %*

DRILLING AND SAMPLING SYMBOLS

GROUNDWATER SYMBOLS

- *Apparent water level noted while drilling.*
- ▽ *Apparent water level noted upon completion.*
- ∇ *Apparent water level noted upon delayed time.*

SAMPLER SYMBOLS

⊠ SS: Split Spoon

RELATIVE DENSITY & CONSISTANCY CLASSIFICATION (NON-COHESIVE SOILS)

<u>TERM</u>	<u>BLOWS PER FOOT</u>
Very Loose	0 - 5
Loose	6 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	>51

RELATIVE DENSITY & CONSISTANCY CLASSIFICATION (COHESIVE SOILS)

<u>TERM</u>	<u>BLOWS PER FOOT</u>
Very Soft	0 - 3
Soft	4 - 5
Medium Stiff	6 - 10
Stiff	11 - 15
Very Stiff	16 - 30
Hard	>31



Alt & Witzig Engineering, Inc.
 4105 West 99th St.
 Carmel, IN 46032
 Telephone: 317-875-7000
 Fax:

GENERAL NOTES

Project: Auburn Electric New Poles
 Location: Auburn Drive
 Number: 19FW0008

US FHWA publication method.
No friction on Bell Section and
Top 5'. Refer to Manual.

FOUNDATION PROFILE & SOIL CONDITIONS

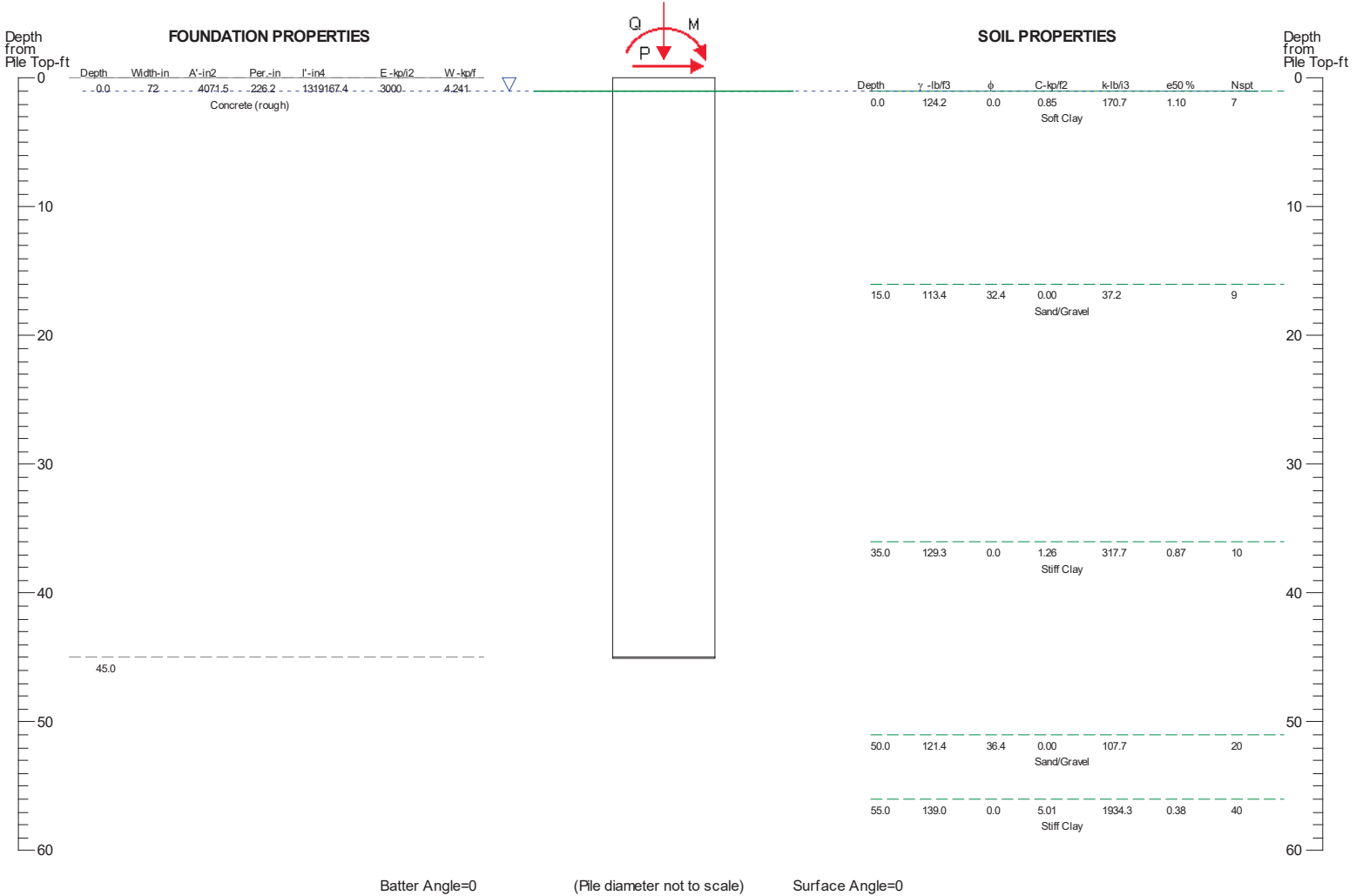


Figure 1

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=1, Kbc=1

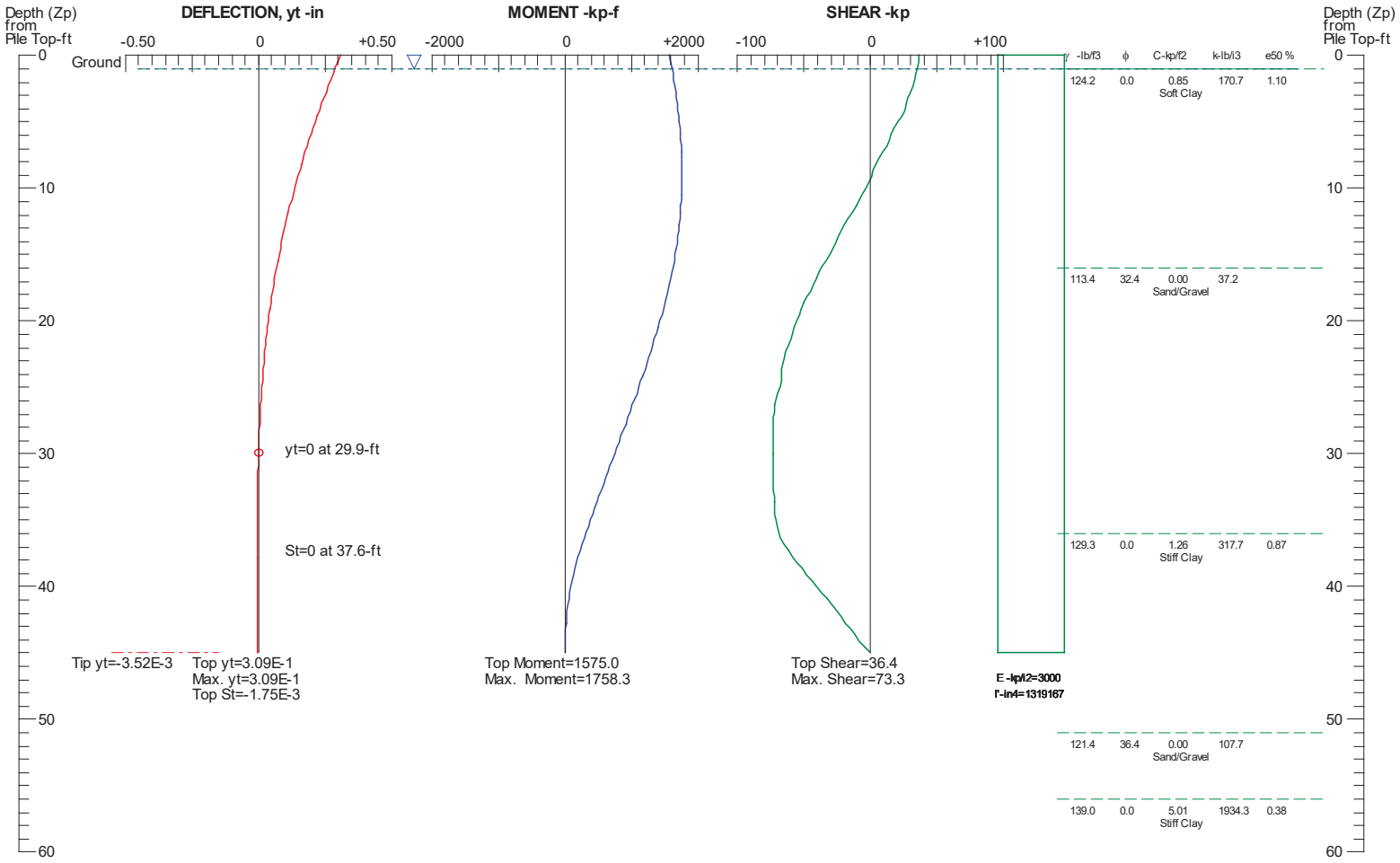
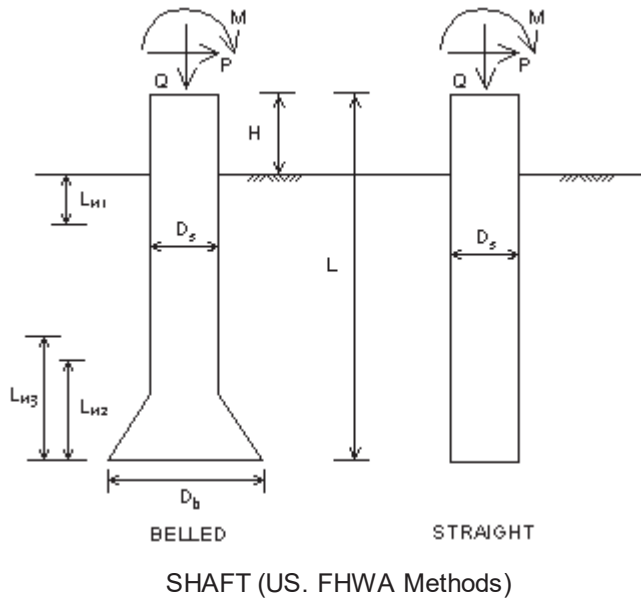


Figure 2

LATERAL ANALYSIS

Figure 2



Loads:

Load Factor for Vertical Loads= 1.0
 Load Factor for Lateral Loads= 1.0
 Loads Supported by Pile Cap= 0 %
 Shear Condition: Static

Vertical Load, Q= 23.9 -kp
 Shear Load, P= 36.4 -kp
 Moment, M= 1573.0 -kp-f

Profile:

Pile Length, L= 45.0 -ft
 Top Height, H= 1.0 -ft
 Slope Angle, As= 0
 Batter Angle, Ab= 0

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	124.2	0.0	0.85	170.7	1.10	7
15	113.4	32.4	0.00	37.2	31.63	9
35	129.3	0.0	1.26	317.7	0.87	10
50	121.4	36.4	0.00	107.7	53.92	20
55	139.0	0.0	5.01	1934.3	0.38	40
71	123.8	38.5	0.00	185.6	70.54	35

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	72	4071.5	226.2	1319167.4	3000	4.241
45.0						

Single Pile Lateral Analysis:

Top Deflection, $y_t = 0.30900$ -in
 Max. Moment, M= 1758.33-kp-f
 Top Deflection Slope, St= -0.00175
 OK! Top Deflection, 0.3090-in is less than the Allowable Deflection= 1.00-in

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.
 The Max. Moment calculated by program is an internal force from the applied load conditions. Structural engineer has to check whether the pile has enough capacity to resist the moment with adequate factor of safety. If not, the pile may fail under the load conditions.

