

BIDDING INSTRUCTIONS FOR SEALED BIDS



Sealed bids will be accepted at the Grand River Dam Authority Administrative Headquarters located at 226 West Dwain Willis Avenue, Vinita, Oklahoma. Bids received after the bid opening time and date will not be opened or considered.

RFQ or RFP Number: 17140

Bid Opening Time & Date: 5/27/2014 10:00 AM CT

Description: Steel Poles for Feeders 44 & 45 Line Clearance Improv.

Contracting & Acquisitions Agent: Monica Fowler

Bids must be enclosed in a sealed envelope or package and addressed as follows:

**PURCHASING UNIT
SEALED BID No. 17140
GRAND RIVER DAM AUTHORITY
226 WEST DWAIN WILLIS AVE
VINITA OK 74301**

Express Mail/Overnight packages must also be addressed as above.

Bids not addressed as instructed above negate the confidentiality of the sealed bid and, therefore, will be rejected and returned to the bidder without being considered.

All bids responses shall be typewritten or handwritten in ink, and any corrections to bids shall be initialed in ink. Bids and proposals submitted in pencil will not be accepted.

All bids and proposals shall include an original signature of the bidder and shall be accompanied by a properly executed non-collusion affidavit with original signatures and notary seal.

Bid responses are to include payment terms and delivery information. Bids and proposals shall be quoted FOB: Destination/Freight Allowed unless stated otherwise within the Request for Quote. All packaging, handling, shipping and delivery charges shall be included in the unit price quoted for each line item. No exceptions will be granted unless approved by the guidelines of the Chief Financial Officer or designee.

Fax or e-mail Bids will not be accepted.

Bidders opting to decline the bid offering are requested to submit a response with a brief explanation.



Grand River Dam Authority is an agency of the State of Oklahoma, fully supported by customer revenues instead of taxes.
Administrative Headquarters • 226 West Dwain Willis Avenue • Vinita, Oklahoma 74301 • Phone: 918-256-5545 • Fax: 918-256-1051

RFQ # 17140
ENG

Quotation Due By: 05/27/2014
Bid Due Time: 10:00:00 AM

REPLY TO:

VENDOR INFO:

VENDOR #: 99999.00

Monica Fowler
PURCHASING DEPARTMENT
Grand River Dam Authority
226 W DWAIN WILLIS AVE
PO BOX 409
VINITA OK 74301

NAME: _____

CONTACT: _____

ADDRESS 1: _____

ADDRESS 2: _____

CITY: _____ STATE: _____ ZIP: _____

EMAIL: _____

PHONE: _____

FAX: _____

PHONE: 405-297-9963 x4650
FAX: 405-840-1390
EMAIL: mfowler@grda.com

NOTE:

- 1.The bid opening date for this RFQ is May 27, 2014. Each bid response must be received by 10:00 am Central Time so it can be recorded as received prior to the bid opening time.
- 2.The outside envelope for each bid must be marked as "Sealed Bid No. 17140". See instructions on the Sealed Bid cover sheet.
- 3.A completed non-collusion affidavit is required and must be submitted with your bid.
- 4.This form must be signed by an authorized representative of your company in the space provided in the lower right hand corner of this form.
- 5.The award to the successful bidder will be based on "Best Value" criteria as specified in section 21. of the General Bidding Instructions for Sealed Bids that meets the specifications listed below and the requirements herein. Preference may be given to E-pay vendors if analysis estimates that such appears to result in a lower cost to GRDA.
- 6.The brand names, model(s), part number(s) provided herein are for comparable quality and identification purposes only and equivalent bids may be submitted.
7. All questions and correspondence prior to award should be directed to Monica Fowler, Assistant Superintendent of Purchasing in writing by sending and email to mfowler@grda.com no later than May 20, 2014.
8. Vendor to submit one original hard copy and one "computer readable" version (e.g., CD-ROM, CD-R, etc.) of the entire bid proposal.

Bidders should list the cost to provide these units by:

- 1) September 15, 2014, and
- 2) bidder's optimum delivery date.

Bidders should specify their optimum delivery date in their bid response.

***** Read the General Bidding Instructions attached to this RFQ for further instructions.*****

GRDA Visa Payment

GRDA provides a Visa payment program which invoices payment by a secure Visa account number assigned to the supplier after award of contract. Notification of payments and required invoice information are issued to your designated Accounts Receivable contact by e-mail remittance payment.

Preference may be shown during the evaluation process to bidders that agree to accept the Visa payment of invoices. To learn more about the benefits of the Visa payment program, and to obtain answers to FAQ, click or copy and paste the following URL into your browser: www.bankofamerica.com/epayablesvendors.

Will accept payment by Visa: Yes ____ No ____ (check one)

Visa acceptance signature: _____



REQUEST FOR QUOTE # 17140

Designated Accounts Receivable Contact for Visa remittance advices:

Name: _____

Phone: _____

Email: _____

LINE ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT OF MEASURE	UNIT PRICE	LINE COST	LEAD TIME
1	<p>Lot of various Steel H-Frame Structures, per attached drawings and specifications. Feeder 44 & 45 Kerr to Salina (W.O. RF014-00628)</p> <p>1.Unit Price for delivery by September 15, 2014</p> <p>Line Cost for delivery by September 15, 2014</p> <p>2.Unit Price for delivery by the bidder's optimum date.</p> <p>Line Cost for delivery by the bidders optimum date.</p> <p>Bidders optimum delivery date</p>	1.0		_____	_____	_____

NOTE: All prices must be quoted FOB: Destination. All freight charges to delivery point must be included in the unit price quoted for each line item. All packaging, handling, delivery and any other surcharges must also be included in the price quoted for each line item.

PAYMENT TERMS: _____

QUOTE EXPIRATION DATE: _____

QUOTATION NUMBER: _____

QUOTED BY (please print): _____

SHIP TO: Grand River Dam Authority
 TRANSMISSION & ENGINEERING HDQTRS
 635 HWY 69A
 PO Box 1128
 PRYOR OK 74362

COMPANY NAME: _____

SIGNATURE: _____

DATE OF QUOTE: _____

THIS IS NOT AN ORDER. We would be pleased to receive your quotation for furnishing the above. This form must be completed **in full** (including signature) and returned by the due date above. You may attach additional pages if necessary. If attached, the Non-Collusion form must be completed and returned with your quotation. NO PARTIAL SHIPMENTS OR PARTIAL PAYMENTS WILL BE ALLOWED WITHOUT PRIOR APPROVAL.

All articles purchased hereunder shall be in accordance with the Bidding Procedures and General Terms & Conditions contained on the attached sheets.

**PROPOSAL TO THE
GRAND RIVER DAM AUTHORITY
FOR PURCHASE OF
STEEL H-FRAME STRUCTURES
FEEDER 44 & 45**

Bidder: _____

Business Address: Street No. _____

City _____ State _____ Zip Code _____

Telephone Number _____

Fax Number _____

E-Mail _____

Date: _____

The Bidder named above hereby tenders his bid and declares that the only person or persons interested in this proposal is or are named above; that the bid is made without collusion with any other Bidder and is in all respects without collusion or fraud. The Bidder further declares he has examined the specifications and has read the attached INSTRUCTIONS TO BIDDERS for the

**STEEL STRUCTURES
FEEDER 44 & 45**

and agrees to furnish all the materials necessary or proper on the terms, and under the conditions set forth therein and in the specifications, **and to accept in full payment the firm lump sum bid listed below for galvanized and weathered steel poles:**

Cost Breakdown:

A. For Steel Structures (*Galvanized Steel*): \$ _____

Total in writing _____ Dollars.

B. For Steel Structures (*Weathered Steel*): \$ _____

Total in writing _____ Dollars.

The Cost Per Pound Will Be Used For Any Additional Structure Modifications Not Included In The Bid Proposal.

C. Steel Cost Per Pound (Galvanized): \$ _____

Total in writing _____ Dollars.

D. Steel Cost Per Pound (Weathered): \$ _____

Total in writing _____ Dollars.

Delivery: A liquidated damages clause applies to this purchase (see Item #20 of the General Bidding Instructions). If awarded the contract, the bidder shall deliver all requested STEEL POLES to the GRDA Transmission and Engineering Headquarters located at 635 Hwy 69A, Pryor, OK 74362 in rural Mayes County, Oklahoma as follows:

Delivery to be completed by **September 15, 2014.**

It is expected the purchase order will be issued no later than June 10, 2014.

Bidder states that he has produced similar poles and structures for the following companies within the last two years. Include companies, contact names, and phone numbers for references:

In the case that any quantities of the planned transmission line improvements require changes, the Bidder further provides unit prices for the addition or deletion of poles or structures at the quoted price per structure on the attached Feeder 44 & 45 Structure Bid Tab.

Signed: _____

(Seal)

BID TAB - FEEDER #44 & #45 Line Clearance Mitigation: KERR TO SALINA							
GALVANIZED STRUCTURES (CORROCOTE OUTSIDE ONLY)							
REF. DWG.	LENGTH (FT)	EMBED (FT)	DESCRIPTION	Quantity of Poles	Quantity of Structures	Unit Price Per Structure	SUB TOTAL
TP-001	115	15.5	161 kV DOUBLE-CIRCUIT TANGENT STEEL H-FRAME STRUCTURE	4	2		
	120	16.0		8	4		
	125	16.5		2	1		
	140	18		2	1		
TP-002	120	16	161 kV DOUBLE-CIRCUIT TANGENT STEEL H-FRAME STRUCTURE	2	1		
TP-004	135	BASE PLATE	161 kV DOUBLE-CIRCUIT TANGENT STEEL STRUCTURE	1	1		
STRUCTURE TOTAL COST							

BID TAB - FEEDER #44 & #45 Line Clearance Mitigation: KERR TO SALINA							
WEATHERED STRUCTURES (CORROCOTE INSIDE AND OUTSIDE OF POLES)							
REF. DWG.	LENGTH (FT)	EMBED (FT)	DESCRIPTION	Quantity of Poles	Quantity of Structures	Unit Price Per Structure	SUB TOTAL
TP-001	115	15.5	161 kV DOUBLE-CIRCUIT TANGENT STEEL H-FRAME STRUCTURE	4	2		
	120	16.0		8	4		
	125	16.5		2	1		
	140	18		2	1		
TP-002	120	16	161 kV DOUBLE-CIRCUIT TANGENT STEEL H-FRAME STRUCTURE	2	1		
TP-004	135	BASE PLATE	161 kV DOUBLE-CIRCUIT TANGENT STEEL STRUCTURE	1	1		
STRUCTURE TOTAL COST							

EXCEPTION STATEMENT

This part of the proposal must be completed even if no exceptions are stated.

State only the EXCEPTIONS. Do not include comments and/or clarifications, which may be shown by attachments to the Proposal.

EXCEPTIONS (If no exceptions, state "NONE"; provide additional pages if needed).

NON-COLLUSION AFFIDAVIT
(To Accompany Bid Proposal)

STATE OF _____)
)SS
COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says:

1. (S)He is the duly authorized agent of _____, the Bidder submitting the competitive bid which is attached to this statement, for the purpose of certifying the facts pertaining to the existence of collusion among Bidders and between Bidders and state officials or employees, as well as facts pertaining to the giving or offering of things of value to government personnel in return for special consideration in the letting of any Contract pursuant to the bid to which this statement is attached;
2. (S)He is fully aware of the facts and circumstances surrounding the making of the bid to which this statement is attached and has been personally and directly involved in the proceedings leading to the submission of such bid; and
3. Neither the Bidder nor anyone subject to the Bidder’s direction or control has been a party:
 - a. to any collusion among Bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding;
 - b. to any collusion with any state official or employee as to quantity, quality or price in the prospective Contract, or as to any other terms of such prospective Contract; nor
 - c. in any discussions between Bidders and any state official concerning exchange of money or other thing of value for special consideration in the letting of a Contract.
4. The Bidder further certifies that no person who has been involved in any manner in the development of that Contract while employed by the State of Oklahoma shall be employed to fulfill any of the services provided for under said Contract.

Signature

Date

Printed Name

Title

Agent

Subscribed and sworn to before me this _____ date of _____, 2014.

Notary Public

(Seal)
My Commission Expires:

GENERAL BIDDING INSTRUCTIONS FOR SEALED BIDS

1. Bids shall be opened by the Purchasing Unit at the Grand River Dam Authority (hereinafter referred to as “GRDA” or “the Authority”) Administrative Headquarters, 226 West Dwain Willis Avenue, Vinita, Oklahoma 74301 on the date (and time, if applicable) shown on the attached RFQ or RFP form. Bids shall be in conformity with these and any additional instructions to bidders and shall be submitted on GRDA’s form. **The RFQ (Request for Quote) or RFP (Request for Proposal) form must be completed in full and signed by the bidder.** If your bid response necessitates additional space, you may attach additional pages; however, the RFQ or RFP form shall be completed, signed and reference the additional pages. All bid responses shall be typewritten or handwritten in ink, and any corrections to bids shall be initialed in ink. Quotations or proposals submitted in pencil shall not be accepted.
2. Sealed bids shall be submitted to the GRDA Purchasing Unit in a properly marked envelope or package, and shall be sealed. The name and address of the bidder shall be printed on the exterior of the envelope or package. The RFQ or RFP number and bid opening date shall be referenced on the face of the sealed envelope or package. Unmarked bids shall be rejected and returned to the bidder. Neither fax nor e-mail submissions shall be accepted for sealed bid requirements, as they negate the confidentiality of the bid. Any bid received via fax or e-mail for a sealed bid requirement shall be rejected and returned to the bidder. Bid opening time extensions shall not be granted. Bids received after the opening time and date shall not be considered. This is a formal bidding procedure with all bid packets recorded upon receipt and held unopened under lock until the bid opening at the time, date and location listed on the RFQ or RFP. At public bid openings, a short description of the item and the bid price will be read. The information shall be recorded on a bid tabulation to be used during the subsequent bid evaluation. Interested bidders may make an appointment to review quotations after an evaluation, recommendation and bid award has been made.
3. **Non-Collusion Affidavit:** RFQs or RFPs anticipated to exceed a total amount of \$5,000 shall be accompanied by a Non-Collusion Affidavit. This affidavit shall be completed by the bidder and include an original signature in ink of an authorized company representative (preferably the bidder) with full knowledge and acceptance of the bid proposal. The Non-Collusion Affidavit with original signature shall be mailed with the bid response to the attention of the Contracting & Acquisitions Agent listed on the RFQ or RFP. Purchase orders in excess of \$5,000 will not be released to the successful bidder without receipt of a properly signed affidavit for the bid.
4. In the event the unit price and line total extension do not agree, the unit price shall be considered the quoted price accepted for evaluation.
5. **Freight Terms:** All prices shall be quoted FOB: Destination/Freight Allowed. All packaging, handling, shipping and delivery charges shall be included in the unit price quoted for each line item. No exceptions shall be granted unless approved by the guidelines of the GRDA Chief Financial Officer or designee.
6. **Other Surcharges:** Any additional surcharges (such as HazMat charges, fuel surcharges, set-up fees, etc.) shall be included in the unit price quoted for each line item. All additional charges are considered a part of the cost of the goods, and bids shall be evaluated to include these additional charges.
7. **Tax-Exempt Status:** GRDA is an agency of the state of Oklahoma and is specifically exempt from the payment of sales tax by Oklahoma state statute, Title 68 O.S.A. § 1356 (10). An excerpt from the statute shall be furnished upon request.
8. **Questions arising during the bidding process should be submitted in writing to the Contracting & Acquisitions Agent named on the RFQ or RFP.** The GRDA Contracting & Acquisitions Agent shall coordinate a reply from the end user to ensure that all potential bidders are provided the same information. Under no circumstances shall a bidder discuss pricing with any GRDA employee prior to the bid opening.
9. All bids submitted shall be subject to GRDA’s Purchasing Policy and Procedures, General Terms and Conditions, the bidding instructions and specifications, the Oklahoma Open Records Act, other statutory regulations as applicable, and any other terms and conditions listed or attached herein – all of which are made part of this Request for Quote or Request for Proposal.
10. GRDA reserves the right to reject any and all bids, and to contract as the best interests of the Authority may require. GRDA reserves the right to reject any bids that do not comply with the requirements and specifications of the Request for Quote or Request for Proposal. All bid responses become the property of GRDA and are subject to the Oklahoma Open Records Act. GRDA shall endeavor to protect technical information designated by the bidder as proprietary information; however, only technical information (i.e., “trade secrets”) may be considered proprietary – pricing and other non-technical aspects of the quote shall be considered non-proprietary.
11. **“Sole Brand” or “No Sub” Items:** Items with a “Sole Brand” or “No Sub” designation in the description shall be furnished as the specified manufacturer and model/part number. No exception may be taken to the specification, and no alternate shall be accepted. In those cases where a manufacturer has discontinued the specified model/part number, the bidder shall indicate so on the RFQ. If a replacement item is available, the new model/part number shall

be indicated on the RFQ form and the price quoted. It shall also be noted whether the replacement item is a direct replacement for the obsolete part number originally requested. If not, or if the specifications differ in any way, the bidder shall explain in detail, and corresponding drawings or descriptive literature shall be included with the quote.

