



Blake Toliver

December 30, 2025

Electric Department / Rochelle Municipal Utilities

E: [btoliver@rmu.net](mailto:btoliver@rmu.net)

P: 815.901.5257

Ref: 2200K001 – Ritchie to Centerpoint Steel Poles Purchase

Dear Mr. Toliver,

The city received and opened bids on November 13th at 2:00pm for the steel pole purchase, a part of the Ritchie to Centerpoint Line project. The bid opportunity was sent to the Rochelle News Leader newspaper for advertisement on 10/17/25, and the bid notice was also emailed out to 10 potential bidders. A total of three (3) bids were received on time and have been reviewed for completeness and ability to meet specification requirements. A summary of bids is shown below:

Steel Pole Bid Comparison		Total Price	Total Weight (lb)	Steel Cost (\$/lb)	Lead Time
Bidder	MVA Power	\$ 1,297,702.46	505,983.00	\$ 2.56	26 Weeks
	ROHN Products	\$ 2,115,800.00	635,607.00	\$ 3.33	42-46 Weeks
	TAPP, Inc	\$ 1,475,246.00	502,731.00	\$ 2.93	64-65 Weeks

The bid from MVA Power was the apparent low bid totaling \$1,297,702.46 for Specification 2200K001. No major exceptions were listed, and the lead time was acceptable. We have not had any past projects with MVA Power, so we had a meeting with them to assess their qualifications and past experiences, and we also have contacted multiple of their listed references. References had issues of varying degrees, although none that were catastrophic to their projects, and many would work with MVA Power again. However, during a phone interview with MVA Power, we learned that although they are based in Canada, the country of manufacture is China, which presents elevated risks of quality, international shipping delays, and tariff price escalations.

Due to these various risks, BHMGM recommends awarding the contract to TAPP, Inc. for the Steel Pole Purchase as they have the second lowest bid and have a strong experience of similar projects. Due to recent shifts in project constraints, the schedule can also accommodate the longer lead time. Additionally, TAPP has agreed to ship standard and WPE poles early to help meet construction constraints.

With the City's approval, release, and financial approval, BHMGM will assist in issuing contract documents. Should you have any questions concerning the proposals or the project, please do not hesitate to contact us.

Sincerely,

**Ben Klene, P.E.**  
Department Manager

Enclosures: Bid Tab, Bids

[bhmg.com](http://bhmg.com)  
636.296.8600



2200 Rochelle Municipal Utilities- Ritchie to Centerpoint Steel Pole Procurement

BIDDERS / PROPOSALS	ROHN		TAPP, Inc.		MVA Power, Inc.			
BID SECURITY	5% <sub>0</sub>		5% <sub>0</sub>		5% <sub>0</sub>			
Furnish the Goods & Special Services for the Equipment Purchase	\$2,115,800. <sup>00</sup>		\$1,475,246. <sup>00</sup>		\$1,297,702.46			
PROJECT COMPLETION TIME - PROPOSAL 1	42-46 Weeks		62-63 Weeks		25-26 Weeks			
	<input checked="" type="checkbox"/>	Registered Bidder	<input checked="" type="checkbox"/>	Registered Bidder	<input checked="" type="checkbox"/>	Registered Bidder	<input checked="" type="checkbox"/>	Registered Bidder
	<input checked="" type="checkbox"/>	Non-Collusion Affidavit	<input checked="" type="checkbox"/>	Non-Collusion Affidavit	<input checked="" type="checkbox"/>	Non-Collusion Affidavit	<input checked="" type="checkbox"/>	Non-Collusion Affidavit
	<input checked="" type="checkbox"/>	Bid Bond	<input checked="" type="checkbox"/>	Bid Bond	<input checked="" type="checkbox"/>	Bid Bond	<input checked="" type="checkbox"/>	Bid Bond
	<input checked="" type="checkbox"/>	Bid Form	<input checked="" type="checkbox"/>	Bid Form	<input checked="" type="checkbox"/>	Bid Form	<input checked="" type="checkbox"/>	Bid Form
		Any other documents as required by the specification		Any other documents as required by the specification		Any other documents as required by the specification		Any other documents as required by the specification
<p><b>BHM ENGINEERS, INC.</b>          Consulting Engineers          9735 Landmark Parkway Dr., Suite 110A          St. Louis, MO 63127</p>			<p><b>Rochelle Municipal Utilities</b>          Ritchie to Centerpoint          Steel Pole Procurement          Bids Received 11/13/25, 2:00 p.m.</p>			<p>Bid Opening Witnesses:           City: <i>Amyl Woodbridge</i>          BHM: <i>Amyl Woodbridge</i></p>		

**ADDENDUM NO. 1**

**FOR**

**ROCHELLE MUNICIPAL UTILITIES**

**STEEL POLE PROCUREMENT  
2200 K001**

**October 30, 2025**

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**ADD-1**

1. The bid due date has changed to November 13, 2025. The time and location remain the same.

**END OF ADDENDUM**

Please confirm receipt of this Addendum by signing and emailing to  
awooldridge@bhmg.com

Name Charly-Marc Hadid *Charly-Marc*

Company MVA POWER INC



**ROCHELLE MUNICIPAL  
UTILITIES**

**RITCHIE TO CENTERPOINT  
34.5KV LINE**

**STEEL POLE PROCUREMENT**

2200 K001

October 17, 2025



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### SPECIFICATIONS

General Specifications & Requirements
RUS Bulletin 1724E-204
RUS Bulletin 1724E-214

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2200-TBP-69G-STL	Alternating Braced Post Tangent
2200-TBP-69GB-STL	Vertical Braced Post Tangent/Light Angle
2200-TBP-69GB-ENG-DDA	Vertical Braced Post Tangent/Light Angle on Drilled Pier W/ Double Davit Arms
2200-TS-4G-ENG	I-String Running Angle on Drilled Pier
2200-TS-4G-1-MOD-ENG	Modified I-String Running Angle on Drilled Pier
2200-TS-69DE-UG-ENG	In-Line Deadend on Drilled Pier W/ 34.5kV Termination
2200-TS-RISER-STL	In-Line Deadend on Arms W/ 34.5kV Termination
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2200-TM-3V-VERT-STL	Vertical 69kV Switch
2200-DETAILS	Steel Details

## SUPPLEMENTAL DRAWINGS

B2901054B11074AX	MacLean Braced Post Insulator Assembly
S14080038MXSS019	MacLean Transmission Suspension Insulator Assembly
H29C10031MXSS016	MacLean Line Post Insulator Assembly
P250043S1020	Hubble Quadri-Sil Line Post Series 250
1GL069203SN	SEECO 69kV One-Way Switch W/ SUMO Operator
TB----144SPX-	PUPI Tangent Assembly – 12FT
DA4000144E4SPX-	PUPI 4000 Deadend Assembly – 12FT

## Seals and Signatures

	<p>I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed professional under the laws of the State of Illinois.</p>
	<p>Reid Aebischer</p> <p></p> <p>Signature _____ Date <u>10/17/2025</u></p> <p>Discipline: Engineer, Illinois License #: 062.076713 License Expires: 11/30/2025</p>

## **INVITATION FOR BIDS**

Rochelle Municipal Utilities, Ogle County, Illinois will receive sealed bids for:

Ritchie to Centerpoint 34.5kV Line  
Steel Pole Procurement

until 2:00 p.m. local time on November 6, 2025, at the City of Rochelle, 420 N. 6<sup>th</sup> Street, Rochelle, IL 61068.

The plans and specifications are on file with the said City of Rochelle for viewing purposes only.

Copies of the documents may be acquired from BHMGE Engineers, Inc., 9735 Landmark Parkway Suite 110A, St. Louis, Missouri 63127, Consulting Engineers for the said Board. Please email Amy Wooldridge, AWooldridge@bhmg.com with request.

Bids shall be received for the aforementioned items.

A certified check or bank draft on a responsible, solvent bank, or a satisfactory bid bond executed by the bidder and an acceptable surety company, payable to the City of Rochelle, John Bearrows, Mayor or Government Bonds or cash in the amount of not less than five percent (5%) of bid, shall be submitted with each bid.

The bid shall be marked to identify bid package contents, reference specification 2200 K001.

The successful bidder will be required to:

- Register as a bidder for this project.
- Furnish **in duplicate** the following executed documents:
  - Non-Collusion Affidavit
  - Bid Form
  - Bid Bond, Certified Check or Money Order
  - And any other documents as required by the specifications.

No bid shall be withdrawn after the opening of bids without the consent of the Utility for a period of sixty (60) days after the scheduled time of closing bids.

The said City of Rochelle reserves the right to reject any or all bids and to waive any informalities in bidding, and to determine and accept the bid most advantageous to the Utility.

Date: October 17, 2025

City of Rochelle, Illinois  
John Bearrows, Mayor

## **Instructions to Bidders**

### **ARTICLE 1 - DEFINED TERMS**

1.01 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below.

- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

### **ARTICLE 2 - BIDS RECEIVED**

2.01 Refer to Article 14 of this section for information on receipt of Bids.

### **ARTICLE 3 - COPIES OF BIDDING DOCUMENTS**

3.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office.

3.02 Complete sets of the Bidding Documents shall be used in preparing Bids; neither Buyer nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.03 Buyer and Engineer have made copies of Bidding Documents available on the above terms only for the purpose of obtaining Bids for furnishing Goods and Special Services and do not authorize or confer a license for any other use.

### **ARTICLE 4 - QUALIFICATIONS OF BIDDERS**

4.01 To demonstrate Bidder's qualifications to furnish Goods and Special Services, within five days of Buyer's request Bidder shall submit written evidence, such as financial data and previous experience.

4.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

## **ARTICLE 5 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND POINT OF DESTINATION**

- 5.01 Upon request, the Buyer will provide Bidder access to the Point of Destination and the site where Goods are to be installed, or Special Services are to be provided so that Bidder may conduct such investigations, examinations, tests, and studies as Bidder deems necessary for submission of a Bid.
- 5.02 It is the responsibility of each Bidder before submitting a Bid to:
- A. Examine and carefully study the Bidding Documents, including any Addenda, and the related data identified in the Bidding Documents.
  - B. Visit the Point of Destination and the site where the Goods are to be installed and Special Services are to be provided to become familiar with the local conditions if required by the Bidding Documents to do so, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.
  - C. Become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, or the furnishing of the Goods and Special Services
  - D. Carefully study, consider, and correlate the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods are to be installed or Special Services are to be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Contract Documents.
  - E. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution (if any) thereof by Engineer is acceptable to Bidder.
  - F. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

- 5.03 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 5, that without exception the Bid is premised upon furnishing Goods and Special Services required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions (if any) thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

**ARTICLE 6 - PRE-BID CONFERENCE** *Not Used*

**ARTICLE 7 - INTERPRETATIONS AND ADDENDA**

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids will not be answered. Only answers in the Addenda will be binding. Oral statements, interpretations, and clarifications may not be relied upon and will not be binding or legally effective.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Buyer or Engineer.

**ARTICLE 8 - BID SECURITY** *Not Used*

**ARTICLE 9 - CONTRACT TIMES** *Not Used*

**ARTICLE 10 - LIQUIDATED DAMAGES**

- 10.01 Any provisions for liquidated damages, such as those for *Seller's* failure to attain a Milestone, or to deliver the Goods or *furnish Special Services within the Contract Times*, are set forth in the Agreement.

**ARTICLE 11 - "OR-EQUAL" ITEMS**

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, including the Addenda. Bidders may propose "or equal" materials and equipment, which if approved by Engineer will be identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function, and quality to be met by any proposed "or-equal" item. No item of material or equipment will be considered by Engineer as an "or-equal" unless written request for approval has been submitted by Bidder and has

been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 5.04 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. Bidders shall not rely upon approvals unless set forth in an Addendum.

## **ARTICLE 12 - PREPARATION OF BID**

- 12.01 The Bid Form is included with the Bidding Documents. Additional copies of Bidding Documents may be obtained from the Issuing Office.
- 12.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each item listed therein. In the case of optional alternates, the words "No Bid," "No Change," or "Not Applicable" may be entered.
- 12.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 12.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 12.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 12.06 A Bid by an individual shall show the Bidder's name and official address.
- 12.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 12.08 All names must be typed or printed in ink below the signature.
- 12.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 12.10 Each Bidder shall list the postal address, e-mail address, and telephone number for communications regarding the Bid.

## **ARTICLE 13 - BASIS OF BID; COMPARISON OF BIDS**

### **13.01 Lump Sum**

- A. Bidder shall submit a Bid on a lump sum basis as set forth in the Bid Form.
- B. For determination of the apparent low Bidder, Bids will be compared on the basis of the lump sum.

## **ARTICLE 14 - SUBMITTAL OF BID**

14.01 The Bid Form is to be completed and submitted with the following documents:

- A. Non-Collusion Affidavit.
- B. Bidder Qualifications.
- C. List of Proposed Suppliers.
- D. List of References.

14.02 Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked envelope with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and the name and address of Bidder and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED". A mailed Bid shall be addressed to:

**City of Rochelle  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068  
2200 K001**

## **ARTICLE 15 - MODIFICATION OR WITHDRAWAL OF BID**

15.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

15.02 If, within 24 hours after Bids are opened, any Bidder files a duly signed written notice with Buyer and promptly thereafter demonstrates to the reasonable satisfaction of Buyer that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Goods and Special Services are rebid, that Bidder will be disqualified from further bidding on the Goods and Special Services.

#### **ARTICLE 16 - OPENING OF BIDS**

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the Base Bids and Alternate Bids, if any, will be made available to Bidders after the opening of Bids.

#### **ARTICLE 17 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Buyer may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

#### **ARTICLE 18 - EVALUATION OF BIDS AND AWARD OF CONTRACT**

18.01 Buyer reserves the right to reject any and all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Buyer further reserves the right to reject the Bid of any Bidder that Buyer finds, after reasonable inquiry and evaluation, to be nonresponsive. Buyer may also reject the Bid of any Bidder if Buyer believes that it would not be in the best interest of the Project to make an award to that Bidder. Buyer also reserves the right to waive all informalities not involving price, time, or changes in the Goods and Special Services, and to negotiate contract terms with the Successful Bidder.

18.02 More than one Bid for the same Goods and Special Services from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Goods and Special Services shall be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

18.03 In evaluating Bids, Buyer will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data as may be requested in the Bid Form or may be requested from Bidders prior to a Notice of Award.

18.04 Buyer may conduct such investigations as Buyer deems necessary to establish the responsibility, qualifications, and financial ability of Bidder.

18.05 If the contract is to be awarded, Buyer will award the Contract to the Bidder whose Bid is in the best interest of the Project.

## **ARTICLE 19 - CONTRACT SECURITY AND INSURANCE**

19.01 Article 4 of the General Conditions and Article 4 of the Supplementary Conditions set forth Buyer's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Buyer, it must be accompanied by such bonds.

## **ARTICLE 20 - SIGNING OF AGREEMENT**

20.01 When Buyer issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents that are to be identified in the Agreement and attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Buyer. Within 10 days thereafter, Buyer shall deliver one fully signed counterpart to Successful Bidder with a complete set of Drawings with appropriate identification.