US FHWA publication method.
No friction on Bell Section and
Top 5'. Refer to Manual.

FOUNDATION PROFILE & SOIL CONDITIONS

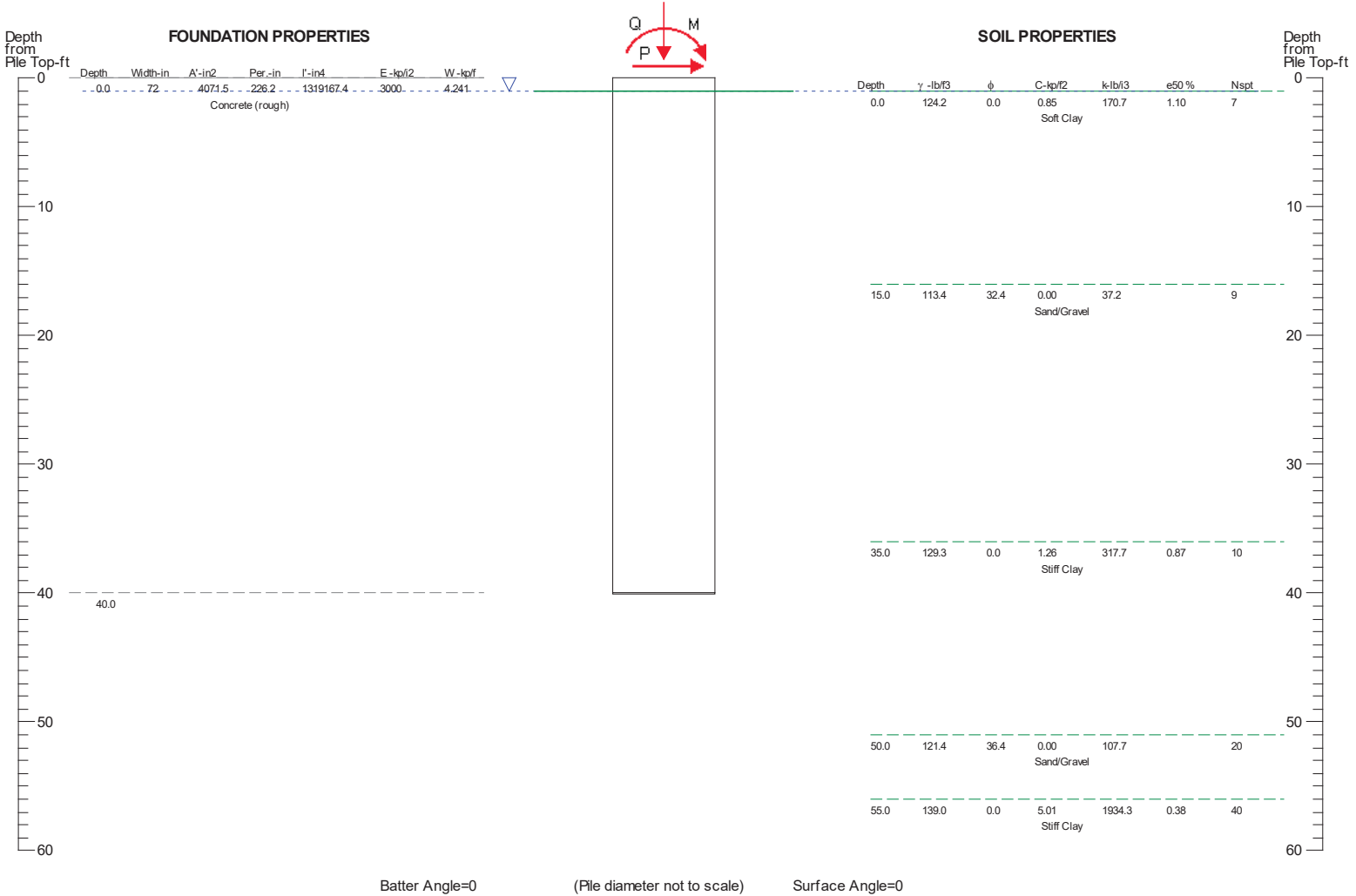