12. **Approved Equivalents:** Unless an item is designated as a "Sole Brand" or "No Sub" item, any manufacturer's name, brand name, information and/or catalog number listed in a specification is for informational or cross-reference purposes and is not intended to limit competition. Bidders may offer any brand/manufacturer for which they are an authorized representative, provided it meets or exceeds the specification of the listed item. However, if quoting an equivalent product, bidders shall indicate on the RFQ form the manufacturer's name and part number. Bidder shall also submit any drawings, descriptive literature and specifications for evaluation purposes. Reference to literature submitted with a previous bid shall not satisfy this provision. The bidder shall also provide written confirmation that the proposed equivalent will meet the requested specifications and is not considered an exception. Bids which do not comply with these requirements may be rejected. GRDA warehouses are not permitted to accept any item with a part number differing from that quoted by the bidder. Bids lacking any written indication of intent to furnish an alternate brand, model or part number shall be considered to be in complete compliance with the specifications as listed on the RFQ.
13. **Insurance Certificates:** Any service to be performed that requires the vendor's employee, vehicle or equipment to be on any GRDA property must be covered by minimum insurance requirements. The workscope to be performed for the Authority shall be evaluated and the minimum insurance requirements shall be provided to prospective bidders with the RFQ or RFP. Evidence of insurance coverage shall be furnished in the form of a Certificate of Insurance, and shall be submitted with the bid response. Bidders shall disclose any subcontractors to be used, and the Authority shall consider the supplier as the single point of contact. The supplier shall assume responsibility for the performance of the subcontractor. Policies shall remain current for the duration of the requested service period, and GRDA shall be notified of any cancellation or revision to policies. Purchase Orders shall not be released to the successful bidder without a current Certificate of Insurance naming GRDA as certificate holder on file. A Memorandum of Insurance shall not be acceptable for this requirement.
14. **MSDS:** Material Safety Data Sheets shall be furnished to GRDA's Safety Department at the address noted on the PO prior to delivery of items.
15. **Purchase Orders** shall be awarded to the "lowest and best" or "best value" bidder. Line items may be split into multiple orders, taking low items from each respective bidder, or orders may be awarded on an "all or none" basis, whichever is in the best interests of the Authority. Award decisions are further subject to consideration of any additional terms and conditions contained in the bid proposal. Vendor protests must be submitted in writing to the Central Purchasing Unit of GRDA within thirty-six (36) hours of award of Contract or Purchase Order.
16. Successful vendor shall deliver the merchandise or perform the service as quoted. Substitutions or changes without prior approval of the GRDA Contracting & Acquisitions Agent shall be rejected and returned at the vendor's expense.
17. **Bidder Responsibilities:** Bidders are to transact all phases of the purchasing function directly with the GRDA Contracting & Acquisitions Agent. Bidders are to conduct all written and verbal communication with the Authority through the GRDA Contracting & Acquisitions Agent. Bidders are to conduct negotiations ethically, without attempts to influence through offers of valuable personal gifts or entertainment. Bidders are to make available as requested any technical information which might be of benefit in the bid evaluation.
18. **Supplier List:** The Finance Department maintains a current listing of suppliers with a cross-reference as to products and services offered. Suppliers may have their names added to the list by submitting a completed Vendor Registration/Payee Application, and shall notify the Authority of any update information. If a supplier fails to respond to bid requests after four appropriate solicitations, that supplier may be removed from the active list. Suppliers who do not meet quoted shipping dates or lead times, supply products or services of poor quality, substitute items of unequal quality, continually over-ship or under-ship items, or do not invoice properly may be placed under suspension or disqualified from the active supplier list. Suppliers may voluntarily request to be removed from the supplier database.
19. **Service Contracts:** By submitting a bid for services, the bidder certifies that they, and any proposed subcontractors, are in compliance with 25 O.S. §1313 and participate in the Status Verification System. The Status Verification System is defined in 25 O.S. §1312 and includes, but is not limited to, the free Employment Verification Program (E-Verify) available at www.dhs.gov/E-Verify. This shall remain in effect through the entire term, including all renewal periods, of the contract. The State may request verification of compliance for any contractor or subcontractor. Should the State suspect or find the contractor or any of its subcontractors are not in compliance, the State may pursue any and all remedies allowed by law, including, but not limited to: suspension of work, termination of the contract for default, and suspension or debarment of the contractor. All costs necessary to verify compliance are the responsibility of the contractor.
20. **Timeliness of Delivery:** The date quoted by the Bidder for delivery of the poles will be considered in the analysis of this bid due to the need for this material for the construction of a major transmission line. As such, time is of the essence in the delivery of these structures. Should the contractor neglect or fail to deliver the quoted items to the

destination in the time frame defined by the contractor in his proposal, the contractor agrees to pay to GRDA, **One Thousand Dollars (\$1,000) per calendar day with a cap of 10% of the bid price**, not as a penalty, but as liquidated damages for each and every calendar day by which the actual delivery exceeds the quoted delivery. The liquidated damages described are fixed and agreed upon by the parties because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages GRDA would sustain in such event. The said amount is agreed by the parties to this contract to be the amount of damages which GRDA would sustain.

21. **Best Value Award:** The award of this contract will be based on a “best value” criteria analysis, to include but not be limited to the following items in no order of preference:
- a. Compliance with the technical specifications
 - b. Price
 - c. Loss cost evaluation
 - d. Quoted delivery time
 - e. Locations of production and maintenance facilities
 - f. Previous history of products with GRDA, if applicable

- End of Page -

GENERAL TERMS AND CONDITIONS



Any contract or order issued by the Grand River Dam Authority (hereinafter referred to as GRDA) is expressly conditioned upon Seller's assent to these terms and conditions, unless otherwise agreed in writing. Any order issued or filled by Seller shall be deemed to constitute Seller's assent to these terms and conditions. Any additional or different terms submitted by the Seller are hereby expressly objected to by GRDA unless expressly agreed to in writing by GRDA.

1. Mail or deliver all invoices or correspondence pertaining to the payment of this Purchase Order to: Accounts Payable Department, Grand River Dam Authority, P.O. Box 409, 226 West Dwain Willis Avenue, Vinita, Oklahoma 74301. Seller shall submit invoices, with one copy detailing each item with unit prices, with the top copy being distinguishable as an original, accompanied by one copy of complete shipping papers. If shipment is not made by routing instructions as specified on the face of this Purchase Order, GRDA reserves the right to deduct any excess transportation charges resulting therefrom. Copy of original freight bill must be supplied for payment. Time, in connection with any discount offered, will be computed from date of delivery of items, or from date the correct invoice is received in Vinita, Oklahoma, whichever period of time is the later date. No Oklahoma State Sales or Use Tax shall be included in payment of this Purchase Order.
2. All articles, materials, equipment and supplies (hereinafter referred to as "items") covered by this Purchase Order, unless otherwise specified, are purchased subject to inspection before and during manufacture and upon arrival at destination. GRDA reserves the right to return for full credit and/or refund, at Seller's sole risks and expense, including all transportation and storage charges, all items found defective or furnished contrary to instructions and/or specifications contained herein.
3. In case of default by Seller, GRDA may procure the items or services from other sources and hold Seller responsible for any excess cost occasioned thereby; provided, that if necessity requires the use of items not conforming to specifications, they may be accepted, and payment made at a proper reduction in price. Notwithstanding anything herein to the contrary, GRDA reserves the right to terminate this Purchase Order for its convenience. In the event of such termination, GRDA shall pay and Seller shall accept the reasonable value of all work performed and items delivered by Seller up through the effective date of such termination.
4. Seller warrants that all items covered by this Purchase Order will conform to the specifications, drawings, samples or other description furnished by GRDA, or any revisions thereof, and any items purchased pursuant to this Purchase Order shall be subject to all warranties expressed or implied by law, and will be merchantable of good material and fit and sufficient for the purpose intended, and shall satisfy any performance guarantee requirements as specified herein by GRDA. In the event the items and/or services purchased hereunder do not meet the warranty specified hereinabove, Seller shall promptly repair or replace any defective item at its expense, or re-perform any necessary services, and shall hold GRDA harmless from any and all costs and expenses incurred due to said defective item or performance of services, including the cost for removing any part or product to be repaired or replaced, as well as transportation and installation charges in connection with the repair, replacement or servicing of any parts or equipment. Seller further agrees that the manufacturer's warranties and guaranties of the items purchased hereunder extended to Seller shall extend to GRDA.
5. Seller shall indemnify and hold GRDA harmless from and against any and all loss, costs or expenses arising out of any liens or claims in any way related to the items or services furnished hereunder. Seller shall likewise indemnify and hold GRDA harmless from any patent, trademark or copyright infringement, except items supplied in accordance with design originating with GRDA. Seller shall be an independent contractor. Seller shall protect, defend, indemnify and hold GRDA harmless from any damage or injury to any persons, including Seller's employees or property, and from any claim, demand, action, cost or expense arising out of the activities hereunder as a result of Seller's negligent or intentional wrongful acts. In no event shall Seller's liability be limited under this Purchase Order for the negligent or intentional wrongful acts of the Seller.
6. Seller shall, before any items are shipped and/or any services are commenced, provide GRDA with certificates evidencing that the following minimum insurance will remain in force until Seller's obligations are completed: (a) Workmen's Compensation Insurance, including Employer's Liability Insurance, in accordance with the laws of the state in which Seller may be required to pay compensation; and (b) Public Liability Insurance with an individual limit of not less than \$100,000 and a total for any one accident of not less than \$300,000, unless otherwise specified herein.
7. This Purchase Order (including Seller's right to receive payments hereunder) shall not be assigned or subcontracted in whole or in part without GRDA's prior written consent. No assignment hereof shall relieve this assignor of its obligations hereunder.
8. Service Contracts: By submitting a bid for services, the Bidder certifies that they, and any proposed Subcontractors, are in compliance with 25 O.S. §1313 and participate in the Status Verification System. The Supplier/Contractor/Consultant/Construction Manager/etc. certifies that it and all proposed Subcontractors, whether known or unknown at the time a contract is executed or awarded, are in compliance with 25 O.S. §1313 and participate in the Status Verification System. The Status Verification System is defined in 25 O.S. §1312 and includes, but is not limited to, the free Employment Verification Program (E-Verify) available at www.dhs.gov/E-Verify. This shall remain in effect through the entire term, including all renewal periods, of the Contract. The State may request verification of compliance for any Contractor or Subcontractor. Should the State suspect or find the Contractor or any of its Subcontractors are not in compliance, the State may pursue any and all remedies allowed by law, including, but not limited to: suspension of work, termination of the Contract for default, and suspension or debarment of the Contractor. All costs necessary to verify compliance are the responsibility of the Contractor.
9. All Items shipped pursuant to this Purchase Order will conform with all municipal, state and federal laws, ordinances and regulations, and Seller will defend and save harmless GRDA from loss, costs or damage by reason of any actual or alleged violation thereof.
10. GRDA hereby notifies Seller that Seller must comply, and by acceptance of this Purchase Order, Seller represents that it has complied with, and will continue to comply with, all applicable federal, state and local laws, regulations or orders.
11. This Purchase Order shall be construed as being performed by both parties in Craig County, Oklahoma, and shall be governed in accordance with the laws of the State of Oklahoma.

Grand River Dam Authority is an agency of the State of Oklahoma.

Administrative Headquarters • 226 West Dwain Willis Avenue • Vinita, Oklahoma 74301 • Phone: 918-256-5545 • Fax: 918-256-1051



TRANSMISSION LINE
STEEL POLE
SPECIFICATIONS
MONOPOLE AND
H-FRAME

SPECIFICATIONS FOR TRANSMISSION LINE STEEL POLES MONOPOLE AND H-FRAME

1. SCOPE:

This specification covers the design, materials, welding, inspection, protective coatings, drawings and delivery of steel transmission single pole and H-frame structures. The proposal submitted by the manufacturer shall include costs for field bolts, locknuts, vangs, attachment provisions for arms and/or insulators, anchor bolts, base plates, and other necessary items to make a complete structure.

2. DEFINITIONS:

A. Cambering - the fabricating of a slight convex curve in a pole or crossarm.

B. D/t - the ratio of the diameter of a tubular pole to the steel plate thickness.

C. Engineer - a registered or licensed person, who may be a staff employee or an outside consultant, and who provides engineering services. Engineer also includes duly authorized assistants and representatives of the licensed person.

D. Groundline - a designated location on the pole where the surface of the ground will be after installation of a direct embedded pole.

E. Overload factors (OLF) - a multiplier which is applied to each of the vertical, transverse and longitudinal structure loads to obtain an *ultimate load*.

F. P-delta moment - secondary moment created by the vertical loads acting on the structure when the structure deflects from its unloaded position.

G. Point of fixity - location on the pole at groundline or below groundline where the maximum moment occurs.

H. Raking - the practice of installing a straight pole out of plumb, or at an inclined angle.

I. w/t - Ratio of the width of the pole (flat-to-flat) to the plate thickness.

J. Ultimate load - The maximum design load which includes the appropriate *overload factor* specified.

3. CODES AND STANDARDS:

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

A. American Concrete Institute (ACI):

1. 318 – Building Code Requirements for Reinforced Concrete.

B. American Institute of Steel Construction (AISC):

1. Manual of Steel Construction.

2. Quality Criteria and Inspection Standards.
- C. American National Standards Institute (ANSI):
1. B18.2.1 – Square and Hex Bolts and Screws including Hex Cap Screws, and Lag Screws.
 2. B18.2.2 – Square and Hex Nuts.
 3. C2 – National Electric Safety Code (NESC).
- D. American Society for Testing and Materials (ASTM):
1. A6 – General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use.
 2. A153 – Zinc Coating (Hot Dip) on Iron and Steel Hardware.
 3. A325 – High Strength Bolts for Structural Steel Joints, including suitable Nuts and Plain Hardened Washers.
 4. A354 – Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
 5. A370 – Mechanical Testing of Steel Products.
 6. A385 – High Quality Zinc Coating (Hot Dip).
 7. A449 – Quenched and Tempered Steel Bolts and Studs.
 8. A563 – Carbon and Alloy Steel Nuts.
 9. A577 – Ultrasonic Angle-Beam Examination of Steel Plates.
 10. A578 – Straight Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications.
 11. A615 – Deformed Billet Steel Bars for Concrete Reinforcement.
 12. A673 – Sampling Procedures for Impact Testing of Structural Steel.
 13. A871 – High Strength Low-Alloy Structural Steel Plate with Atmospheric Corrosion Resistance.
 14. B6 – Zinc (Slab Zinc).
 15. E165 – Liquid Penetrant Inspection Method.
 16. E709 – Magnetic Particle Examination.
- E. American Society of Civil Engineers (ASCE):
1. Manual 72 – Design of Steel Transmission Poles.
- F. American Welding Society (AWS):
1. C2.1 – Recommended Safe Practice for Thermal Spraying.
 2. D1.1 – Structural Welding Code – Steel.
- G. National Electrical Manufacturers Association (NEMA) Standards Publication TT1, Tapered Tubular-Steel Structures.
- H. American Society for Nondestructive Testing, Recommended Practice No. SNT-TC-1A, Supplement A through E.
- I. Zinc Institute:
1. Z170 15M – Inspection Manual for Hot-Dip Galvanized Products.

4. CONFLICT BETWEEN THIS SPECIFICATION, DRAWINGS, AND REFERENCED DOCUMENTS:

In the event of conflict between this specification and the above referenced documents, the requirements of this specification shall take precedence. In cases where the above standards are in conflict, unless specifically noted elsewhere in the Contract Documents, the most stringent requirements shall govern. If a conflict exists between this specification or the referenced documents and the attached drawings, contact the owner or owner's representative.

5. GENERAL REQUIREMENTS:

The design, fabrication, allowable stresses, processes, tolerances, and inspection shall conform to the American Society of Civil Engineers (ASCE) Standard, **Design of Steel Transmission Pole Structures - Manual 72 – Section 2.0** or the latest edition, with the following additions and/or exceptions:

5.1 GENERAL STRUCTURE DESIGN:

5.1.1 The structures shall be single/double circuit galvanized or weathering steel monopoles or H-structure poles as specified by the Owner. Pole designs shall be prepared from the attached configuration drawings and design loads. The Fabricator shall price structures with the use of non-weathering galvanizing and weathering steel. The Owner will determine preferred coating. The structures shall include provisions for attachment of temporary rigging, conductors, climbing ladders, overhead ground wires and their associated hardware. The structures shall be pre-drilled for the attachment of crossarms, braces, insulators or other attachments as specified.

5.1.2 The structure shall be capable of withstanding all specified loading cases including secondary stresses from foundation movements when specified, but not considering the possible restraining effect of conductors or shield wires. The indicated loads shall include all overload capacity factors, therefore, the allowable material stress shall equal the yield stress modified using the methods included in the ASCE Manual – 72 Design of Steel Transmission Pole Structures, Section 2.2. The structure shall withstand the loads without failure, permanent distortion, or exceeding any specified deflection limitations.

5.1.3 Wind pressures shown in the loading criteria shall be multiplied by the appropriate shape factor applied to the poles.

Pressures in psf shall be computed as follows:

$$p = W \times Cd$$

Where p = pressure on projected area of the pole normal to wind, W = wind pressure, and Cd = shape (or drag) factor. Shape factors for computing the wind on poles are:



5.1.4 The maximum design unit stress shall be the minimum yield strength as stated in applicable ASTM specifications for the particular application and types of loads, including overload factors.

5.1.5 Poles shall be designed with a minimum number of joints. Field welding shall not be allowed as part of the design of a new pole. The shaft joints to be made in the field shall be slip joints or bolted flange joints. Slip joint length shall be at least 1-1/2 times the largest inside diameter of the female section. If approved by the owner or owner's representative, a strap across the pole splice to prevent separation of the male and female sections of the pole may be used for X-braced H-frame structures. Approval must be obtained prior to bid. Manufacturer shall verify slip joint fit before shipment. Joints should not interfere with step nuts, ladder clips, X-braces or jacking nuts. Sufficient jacking lugs and permanent orientation marks shall be provided at all slip joints to ensure proper alignment and complete overlap of the joint.

5.1.6 The Fabricator shall supply anchor bolts conforming to ASTM A615 with ASTM A563 Graded C nuts and washers. Anchor bolts shall be threaded at the top end a distance equal to the baseplate thickness plus the thickness of two anchor bolt nuts plus 2 1/2". Each anchor bolt shall include two heavy hex nuts conforming to ASTM A563. Welding on anchor bolts will only be allowed in the bottom 12 inches. Only one length of anchor bolt shall be used on each pole. Anchor bolts/clusters shall be plainly marked to indicate the structure type, structure number, orientation, and top of concrete. Anchor bolts shall be designed to be shipped as a rigid cage with top and bottom plates holding the anchor bolts in place. The anchor bolt thread shall be protected during shipping. The anchor bolts shall be welded to the holding plate in the bottom of the cage. The top template shall be designed to be removable and to support the assembled cage during lifting and setting operations without detrimental deformations. Bolt clusters shall be designed to be rigid enough to withstand the normal jolts of shipping, handling and installation with no displacement of bolts from the proper positions within the cluster. The anchor bolt assemblies shall have a clear distance of not less than 3 inches between adjacent bolts.

The removable template at the top shall be marked to show the centerline for tangent structures and the angle bisector for angle structures. Matching marks are to be on the base plate of the structure so proper alignment can be made.

5.1.7 Minimum plate thickness for all pole components shall be 3/16 inch.

5.1.8 Structures which are to be direct embedded shall have bearing plates and ground sleeves. Bearing plates shall have a diameter not more than 2 inches greater than the maximum pole diameter. **All steel poles** shall have a minimum 2 inch X 2 inch drain hole at the bottom. Ground sleeves shall have a minimum length of 3 feet.

The ground sleeve shall have a minimum thickness of 3/16 inch and shall be centered at the groundline. A seal weld shall be provided around the ground sleeve. The ground sleeve shall not be considered in strength calculations.

5.1.9 Poles shall have nearly a uniform taper throughout their entire length. The maximum difference in tapers between two pole sections measured by the diameters shall be .20 inch/ft. for poles with variable taper.

5.1.10 Poles with elliptical cross sections shall have a minor axis dimension equal to at least 75 percent of the major axis dimension.

5.1.11 All unguyed angle poles or unguyed tangent deadends shall be designed to have no greater than one pole-top diameter of calculated deflection at the top of the pole under the "normal" loading conditions.

5.1.12 In the design of connections for vangs, brackets, or stiffeners attached to the pole shaft, care shall be taken to distribute the loads sufficiently to protect the wall of the pole from local buckling.

5.1.13 Each pole shall be permanently marked on the pole shaft 60 inches above groundline and on the bottom of baseplate or bearing plate with the following identifying information: structure type, height, ultimate groundline moment, owner name, and date manufactured. The method of identification shall be approved by the owner.

5.1.14 A grounding connection shall be welded to the pole shaft, 18 inches above the base plate, or in cases of direct embedded poles, 6 inches above the ground sleeve. The grounding connection will be the two-hole, National Electrical Manufacturers Association, NEMA-drilled pad. Grounding pad face shall not be painted or covered with other coatings.

5.1.15 Clips for removable ladders shall begin not closer than 6 feet above the base plate or 6 feet above ground for a direct embedded pole and extend to the top of the pole. Each ladder clip shall be designed to support a minimum 1,000 lb. shear working load. The clips shall be welded to the pole surface. Ladder clips shall be located to avoid interference between ladders and other attachments.

5.1.16 Weathering steel structures shall be designed to eliminate water and refuse traps. Steel shall conform to ASTM A588 or A871. After fabrication, poles made of weathering steel shall be cleaned of oil, scale, etc., in accordance with the surface preparation specification SSPC/NACE SP-6/NACE 3, to ensure uniform and rapid formation of the protective oxide layer.