## **ARTICLE 21 - SALES AND USE TAXES**

21.01 Owner is exempt from Illinois State sales and use taxes on materials and equipment to be incorporated in the Work, Exemption No. E99941376. Said taxes shall not be included in the Bid.

## **ARTICLE 22 - RETAINAGE**

22.01 Provisions concerning Seller's rights to deposit securities in lieu of retainage are set forth in the Agreement.

## **ARTICLE 23 - CONTRACT TO BE ASSIGNED**      *Not Used*

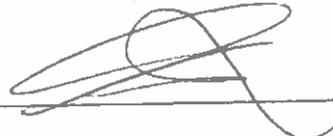
### Non-Collusion Affidavit

The Municipality reserves the right, before any award of contract is made, to require any bidder to whom it may make an award of the Principal Contract, to sign a non-collusion affidavit in the form designated below:

STATE OF Québec

COUNTY OF L'Assomption

Benjamin Hadid, being first duly sworn, deposes and says that he is Sales and Marketing Manager \* (sole owner, partner, president, secretary, etc.) of the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any bidder to fix any overhead, profit or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further, that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, or any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

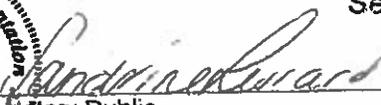
Signed: 

Title: Sales and Marketing Manager

Subscribed and sworn to before me this 4th day of November 20 21

Seal of Notary:



  
Notary Public

\* In making out this form, the title that is not applicable should be struck out. For example, if the Contractor is a corporation and this form is to be executed by its president, the words "Sole Owner, a partner, secretary", etc. should be struck out.

**BID FORM**  
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**This Bid is submitted by:** MVA POWER INC

## **Bid Form**

### **ARTICLE 1 - BID RECIPIENT**

1.01 This Bid is submitted to:

**Rochelle Municipal Utilities  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in the Bidding Documents to furnish the Goods and Special Services as specified or indicated in the Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Bidding Documents.

### **ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS**

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

### **ARTICLE 3 - BIDDER'S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date
<u>1</u>	<u>30 Oct. 2025</u>

B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress, or the furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations in effect as of the date of the Bid that may affect cost, progress, and the furnishing of Goods and Special Services.

- D. Bidder has carefully studied, considered, and correlated the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods will be installed or Special Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Bidding Documents.
- E. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution (if any) thereof by Engineer is acceptable to Bidder.
- F. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing the Goods and Special Services for which this Bid is submitted.

#### **ARTICLE 4 - BIDDER'S CERTIFICATIONS**

##### 4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding.
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
  - 2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer,

(b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition.

3. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels.
4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

### ARTICLE 5 - BASIS OF BID

5.01 **Proposal No. 1** - Bidder will furnish and deliver the equipment described in the Plans, Specifications, and Construction Drawings for the following price:

<b>Lump Sum Total Bid Price for Proposal No. 1</b>	<b>\$ 1297702.46</b>
--	----------------------

- A. Refer to Appendix 1 – Itemized Proposal used for tabulating unit and total price.
- B. Refer to Appendix 2 – Pole Data Summary Table for specifications on each pole.
- C. Refer to Appendix 3 – Underbuild Appurtenances Table for underbuild specification on each pole.

### ARTICLE 6 - TIME OF COMPLETION

- 6.01 Bidder agrees that the material will be delivered no later than August 31, 2026, and will be completed and ready for final payment in accordance with Paragraph 14.07B of the General Conditions on or before 30 days after the delivery date of August 31, 2026.
- 6.02 The time of delivery shall be extended for any reasonable delay due extensively to causes beyond control and without the fault of the Bidder, including but not limited to acts of God, fires, strikes and floods.
- 6.03 Bidder accepts the provisions of the Agreement as to liquidated damages.

## **ARTICLE 7 - ATTACHMENTS TO THIS BID**

7.01 The following documents are attached to and made a condition of this Bid:

- A. List of Proposed Major Suppliers.
- B. Itemized Proposal.
- C. Affidavit of Non-Collusion.
- D. List of Project References.
- E. Bidder's Qualifications.

## **ARTICLE 8 - DEFINED TERMS**

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders and the General Conditions.

**ARTICLE 9 - BID SUBMITTAL**

9.01 This Bid submitted by: MVA POWER INC

If Bidder is:

A Corporation

Corporation Name: MVA POWER INC

State of Incorporation: QUEBEC, CANADA

Type: (General Business, Professional, Service, Other)

By: Charly-Marc  
(Signature – attach evidence of authority to sign)

Name: (typed or printed) Charly-Marc Hadid

Title: Sales and Marketing Associate  
(Corporate Seal)

Attest: Hanna Abiad  
(Signature of Corporate Secretary)

Business Address: 1 HOLLY ROAD, MONTREAL, QUEBAC  
H3X3K6

Phone: 1 450 589 0445

Email Address: tender@mvpower.com

**A Limited Liability Company (LLC)**

LLC Name: \_\_\_\_\_

State in which organized: \_\_\_\_\_

By: \_\_\_\_\_

*(Signature – attach evidence of authority to sign)*

Name: *(typed or printed)* \_\_\_\_\_

Business Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

**BIDDER : MVA POWER INC**

<b>1 - Itemized Proposal</b>							
<i>Complete the below or return itemized list in a similar format</i>							
<b>Ritchie to Centerpoint Engineered Poles</b>				<b>Lbs</b>			
STR #	Length (FT)	Framing	Qty.	Unit Weight	Unit Price	Extended Price	
14	60	TS-5G-ENG	1	15015	\$ 42557.67	\$ 42557.67	
18	65	TS-69DE-UG-ENG	1	14470	41298.34	41298.34	
1, 7, 8	70	TS-69DE-UG-ENG	3	15890	43223.26	129669.78	
19	75	TS-69DE-UG-ENG	1	18100	49534.03	49534.03	
20, 45	80	TS-5G-ENG	2	30465	81296.59	162593.18	
25	80	TS-4G-1-MOD-ENG	1	15500	43661.34	43661.34	
33	80	TS-5GA-ENG	1	23180	62778.55	62778.55	
35, 36	80	TS-69DE-UG-ENG	2	19495-20925	53579.77	107159.54	
51	80	TS-5GG-MOD-ENG	1	20510	55031.71	55031.71	
21, 22, 24	85	TBP-69GB-ENG-DDA	3	12740	34378.22	103134.66	
26	85	TS-4G-ENG	1	11930	32398.91	32398.91	
<b>Centerpoint to Twombly Engineered Poles</b>							
STR #	Length (FT)	Framing	Qty.	Unit Weight	Unit Price	Extended Price	
1	80	TS-5GG-MOD-ENG	1	20500	\$ 55031.71	\$ 55031.71	
					<b>Engineered Poles Total: \$ 884849.42</b>		
<b>Ritchie to Centerpoint Standard Class Poles</b>							
STR #	Length (FT)	Class	Framing	Qty.	Unit Weight	Unit Price	Extended Price
13	75	H2	TBP-69GB-STL	1	2925	\$ 6727.95	\$ 6727.95
TP-51	75	H2	TS-RISER-STL	1	2925	6727.95	6727.95
2, 3, 12	75	H3	TBP-69GB-STL	3	3140	7211.89	21635.67
15	80	H1	TBP-69GB-STL	1	3020	6945.13	6945.13
4, 5	80	H3	TBP-69GB-STL	2	3510	8061.74	16123.48
6	80	H3	TBP-69G-STL	1	3510	8061.74	8061.74
11	85	H3	TBP-69GB-STL	1	3760	8647.19	8647.19
9	85	H7	TBP-69GB-STL	1	5385	12381.79	12381.79
50	90	H3	TBP-69GB-STL	1	4055	9329.43	9329.43
17	90	H7	TBP-69GB-STL	1	5820	13387.44	13387.44
16	90	H8	TBP-69GB-STL	1	5970	13725.02	13725.02
10	90	H9	TBP-69GB-STL	1	6523	15002.15	15002.15
52	95	H1	TM-3V-VERT-STL	1	5115	11760.93	11760.93
46, 47, 48, 49	95	H4	TBP-69GB-STL	4	4725	10861.51	43446.04
34	100	H5	TBP-69G-STL	1	5585	12846.85	12846.85
37, 38, 39, 40, 41, 42, 43, 44	105	H4	TBP-69G-STL	8	5325	12251.95	98015.62
28, 29, 30, 31, 32	105	H5	TBP-69G-STL	5	5970	13725.02	68625.10
23	105	H7	TBP-69GB-STL	1	7035	16182.49	16182.49
27	110	H6	TBP-69G-STL	1	7195	16553.12	16553.12
<b>Centerpoint to Twombly Standard Class Poles</b>							
STR #	Length (FT)	Class	Framing	Qty.	Unit Weight	Unit Price	Extended Price
TP-1	75	H2	TS-RISER-STL	1	2925	\$ 6727.95	\$ 6727.95
					<b>Standard Poles Total: \$ 412853.04</b>		

MVA POWER INC

## SECTION 00420

### Qualifications

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Appointment of Counsel.
- B. Pre-qualifications.
- C. Bidder's Qualifications.
- D. Certifications.
- E. References.
- F. Signatures.

##### 1.02 AWARD OF BID

- A. Failure of Bidder to meet all qualification criteria as stated in these Specifications shall disqualify Bidder from consideration for the Project.
- B. The Owner reserves the right to exclude Bidder from consideration due to the Bidder's failure to present with written documentation his experience and capability to complete the project to the Owner's expectations.

#### PART 2 – QUALIFICATIONS

##### 2.01 APPOINTMENT OF COUNSEL – NON-RESIDENT

- A. Bidder has appointed Please see below, whose address is \_\_\_\_\_, as the agent of Bidder for service of process in the event any litigation or controversy results between the Bidder and Owner arising out of the contractual relationship created by the acceptance of this Bid. Bidder agrees that the courts of the State in which the project is located will have jurisdiction over Bidder for all such purposes to the same extent as though Bidder were a resident of the State.  
MVA POWER agree, we do not have an Illinois Resident appointed by Bid closing, we will provide agent information within 15 days of Notice of Award

## 2.02 PRE-QUALIFICATION

- A. Failure of Bidder to meet the Pre-qualification requirements as stated in the Instruction to Bidders Bid shall disqualify Bidder from consideration for the Project.

## 2.03 BIDDER'S QUALIFICATIONS

- A. Bidder shall prove to the Owner's satisfaction Bidder's experience in completing similar projects, thus demonstrating the ability of the Bidder to complete the Project to the Owner's Satisfaction.
- B. Bidder shall submit written proof and abide by the written proof that the Bidder will complete a minimum of (30) thirty percent of the overall project by his own company and workers.
- C. Bidder shall submit documentation proving that the Bidder is capable of funding the Project and is not in financial hardship.
- D. Bidder shall submit documentation proving that the Bidder uses only qualified, licensed workers experienced in the line of work.
- E. Bidder's subcontractors shall be the responsibility of the Bidder and shall be considered part of the Bidder's company and shall meet qualification requirements for all aspects of the Project.

## 2.04 CERTIFICATIONS

- A. The Bidder certifies the following as required by law:
  - 1. Bidder has not been convicted of bribery or attempting to bribe an officer or employee of the State, nor has the Bidder made an admission of guilt of such conduct which is a matter of record, nor has an official, agent or employee of the Bidder been so convicted or made such admission of bribery on its behalf and pursuant to the direction or authorization of a responsible official thereof.
  - 2. Bidder is not barred from bidding with any unit of state or local government as a result of unlawful bid rigging.

3. Under penalty of perjury, the Bidder certifies that the Federal Taxpayer Identification Number noted below is correct and the Bidder is doing business as a (please check one):

<input type="checkbox"/> Individual	<input type="checkbox"/> Real Estate Agent
<input type="checkbox"/> Partnership	<input type="checkbox"/> Government Entity
<input checked="" type="checkbox"/> Corporation	<input type="checkbox"/> Trust or Estate

4. Bidder, if an individual, is not in default on an educational loan.

## 2.05 REFERENCES

- A. Bidder shall submit a minimum of three (3) written letters of recommendation with references' signatures and contact information to the Engineer.
- B. These References shall be from the Owner, Project Manager, or other individual who is knowledgeable on the project, or recent previous Projects with very similar Scope of Work completed under the current Bidder's name.
- C. Bidder shall submit a minimum of three (3) company brochures, or company information sheets, along with list of completed equivalent projects.

2.06 SIGNATURES

Firm Name: MVA POWER INC

Federal Taxpayer Identification Number: Please see attached our W-8BEN-E cert

By: Charly-Marc Hadid *Charly-Marc*

Title: Sales and Marketing Associate

By: \_\_\_\_\_

Title: \_\_\_\_\_

Note: If the Bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if the Bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if the Bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or member of a partnership, the power of attorney must be submitted with the bid.

**PART 3 – EXECUTION    NOT USED**

**BID BOND**

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

**BIDDER (Name and Address):**

MVA Power Inc.  
1, rue Holly  
Montréal, QC, H3X 3K6

**SURETY (Name and Address of Principal Place of Business):**

Atlantic Specialty Insurance Company  
One State Street Plaza, 31st Floor  
New York, NY 10004

**OWNER (Name and Address):** City of Rochelle  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068

**BID**

Bid Due Date: November 6, 2025  
Project: Ritchie to Centerpoint 34.5kV Line - Steel Pole Procurement

**BOND**

Bond Number: 7911790-25-052  
Date (Not later than Bid due date): October 31st, 2025

Penal sum	<u>Five percent of the tender amount</u>	<u>(5%)</u>
	(Words)	(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

**BIDDER**

MVA Power Inc. MARC HADIS Seal  
Bidder's Name and Corporate Seal

By: MH P. Es.  
Signature and Title

Attest: Hanna Abiad  
Signature and Title

**SURETY**

Atlantic Specialty Insurance Company Seal  
Surety's Name and Corporate Seal

By: Olga Shalia  
Signature and Title Olga Shalia, Attorney-in-Fact  
(Attach Power of Attorney)

Attest: Julie Turland  
Signature and Title Julie Turland

Note: Above addresses are to be used for giving required notice.



PENAL SUM FORM

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents,
  - 3.2. All Bids are rejected by Owner
  - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.



# Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Amanda Boutlier, Anita Rooke, Babajide Alabi, Bryan Kechnie, Chelsea James, Cheryl Best-Pope, Dania Husain, Dina Amaro-Elias, Erin Grandy, Fadi Mortada, Fatima Bouceta, Felipe Lenz, Feodor Ploujnikov, James Harris, James Myers, James Scharf, Jenny Wang, Jigna Patel, Jim Lazenkas, Joharie Racanelli, Julie Turland, Justin Eccleston, Karamjit Kaur, Katherine Gill, Kim Roberts, Korey Pettit, Kylie Balbido, Maria Suarez, Marisa Medeiros, Marites Gatmaitan, Matthew Burns, Meaghan Fowler, Nelson de Quintal, Nicolas Mailhot, Olga Iankine, Olga Shalla, Preya Prashad, Reena Ahamad, Richard Longland, Ryan Brady, Sheriar Irani, Tin Wah Leung**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **unlimited** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

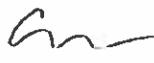
Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

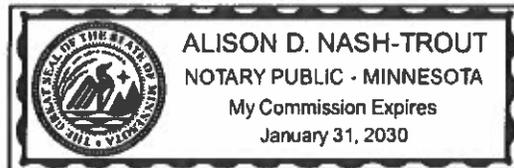
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this first day of January, 2023.