Figure 1

PILE DEFLECTION & FORCE vs DEPTH

Single Pile, Khead=1, Kbc=1

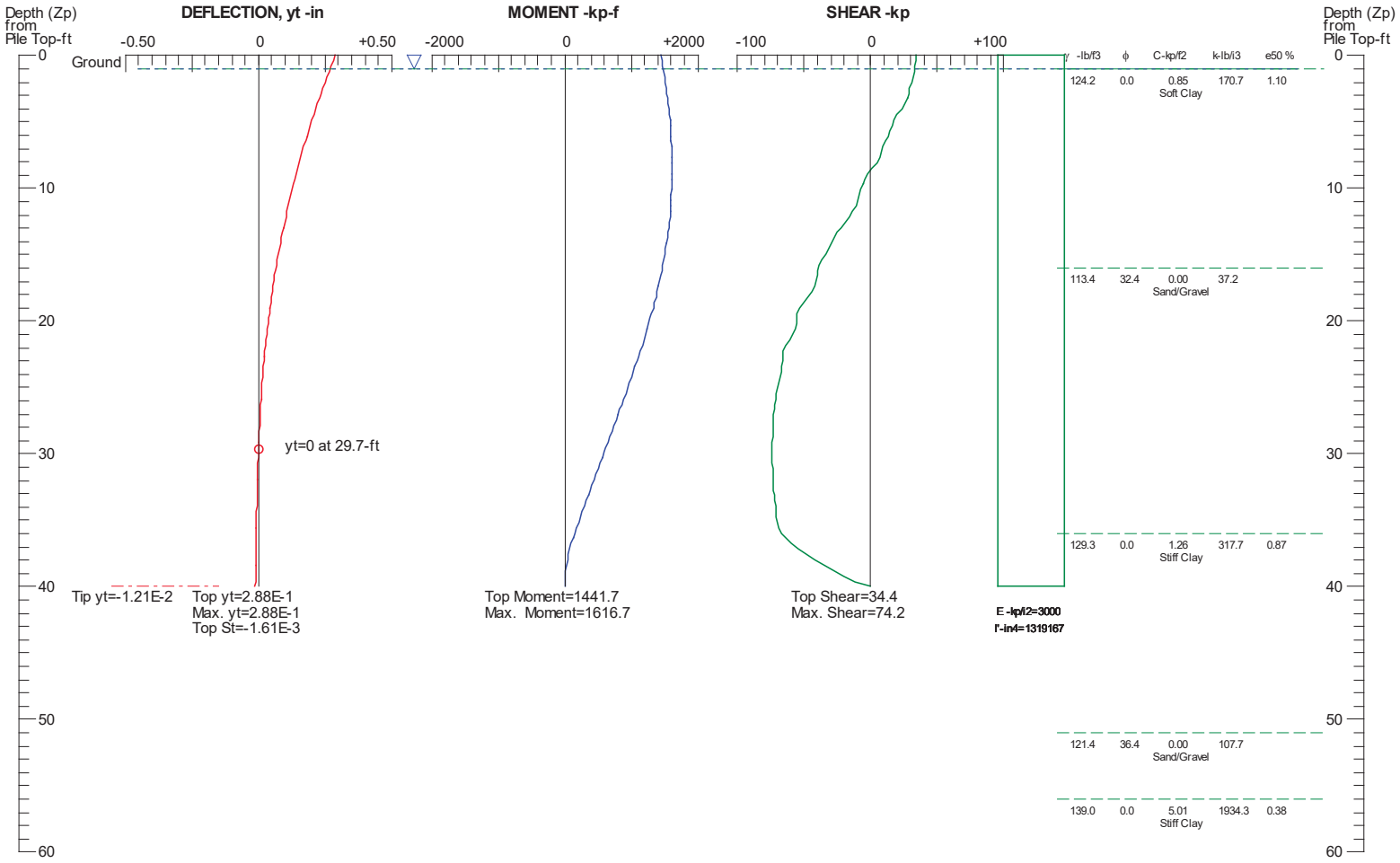
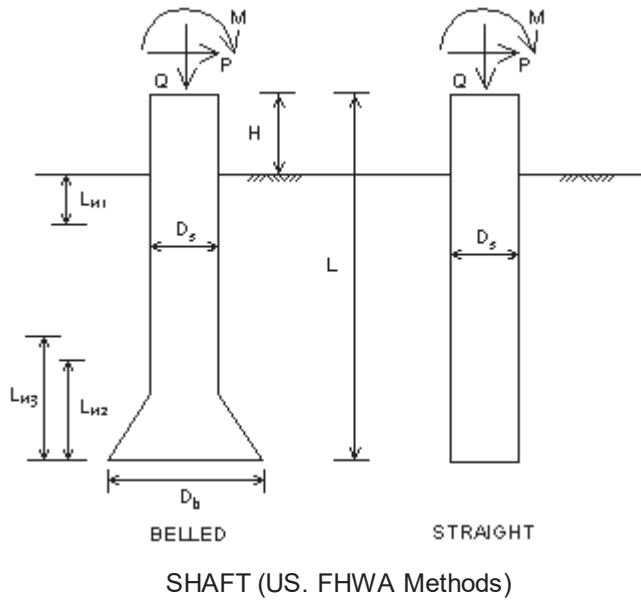