Plastic plugs shall be installed in all nuts welded to the structure and all tapped holes.

5.2 Materials

5.2.1 All materials shall comply with the applicable requirements of ASTM specifications. Any modifications to ASTM specifications must be approved by the owner's representative prior to bidding.

5.2.2 Poles, arms and conductor brackets shall conform to ASTM A36, ASTM A572, ASTM 581, ASTM A588, ASTM A871 or ASTM A595.

5.2.3 Base plate shall conform to ASTM A572, ASTM A588, ASTM A633, or ASTM A595.

5.2.4 Anchor bolts shall conform to ASTM A615, Grade 60 or 75.

5.2.5 Other bolts and nuts shall conform, as applicable, to ASTM A307, ASTM A325, ASTM A354, ASTM A394, or ASTM A687. Lockwashers shall be provided for each structure bolt.

5.2.6 Anchor bolts, structural plate, and weld material, shall meet ASCE requirements for Charpy tests.

5.2.7 For galvanized structures, steel used for the pole shaft and arms shall have a silicon content less than .06 percent

5.2.8 The Manufacture shall provide 5 percent more fastening hardware than required to assemble and erect the structures and shall provide coating material for repair of damaged surfaces.

5.3 FABRICATION

5.3.1 All welding shall be in accordance with the American Welding Society Code AWS D1.1, latest edition. Welders shall be qualified in accordance with AWS D1.1 welding procedures. All welding materials shall conform to the latest revision of the "Electrode and Flux Specifications" set forth in ANSI/AWS D1.1.

5.3.2 One hundred percent (100%) penetration welds shall be required in, but not limited to, the following areas:

- circumferential welds (C-welds) joining structural members;
- longitudinal welds in the female portion of the joint within the slip joint area;
- welds at the butt joints of back-up strips; and
- base plate-to-shaft weld.
- longitudinal welds for a minimum length of 3 inches where there are adjacent C-welds, flange welds, base welds and ends of tubes.

5.3.3 Base plate-to-pole shaft welds, arm base-to-base welds, vangs-to-shaft welds, arm box joint welds, and all welds in major load carrying "tee" joints shall be 100% penetration with 100% fusion.

5.3.4 Quality and acceptability of every inch of the full penetration welds shall be determined by visual and ultrasonic inspection.

5.3.5 Welding shall be performed by the manual shielded metal-arc process, submerged-arc process, gas metal-arc process, or gas shielded flux-core-arc process.

5.3.6 Welding procedure and electrode selection shall be adjusted so as to provide a notch toughness of 15 ft-lbs absorbed energy at -20°F as measured by the Charpy "V" notch test.

5.3.7 All undercutting shall conform to the following:

- a. Base plate to pole shaft welds, circumferential groove welds, longitudinal welds in a female telescoping joint, and arm shaft to pole connection plate welds, shall have no undercutting in excess of 0.008 inch with the exception that a 0.02 inch undercut is allowed for two (2) inches in any twelve inches of weld length.
- b. Longitudinal welds in vang, pull-offs, seam welds of arms, step welds, ladder lugs and other areas shall have no undercutting in excess of 0.02 inch.

5.3.8 Field welding shall not be permitted except with owner's approval and the manufacturer's direction in repairing a pole. All weld repair shall be in accordance with ANSI/AWS D1.1 and repaired welds shall be inspected per the same methods and procedures specified for the original welds.

5.3.9 All parts of the structure shall be neatly finished and free from kinks or twists. All holes, blocks, and clips shall be made with sharp tools and shall be clean-cut without torn or ragged edges.

5.3.10 Before being laid out or worked in any manner, structural material shall be straight and clean. If straightening is necessary, it shall be done by methods that will not injure the metal.

5.3.11 Shearing and cutting shall be performed carefully and all portions of the work shall be finished neatly. Copes and re-entrant cuts shall be filleted before cutting.

5.3.12 All forming or bending during fabrication shall be done by methods that will prevent embrittlement or loss of strength in the material being worked.

5.3.13 Holes for connection bolts shall be 1/16 inch larger than the nominal diameter of the bolts. Holes in the flange plates for bolted splices shall be 1/8 inch larger than the bolt diameter. Holes in the base plates for anchor bolts shall be 3/8 inch larger than the nominal diameter of the anchor bolts. The details of all connections and splices shall be subject to the approval of the owner or his representatives.

5.3.14 Holes may be punched in steel plate of 13/16-inch thickness or less. Plate material greater than 13/16-inch shall be drilled or subpunched and reamed or cut with a machine guided oxygen torch.

5.3.15 All holes shall be perpendicular to the member and be cylindrical, sharp and clean cut without excessive tear-out or depression. Any burrs that remain after punching, drilling, or cutting shall be removed by grinding, reaming, etc.

5.3.17 The overall length of the assembled structure should not be less than 6 inches of the specified length and not more than 12 inches.

5.4 FINISHES

5.4.1 The following finishes are acceptable: galvanizing or weathering steel, and below grade coating.

a. Galvanizing - All structures and structural components which are hot-dip galvanized shall meet all the requirements of ASTM A123 or ASTM A153. Measures shall be taken to prevent warping and distortion according to ASTM A384 and to prevent embrittlement according to ASTM A143. Pre-clean the poles and attachments utilizing a caustic bath, acid pickle and flux or mechanical method to remove mill scale, rust, grease or other deleterious substances. Galvanize the threaded portion of anchor bolts and 6 inches below the threads, conforming to ASTM A123. The "Finish" shall be a galvanized coating that is continuous, adherent and free of uncoated spots, blisters, chemical flux and projections which will interfere with the intended use of the structure and assemblies. Holes shall be clean and free of superfluous spelter. Poles made of ASTM A588 steel shall not be galvanized due to the high silicon content of the steel.

b. Weathering Steel - Steel shall conform to ASTM A588 or A871. After fabrication, poles made of weathering steel shall be cleaned of oil, scale, etc.

c. Coatings for the Embedded Portion of the Pole - When poles are to be directly embedded, a 16 mil (minimum dry film thickness), two component hydrocarbon extended polyurethane coating that is resistant to ultraviolet light shall be applied on the exposed surface of the embedded portion of the pole. The coating shall extend from the butt to the top of the ground sleeve. Other coatings shall be approved by the owner prior to their use.

5.4.2 Galvanized bolts and nuts with yield strengths less than 100,000 psi shall be hot-dip galvanized per ASTM A153 and ASTM A143, or mechanically coated with zinc in accordance with ASTM B454, Class 50. Bolting materials with yield strengths in excess of 100,000 psi shall not be hot-dip galvanized. Instead, they shall be painted with zinc enriched paint or mechanically coated with zinc per ASTM B454, Class 50.

5.5 INSPECTION AND TESTING

5.5.1 Adequate tests and inspections shall be made to determine whether the material furnished conforms to the applicable standards.

5.5.2 Ultrasonic inspection of all complete penetration welds and testing of the remainder of the welds shall be performed in accordance with NEMA TT1. All personnel performing nondestructive testing shall be qualified in accordance with the American Society for Non-Destructive Testing Recommended Practice No. SNT-TC-1A, Supplement A through E.

5.5.3 All materials for base plates, shafts, crossarms, arms, and major attachments shall be tested as specified in NEMA TT1 for notch toughness on a heat lot basis.

5.5.4 Each individual base plate shall be tested after welding in accordance with ASTM A578.

5.5.5 Certified test reports, including complete test results for all structures shall be provided to the Owner. The manufacturer shall make certified welding reports for each structure. The reports covering welding shall include all welds of a structure. Each weld shall be clearly identified; and the report shall consist of the method of testing, whether the weld is acceptable, the identification of the structure, the date, and the name and signature of the inspector.

5.5.6 The cost of tests made by the manufacturer (except full scale load tests on poles), including cost of the certified test reports shall be considered included in the price.

5.5.7 Mill test reports showing chemical and physical properties of all material furnished under this specification shall be maintained by the manufacturer for a period of 5 years and shall be traceable to the structure.

5.5.8 All plates over 1-1/2 inches thick shall be ultrasonically tested to assure against defects which could lead to lamellar tearing.

5.5.9 Shafts having slip joints shall be mated and matched at the Fabricator's plant to ensure that component parts fit to the tolerances required.

5.5.10 Members which are bent or warped or otherwise improperly fabricated shall be properly repaired or replaced

5.5.11 The owner and the owner's designated agents shall have free entry at all times while work is being carried on, to all parts of the manufacturer's plant to inspect any part of the production of the poles covered by this specification.

5.6 STRUCTURE TESTING

5.6.1 Any structures which are to have full-scale load tests performed on them will be identified prior to issue of a purchase order.

5.6.2 Details of the test procedures and methods of measuring and recording test loads and deflections shall be specified by the manufacturer prior to testing and shall be subject to the review and approval of the owner or his representative.

5.6.3 Deflections shall be recorded in the transverse and longitudinal directions when applicable. Deflection measurements shall be taken under the no load condition both before and after testing.

5.6.4 Material procurement for test poles shall be identical to material procurement procedures for regular production run poles.

5.6.5 A full report listing results shall be submitted after completion of all testing. Copies of mill test reports shall be included in the load test report. The report shall also include a complete description of the load tests with diagrams and photographs.

5.6.6 The Fabricator shall provide field services of representatives, equipment and material to correct errors, discrepancies or omissions in the structures furnished as required by the Owner.

5.6.7 Misfabricated pieces shall be repaired or replaced by the Fabricator at no additional cost to the Owner. Costs incurred due to delays caused by these misfabricated pieces shall be borne by the Fabricator.

5.6.8 The owner or his representative reserves the right to be present during testing and shall be notified 2 weeks prior to the start of structure fabrication.

5.7 SHIPPING

5.7.1 Each shipment shall be accompanied by a list of all parts, identifiable by structure type and number. Arms, bolts and miscellaneous hardware will be identified by the list for match up with the respective pole shaft. All parts required for any one structure shall be in one shipment, if possible.

5.7.2 The owner and owner's representative shall be notified prior to shipment that such shipment is to take place, and they reserve the right to inspect the components prior to shipment. The notification shall give quantities, weight, name of common carrier used, and expected time of arrival.

5.7.3 The anchor bolts shall be welded to the holding plate in the bottom of the cage. Bolt clusters shall be rigid enough to withstand the normal jolts of shipping and handling with no displacement of bolts from the proper positions within the cluster.

5.7.4 Unless otherwise agreed to by the owner, the anchor bolt cage shall be shipped at least 30 days prior to pole shipment.

5.7.5 Salt-treated wood blocking and urethane foams shall not be used when shipping or storing weathering steel poles.

5.7.6 Bolts, nuts and washers for weathering steel structures shall receive a suitable solvent and be packaged in a sealed container for shipment.

5.7.7 Bundling straps or bands, or their equivalent, and related items as well as containers and crating shall be of sufficient strength to contain and protect the contents under normal export shipping, handling, and storage yard conditions. The banding material shall be galvanized or aluminized steel or other equivalent material which will not rust or otherwise deteriorate during shipping and storage. The containers shall be constructed in a manner which will prevent pilferage of contents from the unopened container.

5.7.8 Vehicles in which steel is shipped or stored shall be clean and free from foreign materials which could in any way injure the steel or the structure coating.

6. INFORMATION TO BE SUPPLIED BY THE MANUFACTURER

6.1 Information to be supplied with the proposal.

- a. Calculated shipping weight of each structure excluding anchor bolts. Separate weights shall be given for arms and poles.
- b. Ultimate groundline reactions (including overload factors) in poles and guy wires.
- c. Anchor bolt size, length and locations (bolt circle diameters).
- d. Type of material of major components (ASTM number).
- e. Description of pole shaft, including thickness, length, diameter, cross-sectional geometry, and method of fastening each shaft component.
- f. Data showing the design of the arm, arm connections, arm attachment plates and brackets.
- g. Draft drawings of structure and structure attachments.

6.2 Documentation to be supplied for the owner's approval prior to fabrication.

Documentation includes final design calculations for pole shaft, base plate, anchor bolts, arms, and other appurtenances, including their connections for all structures. The following information shall be supplied:

- a. For the loading cases with overload factors, the total shear, axial forces, moments, stresses or stress ratios, section moduli, cross-sectional areas, deflections w/t's for polygonal and D/t's for round cross sections at all splices, at arm attachment points (top and bottom), and at least every 10 feet along the pole.

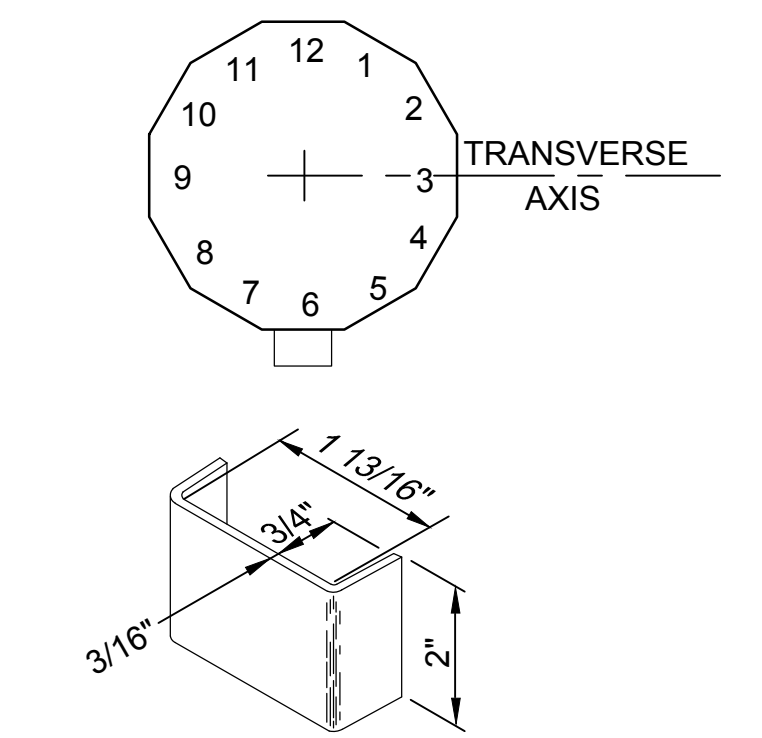
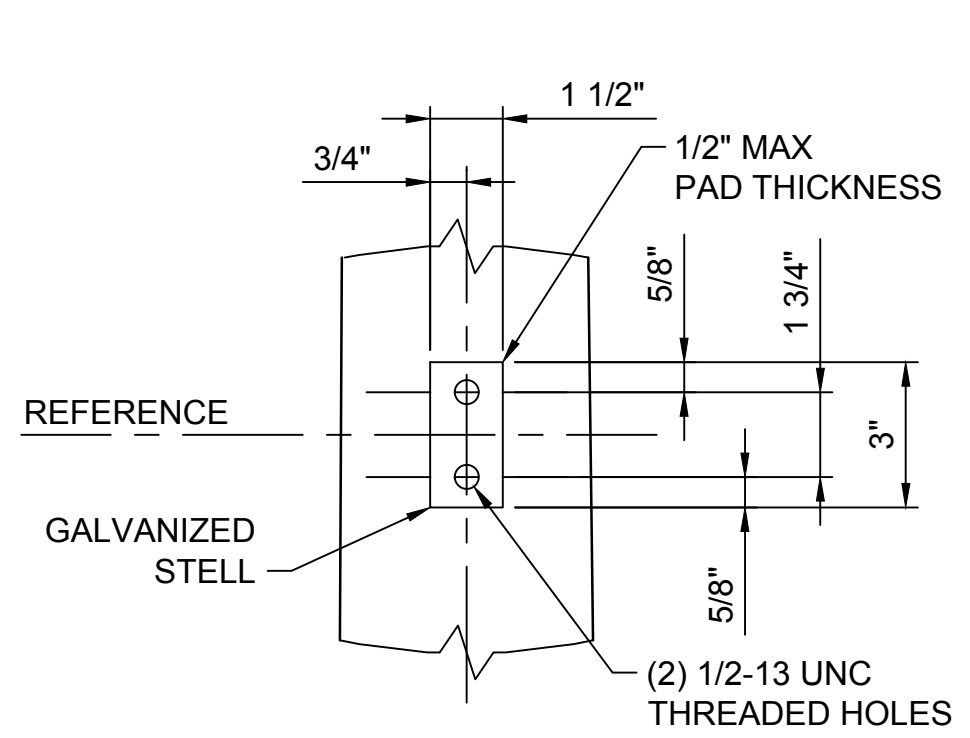
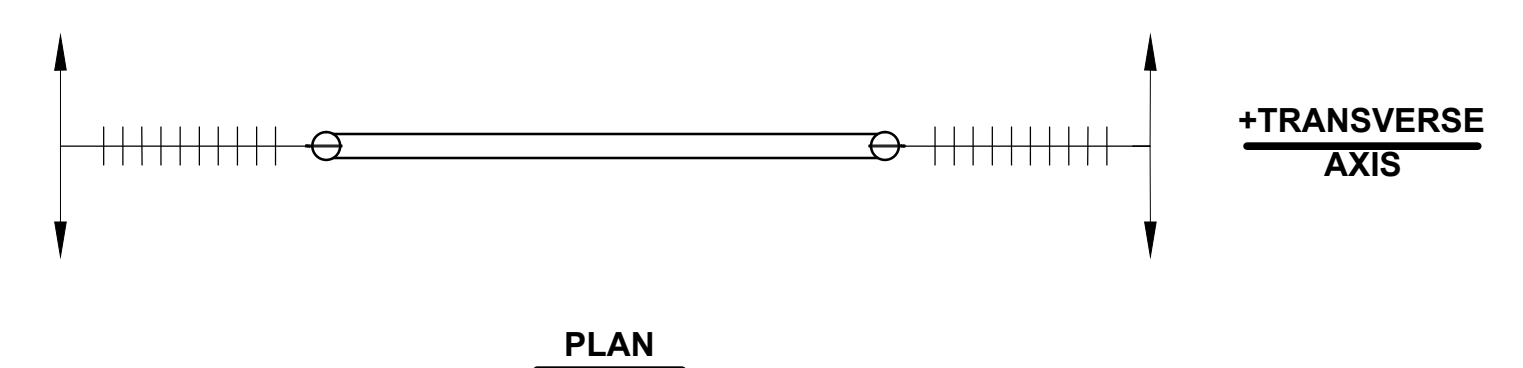
- b. For the critical loading case, shear and axial forces, moments, stresses, section moduli, cross-sectional areas at the arm connections, bolt stresses in the arm connection, and deflection at the end of the arm.
- c. Anticipated deflections at the top of the pole and at the ends of the arms shall be indicated for each pole for the "normal" loading condition of 60°F, no wind.
- d. For all specified loading cases, reactions and groundline moments shall be supplied.
- e. Detail drawings for each structure type giving weights of structure components, dimensions, and bill of materials.
- f. Assembly instructions and erection drawings. Slip joint lengths and allowable tolerances.

6.4 Test Reports (as requested).

- a. Certified mill test reports for all structural material.
- b. Certified welding reports for each structure.
- c. Impact property test reports showing that the material used in the structures meets the impact properties.
- d. Test reports on coating thickness.
- e. Report of structure testing, when required, including photographs, diagrams, load trees, etc.

6.5 Final Documents shall be supplied to the owner for the items in Section 6.2.e, after fabrication of all structures and prior to final payment.