By   
Sarah A. Kolar, Vice President and General Counsel

STATE OF MINNESOTA  
HENNEPIN COUNTY

On this first day of January, 2023, before me personally came Sarah A. Kolar, Vice President and General Counsel of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and she acknowledged the execution of the same, and being by me duly sworn, that she is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



  
Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 31st day of October, 2025.



  
Kara L.B. Barrow, Secretary

This Power of Attorney expires  
January 31, 2030

**BIDDER : MVA POWER INC**

<b>1 - Itemized Proposal</b>							
<i>Complete the below or return itemized list in a similar format</i>							
<b>Ritchie to Centerpoint Engineered Poles</b>							
STR #	Length (FT)	Framing	Qty.	Unit Weight	Unit Price	Extended Price	Lbs
14	60	TS-5G-ENG	1	15015	\$ 42557.67	\$ 42557.67	
18	65	TS-69DE-UG-ENG	1	14470	41298.34	41298.34	
1, 7, 8	70	TS-69DE-UG-ENG	3	15890	43223.26	129669.78	
19	75	TS-69DE-UG-ENG	1	18100	49534.03	49534.03	
20, 45	80	TS-5G-ENG	2	30465	81296.59	162593.18	
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21, 22, 24	85	TBP-69GB-ENG-DDA	3	12740	34378.22	103134.66	
26	85	TS-4G-ENG	1	11930	32398.91	32398.91	
<b>Centerpoint to Twombly Engineered Poles</b>							
STR #	Length (FT)	Framing	Qty.	Unit Weight	Unit Price	Extended Price	
1	80	TS-5GG-MOD-ENG	1	20500	\$ 55031.71	\$ 55031.71	
						<b>Engineered Poles Total:</b>	<b>\$ 884849.42</b>
<b>Ritchie to Centerpoint Standard Class Poles</b>							
STR #	Length (FT)	Class	Framing	Qty.	Unit Weight	Unit Price	Extended Price
13	75	H2	TBP-69GB-STL	1	2925	\$ 6727.95	\$ 6727.95
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2, 3, 12	75	H3	TBP-69GB-STL	3	3140	7211.89	21635.67
15	80	H1	TBP-69GB-STL	1	3020	6945.13	6945.13
4, 5	80	H3	TBP-69GB-STL	2	3510	8061.74	16123.48
6	80	H3	TBP-69G-STL	1	3510	8061.74	8061.74
11	85	H3	TBP-69GB-STL	1	3760	8647.19	8647.19
9	85	H7	TBP-69GB-STL	1	5385	12381.79	12381.79
50	90	H3	TBP-69GB-STL	1	4055	9329.43	9329.43
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16	90	H8	TBP-69GB-STL	1	5970	13725.02	13725.02
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52	95	H1	TM-3V-VERT-STL	1	5115	11760.93	11760.93
46, 47, 48, 49	95	H4	TBP-69GB-STL	4	4725	10861.51	43446.04
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37, 38, 39, 40, 41, 42, 43, 44	105	H4	TBP-69G-STL	8	5325	12251.95	98015.62
28, 29, 30, 31, 32	105	H5	TBP-69G-STL	5	5970	13725.02	68625.10
23	105	H7	TBP-69GB-STL	1	7035	16182.49	16182.49
27	110	H6	TBP-69G-STL	1	7195	16553.12	16553.12
<b>Centerpoint to Twombly Standard Class Poles</b>							
STR #	Length (FT)	Class	Framing	Qty.	Unit Weight	Unit Price	Extended Price
TP-1	75	H2	TS-RISER-STL	1	2925	\$ 6727.95	\$ 6727.95
						<b>Standard Poles Total:</b>	<b>\$ 412853.04</b>

MVA POWER INC

**2200-K007 \_ RITCHIE TO CENTERPOINT STEEL POLES \_ ROCHELLE IL  
MVA POWER \_ SCHEDULE OF WORK \_ MVAB25141**

<b>Week from</b>	<b>PO</b>	<b>Design submission</b>	<b>Design approval</b>	<b>Detailed Drawings</b>	<b>Drawing modification and approval</b>	<b>Manufacturing</b>	<b>CIF Destination</b>
11/10/2025							
11/17/2025							
11/24/2025							
12/1/2025							
12/8/2025							
12/15/2025							
12/22/2025							
12/29/2025							
1/5/2026							
1/12/2026							
1/19/2026							
1/26/2026							
2/2/2026							
2/9/2026							
2/16/2026							
2/23/2026							
3/2/2026							
3/9/2026							
3/16/2026							
3/23/2026							
3/30/2026							
4/6/2026							
4/13/2026							
4/20/2026							
4/27/2026							
5/4/2026							

**2200-K007 \_ RITCHIE TO CENTERPOINT STEEL POLES \_ ROCHELLE IL  
MVA POWER SUMMARY DESIGN FOR ANCHOR BOLTFE CAGES \_ MVAR25141**

Structure name	Height (ft)	Anchor bolt cage quantity per structure	Anchor bolt quantity per cage	Anchor bolt size(in) x length(in)	Material	Template circle dia(in)	template outside dia(in)	template inside dia(in)	Bottom template thick(in)	Top template thick(in)	Weight Per Cage (Lbs)
STR1	70	1	20	2.25x120	ASTM A615 GR75	59.84	65.75	53.94	0.50	0.50	3519
STR7	70	1	20	2.25x120	ASTM A615 GR75	59.84	65.75	53.94	0.50	0.50	3519
STR8	70	1	20	2.25x120	ASTM A615 GR75	59.84	65.75	53.94	0.50	0.50	3519
STR14	60	1	20	2.25x120	ASTM A615 GR75	61.02	66.93	55.12	0.50	0.50	3526
STR18	65	1	20	2.25x120	ASTM A615 GR75	58.07	63.98	52.17	0.50	0.50	3510
STR19	75	1	20	2.25x120	ASTM A615 GR75	61.02	66.93	55.12	0.50	0.50	3526
STR20	80	1	32	2.25x120	ASTM A615 GR75	70.67	76.57	64.76	0.50	0.50	5356
STR21	85	1	12	2.25x120	ASTM A615 GR75	51.97	57.87	46.06	0.50	0.50	2252
STR22	85	1	12	2.25x120	ASTM A615 GR75	51.97	57.87	46.06	0.50	0.50	2252
STR24	85	1	12	2.25x120	ASTM A615 GR75	51.97	57.87	46.06	0.50	0.50	2252
STR25	80	1	16	2.25x120	ASTM A615 GR75	61.02	66.93	55.12	0.50	0.50	3526
STR26	85	1	12	2.25x120	ASTM A615 GR75	53.15	59.06	47.24	0.50	0.50	2204
STR33	80	1	24	2.25x120	ASTM A615 GR75	66.34	72.24	60.43	0.50	0.50	4194
STR35	80	1	15	2.25x120	ASTM A615 GR75	62.80	68.70	56.89	0.50	0.50	2895
STR36	80	1	20	2.25x120	ASTM A615 GR75	64.17	70.08	58.27	0.50	0.50	3542
STR45	80	1	32	2.25x120	ASTM A615 GR75	70.28	76.18	64.37	0.50	0.50	5495
STR51	80	1	20	2.25x120	ASTM A615 GR75	64.96	70.87	59.06	0.50	0.50	3567
STR1(CP-T)	80	1	20	2.25x120	ASTM A615 GR75	64.96	70.87	59.06	0.50	0.50	3567



## WORK EXPERIENCE/REFERENCES

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Project: Purchase of Steel Poles for Rodgers to Rayburn & Loop-in Stage 1

Owner: BRYAN TEXAS UTILITIES (BTU) Location: BRYAN- TEXAS -USA

Contact: Corey Bower BowerCS@bv.com Phone: D +1 407-419-3556 O +1 407-419-3500

Date Started & Completed: 2019 Value of Work: \$ 210000 USD

Description of Work: \_\_\_\_\_

69 KV Design, materials, and fabrication for furnishing tubular steel structures for use in the

Owner's transmission system.

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Project: Purchase of Steel Poles for Steele Store to Smetana

Owner: BRYAN TEXAS UTILITIES (BTU) Location: Smetana - TEXAS - USA

Contact: Corey Bower BowerCS@bv.com Phone: D +1 407-419-3556 O +1 407-419-3500

Date Started & Completed: 2020 Value of Work: \$ 1300000 USD

Description of Work: \_\_\_\_\_

138KV Tubular Galvanizing Steel Poles - Design & Manufacturing

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Project: KOFA DOME SUBSTATION

Owner: WESTERN AREA POWER AUTHORITY  
(WAPA)

Location: PHOENIX - AZ - USA

Contact: Rick Schuler | Civil Engineer

Phone: 602.605.2487

Schuler@WAPA.GOV

Date Started & Completed: 2020 Value of Work: \$ 78000 USD

Description of Work: \_\_\_\_\_

161KV, A total of eight (8) dulled galvanized light duty, class 2 wood equivalent, steel pole structures.

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Project: TUBULAR STEEL POLES

Owner: PUD. NO.1 OF DOUGLAS COUNTY

Location: 1151, Valley Mall Parkway East  
Wenatchee, WA. 98802

Contact: Michael Gasbar michael.gasbar@dcpud.org Phone: 509 884 7191

Date Started & Completed: 2021- 2022 Value of Work: \$ 4030000 USD

Description of Work: SUPPLY AND DELIVERY OF TUBULAR STEEL POLES FOR THE RAPIDS TO  
COLUMBIA 230KV TRANSMISSION LINE - Design & Manufacturing

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## WORK EXPERIENCE/REFERENCES

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Project Galvanized Steel Transmission Poles

Owner: FRANKLIN PUD

Location: Pasco, WA.

Phone: 509 546 5950

Contact: Julie Anderson

Purchasing@franklinpud.com

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Date Started & Completed: 2023-2024

Value of Work: \$ 190000 USD

Description of Work:

Railroad Avenue 115Kv Double Circuit Transmission 25 mile Line. Design and Manufacturing

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Project: Steel Poles for Clovis  
Substation

Location: 1151, Valley Mall Parkway East  
Wenatchee, WA. 98802

Owner: PUD. NO.1 OF DOUGLAS COUNTY

Contact: Michael Gasbar

Phone: 509 884 7191

michael.gasbar@dcpud.org

Date Started & Completed: 2024-2025

Value of Work: \$ 2871800 USD

Description of Work:

SUPPLY AND DELIVERY OF TUBULAR STEEL POLES FOR THE CLOVIS  
SUBSTATION \_ 230KV TRANSMISSION LINE - Design & Manufacturin

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Project : Two 100ft Engineered Poles

Owner: CPS ENERGY

Location: San Antonio TX.

Phone: 210.353.2399

Contact: Ryan Martinez

ramartinez@CPSEnergy.com

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Date Started & Completed: 2024

Value of Work: \$ 114676 USD

Description of Work:

Two 100ft Engineered Poles \*Pole is to not surpass 42 inches at ground line diameter.\*

. Design and Manufacturing

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### Certificate of Status of Beneficial Owner for United States Tax Withholding and Reporting (Entities)

▶ For use by entities. Individuals must use Form W-8BEN. ▶ Section references are to the Internal Revenue Code.  
▶ Go to [www.irs.gov/FormW8BENE](http://www.irs.gov/FormW8BENE) for instructions and the latest information.  
▶ Give this form to the withholding agent or payer. Do not send to the IRS.

Do NOT use this form for:

- U.S. entity or U.S. citizen or resident . . . . . W-9
- A foreign individual . . . . . W-8BEN (Individual) or Form 8233
- A foreign individual or entity claiming that income is effectively connected with the conduct of trade or business within the United States (unless claiming treaty benefits) . . . . . W-8ECI
- A foreign partnership, a foreign simple trust, or a foreign grantor trust (unless claiming treaty benefits) (see instructions for exceptions) . . . W-8IMY
- A foreign government, international organization, foreign central bank of issue, foreign tax-exempt organization, foreign private foundation, or government of a U.S. possession claiming that income is effectively connected U.S. income or that is claiming the applicability of section(s) 115(2), 501(c), 892, 895, or 1443(b) (unless claiming treaty benefits) (see instructions for other exceptions) . . . . . W-8ECI or W-8EXP
- Any person acting as an intermediary (including a qualified intermediary acting as a qualified derivatives dealer) . . . . . W-8IMY

Instead use Form:

#### Part I Identification of Beneficial Owner

<b>1</b> Name of organization that is the beneficial owner <b>MVA POWER INC</b>	<b>2</b> Country of incorporation or organization <b>CANADA</b>
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**3** Name of disregarded entity receiving the payment (if applicable, see instructions)

**4** Chapter 3 Status (entity type) (Must check one box only):

<input type="checkbox"/> Simple trust	<input type="checkbox"/> Tax-exempt organization	<input checked="" type="checkbox"/> Corporation	<input type="checkbox"/> Partnership
<input type="checkbox"/> Central Bank of Issue	<input type="checkbox"/> Private foundation	<input type="checkbox"/> Complex trust	<input type="checkbox"/> Foreign Government - Controlled Entity
<input type="checkbox"/> Grantor trust	<input type="checkbox"/> Disregarded entity	<input type="checkbox"/> Estate	<input type="checkbox"/> Foreign Government - Integral Part
		<input type="checkbox"/> International organization	

If you entered disregarded entity, partnership, simple trust, or grantor trust above, is the entity a hybrid making a treaty claim? If "Yes," complete Part III.  Yes  No

**5** Chapter 4 Status (FATCA status) (See instructions for details and complete the certification below for the entity's applicable status.)