Figure 2

LATERAL ANALYSIS

Figure 2



Loads:

Load Factor for Vertical Loads= 1.0
 Load Factor for Lateral Loads= 1.0
 Loads Supported by Pile Cap= 0 %
 Shear Condition: Static

Vertical Load, Q= 21.3 -kp
 Shear Load, P= 34.4 -kp
 Moment, M= 1444.0 -kp-f

Profile:

Pile Length, L= 40.0 -ft
 Top Height, H= 1.0 -ft
 Slope Angle, As= 0
 Batter Angle, Ab= 0

Soil Data:

Depth -ft	Gamma -lb/f3	Phi	C -kp/f2	K -lb/i3	e50 or Dr %	Nspt
0	124.2	0.0	0.85	170.7	1.10	7
15	113.4	32.4	0.00	37.2	31.63	9
35	129.3	0.0	1.26	317.7	0.87	10
50	121.4	36.4	0.00	107.7	53.92	20
55	139.0	0.0	5.01	1934.3	0.38	40
71	123.8	38.5	0.00	185.6	70.54	35

Pile Data:

Depth -ft	Width -in	Area -in2	Per. -in	I -in4	E -kp/i2	Weight -kp/f
0.0	72	4071.5	226.2	1319167.4	3000	4.241
40.0						

Single Pile Lateral Analysis:

Top Deflection, y_t= 0.28800-in
 Max. Moment, M= 1616.67-kp-f
 Top Deflection Slope, St= -0.00161
 OK! Top Deflection, 0.2880-in is less than the Allowable Deflection= 1.00-in

Note: If the program cannot find a result or the result exceeds the upper limit. The result will be displayed as 99999.
 The Max. Moment calculated by program is an internal force from the applied load conditions. Structural engineer has to check whether the pile has enough capacity to resist the moment with adequate factor of safety. If not, the pile may fail under the load conditions.