- a. The Fabricator shall provide data files in PLS-Pole (latest version) format of the model of each structure type and height for inclusion into the Owner's PLS-Cadd design model. All PLS-Pole model files shall be submitted in "backup" file format and included on compact disc (CD), DVD or USB medial storage device. Individual component/library files used for each structure shall not be accepted.
- b. All final drawings shall become the property of the owner, who shall have full rights to reproduce drawings and use them as the owner sees fit, including submitting them to other vendors for the purpose of obtaining bids on future steel pole purchases.



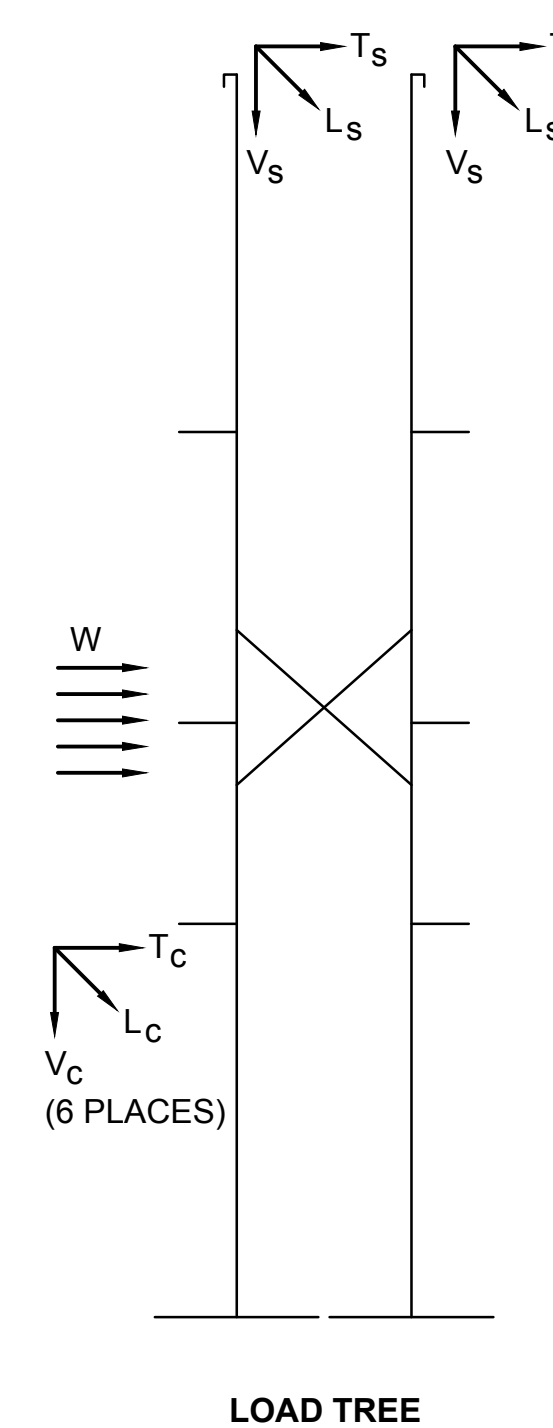
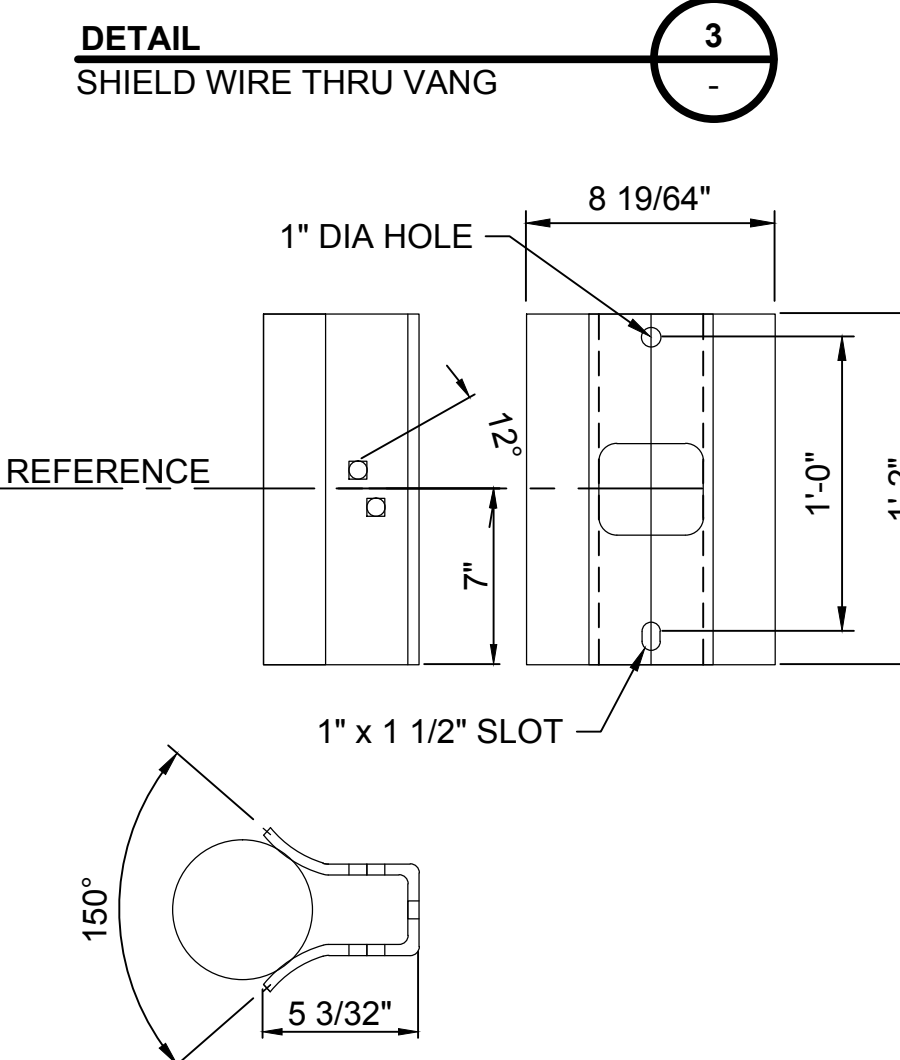
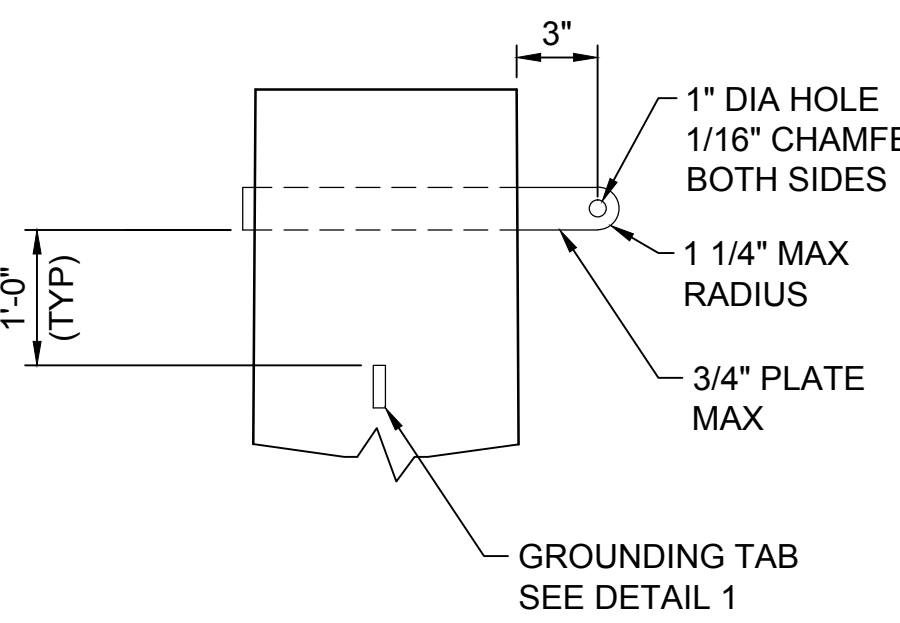
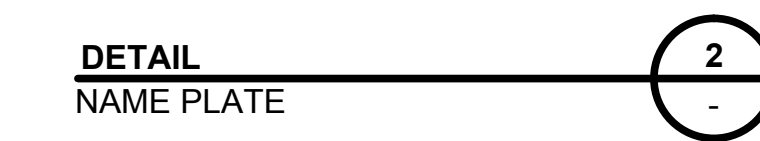
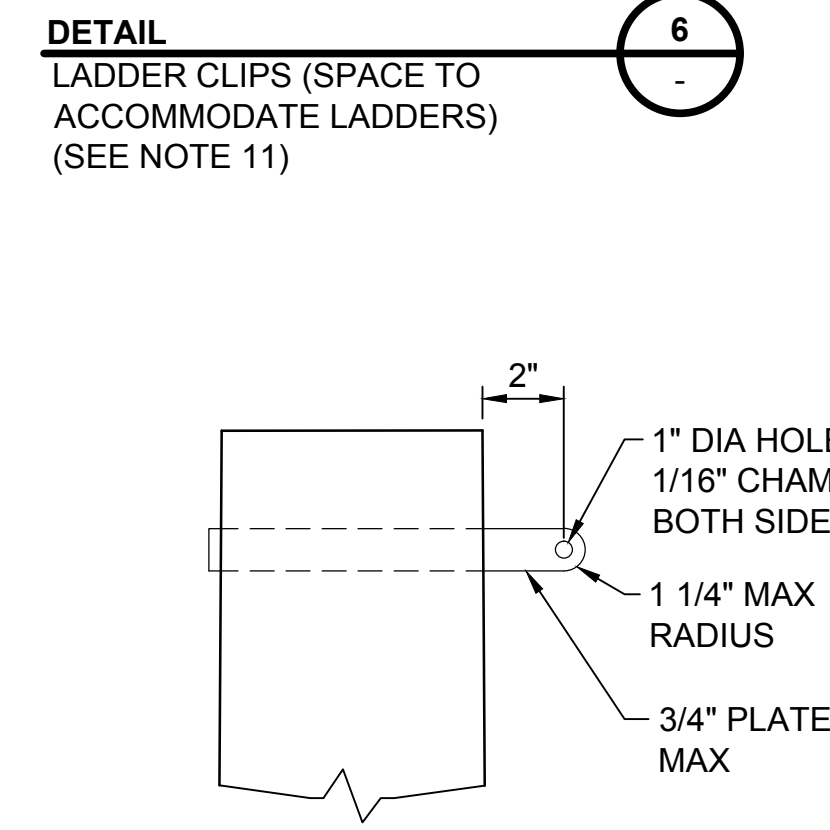
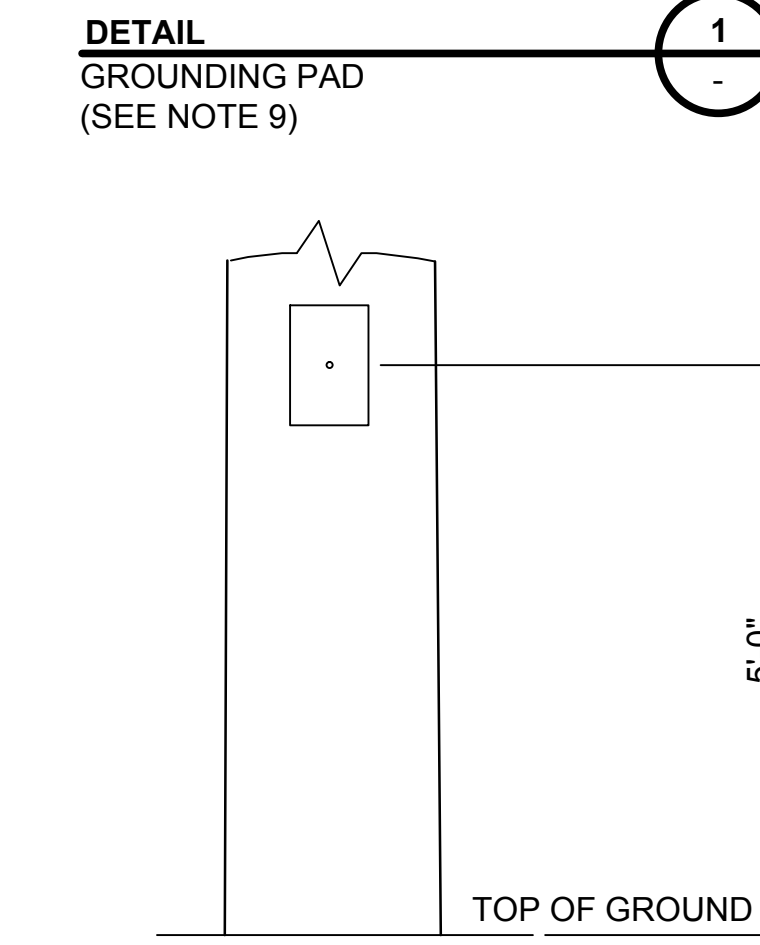
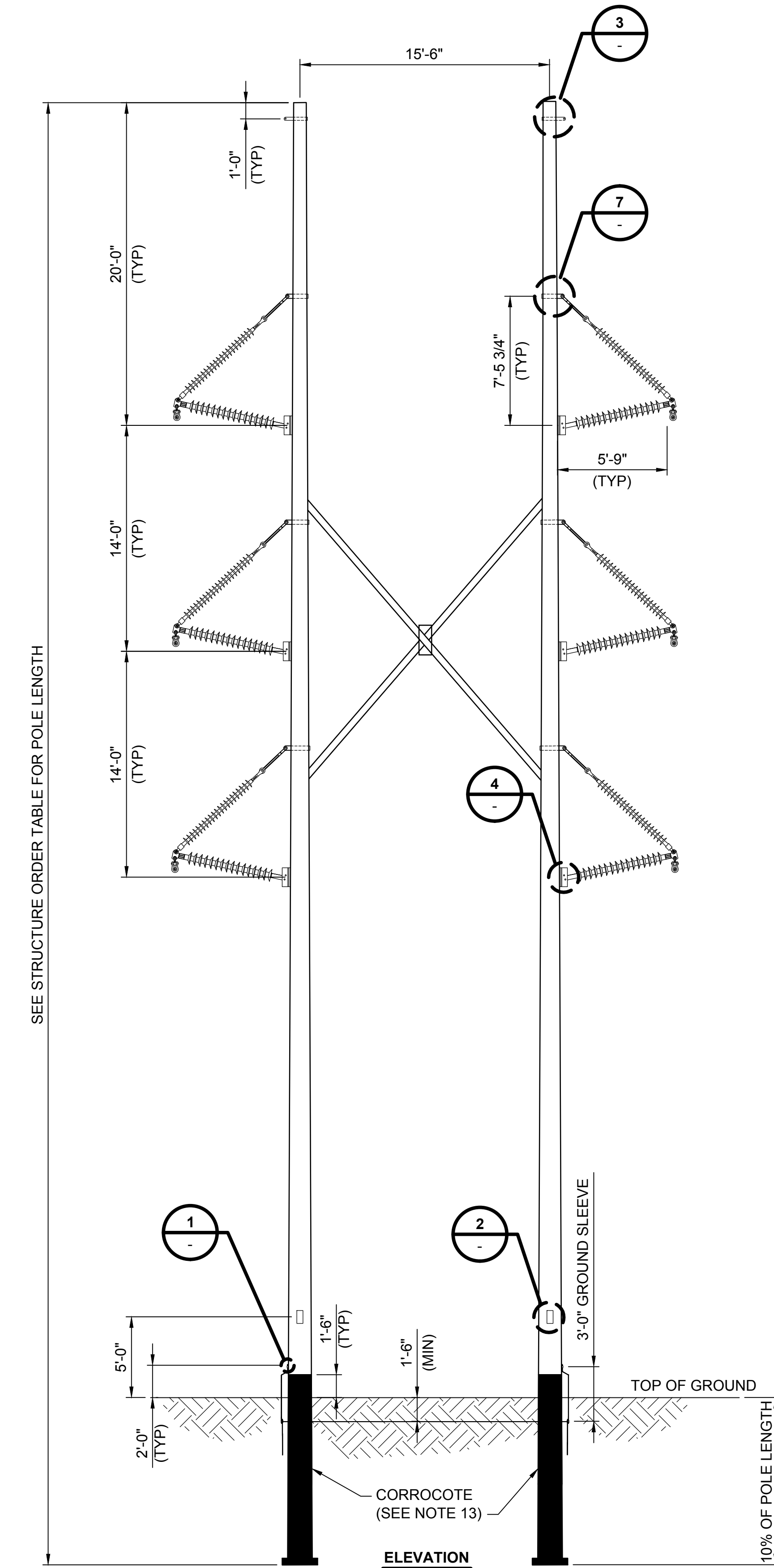
LOAD CASE	DESCRIPTION	OVERLOAD CAPACITY FACTORS	CONDUCTOR (KIPS)			SHIELD (KIPS)			W (PSF)	REMARKS
			Vc	Tc	Lc	Vs	Ts	Ls		
1	NESC HEAVY DISTRICT (1/2" ICE, 4 PSF WIND, 0° F+K)	VERTICAL: 1.50 TENSION: 1.65 WIND: 2.50	2.3	1.6	0.5	1.0	1.1	0.8	10.0	SEE NOTES
2	EXTREME WIND 100 MPH (NO ICE, 25.8 PSF WIND, 60° F)	VERTICAL: 1.10 TENSION: 1.10 WIND: 1.10	0.9	1.8	0.5	0.3	0.8	0.5	28.6	SEE NOTES
3	1" ICE (1" ICE, NO WIND, 30° F)	VERTICAL: 1.10 TENSION: 1.10	2.9	0.3	1.3	1.7	0.2	0.9	0.0	SEE NOTES
4	1" ICE + 40 MPH WIND (1" ICE, 4 PSF WIND, 15° F)	VERTICAL: 1.10 TENSION: 1.10 WIND: 1.10	2.9	1.1	1.3	1.7	0.8	0.9	4.5	SEE NOTES
5	NORMAL (0" ICE, 0 PSF WIND, 60° F)	VERTICAL: 1.00 TENSION: 1.00	0.8	0.2	0.0	0.3	0.1	0.0	0.0	SEE NOTES
6	UNBALANCED ICE (0.5" ICE, 0 PSF WIND, 30° F)	VERTICAL: 1.00 TENSION: 1.00	1.2	0.2	3.0	0.5	0.1	1.8	0.0	SEE NOTES

STRUCTURE DESIGN CRITERIA:
 STR. TYPE: TANGENT
 SHIELD WIRE (1): 48-FIBER OPGW
 SHIELD WIRE (1): 3/8" 7 STRAND HS
 CONDUCTOR (6): 795 KCMIL ACSR "DRAKE"

ANGLE: 0° - 1°
 WIND SPAN: 750 FT
 WEIGHT SPAN: 750 FT

- DESIGN NOTES:**
- ALL INDICATED DESIGN AND FABRICATIONS SHALL BE IN ACCORDANCE WITH BURNS AND MCDONNELL SPECIFICATIONS.
 - W = WIND ON PROJECTED AREA OF POLE, INCLUDING OVERLOAD FACTORS. WIND ON DIRECTION OF MAXIMUM STRUCTURE LOADING.
 - INCREASE W BY APPLICABLE SHAPE FACTOR FOR POLES.
 1.1 = 12 SIDED
 1.4 = 8 SIDED
 1.6 = LATTICE AND FLAT SURFACES
 - CONDUCTOR AND SHIELD WIRE LOADS ARE PER ATTACHMENT AND INCLUDE OVERLOAD FACTORS.
 - POLE TOP DEFLECTION SHALL NOT EXCEED THE DISTANCE OF ONE POLE TOP DIAMETER UNDER NORMAL LOAD CASE 5.
 - STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOADING CASE.
 - MANUFACTURER SHALL FURNISH AND UTILIZE STEEL X-BRACES AS REQUIRED. A MINIMUM OF 1 X-BRACE PER STRUCTURE WILL BE REQUIRED.
 - NAME PLATE SHALL ATTACH AT 5'-0" ABOVE GROUND LINE. ASSUME 1'-0" FOUNDATION REVEAL ON BASE PLATED STRUCTURES. NAME PLATE SHALL INDICATE STRUCTURE TYPE, STRUCTURE HEIGHT, ULTIMATE GROUND-LINE MOMENT, MANUFACTURE'S NAME AND DATE OF MANUFACTURE.
 - MANUFACTURER SHALL DRILL AND THREAD GROUNDING PAD HOLES COMPLETELY THROUGH POLE FACE.
 - MANUFACTURER SHALL PRE-DRILL 1" THRU HOLES & PROVIDE MOUNTING BOLTS 1/2" DIAMETER X REQUIRED LENGTH, INCLUDING NUTS, WASHERS, AND LOCK WASHERS FOR GAIN BASE PLATE DETAIL. GAIN BASE DETAIL SHOWN FOR DIMENSION PURPOSES ONLY AND SHALL NOT BE PROVIDED BY POLE MANUFACTURER.
 - MANUFACTURER SHALL PROVIDE PERMANENT LADDER CLIPS SUITABLE FOR USE WITH MACGREGOR TYPE (3'-10") CLIMBING LADDERS. CLIPS SHALL BE WELDED TO THE FACE OF THE PLATE BEGINNING 8'-0" ABOVE GROUND LEVEL AND EXTENDING TO THE TOP OF THE STRUCTURE. MANUFACTURER SHALL ENSURE CLIPS PROVIDE ADEQUATE CLEARANCE BETWEEN CLIMBER AND ENERGIZED PARTS.
 - MANUFACTURER SHALL PROVIDE TWO SEPARATE BIDS, ONE FOR WEATHERING STEEL FINISH AND ONE FOR GALVANIZED STEEL FINISH.
 - FOR POLES WITH WEATHERING STEEL FINISH, THE BEARING PLATE SHALL HAVE AN OPEN DRAIN HOLE. THE INSIDE AND OUTSIDE OF THE EMBEDDED POLE SHALL HAVE CORROSCOTE FROM BASE TO 2 FT ABOVE GROUNDLINE.