<input type="checkbox"/> Nonparticipating FFI (including an FFI related to a Reporting IGA FFI other than a deemed-compliant FFI, participating FFI, or exempt beneficial owner).	<input type="checkbox"/> Nonreporting IGA FFI. Complete Part XII.
<input type="checkbox"/> Participating FFI.	<input type="checkbox"/> Foreign government, government of a U.S. possession, or foreign central bank of issue. Complete Part XIII.
<input type="checkbox"/> Reporting Model 1 FFI.	<input type="checkbox"/> International organization. Complete Part XIV.
<input type="checkbox"/> Reporting Model 2 FFI.	<input type="checkbox"/> Exempt retirement plans. Complete Part XV.
<input type="checkbox"/> Registered deemed-compliant FFI (other than a reporting Model 1 FFI, sponsored FFI, or nonreporting IGA FFI covered in Part XII). See instructions.	<input type="checkbox"/> Entity wholly owned by exempt beneficial owners. Complete Part XVI.
<input type="checkbox"/> Sponsored FFI. Complete Part IV.	<input type="checkbox"/> Territory financial institution. Complete Part XVII.
<input type="checkbox"/> Certified deemed-compliant nonregistering local bank. Complete Part V.	<input type="checkbox"/> Excepted nonfinancial group entity. Complete Part XVIII.
<input type="checkbox"/> Certified deemed-compliant FFI with only low-value accounts. Complete Part VI.	<input type="checkbox"/> Excepted nonfinancial start-up company. Complete Part XIX.
<input type="checkbox"/> Certified deemed-compliant sponsored, closely held investment vehicle. Complete Part VII.	<input type="checkbox"/> Excepted nonfinancial entity in liquidation or bankruptcy. Complete Part XX.
<input type="checkbox"/> Certified deemed-compliant limited life debt investment entity. Complete Part VIII.	<input type="checkbox"/> 501(c) organization. Complete Part XXI.
<input type="checkbox"/> Certain investment entities that do not maintain financial accounts. Complete Part IX.	<input type="checkbox"/> Nonprofit organization. Complete Part XXII.
<input type="checkbox"/> Owner-documented FFI. Complete Part X.	<input type="checkbox"/> Publicly traded NFFE or NFFE affiliate of a publicly traded corporation. Complete Part XXIII.
<input type="checkbox"/> Restricted distributor. Complete Part XI.	<input type="checkbox"/> Excepted territory NFFE. Complete Part XXIV.
	<input type="checkbox"/> Active NFFE. Complete Part XXV.
	<input type="checkbox"/> Passive NFFE. Complete Part XXVI.
	<input type="checkbox"/> Excepted inter-affiliate FFI. Complete Part XXVII.
	<input type="checkbox"/> Direct reporting NFFE.
	<input type="checkbox"/> Sponsored direct reporting NFFE. Complete Part XXVIII.
	<input type="checkbox"/> Account that is not a financial account.

**6** Permanent residence address (street, apt. or suite no., or rural route). Do not use a P.O. box or in-care-of address (other than a registered address).  
**1 HOLLY**

City or town, state or province. Include postal code where appropriate. <b>MONTREAL. QUEBEC H3X 3K6</b>	Country <b>CANADA</b>
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**7** Mailing address (if different from above)

City or town, state or province. Include postal code where appropriate.	Country
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**Part I Identification of Beneficial Owner (continued)**

8 U.S. taxpayer identification number (TIN), if required

9a GIIN	b Foreign TIN 131074437RC0001	c Check if FTIN not legally required. . . . . <input type="checkbox"/>
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10 Reference number(s) (see instructions)

Note: Please complete remainder of the form including signing the form in Part XXX.

**Part II Disregarded Entity or Branch Receiving Payment. (Complete only if a disregarded entity with a GIIN or a branch of an FFI in a country other than the FFI's country of residence. See instructions.)**

- 11 Chapter 4 Status (FATCA status) of disregarded entity or branch receiving payment
- |  |   |                                       |
|--|---|---------------------------------------|
| <input type="checkbox"/> Branch treated as nonparticipating FFI. | <input type="checkbox"/> Reporting Model 1 FFI. | <input type="checkbox"/> U.S. Branch. |
| <input type="checkbox"/> Participating FFI.                      | <input type="checkbox"/> Reporting Model 2 FFI. |                                       |
- 12 Address of disregarded entity or branch (street, apt. or suite no., or rural route). Do not use a P.O. box or in-care-of address (other than a registered address).

City or town, state or province. Include postal code where appropriate.

Country

13 GIIN (if any)

**Part III Claim of Tax Treaty Benefits (if applicable). (For chapter 3 purposes only.)**

- 14 I certify that (check all that apply):
- a  The beneficial owner is a resident of \_\_\_\_\_ within the meaning of the income tax treaty between the United States and that country.
- b  The beneficial owner derives the item (or items) of income for which the treaty benefits are claimed, and, if applicable, meets the requirements of the treaty provision dealing with limitation on benefits. The following are types of limitation on benefits provisions that may be included in an applicable tax treaty (check only one; see instructions):
- |  |   |
|--|---|
| <input type="checkbox"/> Government                                  | <input type="checkbox"/> Company that meets the ownership and base erosion test                         |
| <input type="checkbox"/> Tax-exempt pension trust or pension fund    | <input type="checkbox"/> Company that meets the derivative benefits test                                |
| <input type="checkbox"/> Other tax-exempt organization               | <input type="checkbox"/> Company with an item of income that meets active trade or business test        |
| <input type="checkbox"/> Publicly traded corporation                 | <input type="checkbox"/> Favorable discretionary determination by the U.S. competent authority received |
| <input type="checkbox"/> Subsidiary of a publicly traded corporation | <input type="checkbox"/> No LOB article in treaty   |
|  | <input type="checkbox"/> Other (specify Article and paragraph): _____                                   |
- c  The beneficial owner is claiming treaty benefits for U.S. source dividends received from a foreign corporation or interest from a U.S. trade or business of a foreign corporation and meets qualified resident status (see instructions).

15 **Special rates and conditions** (if applicable—see instructions):  
 The beneficial owner is claiming the provisions of Article and paragraph \_\_\_\_\_  
 of the treaty identified on line 14a above to claim a \_\_\_\_\_ % rate of withholding on (specify type of income): \_\_\_\_\_  
 Explain the additional conditions in the Article the beneficial owner meets to be eligible for the rate of withholding: \_\_\_\_\_

**Part IV Sponsored FFI**

- 16 Name of sponsoring entity: \_\_\_\_\_
- 17 **Check whichever box applies.**
- I certify that the entity identified in Part I:
- Is an investment entity;
  - Is not a QI, WP (except to the extent permitted in the withholding foreign partnership agreement), or WT; and
  - Has agreed with the entity identified above (that is not a nonparticipating FFI) to act as the sponsoring entity for this entity.
- I certify that the entity identified in Part I:
- Is a controlled foreign corporation as defined in section 957(a);
  - Is not a QI, WP, or WT;
  - Is wholly owned, directly or indirectly, by the U.S. financial institution identified above that agrees to act as the sponsoring entity for this entity; and
  - Shares a common electronic account system with the sponsoring entity (identified above) that enables the sponsoring entity to identify all account holders and payees of the entity and to access all account and customer information maintained by the entity including, but not limited to, customer identification information, customer documentation, account balance, and all payments made to account holders or payees.

**Part V Certified Deemed-Compliant Nonregistering Local Bank**18  I certify that the FFI identified in Part I:

- Operates and is licensed solely as a bank or credit union (or similar cooperative credit organization operated without profit) in its country of incorporation or organization;
- Engages primarily in the business of receiving deposits from and making loans to, with respect to a bank, retail customers unrelated to such bank and, with respect to a credit union or similar cooperative credit organization, members, provided that no member has a greater than 5% interest in such credit union or cooperative credit organization;
- Does not solicit account holders outside its country of organization;
- Has no fixed place of business outside such country (for this purpose, a fixed place of business does not include a location that is not advertised to the public and from which the FFI performs solely administrative support functions);
- Has no more than \$175 million in assets on its balance sheet and, if it is a member of an expanded affiliated group, the group has no more than \$500 million in total assets on its consolidated or combined balance sheets; and
- Does not have any member of its expanded affiliated group that is a foreign financial institution, other than a foreign financial institution that is incorporated or organized in the same country as the FFI identified in Part I and that meets the requirements set forth in this part.

**Part VI Certified Deemed-Compliant FFI with Only Low-Value Accounts**19  I certify that the FFI identified in Part I:

- Is not engaged primarily in the business of investing, reinvesting, or trading in securities, partnership interests, commodities, notional principal contracts, insurance or annuity contracts, or any interest (including a futures or forward contract or option) in such security, partnership interest, commodity, notional principal contract, insurance contract or annuity contract;
- No financial account maintained by the FFI or any member of its expanded affiliated group, if any, has a balance or value in excess of \$50,000 (as determined after applying applicable account aggregation rules); and
- Neither the FFI nor the entire expanded affiliated group, if any, of the FFI, have more than \$50 million in assets on its consolidated or combined balance sheet as of the end of its most recent accounting year.

**Part VII Certified Deemed-Compliant Sponsored, Closely Held Investment Vehicle**

20 Name of sponsoring entity: \_\_\_\_\_

21  I certify that the entity identified in Part I:

- Is an FFI solely because it is an investment entity described in Regulations section 1.1471-5(e)(4);
- Is not a QI, WP, or WT;
- Will have all of its due diligence, withholding, and reporting responsibilities (determined as if the FFI were a participating FFI) fulfilled by the sponsoring entity identified on line 20; and
- 20 or fewer individuals own all of the debt and equity interests in the entity (disregarding debt interests owned by U.S. financial institutions, participating FFIs, registered deemed-compliant FFIs, and certified deemed-compliant FFIs and equity interests owned by an entity if that entity owns 100% of the equity interests in the FFI and is itself a sponsored FFI).

**Part VIII Certified Deemed-Compliant Limited Life Debt Investment Entity**22  I certify that the entity identified in Part I:

- Was in existence as of January 17, 2013;
- Issued all classes of its debt or equity interests to investors on or before January 17, 2013, pursuant to a trust indenture or similar agreement; and
- Is certified deemed-compliant because it satisfies the requirements to be treated as a limited life debt investment entity (such as the restrictions with respect to its assets and other requirements under Regulations section 1.1471-5(f)(2)(iv)).

**Part IX Certain Investment Entities that Do Not Maintain Financial Accounts**23  I certify that the entity identified in Part I:

- Is a financial institution solely because it is an investment entity described in Regulations section 1.1471-5(e)(4)(i)(A), and
- Does not maintain financial accounts.

**Part X Owner-Documented FFI**

**Note:** This status only applies if the U.S. financial institution, participating FFI, or reporting Model 1 FFI to which this form is given has agreed that it will treat the FFI as an owner-documented FFI (see instructions for eligibility requirements). In addition, the FFI must make the certifications below.

24a  (All owner-documented FFIs check here) I certify that the FFI identified in Part I:

- Does not act as an intermediary;
- Does not accept deposits in the ordinary course of a banking or similar business;
- Does not hold, as a substantial portion of its business, financial assets for the account of others;
- Is not an insurance company (or the holding company of an insurance company) that issues or is obligated to make payments with respect to a financial account;
- Is not owned by or in an expanded affiliated group with an entity that accepts deposits in the ordinary course of a banking or similar business, holds, as a substantial portion of its business, financial assets for the account of others, or is an insurance company (or the holding company of an insurance company) that issues or is obligated to make payments with respect to a financial account;
- Does not maintain a financial account for any nonparticipating FFI; and
- Does not have any specified U.S. persons that own an equity interest or debt interest (other than a debt interest that is not a financial account or that has a balance or value not exceeding \$50,000) in the FFI other than those identified on the FFI owner reporting statement.

**Part X Owner-Documented FFI (continued)****Check box 24b or 24c, whichever applies.**

- b  I certify that the FFI identified in Part I:
- Has provided, or will provide, an FFI owner reporting statement that contains:
    - (i) The name, address, TIN (if any), chapter 4 status, and type of documentation provided (if required) of every individual and specified U.S. person that owns a direct or indirect equity interest in the owner-documented FFI (looking through all entities other than specified U.S. persons);
    - (ii) The name, address, TIN (if any), and chapter 4 status of every individual and specified U.S. person that owns a debt interest in the owner-documented FFI (including any indirect debt interest, which includes debt interests in any entity that directly or indirectly owns the payee or any direct or indirect equity interest in a debt holder of the payee) that constitutes a financial account in excess of \$50,000 (disregarding all such debt interests owned by participating FFIs, registered deemed-compliant FFIs, certified deemed-compliant FFIs, excepted NFFEs, exempt beneficial owners, or U.S. persons other than specified U.S. persons); and
    - (iii) Any additional information the withholding agent requests in order to fulfill its obligations with respect to the entity.
  - Has provided, or will provide, valid documentation meeting the requirements of Regulations section 1.1471-3(d)(6)(iii) for each person identified in the FFI owner reporting statement.
- c  I certify that the FFI identified in Part I has provided, or will provide, an auditor's letter, signed within 4 years of the date of payment, from an independent accounting firm or legal representative with a location in the United States stating that the firm or representative has reviewed the FFI's documentation with respect to all of its owners and debt holders identified in Regulations section 1.1471-3(d)(6)(v)(A)(2), and that the FFI meets all the requirements to be an owner-documented FFI. The FFI identified in Part I has also provided, or will provide, an FFI owner reporting statement of its owners that are specified U.S. persons and Form(s) W-9, with applicable waivers.

**Check box 24d if applicable (optional, see instructions).**

- d  I certify that the entity identified on line 1 is a trust that does not have any contingent beneficiaries or designated classes with unidentified beneficiaries.

**Part XI Restricted Distributor**

25a  (All restricted distributors check here) I certify that the entity identified in Part I:

- Operates as a distributor with respect to debt or equity interests of the restricted fund with respect to which this form is furnished;
- Provides investment services to at least 30 customers unrelated to each other and less than half of its customers are related to each other;
- Is required to perform AML due diligence procedures under the anti-money laundering laws of its country of organization (which is an FATF-compliant jurisdiction);
- Operates solely in its country of incorporation or organization, has no fixed place of business outside of that country, and has the same country of incorporation or organization as all members of its affiliated group, if any;
- Does not solicit customers outside its country of incorporation or organization;
- Has no more than \$175 million in total assets under management and no more than \$7 million in gross revenue on its income statement for the most recent accounting year;
- Is not a member of an expanded affiliated group that has more than \$500 million in total assets under management or more than \$20 million in gross revenue for its most recent accounting year on a combined or consolidated income statement; and
- Does not distribute any debt or securities of the restricted fund to specified U.S. persons, passive NFFEs with one or more substantial U.S. owners, or nonparticipating FFIs.

**Check box 25b or 25c, whichever applies.**

I further certify that with respect to all sales of debt or equity interests in the restricted fund with respect to which this form is furnished that are made after December 31, 2011, the entity identified in Part I:

- b  Has been bound by a distribution agreement that contained a general prohibition on the sale of debt or securities to U.S. entities and U.S. resident individuals and is currently bound by a distribution agreement that contains a prohibition of the sale of debt or securities to any specified U.S. person, passive NFFE with one or more substantial U.S. owners, or nonparticipating FFI.
- c  Is currently bound by a distribution agreement that contains a prohibition on the sale of debt or securities to any specified U.S. person, passive NFFE with one or more substantial U.S. owners, or nonparticipating FFI and, for all sales made prior to the time that such a restriction was included in its distribution agreement, has reviewed all accounts related to such sales in accordance with the procedures identified in Regulations section 1.1471-4(c) applicable to preexisting accounts and has redeemed or retired any, or caused the restricted fund to transfer the securities to a distributor that is a participating FFI or reporting Model 1 FFI securities which were sold to specified U.S. persons, passive NFFEs with one or more substantial U.S. owners, or nonparticipating FFIs.

**Part XII Nonreporting IGA FFI**26  I certify that the entity identified in Part I:

- Meets the requirements to be considered a nonreporting financial institution pursuant to an applicable IGA between the United States and \_\_\_\_\_ . The applicable IGA is a  Model 1 IGA or a  Model 2 IGA; and is treated as a \_\_\_\_\_ under the provisions of the applicable IGA or Treasury regulations (if applicable, see instructions);
- If you are a trustee documented trust or a sponsored entity, provide the name of the trustee or sponsor \_\_\_\_\_ .  
The trustee is:  U.S.  Foreign

**Part XIII Foreign Government, Government of a U.S. Possession, or Foreign Central Bank of Issue**27  I certify that the entity identified in Part I is the beneficial owner of the payment, and is not engaged in commercial financial activities of a type engaged in by an insurance company, custodial institution, or depository institution with respect to the payments, accounts, or obligations for which this form is submitted (except as permitted in Regulations section 1.1471-6(h)(2)).**Part XIV International Organization**

Check box 28a or 28b, whichever applies.

28a  I certify that the entity identified in Part I is an international organization described in section 7701(a)(18).b  I certify that the entity identified in Part I:

- Is comprised primarily of foreign governments;
- Is recognized as an intergovernmental or supranational organization under a foreign law similar to the International Organizations Immunities Act or that has in effect a headquarters agreement with a foreign government;
- The benefit of the entity's income does not inure to any private person; and
- Is the beneficial owner of the payment and is not engaged in commercial financial activities of a type engaged in by an insurance company, custodial institution, or depository institution with respect to the payments, accounts, or obligations for which this form is submitted (except as permitted in Regulations section 1.1471-6(h)(2)).

**Part XV Exempt Retirement Plans**

Check box 29a, b, c, d, e, or f, whichever applies.

29a  I certify that the entity identified in Part I:

- Is established in a country with which the United States has an income tax treaty in force (see Part III if claiming treaty benefits);
- Is operated principally to administer or provide pension or retirement benefits; and
- Is entitled to treaty benefits on income that the fund derives from U.S. sources (or would be entitled to benefits if it derived any such income) as a resident of the other country which satisfies any applicable limitation on benefits requirement.

b  I certify that the entity identified in Part I:

- Is organized for the provision of retirement, disability, or death benefits (or any combination thereof) to beneficiaries that are former employees of one or more employers in consideration for services rendered;
- No single beneficiary has a right to more than 5% of the FFI's assets;
- Is subject to government regulation and provides annual information reporting about its beneficiaries to the relevant tax authorities in the country in which the fund is established or operated; and

(i) Is generally exempt from tax on investment income under the laws of the country in which it is established or operates due to its status as a retirement or pension plan;

(ii) Receives at least 50% of its total contributions from sponsoring employers (disregarding transfers of assets from other plans described in this part, retirement and pension accounts described in an applicable Model 1 or Model 2 IGA, other retirement funds described in an applicable Model 1 or Model 2 IGA, or accounts described in Regulations section 1.1471-5(b)(2)(i)(A));

(iii) Either does not permit or penalizes distributions or withdrawals made before the occurrence of specified events related to retirement, disability, or death (except rollover distributions to accounts described in Regulations section 1.1471-5(b)(2)(i)(A) (referring to retirement and pension accounts), to retirement and pension accounts described in an applicable Model 1 or Model 2 IGA, or to other retirement funds described in this part or in an applicable Model 1 or Model 2 IGA); or

(iv) Limits contributions by employees to the fund by reference to earned income of the employee or may not exceed \$50,000 annually.

c  I certify that the entity identified in Part I:

- Is organized for the provision of retirement, disability, or death benefits (or any combination thereof) to beneficiaries that are former employees of one or more employers in consideration for services rendered;
- Has fewer than 50 participants;
- Is sponsored by one or more employers each of which is not an investment entity or passive NFFE;
- Employee and employer contributions to the fund (disregarding transfers of assets from other plans described in this part, retirement and pension accounts described in an applicable Model 1 or Model 2 IGA, or accounts described in Regulations section 1.1471-5(b)(2)(i)(A)) are limited by reference to earned income and compensation of the employee, respectively;
- Participants that are not residents of the country in which the fund is established or operated are not entitled to more than 20% of the fund's assets; and
- Is subject to government regulation and provides annual information reporting about its beneficiaries to the relevant tax authorities in the country in which the fund is established or operates.

**Part XV Exempt Retirement Plans (continued)**

- d  I certify that the entity identified in Part I is formed pursuant to a pension plan that would meet the requirements of section 401(a), other than the requirement that the plan be funded by a trust created or organized in the United States.
- e  I certify that the entity identified in Part I is established exclusively to earn income for the benefit of one or more retirement funds described in this part or in an applicable Model 1 or Model 2 IGA, or accounts described in Regulations section 1.1471-5(b)(2)(i)(A) (referring to retirement and pension accounts), or retirement and pension accounts described in an applicable Model 1 or Model 2 IGA.
- f  I certify that the entity identified in Part I:
- Is established and sponsored by a foreign government, international organization, central bank of issue, or government of a U.S. possession (each as defined in Regulations section 1.1471-6) or an exempt beneficial owner described in an applicable Model 1 or Model 2 IGA to provide retirement, disability, or death benefits to beneficiaries or participants that are current or former employees of the sponsor (or persons designated by such employees); or
  - Is established and sponsored by a foreign government, international organization, central bank of issue, or government of a U.S. possession (each as defined in Regulations section 1.1471-6) or an exempt beneficial owner described in an applicable Model 1 or Model 2 IGA to provide retirement, disability, or death benefits to beneficiaries or participants that are not current or former employees of such sponsor, but are in consideration of personal services performed for the sponsor.

**Part XVI Entity Wholly Owned by Exempt Beneficial Owners**

- 30  I certify that the entity identified in Part I:
- Is an FFI solely because it is an investment entity;
  - Each direct holder of an equity interest in the investment entity is an exempt beneficial owner described in Regulations section 1.1471-6 or in an applicable Model 1 or Model 2 IGA;
  - Each direct holder of a debt interest in the investment entity is either a depository institution (with respect to a loan made to such entity) or an exempt beneficial owner described in Regulations section 1.1471-6 or an applicable Model 1 or Model 2 IGA.
  - Has provided an owner reporting statement that contains the name, address, TIN (if any), chapter 4 status, and a description of the type of documentation provided to the withholding agent for every person that owns a debt interest constituting a financial account or direct equity interest in the entity; and
  - Has provided documentation establishing that every owner of the entity is an entity described in Regulations section 1.1471-6(b), (c), (d), (e), (f) and/or (g) without regard to whether such owners are beneficial owners.

**Part XVII Territory Financial Institution**

- 31  I certify that the entity identified in Part I is a financial institution (other than an investment entity) that is incorporated or organized under the laws of a possession of the United States.

**Part XVIII Excepted Nonfinancial Group Entity**

- 32  I certify that the entity identified in Part I:
- Is a holding company, treasury center, or captive finance company and substantially all of the entity's activities are functions described in Regulations section 1.1471-5(e)(5)(i)(C) through (E);
  - Is a member of a nonfinancial group described in Regulations section 1.1471-5(e)(5)(i)(B);
  - Is not a depository or custodial institution (other than for members of the entity's expanded affiliated group); and
  - Does not function (or hold itself out) as an investment fund, such as a private equity fund, venture capital fund, leveraged buyout fund, or any investment vehicle with an investment strategy to acquire or fund companies and then hold interests in those companies as capital assets for investment purposes.

**Part XIX Excepted Nonfinancial Start-Up Company**

- 33  I certify that the entity identified in Part I:
- Was formed on (or, in the case of a new line of business, the date of board resolution approving the new line of business) \_\_\_\_\_ (date must be less than 24 months prior to date of payment);
  - Is not yet operating a business and has no prior operating history or is investing capital in assets with the intent to operate a new line of business other than that of a financial institution or passive NFFE;
  - Is investing capital into assets with the intent to operate a business other than that of a financial institution; and
  - Does not function (or hold itself out) as an investment fund, such as a private equity fund, venture capital fund, leveraged buyout fund, or any investment vehicle whose purpose is to acquire or fund companies and then hold interests in those companies as capital assets for investment purposes.

**Part XX Excepted Nonfinancial Entity in Liquidation or Bankruptcy**

- 34  I certify that the entity identified in Part I:
- Filed a plan of liquidation, filed a plan of reorganization, or filed for bankruptcy on \_\_\_\_\_;
  - During the past 5 years has not been engaged in business as a financial institution or acted as a passive NFFE;
  - Is either liquidating or emerging from a reorganization or bankruptcy with the intent to continue or recommence operations as a nonfinancial entity; and
  - Has, or will provide, documentary evidence such as a bankruptcy filing or other public documentation that supports its claim if it remains in bankruptcy or liquidation for more than 3 years.

**Part XXI 501(c) Organization**35  I certify that the entity identified in Part I is a 501(c) organization that:

- Has been issued a determination letter from the IRS that is currently in effect concluding that the payee is a section 501(c) organization that is dated \_\_\_\_\_; or
- Has provided a copy of an opinion from U.S. counsel certifying that the payee is a section 501(c) organization (without regard to whether the payee is a foreign private foundation).

**Part XXII Nonprofit Organization**36  I certify that the entity identified in Part I is a nonprofit organization that meets the following requirements.

- The entity is established and maintained in its country of residence exclusively for religious, charitable, scientific, artistic, cultural or educational purposes;
- The entity is exempt from income tax in its country of residence;
- The entity has no shareholders or members who have a proprietary or beneficial interest in its income or assets;
- Neither the applicable laws of the entity's country of residence nor the entity's formation documents permit any income or assets of the entity to be distributed to, or applied for the benefit of, a private person or noncharitable entity other than pursuant to the conduct of the entity's charitable activities or as payment of reasonable compensation for services rendered or payment representing the fair market value of property which the entity has purchased; and
- The applicable laws of the entity's country of residence or the entity's formation documents require that, upon the entity's liquidation or dissolution, all of its assets be distributed to an entity that is a foreign government, an integral part of a foreign government, a controlled entity of a foreign government, or another organization that is described in this part or escheats to the government of the entity's country of residence or any political subdivision thereof.

**Part XXIII Publicly Traded NFFE or NFFE Affiliate of a Publicly Traded Corporation**

Check box 37a or 37b, whichever applies.

37a  I certify that:

- The entity identified in Part I is a foreign corporation that is not a financial institution; and
- The stock of such corporation is regularly traded on one or more established securities markets, including \_\_\_\_\_ (name one securities exchange upon which the stock is regularly traded).

b  I certify that:

- The entity identified in Part I is a foreign corporation that is not a financial institution;
- The entity identified in Part I is a member of the same expanded affiliated group as an entity the stock of which is regularly traded on an established securities market;
- The name of the entity, the stock of which is regularly traded on an established securities market, is \_\_\_\_\_; and
- The name of the securities market on which the stock is regularly traded is \_\_\_\_\_.

**Part XXIV Excepted Territory NFFE**38  I certify that:

- The entity identified in Part I is an entity that is organized in a possession of the United States;
- The entity identified in Part I:
  - (i) Does not accept deposits in the ordinary course of a banking or similar business;
  - (ii) Does not hold, as a substantial portion of its business, financial assets for the account of others; or
  - (iii) Is not an insurance company (or the holding company of an insurance company) that issues or is obligated to make payments with respect to a financial account; and
- All of the owners of the entity identified in Part I are bona fide residents of the possession in which the NFFE is organized or incorporated.

**Part XXV Active NFFE**39  I certify that:

- The entity identified in Part I is a foreign entity that is not a financial institution;
- Less than 50% of such entity's gross income for the preceding calendar year is passive income; and
- Less than 50% of the assets held by such entity are assets that produce or are held for the production of passive income (calculated as a weighted average of the percentage of passive assets measured quarterly) (see instructions for the definition of passive income).

**Part XXVI Passive NFFE**40a  I certify that the entity identified in Part I is a foreign entity that is not a financial institution (other than an investment entity organized in a possession of the United States) and is not certifying its status as a publicly traded NFFE (or affiliate), excepted territory NFFE, active NFFE, direct reporting NFFE, or sponsored direct reporting NFFE.

Check box 40b or 40c, whichever applies.

- b  I further certify that the entity identified in Part I has no substantial U.S. owners (or, if applicable, no controlling U.S. persons); or
- c  I further certify that the entity identified in Part I has provided the name, address, and TIN of each substantial U.S. owner (or, if applicable, controlling U.S. person) of the NFFE in Part XXIX.



# CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

## **MVA Puissance Inc / MVA Power Inc**

Main Site: 734 rue Saint Étienne,  
L'Assomption, Québec, J5W 1Z1, Canada

has been registered by Intertek as conforming to the requirements of:

## **ISO 9001:2015**

The management system is applicable to:

Design, manufacturing and supply of structures for the power transmission, power distribution, power substations, telecommunications, and light rail networks; design, manufacture and supply of equipment, materials and components for the high voltage and medium voltage power networks, light rail and fiber optic networks individually or for turnkey packages.

**Certificate Number:**  
0097401

**Initial Certification Date:**  
19 December 2019

**Date of Certification Decision:**  
18 November 2022

**Issuing Date:**  
18 November 2022

**Valid Until:**  
18 December 2025



**intertek**



**Calin Moldovean**  
President, Business Assurance

Intertek Testing Services NA, Inc.  
900 Chelmsford Street, Lowell  
MA 01851, USA





# CERTIFICATE OF INSURANCE

This is to certify to: **To whom it may concern**  
 Named Insured: **MVA Puissance inc. & MVA Power Inc. & MVA Power Ontario Inc. & MVA Power USA**  
 734, rue St-Étienne, L'Assomption (Québec) J5W 1Z1

holds the policy(ies) of insurance as herein described.