- CONSTRUCTION NOTES:**
- STRUCTURE NOT DESIGNED FOR ENERGIZED MAINTENANCE.



STRUCTURE ORDER TABLE			
LENGTH (FT)	EMBED (FT)	STRUCTURE NUMBER	QUANTITY
115	15.5	1-2A, 2-2A	2
120	16.0	1-1A, 1-3A, 2-1A, 2-3A	4
125	16.5	5-1A	1
140	18.0	5-3A	1

GRAND RIVER DAM AUTHORITY FEEDER #44 & #45 RERATE 161KV <MAYES COUNTIES, OKLAHOMA> 161KV-L321			
161KV DOUBLE CIRCUIT TANGENT STEEL H-FRAME STRUCTURE			
SCALE: NONE	DRAWN BY: --	ENGR: --	APPD: --
CH: --	DATE: 12/03/13	DRAWING No. REV. TP-001 1	
NO.	DATE	DESCRIPTION	BY CHK APP
1	04/30/14	ISSUED FOR BID	CGL DTS KJG
0	04/15/14	ISSUED FOR REVIEW	CGL DTS KJG

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 TP-001.dwg May 06, 2014 - 3:34pm SCARDENAS B&Mcd

LOAD CASE	DESCRIPTION	OVERLOAD CAPACITY FACTORS	CONDUCTOR (KIPS)			SHIELD (KIPS)		W (PSF)	REMARKS	
			Vc	Tc	Lc	Vs	Ls			
1	NESC HEAVY DISTRICT (1/2" ICE, 4 PSF WIND, 0° F+K)	VERTICAL: 1.50 TENSION: 1.65 WIND: 2.50	2.3	1.6	0.5	1.0	1.1	0.8	10.0	SEE NOTES
2	EXTREME WIND 100 MPH (NO ICE, 25.8 PSF WIND, 60° F)	VERTICAL: 1.10 TENSION: 1.10 WIND: 1.10	0.9	1.8	0.5	0.3	0.8	0.5	28.6	SEE NOTES
3	1" ICE (1" ICE, NO WIND, 30° F)	VERTICAL: 1.10 TENSION: 1.10	2.9	0.3	1.3	1.7	0.2	0.9	0.0	SEE NOTES
4	1" ICE + 40 MPH WIND (1" ICE, 4 PSF WIND, 15° F)	VERTICAL: 1.10 TENSION: 1.10 WIND: 1.10	2.9	1.1	1.3	1.7	0.8	0.9	4.5	SEE NOTES
5	NORMAL (0" ICE, 0 PSF WIND, 60° F)	VERTICAL: 1.00 TENSION: 1.00	0.8	0.2	0.0	0.3	0.1	0.0	0.0	SEE NOTES
6	UNBALANCED ICE (0.5" ICE, 0 PSF WIND, 30° F)	VERTICAL: 1.00 TENSION: 1.00	1.2	0.2	3.0	0.5	0.1	1.8	0.0	SEE NOTES

STRUCTURE DESIGN CRITERIA:
 STR. TYPE: TANGENT
 SHIELD WIRE (1): 48-FIBER OPGW
 SHIELD WIRE (1): 3/8" 7 STRAND HS
 CONDUCTOR (6): 795 KCML ACSR "DRAKE"

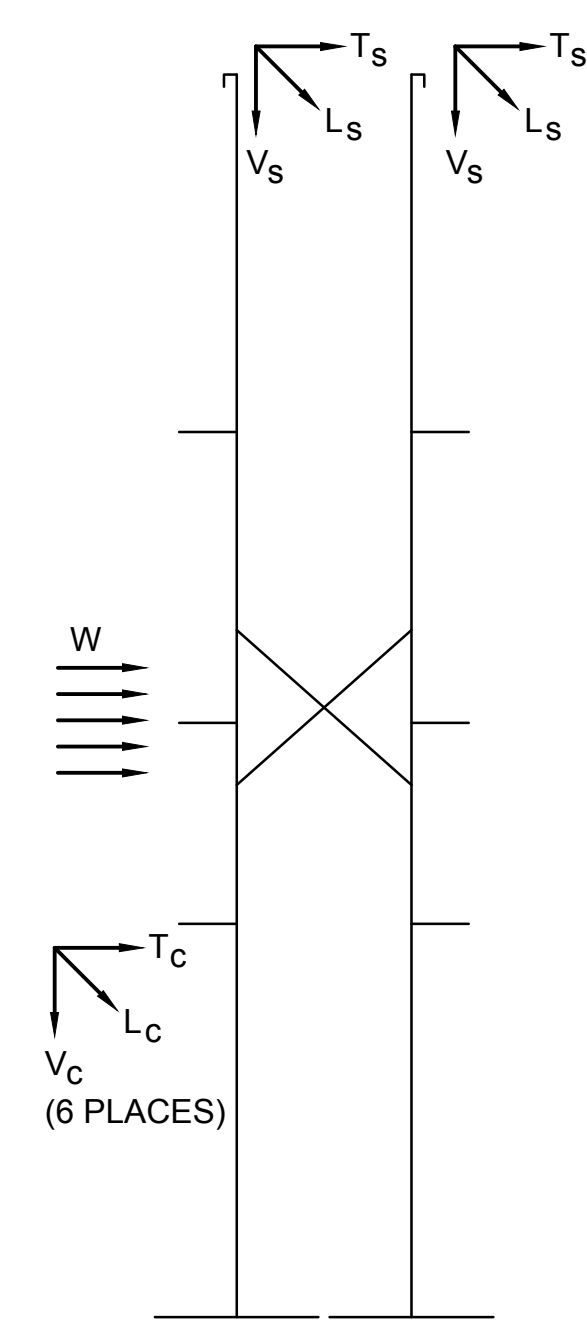
ANGLE	WIND SPAN	WEIGHT SPAN
0° - 1°	750 FT	750 FT
0° - 1°	750 FT	750 FT
0° - 1°	750 FT	750 FT

DESIGN NOTES:

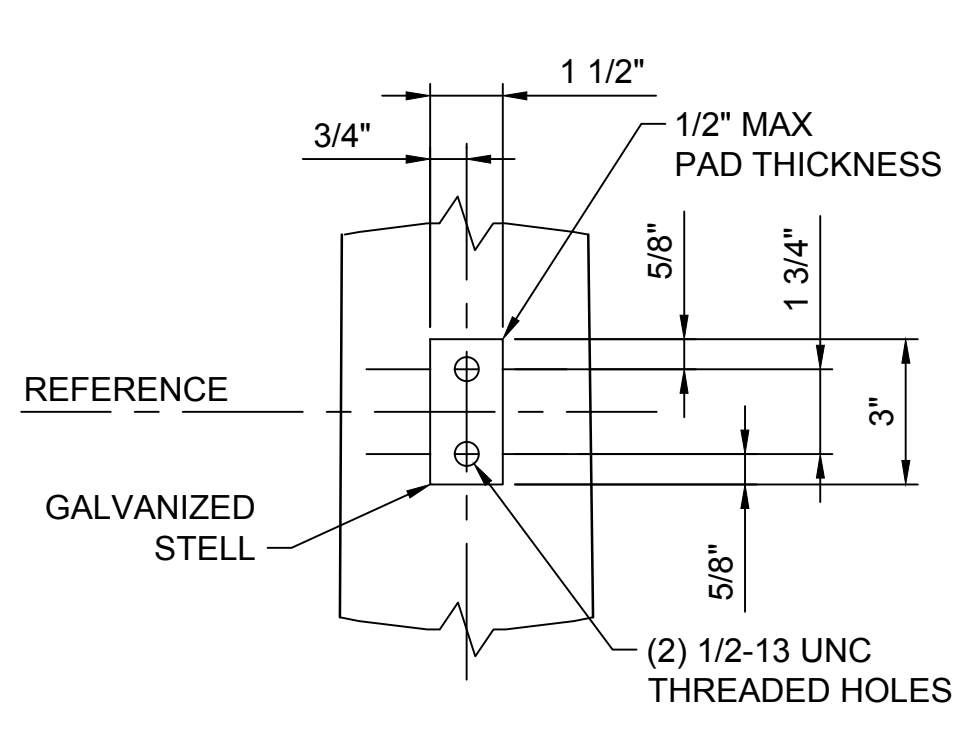
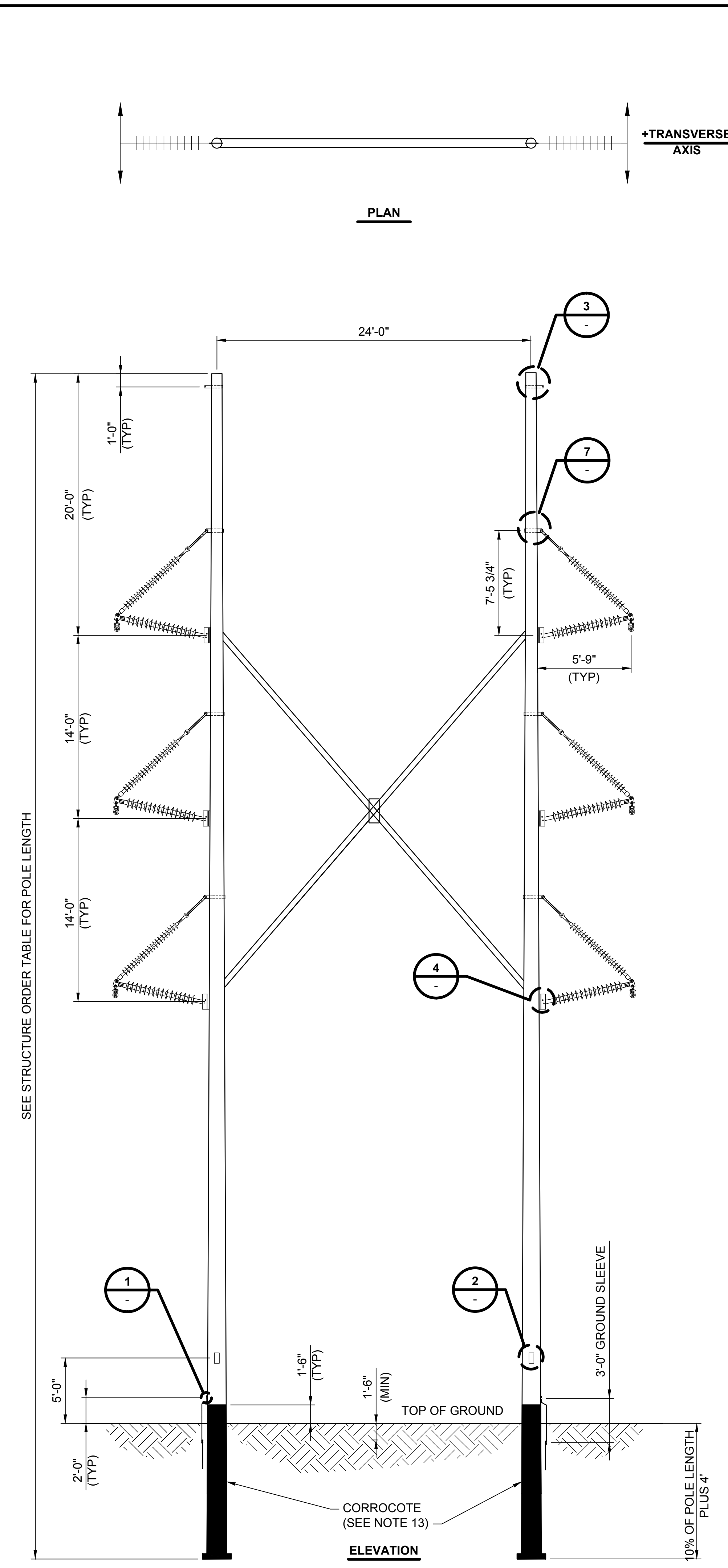
- ALL INDICATED DESIGN AND FABRICATIONS SHALL BE IN ACCORDANCE WITH BURNS AND MCDONNELL SPECIFICATIONS.
- W = WIND ON PROJECTED AREA OF POLE, INCLUDING OVERLOAD FACTORS. WIND ON DIRECTION OF MAXIMUM STRUCTURE LOADING.
- INCREASE W BY APPLICABLE SHAPE FACTOR FOR POLES.
 1.1 = 12 SIDED
 1.4 = 8 SIDED
 1.6 = LATTICE AND FLAT SURFACES
- CONDUCTOR AND SHIELD WIRE LOADS ARE PER ATTACHMENT AND INCLUDE OVERLOAD FACTORS.
- POLE TOP DEFLECTION SHALL NOT EXCEED THE DISTANCE OF ONE POLE TOP DIAMETER UNDER NORMAL LOAD CASE 5.
- STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOADING CASE.
- MANUFACTURER SHALL FURNISH AND UTILIZE STEEL X-BRACES AS REQUIRED. A MINIMUM OF 1 X-BRACE PER STRUCTURE WILL BE REQUIRED.
- NAME PLATE SHALL ATTACH AT 5'-0" ABOVE GROUND LINE. ASSUME 1'-0" FOUNDATION REVEAL ON BASE PLATED STRUCTURES. NAME PLATE SHALL INDICATE STRUCTURE TYPE, STRUCTURE HEIGHT, ULTIMATE GROUND-LINE MOMENT, MANUFACTURE'S NAME AND DATE OF MANUFACTURE.
- MANUFACTURER SHALL DRILL AND THREAD GROUNDING PAD HOLES COMPLETELY THROUGH POLE FACE.
- MANUFACTURER SHALL PRE-DRILL 1" THRU HOLES & PROVIDE MOUNTING BOLTS 1/4" DIAMETER X REQUIRED LENGTH, INCLUDING NUTS, WASHERS, AND LOCK WASHERS FOR GAIN BASE PLATE DETAIL. GAIN BASE DETAIL SHOWN FOR DIMENSION PURPOSES ONLY AND SHALL NOT BE PROVIDED BY POLE MANUFACTURER.
- MANUFACTURER SHALL PROVIDE PERMANENT LADDER CLIPS SUITABLE FOR USE WITH MACGREGOR TYPE (3'-10 1/2") CLIMBING LADDERS. CLIPS SHALL BE WELDED TO THE FACE OF THE PLATE BEGINNING 8'-0" ABOVE GROUND LEVEL AND EXTENDING TO THE TOP OF THE STRUCTURE. MANUFACTURER SHALL ENSURE CLIPS PROVIDE ADEQUATE CLEARANCE BETWEEN CLIMBER AND ENERGIZED PARTS.
- MANUFACTURER SHALL PROVIDE TWO SEPARATE BIDS, ONE FOR WEATHERING STEEL FINISH AND ONE FOR GALVANIZED STEEL FINISH.
- FOR POLES WITH WEATHERING STEEL FINISH, THE BEARING PLATE SHALL HAVE AN OPEN DRAIN HOLE. THE INSIDE AND OUTSIDE OF THE EMBEDDED POLE SHALL HAVE CORROSCOTE FROM BASE TO 2 FT ABOVE GROUNDLINE.

CONSTRUCTION NOTES:

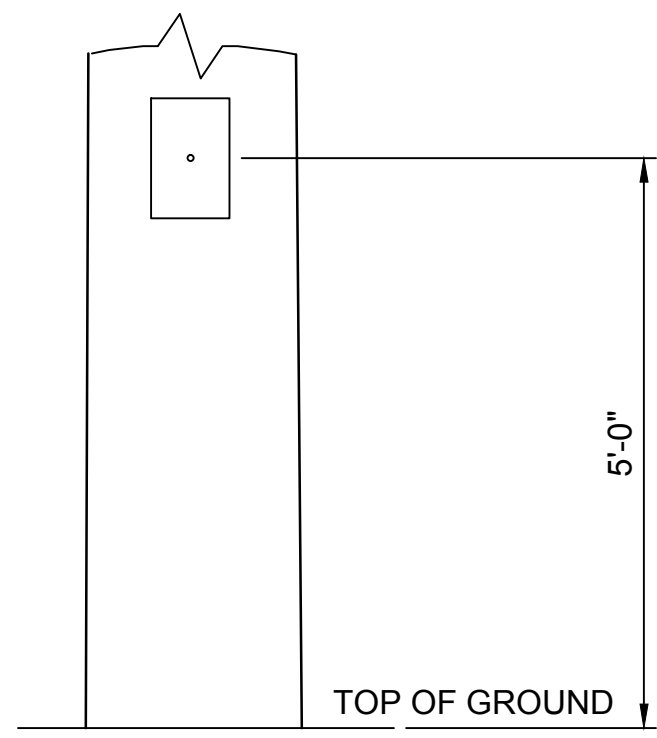
- STRUCTURE NOT DESIGNED FOR ENERGIZED MAINTENANCE.



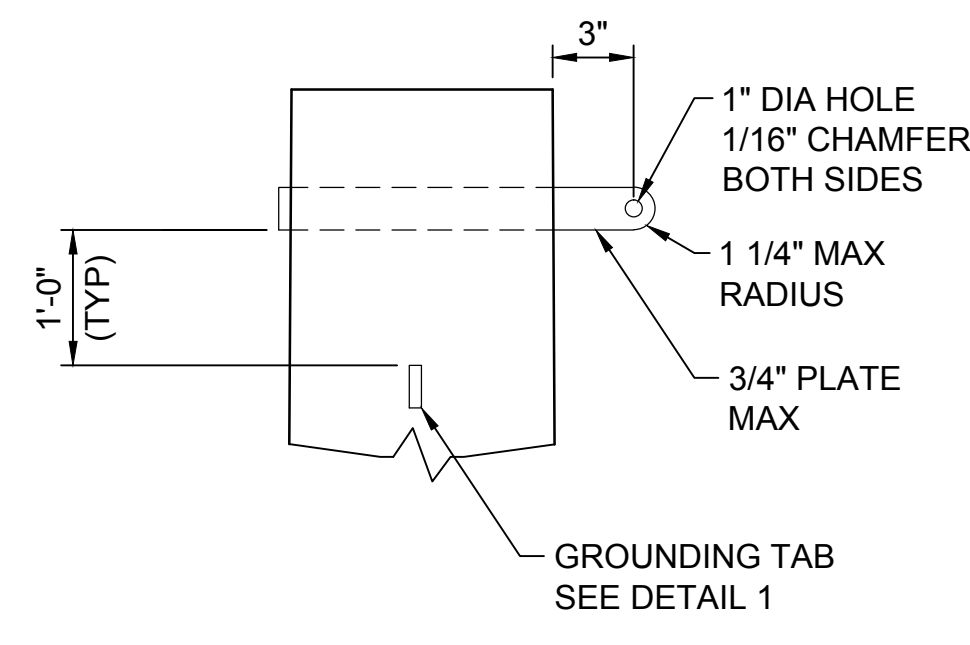
LOAD TREE



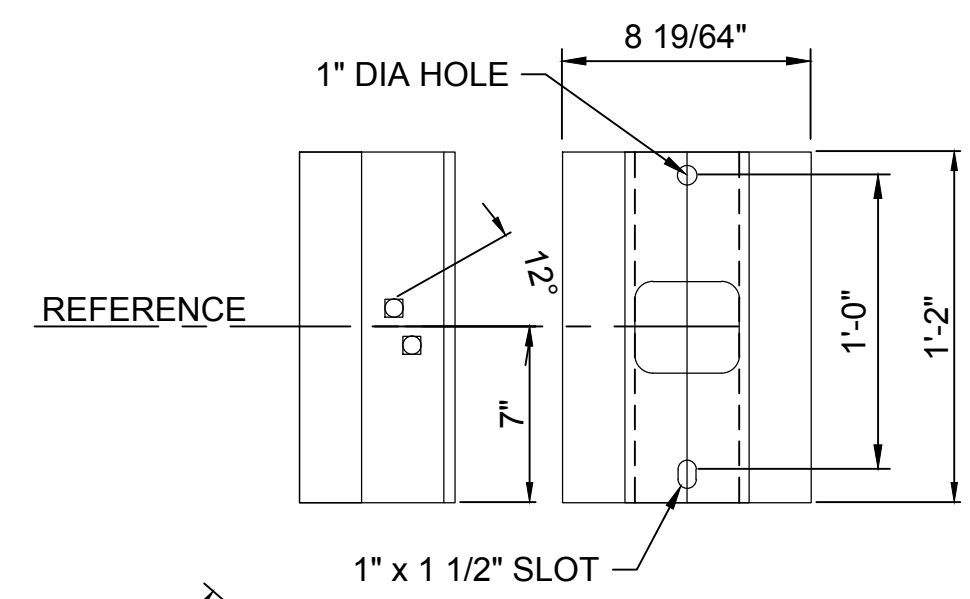
DETAIL 1
GROUNDING PAD (SEE NOTE 9)



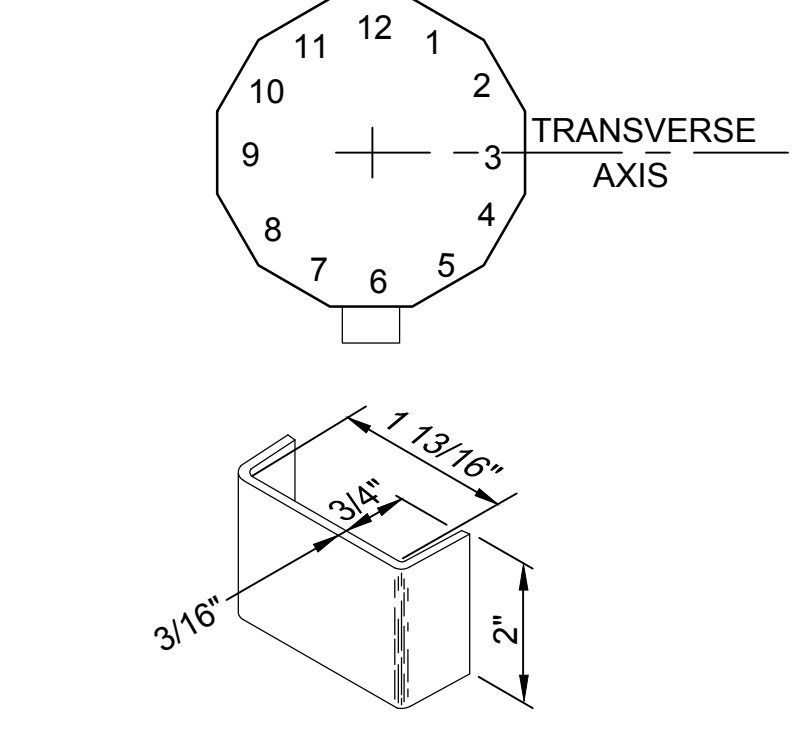
DETAIL 2
NAME PLATE



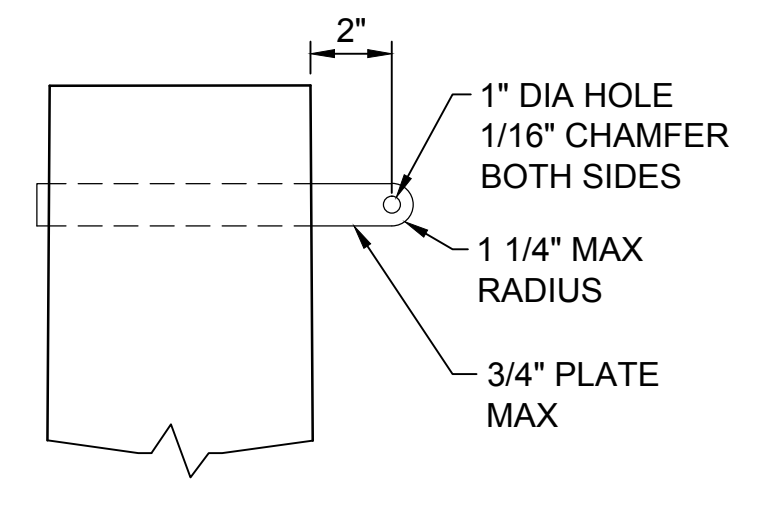
DETAIL 3
SHIELD WIRE THRU VANG



DETAIL 4
GAIN BASE MOUNTING BRACKET (SEE NOTE 12)



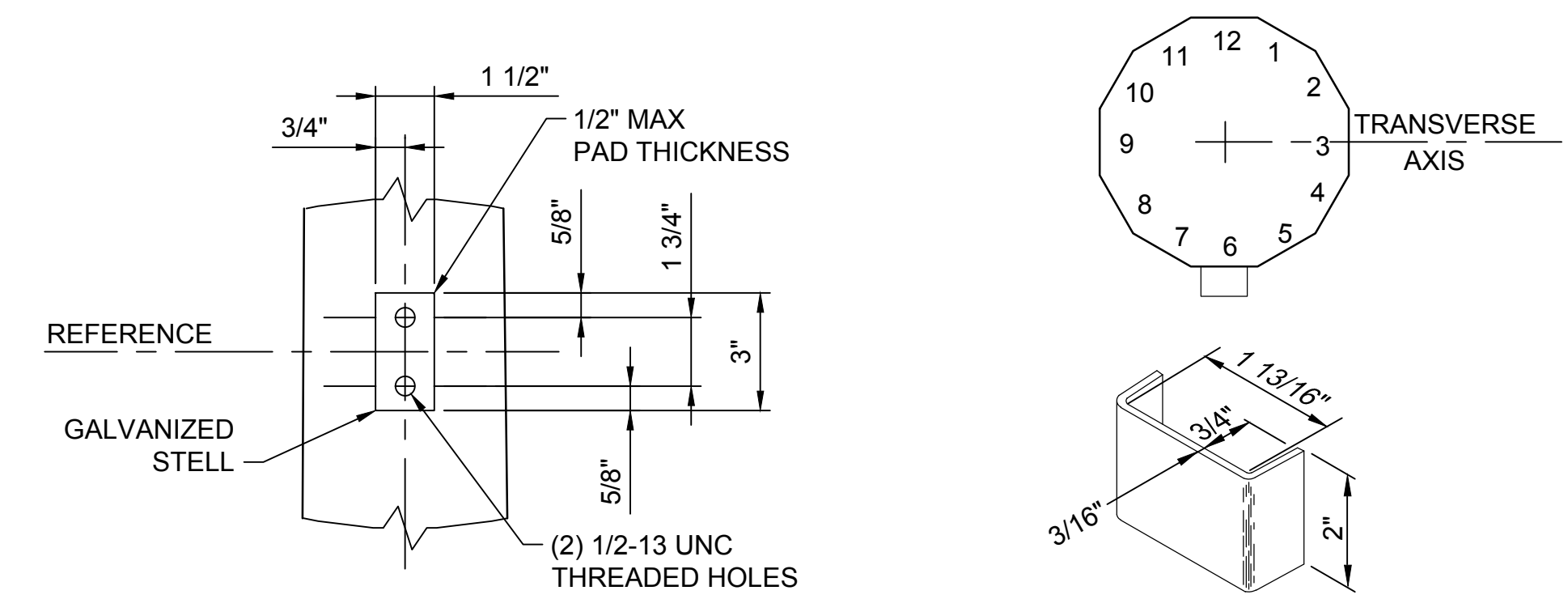
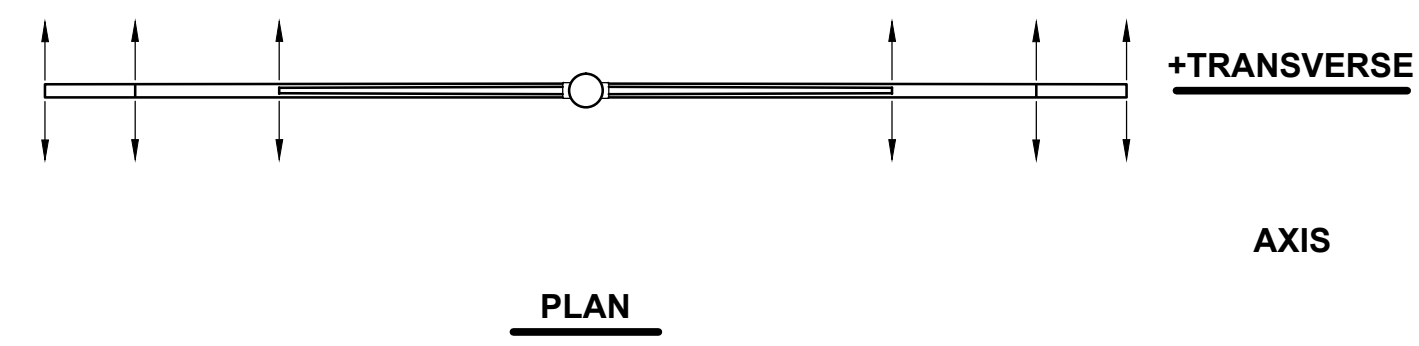
DETAIL 6
LADDER CLIPS (SPACE TO ACCOMMODATE LADDERS) (SEE NOTE 11)



DETAIL 7
BRACE POST THRU VANG

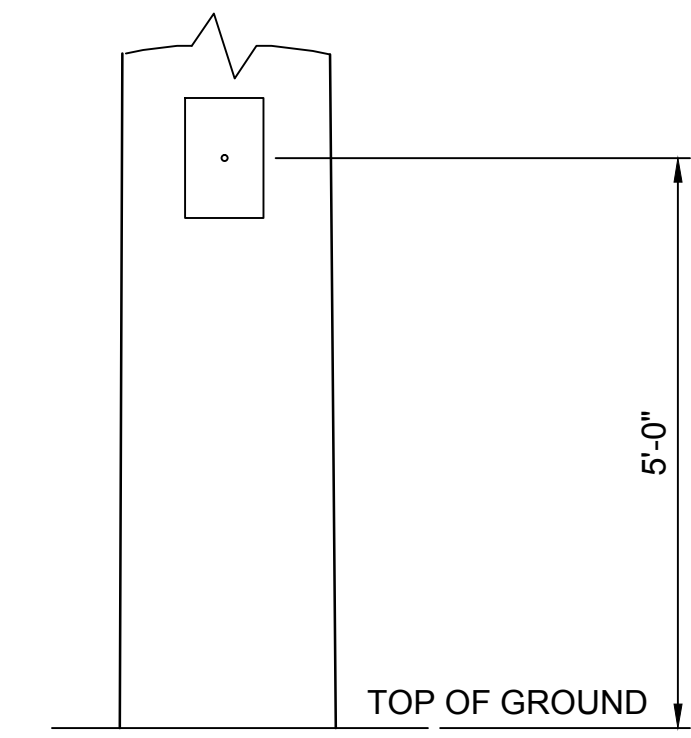
LENGTH (FT)	EMBED (FT)	STRUCTURE NUMBER	QUANTITY
120	16.0	1A	1

GRAND RIVER DAM AUTHORITY FEEDER #44 & #45 RERATE 161KV <MAYES COUNTIES, OKLAHOMA> 161KV-L321 161KV DOUBLE CIRCUIT TANGENT STEEL H-FRAME STRUCTURE			
SCALE: NONE	DRAWN BY: --	ENGR: --	APPD: --
CH: --	DATE: 12/03/13	GRAND RIVER DAM AUTHORITY P.O. BOX 409 VINETA, OK 74301	
NO.	DATE	DESCRIPTION	BY
1	04/30/14	ISSUED FOR BID	CGL DTS KJG
0	04/15/14	ISSUED FOR REVIEW	CGL DTS KJG
DRAWING No.		REV.	
TP-002		1	

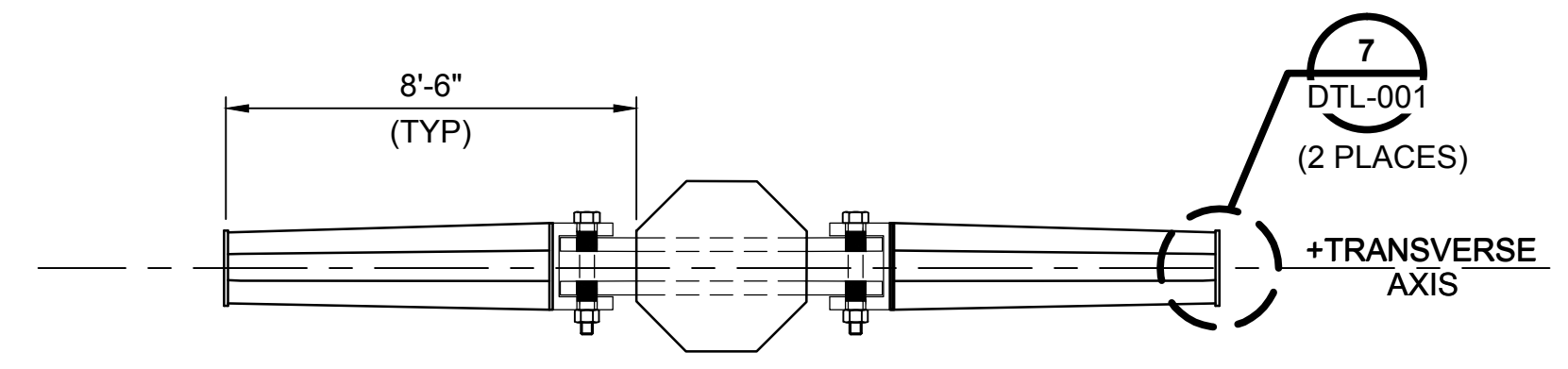


DETAIL 1
GROUNDING PAD
(SEE NOTE 8)

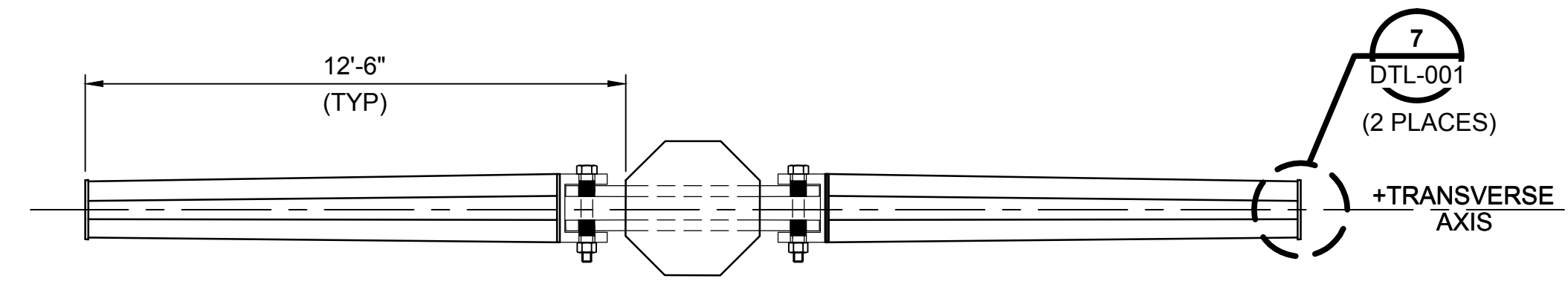
DETAIL 3
LADDER CLIPS (SPACE TO
ACCOMMODATE LADDERS)
(SEE NOTE 9)