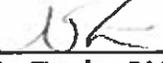
Activity and location insured: **Distributor of hardware and electrical equipment medium and high voltage**

Insurance coverage	Insurance company	Policy number	Expiry date (mm/dd/yy)	Insurance limit
<b>Commercial General Liability (Occurrence Basis)</b>  Including : <input checked="" type="checkbox"/> Products / completed operations <input checked="" type="checkbox"/> Tenant's legal liability <input checked="" type="checkbox"/> Non-owned auto policy	Aviva, Compagnie d'assurance du Canada, La Souveraine Compagnie d'Assurance Générale, Tokio Marine Canada, Compagnie d'assurance Trisura Garantie by SUM Strategic Underwriting Managers Inc.	SUM-CGI-03059-011	2025-02-19	2 000 000 \$ each occurrence  2 000 000 \$ annual aggregate limit 250 000 \$ per location 2 000 000 \$ each occurrence
<b>Automobile Liability (QPF no. 1)</b>	L'Unique Assurances générales	18501734	09/16/2024	2 000 000 \$ each occurrence
<b>Complementary Liability « Umbrella »</b>  <input checked="" type="checkbox"/> Including automobiles <input type="checkbox"/> Excluding automobiles	Aviva, Compagnie d'assurance du Canada, La Souveraine Compagnie d'Assurance Générale, Liberty Mutual Insurance Company, Tokio Marine Canada, Compagnie d'assurance Trisura Garantie SUM Strategic Underwriting Managers Inc.	SUM-EXC-03060-011	2025-02-19	5 000 000 \$ each occurrence

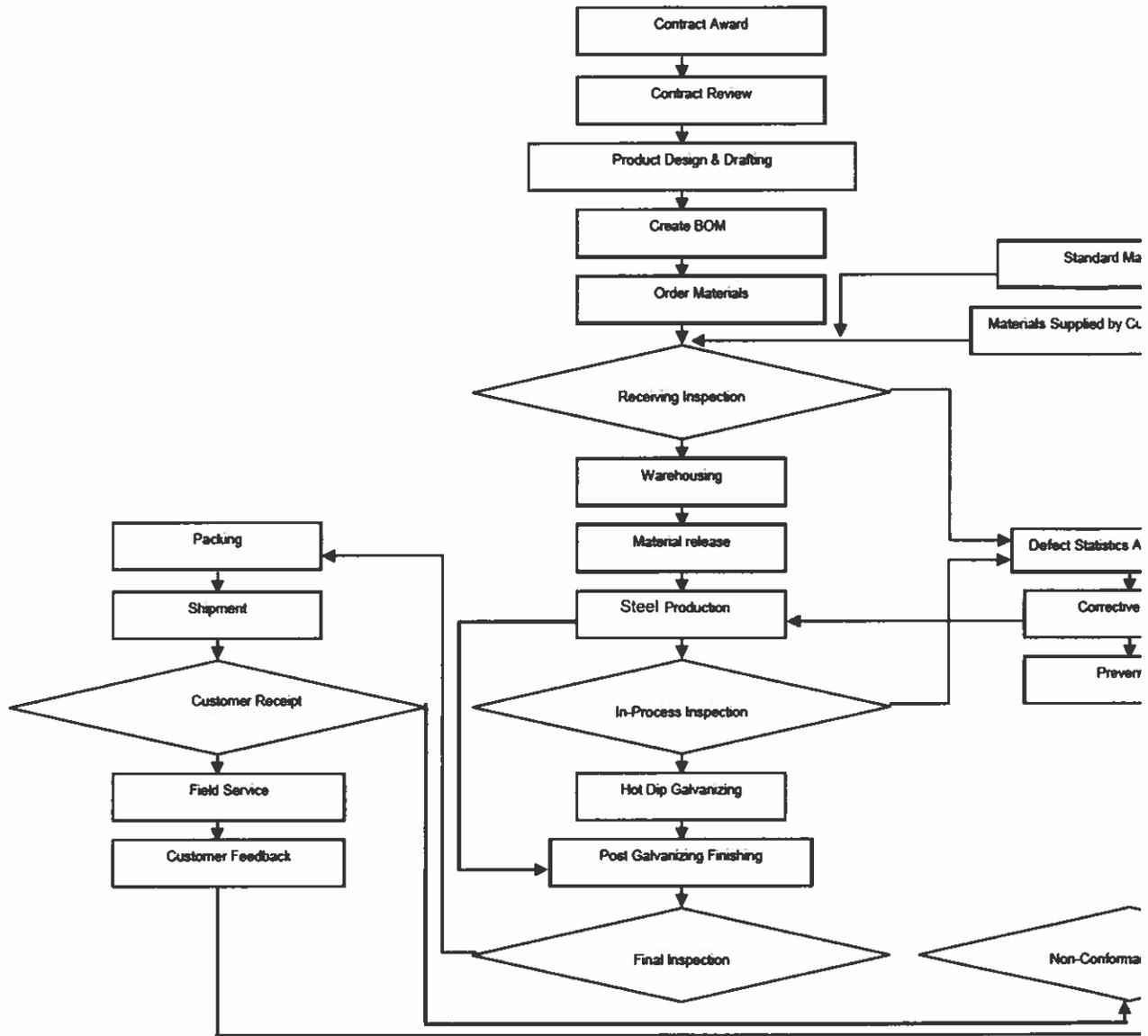
**Notes :**  
 This is to certify that the policy(ies) of insurance described herein have been issued to the Named Insured for the policy period indicated, notwithstanding any requirement, term or condition of any contract or other document with respect to which the Certificate may be issued or may pertain. The insurance afforded by the policy(ies) described herein is subject to all the terms, conditions and exclusions of such policy(ies). Limits shown may have been reduced by paid claims. This Certificate is issued as a matter of information only and confers no rights upon the Certificate Holder. This Certificate does not amend, extend or alter the coverage afforded by the policy(ies) described herein.

All values shown on this certificate are in Canadian currency.

**LANGELIER ASSURANCES INC.**

PAR :   
**Nicholas Therrien, PAA, RIBO**  
 Courtier en assurance de dommages

February 20, 2024 (mf)  
 Date



FOR MORE INFORMATION CONTACT YOUR MVA REP AT 4505890445 - MVAPOWER.COM - Page 1 o

## Hot Dip Galvanizing Processing Procedure

Reference International Standard:  
ASTM A123

### ◆ Main Processing Procedure

Raw Material Inspection → Pickling → Rinsing → Fluxing Process → Drying → Hot Dip Galvanizing

→ Cooling → Passivation → Treatment → Quality Inspection → Packing & Out Cargo.

### ◆ Raw Material Inspection

The surface of raw material shall be free of grease, oil stain, cement, paint and other contaminants, with appropriate exhausting and zinc flow holes, and have suspension points to be suitable for hot dip galvanizing.

### ◆ Acid Pickling

The oxides on the surface of materials/structures are washed by the chemical reaction with Hydrochloric Acid Aqueous Solution at a certain concentration to expose the clean surface. Pickling liquid is 30% hydrochloric acid

### ◆ Rinsing

Wash the residual acid in the surface by running water for 3~5 minutes.

### ◆ Fluxing Process

The raw materials are immersed in a mixture solution of zinc chloride and ammonium chloride to form a film on the surface to prevent oxidation on the surface and promote the reaction of zinc and iron.

### ◆ Drying Process

Wait for the surface moisture to evaporate.

### ◆ Hot Dip Galvanizing

Immerse the qualified material after pretreatment into  $445\text{ }^{\circ}\text{C}\pm 5\text{ }^{\circ}\text{C}$  99.99% pure liquid zinc, dipping commonly 2-7 minutes, slowly put forward out of liquid zinc.

Trace alloy elements(only aluminum and nickel) are added into zinc bath. The zinc content of the bath is not less than 98.5%.

### ◆ Cooling

Remove the material which was hot dip galvanized into water or on specified area to cool them down.

◆ **Passivation**

Immerse the cooled material to an aqueous solution of chromate to form a passivation film, to prevent them from growing "white rust" in a moist storage environment.

◆ **Check and Finishing**

Repair the defects that may be repaired on the surface of the galvanized parts.

For more details please refer to ASTM A780

◆ **Quality inspection**

Inspect the appearance, galvanizing thickness and adhesion as required by the contract.

◆ **Packing & Delivery**

Final packing, marking and delivery.



1 Rue Holly  
Montreal, PQ, H3X 3K6  
Tel: 450-589-0445  
Fax: 450-589-0733  
Email: info@MVAPOWER.qc.ca

# MVA Power Inc.. QUALITY MANUAL

Montreal, QC Operations

NOTE: EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THIS QUALITY MANUAL IS THE PROPERTY OF MVA Power Inc.. THIS DOCUMENT IS ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE REPRODUCED, COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF PRODUCT WITHOUT PERMISSION.

Revision Number	Effective Date	Revision Description
0	1-30-2008	Original issue

# APPROVALS

<b>NAME</b>	<b>FUNCTION</b>
Marc Hadid, Eng. (Electrical Engineer)	President MVA Power Inc.
Charly-Marc Hadid, Eng. (Industrial Engineer)	V.P. Sales & Marketing MVA Power Inc.
Ismail Ghunir	Quality Manager MVA Power Inc.
Benjamin-Avi Hadid	Shipping & Warehouse Manager MVA Power Inc.

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- 1.0 Management Responsibility
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## 1.0 MANAGEMENT RESPONSIBILITY

### 1.1 Quality Policy

The quality policy is to achieve and maintain customer satisfaction for all our products and services. Policy objectives are as follows:

- assure that products and services are *right the first time*
- deliver products and services on time to both internal and external customers
- minimize all scrap and waste

## 2.0 QUALITY SYSTEM

The quality system described in this manual is designed to meet our customer's needs in terms of product quality, on-time-delivery, customer service and product performance.

## 3.0 CONTRACT and/or SPECIFICATION REVIEW

### 3.1 General

Most purchases are made on a "commercial" basis without a specific CONTRACT or SPECIFICATION. Those purchases made on a CONTRACT and/or SPECIFICATION basis are handled as indicated below.

### 3.2 Review

If are purchased in accordance with a CONTRACT or SPECIFICATION, a preliminary review is conducted by sales to determine if there are any special or non-standard requirements. If so, the CONTRACT or SPECIFICATION is forwarded to DESIGN, MANUFACTURING ENGINEERING and QUALITY ASSURANCE for comment which may include

- expected product performance relative to customer requirements (including supporting test reports)
- cost of any non-standard testing
- time required to execute any non-standard testing
- cost of any non-standard packaging
- exceptions or clarifications to requirements contained in the CONTRACT or SPECIFICATION

### 3.3 Amendment to Contract

After MVA Power Inc.. accepts a firm order from a customer, amendments to the CONTRACT or SPECIFICATION

may still be necessary in cases where:

- the needs of the customer change sufficiently to alter the terms of the contract
- MVA Power Inc.. encounters unexpected delays in providing the product

### 3.3 Records

A record of review and response to the CONTRACT and/or SPECIFICATION is maintained in the Engineering Project File. Each project is assigned a project number (e.g. VAXXX).

## 4.0 DESIGN CONTROL

### 4.1 General

The need for a design and development project arises when:

- MVA Power Inc.. decides to enter or create a new market of products
- the customer requests MVA Power Inc.. to manufacture an unproven design

### 4.2 Design and Development Planning

Design and development projects have three distinct stages:

#### **4.2.1 Market Analysis**

An analysis is performed to determine current and future market conditions.

#### **4.2.2 Proposal to R & D Committee**

Based on market analysis, a decision is made on whether or not to prepare a proposal to present to the R & D Committee. The R & D Committee is comprised of top management, product managers and technical managers. The R & D Committee determines whether the proposal should become a formal project.

#### **4.2.3 Project Monitoring**

Project activity and status is reviewed each quarter in the R & D Committee meeting.

### **4.3 Design Input**

Design input is all the information needed to design a product. This could include one or more of the following:

- environmental conditions where the product will be installed
- product performance requirements as stated by the customer
- correspondence between the customer and MVA Power Inc. concerning design
- any industry imposed standards
- any statutory or regulatory requirements

### **4.4 Design Output**

Design output is the translation of customer or market product requirements into a product design and predicted performance. The design must be consistent with MVA Power Inc.'s manufacturing capability, thus facilitating the transition to manufacturing a prototype and ultimately a production run. The design output should:

- be verified against design input requirements and validated
- contain acceptance criteria (testing)
- identify characteristics that are crucial to safe and proper handling or use
- be reviewed and approved before release to manufacturing and sales

### **4.5 Design Review**

Design reviews are conducted by the R & D Committee on a quarterly basis. Records are maintained in the form of meeting minutes.

### **4.6 Design Validation**

Design validation is used to assure that the final design satisfies the Design Inputs and Design Outputs. Design validation includes testing of the final product design to assure that the design satisfies the defined performance criteria.

### **4.7 Design Change Request**

The need for a design change may be identified by one or more of the following:

- customer
- Application Engineering
- Design Engineering
- Manufacturing Engineering
- Manufacturing
- Materials
- Quality Assurance

### **4.8 Design Change Control**

Design Engineering is the only function approved to document, review and approve changes. Records of change are maintained in Project Files and detailed on drawing revision notes.

## 5.0 DOCUMENT CONTROL

### 5.1 General

Documents are controlled to ensure that:

- information is easily accessible at appropriate locations
- only current revisions of documents are in use at all times
- obsolete documents are discarded

Two document control systems are utilized:

- LAN (local area network) based system
- Paper controlled system (limited use)

Complete system description is done according to customers requests & specifications for Doc Control (if applicable). In other cases, MVA Power keeps documents secure in paper & electronic copies for easy access when needed (i.e. MRB – Material Requirement Book or Project Book).

### 5.2 Document and Data Approval & Issue

#### 5.2.1 Approval

All documents and data are approved and reviewed for adequacy by authorized associates, or their delegate, prior to release.

##### 5.2.1.1 LAN Controlled Documents

Electronic media documents are approved using the LAN document control system.

##### 5.2.1.2 Paper Controlled Documents

Paper controlled documents are approved by the author, or person currently performing that function.

#### 5.2.2 Issue

##### 5.2.2.1 LAN Controlled Documents

LAN documents are kept in a secure location on the LAN which is accessible by MVA Power Inc. associates, for use when needed. Hard copies on LAN documents can be printed; but, a watermark will appear on those hard copies indicating “valid only (date of print)”.

##### 5.2.2.2 Paper Controlled Documents

Paper documents are controlled and issued by the originator, or person currently performing that function.

#### 5.2.3 Current Revision Status

The LAN document control system includes a document index. This index identifies each document with the appropriate status, as follows:

- document number assigned
- document routing for approval
- approved
- obsolete

### 5.3 Document and Data Change

Document and data changes are reviewed and approved by the function that approved the original document.

## 6.0 PURCHASING

**6.1 General**

Purchasing of raw material, semi-finished goods and finished product for resale is based on reference numbers, referred to as "item numbers". Item numbers are set-up, maintained and controlled by the Engineering Department. The item number master includes the name of qualified supplier(s), the appropriate drawing number and any special instructions that need to be communicated to the supplier on the PO.

**6.2 Supplier Evaluation**

Suppliers of critical products are evaluated to ensure that they are capable of meeting MVA Power Inc. requirements.

**6.2.1 Evaluation Methods**

MVA Power Inc. qualifies major suppliers by means of review of their ISO9000 certificate, QA Manual, Reference list & contacts or a visit to the supplier's facility. A new or existing supplier must submit samples for "1st article" approval on any article manufactured for the first time. Following 1st article approval, that article/supplier is qualified.

MVA POWER INC.. evaluates each supplier's capability by means of product receipt inspection on at least the first four consecutive receipts after 1<sup>st</sup> article approval.

MVA POWER INC.. evaluates major supplier's quality systems by means of a visit to the supplier's facility and by the review of their quality manual & NCR Reports on similar project scopes.

**6.3 Purchasing Data**

Suppliers are sent a purchase order that precisely identifies the material being ordered. This may include one or more of the following:

- product description
- supplier or customer's drawing number (contains technical and quality requirements)
- special manufacturing requirements
- material description

On certain critical products, suppliers are provided with a Material Specification which contains a complete description of technical and quality requirements.

**6.4 Purchase Order Approval**

The planner/buyers have the authority to purchase existing items from existing suppliers. New suppliers of existing items or new items are evaluated as previously described. New raw material items are reviewed to assure conformance to necessary technical and quality requirements prior to authorization to add the item to the purchasing data base.

**6.5 Verification of Materials at Point of Manufacture**

MVA POWER INC.. does not normally perform verification of materials at the supplier's manufacturing facility.

**7.0 CONTROL OF CUSTOMER SUPPLIED MATERIAL**

MVA Power Inc. does not currently use customer supplied material. If such activity developed, the Materials Manager is responsible for documenting and implementing the appropriate procedures.

**8.0 PRODUCT IDENTIFICATION AND TRACEABILITY****8.1 Identification**

Product is identified at receipt and at all stages of production, delivery and installation.

**8.1.1 At Receipt**

All raw materials, semi-finished goods and finished goods for resale are identified according to MVA Power Inc or client requirements, as specified on drawings and/or item master detail.

### **8.1.2 During Production**

All sub-assembly components and all finished assemblies are identified with a unique manufacturing number. This identifying number travels with the components throughout manufacturing.

### **8.1.3 Finished Goods Inventory, Delivery and Installation**

At a minimum, each finished assembly is identified with the MVA Power Inc. catalog number.

## **8.2 Traceability**

On every contract, traceability from receipt thru manufacturing to finished goods is rigidly controlled. Receipts are traceable to a specific project number, PO number or item description.

Production lots are stored-in and shipments are traceable-to specific inventory locations; but one or more production lots may be in the same inventory location.

## **9.0 PROCESS CONTROL**

### **9.1 Planning and Work Instructions**

Discrete job travelers accompany each production lot throughout its manufacturing cycle. The Discrete Job Traveler provides the order of operations and work instructions for each operation.

### **9.2 Special Processes**

Special processes (where applicable) include Magnetic Particle Inspection, Heat Treating and Welding. These processes are qualified, monitored and controlled as follows:

Magnetic Particle Inspection is performed by a trained and certified inspector.

Heat Treating is verified by mechanical test reports (T,Y,E) or hardness test reports.

Welding is done using qualified procedures, welding procedure specifications and certified welders.

## **10.0 INSPECTION AND TESTING**

### **10.1 General**

Inspection and/or testing is conducted at three critical process steps: Receiving, Manufacturing, Finished Production.

### **10.2 Receiving Inspection**

All materials designated for use in product manufacturing and all finished goods purchased and designated for sale with MVA Power Inc. products are subjected to Receiving Inspection. The following types of materials are actually inspected:

- Any product from a new supplier
- Any new product from existing supplier
- Any product that is found defective during manufacturing
- Certain critical products

Articles are inspected according to various Receiving Inspection Checklists (BOL – Bill of Lading) and/or drawings.

Inspection includes verification of any required supplier certifications and in-house testing as specified in the Receiving Inspection Checklist. Receiving Inspection is conducted in a designated area. Items are moved from Receiving Inspection only upon authorization by the Receiving Inspection function.

### **10.3 Manufacturing Quality Control**

Each manufacturing plant is responsible for product quality exiting that plant. A quality process flow chart is used at each plant. This flow chart details how quality is to be controlled and what quality records are to be made. A quality record is generated for each production lot at each

plant.

#### **10.4 Final Inspection and Testing**

Each completed production lot is submitted to Final Inspection. These lots are inspected based on requirements specified on drawings and in manufacturing instructions that are routed with each lot. In addition, Inspection Checklists detail inspection and test instructions for many types of products. A record of each inspection is maintained. The system for handling non-conforming product is described later in this manual.

### **11.0 CONTROL OF INSPECTION, MEASURING and TEST EQUIPMENT**

#### **11.1 General**

Procedures to control, calibrate and maintain measuring and test equipment are documented.

#### **11.2 Control Procedure**

Inspection, measuring and test equipment are controlled by:

- selecting appropriate test equipment that is capable of the necessary accuracy and precision defined by the measurements that need to be made
- identifying all test equipment with a unique equipment number, calibration status, technician (or external service) that performed the calibration and next calibration date
- calibrating and adjusting at predefined intervals against recognized industry standards, or in the cases where no standards exist, documenting the basis of calibration
- documenting details of equipment type, unique identification, location, frequency of checks, check method, acceptance criteria, action taken when acceptance criteria is not met and records for all calibrations performed
- accessing and documenting the validity of test records produced from equipment that has been found to be out of calibration
- ensuring that environmental conditions are appropriate for calibration (both internal and external) and tests being performed
- assuring that proper handling and storage of equipment is appropriate to maintain accuracy and fitness for use
- where appropriate, safeguarding equipment hardware and software from inadvertent adjustments that would invalidate the calibration settings

If a measurement device is found to be out of calibration, the validity of prior inspection and test results is assessed as follows:

- The device is taken out of service immediately.
- The Quality Manager is notified of the finding.
- A review of the time frame and validity of previous measurements on product produced and tested with the suspect device is evaluated for risk by the Quality Manager.
- The QA Manager reviews the finding with Production, Engineering and Sales to determine whether any action is necessary, i.e. product hold, product retest, product recall.

### **12.0 INSPECTION and TEST STATUS**

Inspection Status and Inspection data are documented at each manufacturing work center as part of the Quality At The Source system. Each operation, when complete, is "signed-off" on the manufacturing order (MO) by the operator at each work center. Inspection and Test Status is also documented at Final Inspection. Should all or part of a production lot fail inspection or test, such failure is noted on the manufacturing order and handled as described in another section of this manual.

### **13.0 CONTROL OF NON-CONFORMING PRODUCT**

#### **13.1 General**

Non-conforming material is documented on a Non-Conforming Material Inspection Report (NCMIR). The NCMIR identifies the non-conforming material, documents the type of non-conformance and

provides for material review, disposition and corrective action.

### **13.2 Types of Non-conforming Product**

Non-conforming product is identified as TYPE I or TYPE II. Quality Assurance Technicians are authorized to execute the review, disposition and corrective action on TYPE I non-conforming product. TYPE II non-conforming product is submitted to the Material Review Board (MRB).

### **13.3 Material Review Board**

The Material Review Board (MRB) consists of the Manufacturing Team Manager, the Quality Team Manager and the appropriate Application/Design Engineer. The MRB must reach consensus regarding disposition and corrective action. In cases where the non-conforming condition does not effect function of the part, customer input may be requested and considered.

### **13.4 Disposition of Non-conforming Product**

Disposition includes the following options:

- accept as-is
- rework and reinspect
- sort and remanufacture shortage
- scrap and remanufacture

### **13.5 Corrective Action**

The NCMIR provides for determination of the root cause and specifies corrective action which may include such things as:

- retraining of manufacturing associate
- process capability studies
- modifications to drawings, drawing tolerances
- modifications to manufacturing procedures
- modifications to Quality At The Source procedures

## **14.0 HANDLING, STORAGE, PACKAGING, PRESERVATION and DELIVERY**

### **14.1 Handling**

All raw material, sub-assemblies and finished product are handled to prevent damage and deterioration. Large items are handled with fork lifts operated by associates with specific training and certification.

### **14.2 Storage**

All raw materials are stored in designated and controlled warehouse locations to prevent damage and to facilitate inventory control. All in-process material is stored in staging areas behind the next process.

### **14.3 Packaging**

Packaging and marking requirements are specified on the manufacturing order and supplemented by additional instructions on the packing request sheet known as the "pick".

### **14.4 Preservation**

Many components are sealed in bio-degradable waterproof plastic. The plastic bio-degrades after about six months of exposure to sunlight. Standard shipping containers are heavy duty water resistant cardboard.

### **14.5 Delivery**

The method of shipment is determined on a "least cost" basis unless otherwise specified by the customer.

## **15.0 CONTROL OF QUALITY RECORDS**

### **15.1 General**

Quality records are maintained to demonstrate conformance of products and processes to specified requirements.

### **15.2 Types of Quality Records**

Quality records include, but are not limited to, the following:

- Material purchasing records
- Receiving Inspection (Receipt Traveler)
- Supplier Certification of Conformance or Test Reports
- Inventory Control Records
- Manufacturing procedures
- Manufacturing quality records
- Quality Assurance inspection and test records

### **16.0 INTERNAL QUALITY AUDITS**

Quality at the Source is audited on a daily basis to ensure that plant quality records are reliable and complete.

### **17.0 TRAINING**

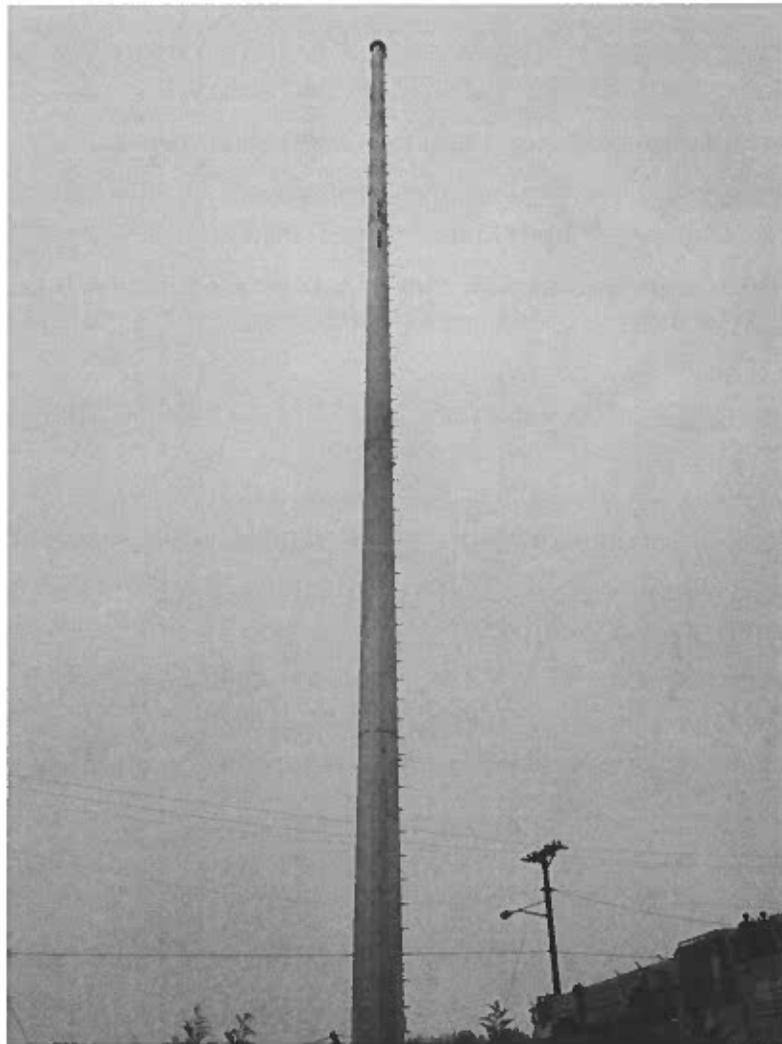
All associates are required to complete a variety of training activities. A training record is maintained for each associate. Periodic audits are conducted to assure that each associate's training requirements are current and updated, if needed.

### **18.0 SERVICING MANUFACTURED GOODS**

MVA POWER INC.. does not provide servicing to manufactured goods. MVA POWER INC.. does provide field service consultation upon customer request.

# MVA POWER

## Standard Tower Assembly Manual



**MVA**  
**POWER INC.**

# Introduction and Safety Guidelines

## **Important!**

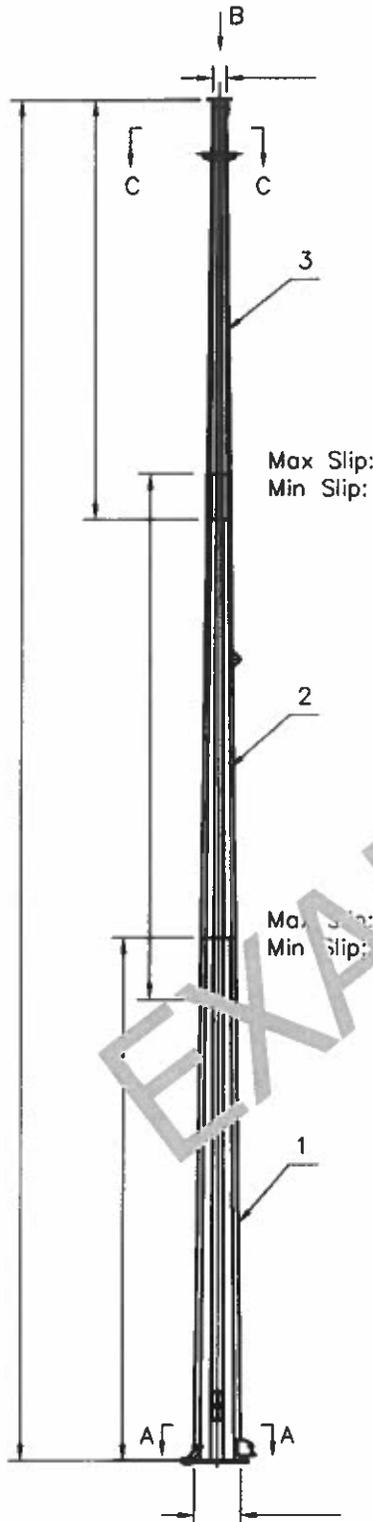
- Read through the manual in its entirety prior to assembly and installation of the tower.
- **WARNING:** Improper use may cause property damage, serious injury or death; therefore, it is highly recommended that trained professionals are installing the towers.

## **Safety**

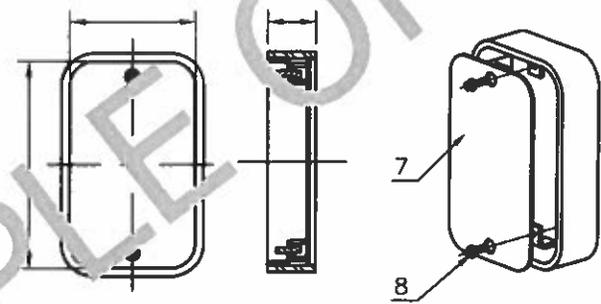
- All planning should take place prior to installation to determine the required clearance and ensure proper space for raising and lowering the tower.
- The work area should be kept clean and free from trip hazards.
- Products should be inspected for damage prior to use. If any damage is noted, parts must be replaced or repaired immediately, per manufacturer's recommendation.
- When construction or erection of free-standing objects is planned, it must be in compliance with local ordinances and local design specifications (i.e. wind speed requirements).
- Tower grounding **must** follow local ordinances. If no local ordinance is given, you may refer to the Ambor Pole Grounding Manual.
- During tower installation, all operators must wear head protection and take adequate safety precaution. **Never** leave equipment unattended while in operation.
- **NEVER** stand or walk beneath a tower in the middle of the installation. Operators must remain a minimum of two meters from the pole when operating the equipment.
- Installation and/or assembly during severe weather conditions must be avoided, especially electrical storm activity (lightening).
- Maximum allowable wind speed during installation or maintenance is 17m/s (38mph).
- **SAFETY FIRST!** Caution and common sense must be used when installing/using this product.

# Standard Tower BOM

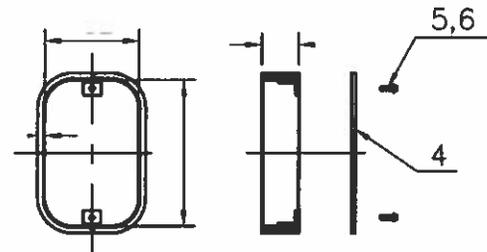
Detailed information and BOM for each order should be provided shortly after the order is shipped. Please contact your representative for detailed BOM for your tower.