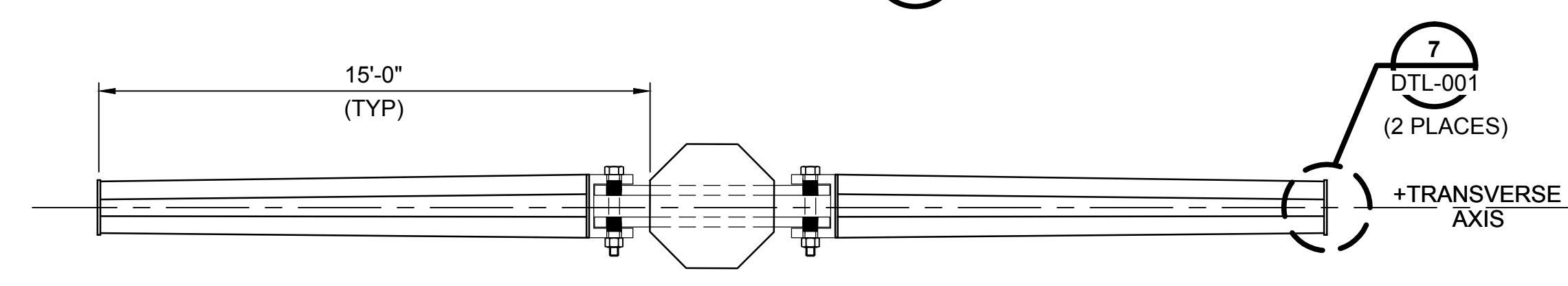
DETAIL 2
NAME PLATE



SECTION A
SHIELD WIRE ARMS



SECTION B
CONDUCTOR ARMS



SECTION C
CONDUCTOR ARMS

LOAD CASE	DESCRIPTION	OVERLOAD CAPACITY FACTORS	CONDUCTOR (KIPS)			SHIELD (KIPS)			W (PSF)	REMARKS
			Vc	Tc	Lc	Vs	Ts	LS		
1	NESC HEAVY DISTRICT (1/2" ICE, 4 PSF WIND, 0° F+K)	VERTICAL: 1.50 TENSION: 1.65 WIND: 2.50	8.0	4.5	2.3	3.5	3.2	2.7	10.0	SEE NOTES
2	EXTREME WIND 100 MPH (NO ICE, 25.8 PSF WIND, 60° F)	VERTICAL: 1.10 TENSION: 1.10 WIND: 1.10	3.1	5.1	1.6	0.9	2.3	0.8	28.6	SEE NOTES
3	1" ICE (1" ICE, NO WIND, 30° F)	VERTICAL: 1.10 TENSION: 1.10	10.3	0.3	1.4	5.9	0.3	2.9	0.0	SEE NOTES
4	1" ICE + 40 MPH WIND (1" ICE, 4 PSF WIND, 15° F)	VERTICAL: 1.10 TENSION: 1.10 WIND: 1.10	10.3	3.0	1.5	5.9	2.4	3.2	4.5	SEE NOTES
5	NORMAL (0" ICE, 0 PSF WIND, 60° F)	VERTICAL: 1.00 TENSION: 1.00	2.8	0.1	0.0	0.8	0.1	0.0	0.0	SEE NOTES
6	UNBALANCED ICE (0.5" ICE, 0 PSF WIND, 30° F)	VERTICAL: 1.00 TENSION: 1.00	4.4	0.2	4.2	1.8	0.2	3.6	0.0	SEE NOTES

STRUCTURE DESIGN CRITERIA:
STR. TYPE: TANGENT
SHIELD WIRE (1): 48-FIBER OPGW
SHIELD WIRE (1): 3/8" 7 STRAND HS
CONDUCTOR (6): 795 KCMIL ACSR "DRAKE"

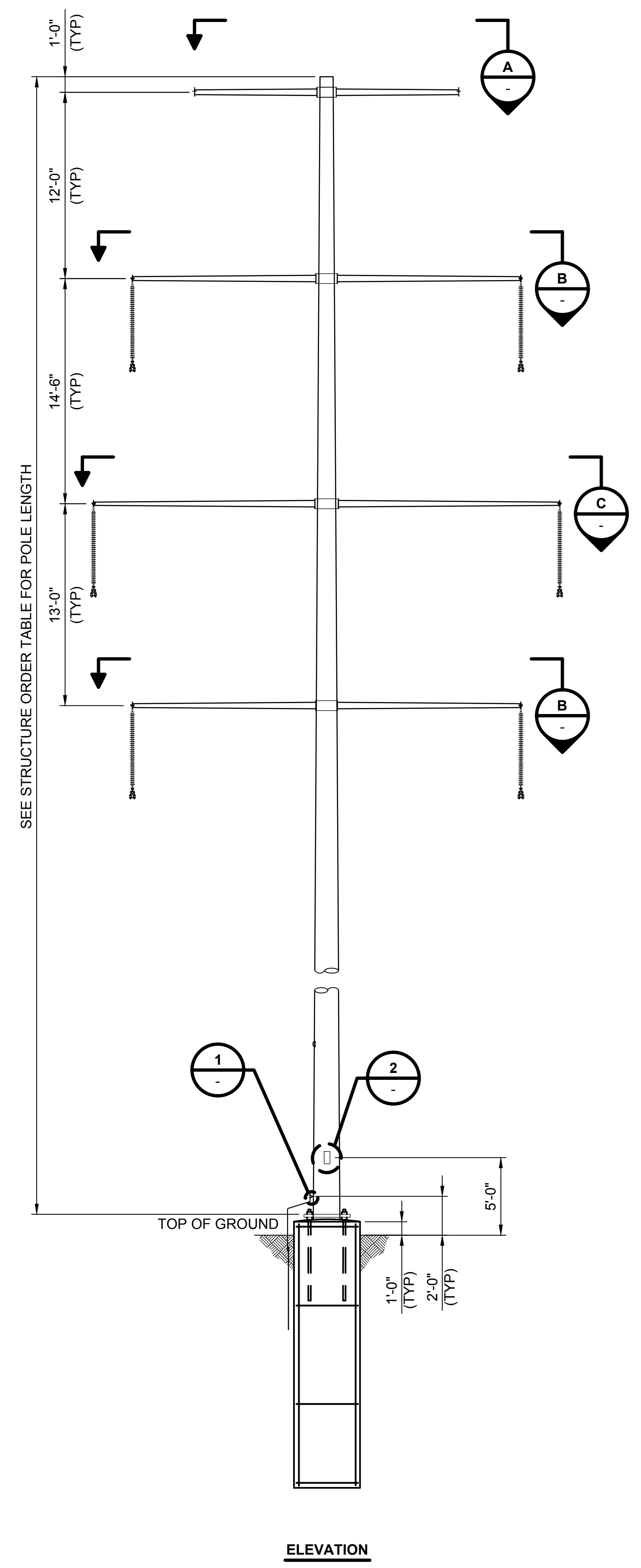
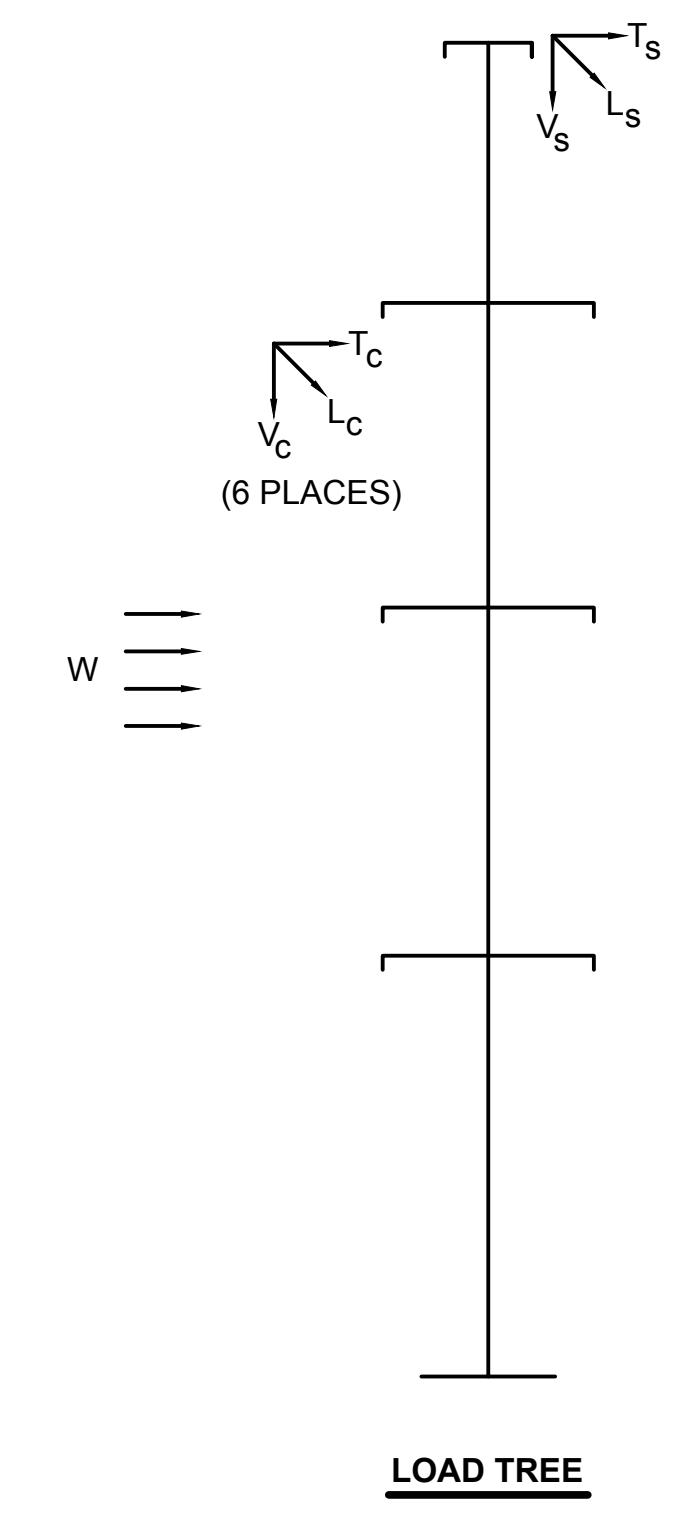
ANGLE
0° - 1°
0° - 1°
0° - 1°

DESIGN NOTES:

- ALL INDICATED DESIGN AND FABRICATIONS SHALL BE IN ACCORDANCE WITH BURNS AND MCDONNELL SPECIFICATIONS.
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- INCREASE W BY APPLICABLE SHAPE FACTOR FOR POLES.
1.1 = 12 SIDED
1.4 = 8 SIDED
1.6 = LATTICE AND FLAT SURFACES
- CONDUCTOR AND SHIELD WIRE LOADS ARE PER ATTACHMENT AND INCLUDE OVERLOAD FACTORS.
- POLE TOP DEFLECTION SHALL NOT EXCEED THE DISTANCE OF ONE POLE TOP DIAMETER UNDER NORMAL LOAD CASE 5.
- STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOADING CASE.
- NAME PLATE SHALL ATTACH AT 5'-0" ABOVE GROUND LINE. ASSUME 1'-0" FOUNDATION REVEAL ON BASE PLATED STRUCTURES. NAME PLATE SHALL INDICATE STRUCTURE TYPE, STRUCTURE HEIGHT, ULTIMATE GROUND-LINE MOMENT, MANUFACTURE'S NAME AND DATE OF MANUFACTURE.
- MANUFACTURER SHALL DRILL AND THREAD GROUNDING PAD HOLES COMPLETELY THROUGH POLE FACE.
- MANUFACTURER SHALL PROVIDE PERMANENT LADDER CLIPS SUITABLE FOR USE WITH MACGREGOR TYPE (3'-10") CLIMBING LADDERS. CLIPS SHALL BE WELDED TO THE FACE OF THE PLATE BEGINNING 8'-0" ABOVE GROUND LEVEL AND EXTENDING TO THE TOP OF THE STRUCTURE. MANUFACTURER SHALL ENSURE CLIPS PROVIDE ADEQUATE CLEARANCE BETWEEN CLIMBER AND ENERGIZED PARTS.
- MANUFACTURER SHALL PROVIDE TWO SEPARATE BIDS, ONE FOR WEATHERING STEEL FINISH AND ONE FOR GALVANIZED STEEL FINISH.

CONSTRUCTION NOTES:

- STRUCTURE NOT DESIGNED FOR ENERGIZED MAINTENANCE.

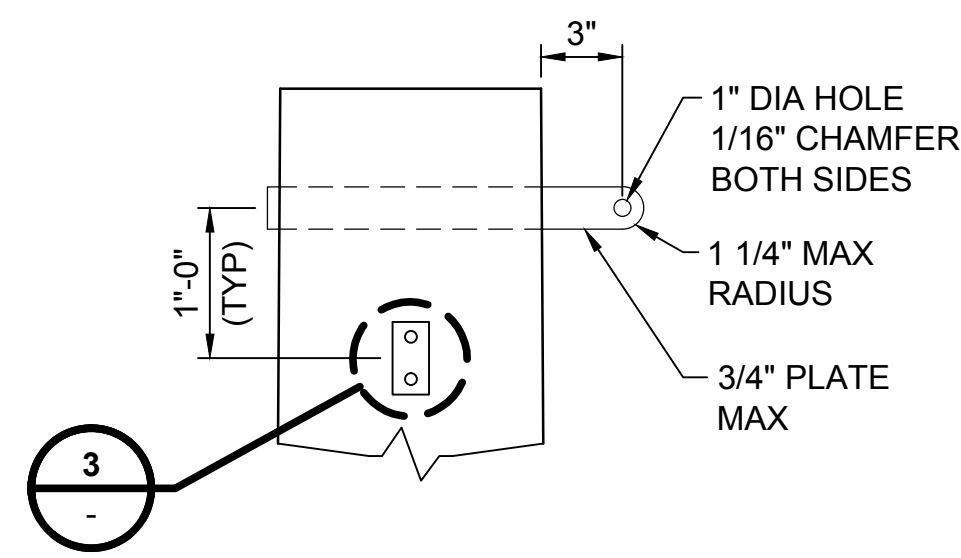


ELEVATION

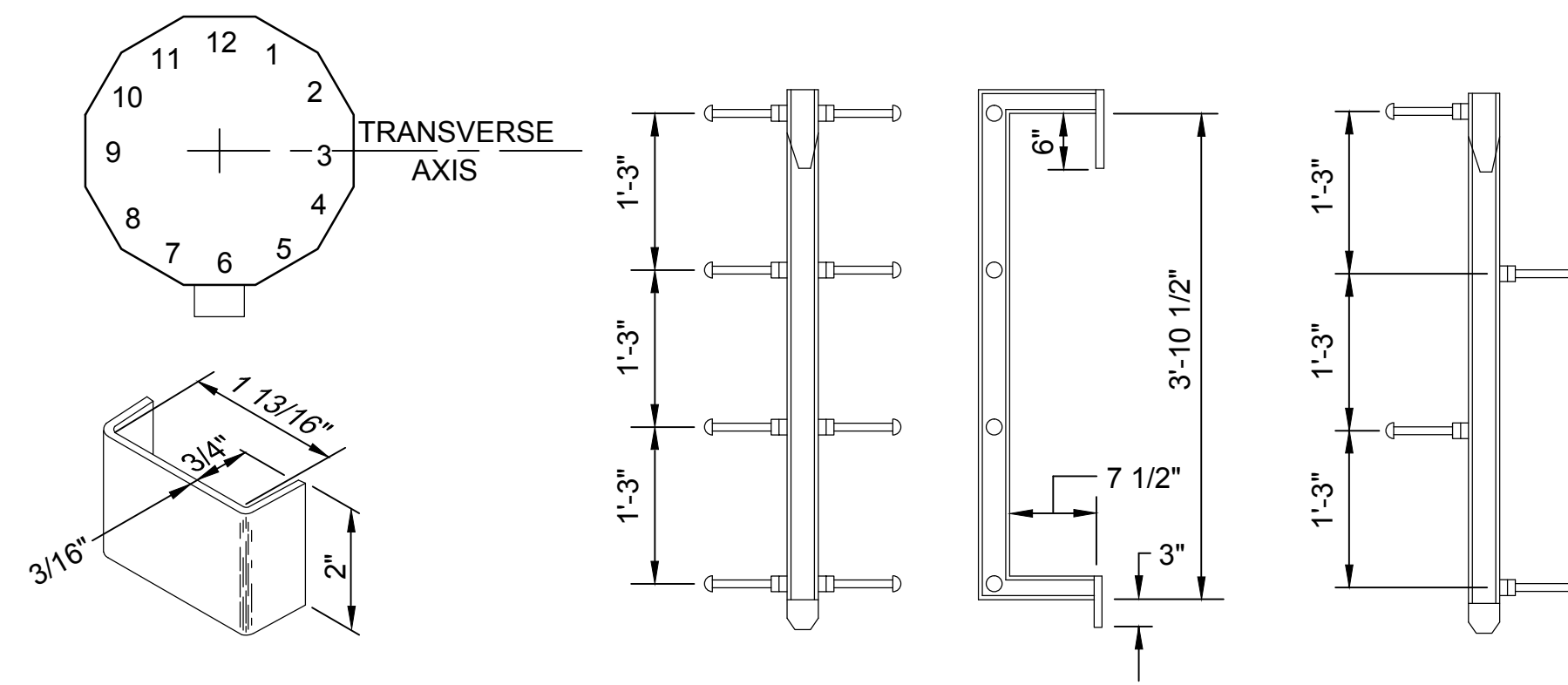
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STRUCTURE ORDER TABLE				
LENGTH (FT)	EMBED (FT)	POLE CLASS	STRUCTURE NUMBER	QUANTITY
135		BASE PLATE	ENGR	3-4
				1

GRAND RIVER DAM AUTHORITY FEEDER #44 & #45 RERATE 161KV <MAYES COUNTIES, OKLAHOMA> 161KV-L321			
161KV DOUBLE CIRCUIT TANGENT STEEL STRUCTURE			
SCALE: NONE	DRAWN BY: --	ENGR: --	APPD: --
CH: --		DATE: --	
		DRAWING No.	REV.
		TP-004	1

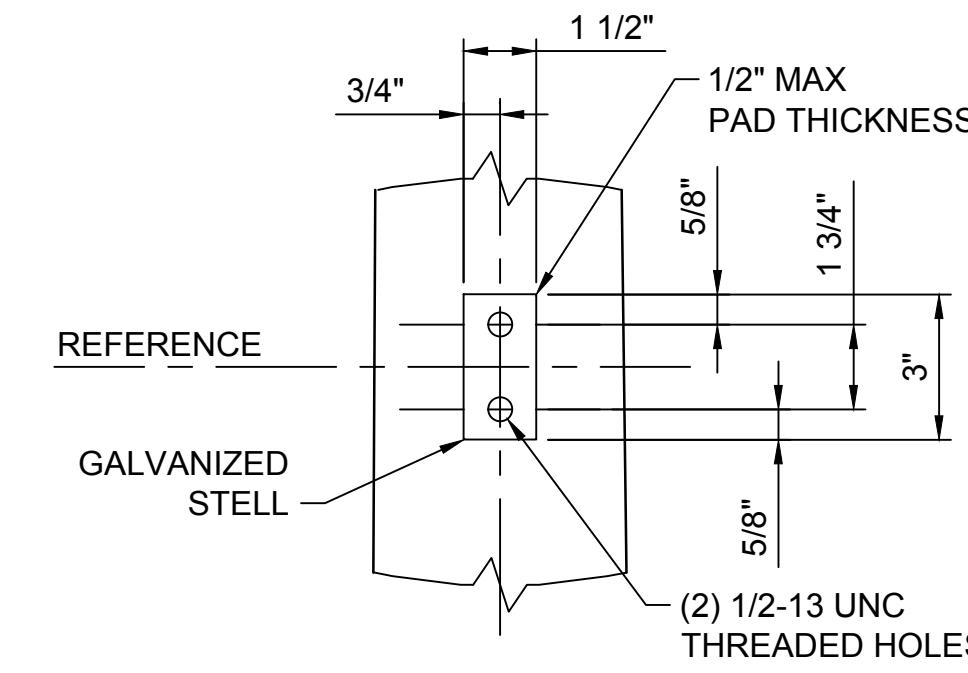


DETAIL
SHIELD WIRE/CONDUCTOR
THRU VANG
(SEE NOTES 1 & 2)

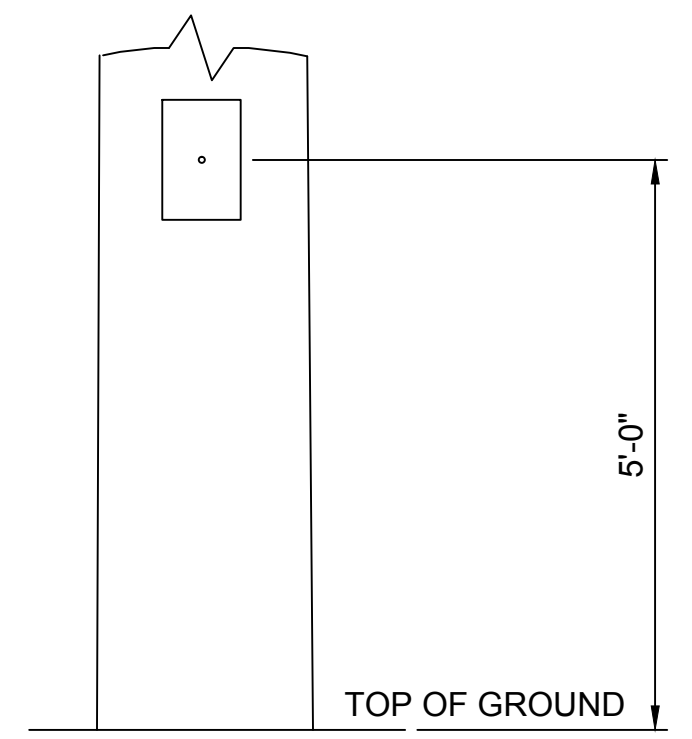


DETAIL
LADDER CLIPS (SPACE TO
ACCOMMODATE LADDERS)
(SEE NOTE 4)

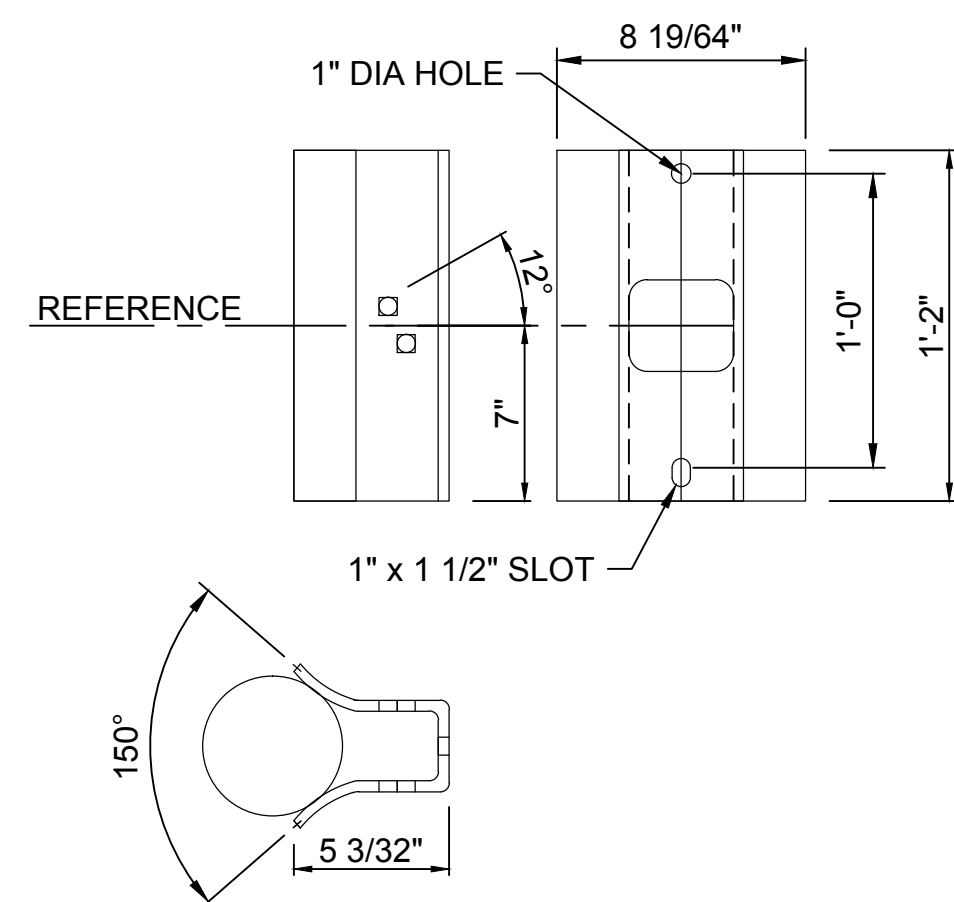
WORKING LADDER CLIMBING LADDER



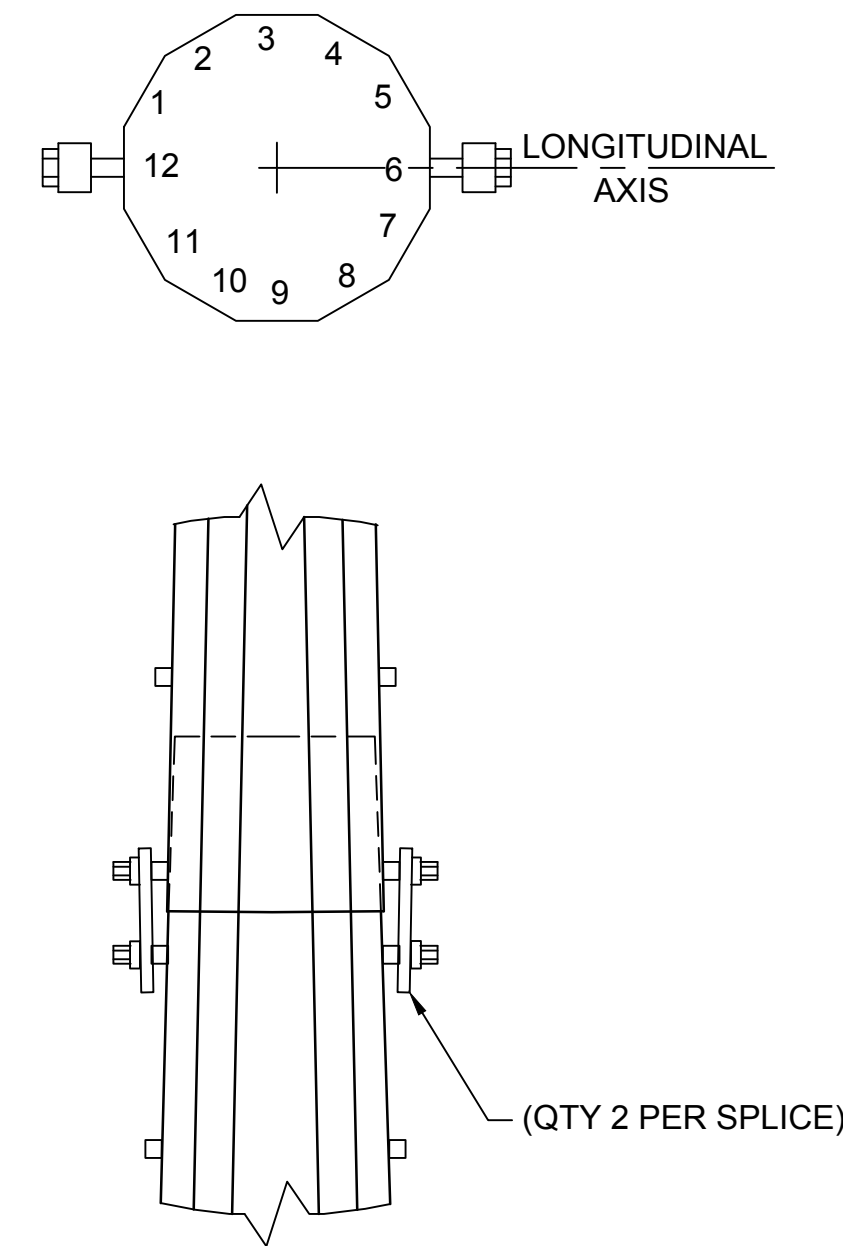
DETAIL
GROUNDING PAD
(SEE NOTE 5)



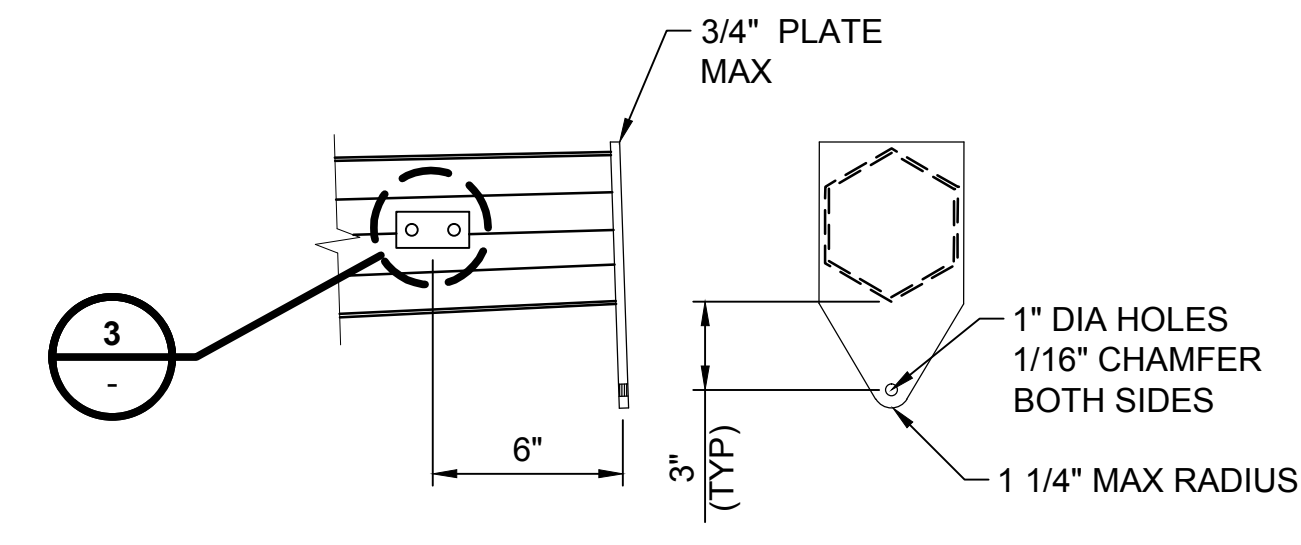
DETAIL
NAME PLATE
(SEE NOTE 6)



DETAIL
POST INSULATOR BASE
(SEE NOTE 7)



DETAIL
SPLICE LOCK BAR
(SEE NOTE 8)



DETAIL
ARM VANG

NOTES:

1. MANUFACTURER SHALL PROVIDE GROUNDING PAD AT SHIELD WIRE VANG ATTACHMENT LOCATIONS SHOWN IN DETAIL 1 AND 2 FT ABOVE GROUND LINE AS SPECIFIED ON STRUCTURE DRAWINGS.
2. DIMENSIONS TO POLE TOP AND GROUND PAD ARE SHOWN FOR SHIELD WIRE APPLICATION ONLY, AND DO NOT APPLY TO CONDUCTOR VANGS.
3. MANUFACTURER SHALL REFER TO SECTION VIEWS FOR VANG, MOUNTING BRACKETS AND THRU HOLE ORIENTATIONS.
4. MANUFACTURER SHALL PROVIDE PERMANENT LADDER CLIPS SUITABLE FOR USE WITH MACGREGOR TYPE (3'-10 1/2") CLIMBING LADDERS. CLIPS SHALL BE WELDED TO THE FACE OF THE PLATE BEGINNING 8'-0" ABOVE GROUND LEVEL AND EXTENDING TO THE TOP OF THE STRUCTURE. MANUFACTURER SHALL ENSURE CLIPS PROVIDE ADEQUATE CLEARANCE BETWEEN CLIMBER AND ENERGIZED PARTS. CLIPS MUST CONFORM TO LOADING AS STATED IN OSHA 3124-12R. LADDER CLIPS SHALL NOT INTERFERE WITH POST INSULATOR BASE.
5. MANUFACTURER SHALL DRILL AND THREAD GROUNDING PAD HOLES COMPLETELY THRU THE POLE FACE.
6. NAME PLATE SHALL ATTACH AT 5'-0" ABOVE GROUND LINE. ASSUME 1'-0" FOUNDATION REVEAL ON BASE PLATED STRUCTURES. NAME PLATE SHALL INDICATE STRUCTURE TYPE, STRUCTURE HEIGHT, ULTIMATE GROUND-LINE MOMENT, MANUFACTURE'S NAME AND DATE OF MANUFACTURE.
7. MANUFACTURER SHALL DRILL 5/8" DIAMETER HOLE COMPLETELY THRU POLE FACE AND ATTACH 1/2-13 GALVANIZED STEEL NUTS TO ALLOW FOR ATTACHMENT OF 1/2-13, 2.5" LONG BOLT. NUTS SHALL BE LOCATED ON OPPOSITE SIDE OF LADDER CLIPS. SEE STRUCTURE DRAWINGS FOR STRUCTURE SPECIFIC LOCATIONS OF THIS ADDITION. MANUFACTURER SHALL INCLUDE POLE TOP PLATE FOR EACH POLE.
8. MANUFACTURER SHALL PROVIDE TWO SPLICE LOCK BARS FOR EACH POLE SLIP JOINT. ONE HOLE SHALL BE PREDRILLED FOR UPPER ATTACHMENT AND ALL HARDWARE REQUIRED FOR SPLICE LOCK SHALL BE PROVIDED BY MANUFACTURER.
9. MANUFACTURER SHALL NOT FURNISH CLIMBING OR WORKING LADDERS. LADDERS WILL BE PROVIDED BY OTHERS.

GRAND RIVER DAM AUTHORITY FEEDER #44 & #45 RERATE 161kV <MAYES, OKLAHOMA> 161kV			
DETAILS SHEET			
SCALE: NONE	DRAWN BY: S. CAR	ENGR: C. LANGE	APPD:
1 04/30/14 ISSUED FOR BID	CGL	DTS	KJG
0 04/09/14 ISSUED FOR REVIEW	CGL	DTS	KJG
NO.	DATE	DESCRIPTION	BY
DRAWING No. DTL-001			REV. 1

REVISIONS

0 FEB. 15, 2012

NOTES:

1. DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS (mm) ARE SHOWN IN ().
2. MECHANICAL VALUES ARE FOR SINGLE LOADS IN THE SPECIFIED DIRECTION.
3. ELECTRICAL VALUES ARE THE MINIMUMS OF THE INDIVIDUAL COMPONENTS.



DWG. NO.

LP-13029

BRACED LINE POST ASSEMBLY

REFERENCE DATA

CHARACTERISTICS

ELECTRICAL VALUES

- Power Frequency Dry Flashover, kV
- Power Frequency Wet Flashover, kV
- Critical-Impulse Flashover, Pos., kV
- Critical-Impulse Flashover, Neg., kV

RATING

600
525
920
1000

LEAKAGE DISTANCES

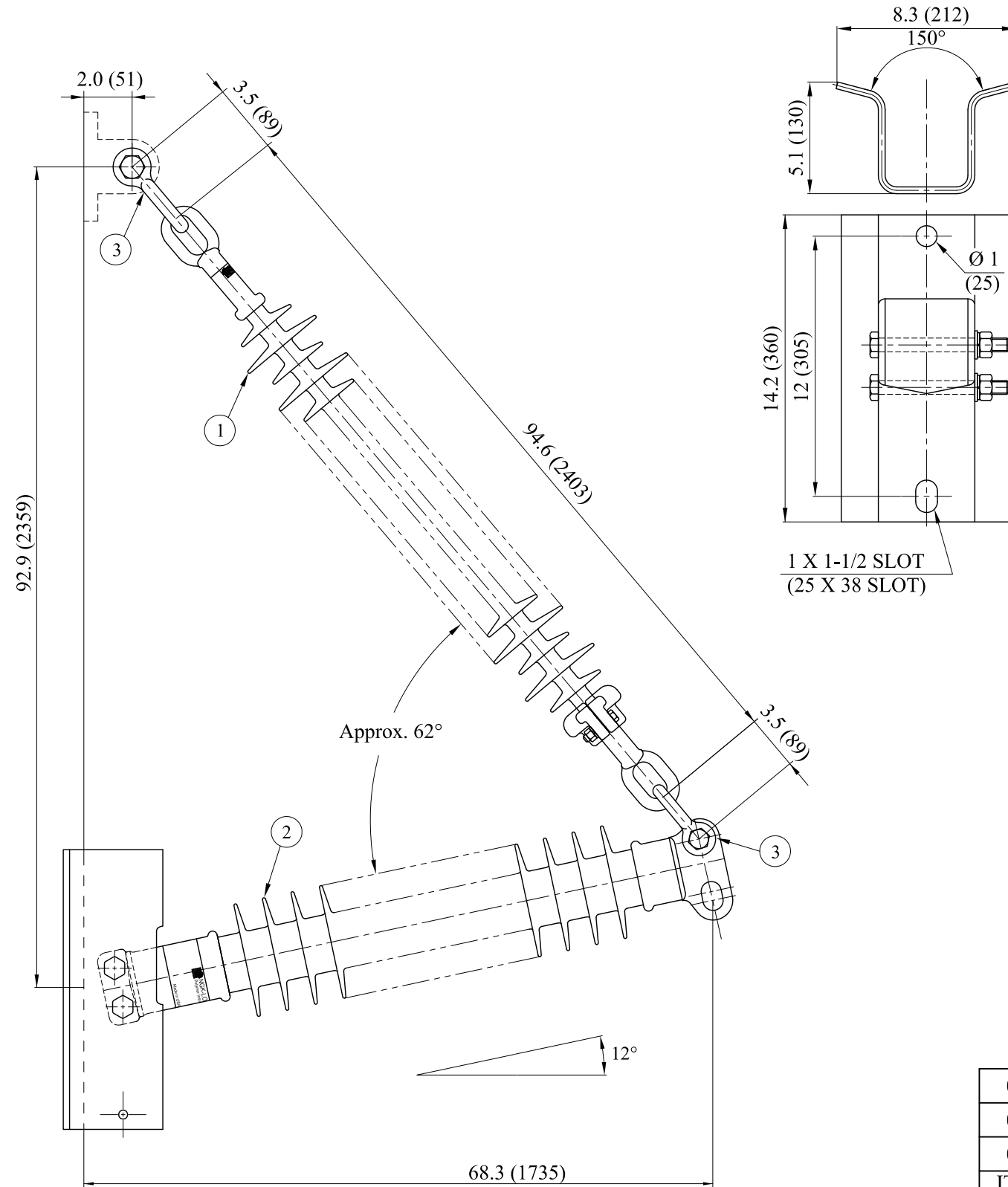
- Stay Insulator (Item #1), in. (mm)
- Strut Insulator (Item #2), in. (mm)

233.5 (5932)
161.2 (4095)

MECHANICAL VALUES

- Maximum Design Vertical Load, lbs.
(Single load value w/o any other applied loads.)
- Maximum Design Longitudinal Load, lbs.
(Single load value w/o any other applied loads / 50% of the minimum average cantilever breaking load of the Strut Insulator.)
- Maximum Design Tension Load, lbs.
(Single load value w/o any other applied loads / 50% SML of the Strut Insulator.)
- Maximum Design Compression Load, lbs.
(Single load value w/o any other applied loads / Less than 80% of the critical buckling load of the Strut Insulator.)

10000
1275
7500
7500



③	Anchor Shackle	Anderson: AS-50-BNK or Equal	2
②	Strut / Line Post Insulator	L2-SN391-13	1
①	Stay / Suspension Insulator	251-SS690-EE-04	1
ITEM	COMPONENT	PART NUMBER	QTY
MADE BY	MM	NGK-LOCKE POLYMER INSULATORS, INC. VIRGINIA BEACH, VA 23455	CAT. NO. HV-720
APPROVED	KE		