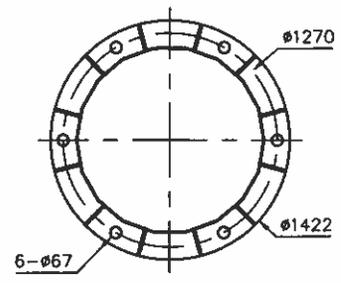
NUM	PART NUMBER	DESCRIPTION	WEIGHT	QTY
1		Section A	4250	1
2		Section B	3060	1
3		Section C	1360	1
4		Handhole Cover Assembly	2.2	1
5		Handhole Cover Assembly	12	1
6		M8x30 Socket Head Cap Screw	/	1
7		6mm Allen Wrench	/	1



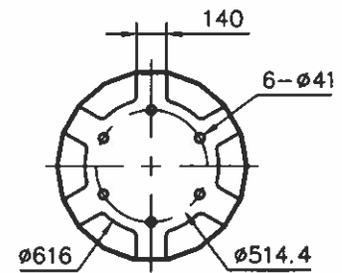
Handhole



Handhole A

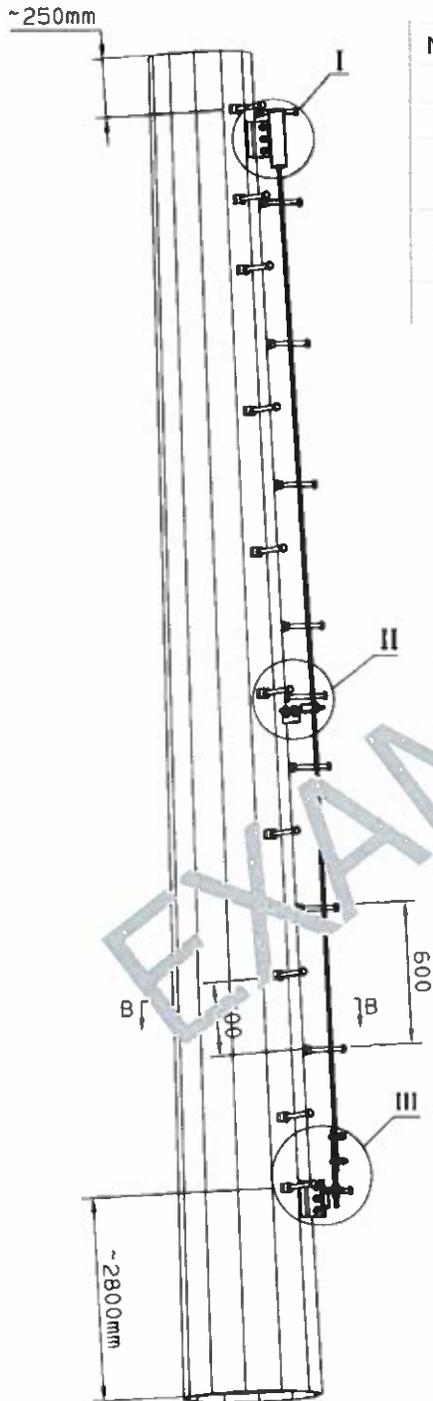


A-A

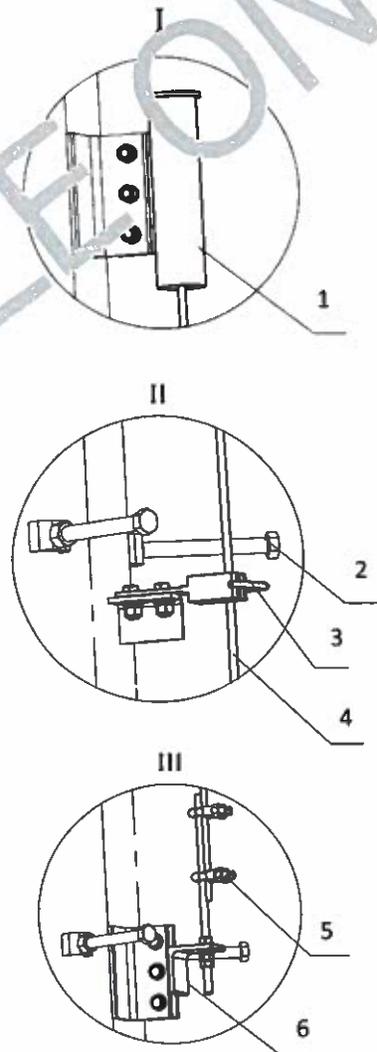


# Climbing System—Climbing Pegs BOM

Climbing Peg and Ladder System BOM are provided. Check for details specific to your order on BOM document provided to you by your sales representative.

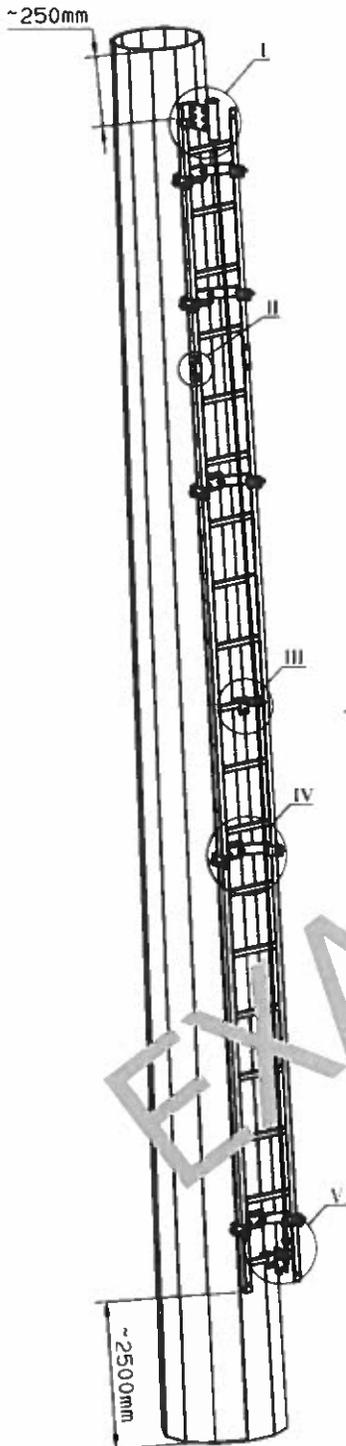


NUM	PART NUMBER	DESCRIPTION	WEIGHT	QTY
1	C500068	Top Safety Bracket		1
2		Step Bolts		var.
3	DS-6100035	Cable Guide		var.
4	DS-6110000	Steel Cable D9.3		1
5	DS-6100710	Bottom Cable Attachment		1
6	DS-6100035	Bottom Bracket		1
7		M12x50 1N1SW		var.

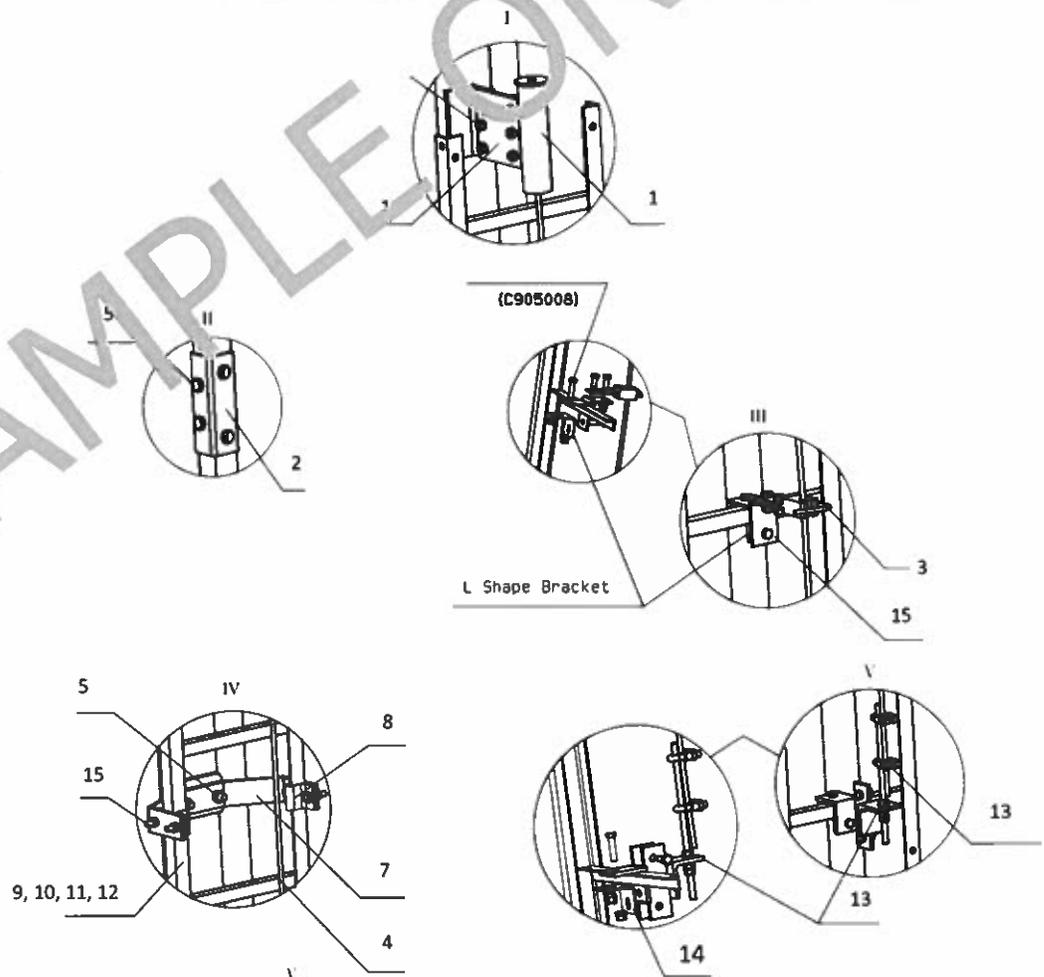


# Climbing System—Ladder BOM

Climbing Peg and Ladder System BOM are provided. Check for details specific to your order on BOM document provided to you by your sales representative.



NUM	PART NUMBER	DESCRIPTION	WEIGHT	QTY
1	C500068	Top Safety Bracket		1
2		Ladder Connection Bracket		var.
3	DS-6100035	Cable Guide		var.
4	DS-6110000	Steel Cable D9.3		1
5		Ladder Fixing Bracket		var.
6		M16x50 1N1SW		var.
7		Ladder Bracket		var.
8		U-style Ladder Clamp		var.
9		Ladder Section A		1
10		Ladder Section B		2
11		Ladder Section C		1
12		Ladder Section D		1
13	DS-6100710	Bottom Cable Assembly		1
14	DS-6100035	Bottom Bracket		1
15		M12x50 1N1SW		var.



## Prior to Tower Assembly:

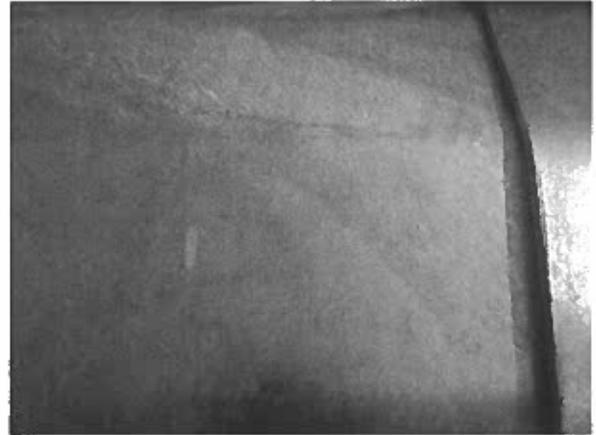
1. Check shipment and verify there are no missing items.
2. Discuss picking options with your Crane Operating Engineer. Make sure to discuss and plan out the proper pick points and complete tower erection.
3. Measure the bolts from the concrete and set each of the leveling nuts to 120mm above the concrete. Adjust each of the leveling nuts to create a level surface for the tower.



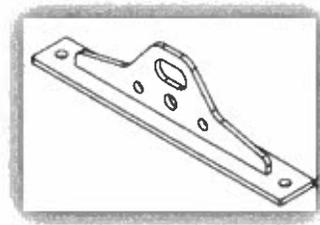
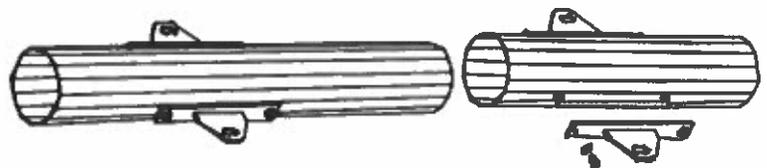
4. Place a washer on each of the leveling nuts.

## Joining Tower Sections

1. Arrange tower sections in order with the male and female ends aligned. Make sure each section is propped up off the ground to prevent damage to the tower shaft. Align the sections on the weld seams.
2. Measure and mark all slip distances. This is to make sure the tower meets the minimum slip distance and does not exceed the maximum.
3. Located near the top and bottom of each section are M24 nuts that have been welded onto the tower. Attach the all four jacking brackets or step bolt brackets to each side of the tower using the hardware provided with the jacking bracket sets. These will be used to assist in joining the sections.
4. Once all Jacking Brackets are in place, attach device to jacking bracket and pull sections together. It is up to the installer to determine the appropriate tool for achieving the pull force requirement specified below (i.e., ratchet chain hoist, ratchet binder, cable hoist, etc.).
5. For towers with more than two sections, repeat steps 2-4.



PULL FORCE REQUIREMENT	
Inner diameter (flat to flat) of the female end (mm)	Minimum Pull Force "A" Per side (kN)
<300	20
300-500	30
500-700	40
700-900	50
900-1200	60
1200-1400	80
1400-1600	100
1600-1800	120
1800-2000	150
>2000	200



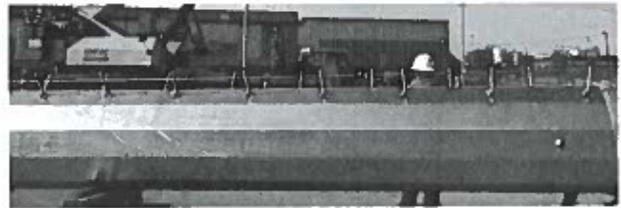
## Assembly Instructions

### Installing climbing hardware:

1. After the sections are nested together, loosely assemble climbing hardware. This could include: ladder brackets, ladder connections, step bolts, cable guides, Top Safety brackets, etc.)

**NOTE:** when lifting the sections separately with the crane, only assemble safety cable at the top safety brackets. Cable should be attached to cable guides and bottom bracket once all tower sections are fully joined.

2. Install ladder sections, but do not tighten. There will be adjustments once all sections are together.



### Installing Accessories:

1. In many cases there are accessories such as platforms or wind turbines to mount onto the tower. Most of the time these can be installed while the tower is still on the ground.
2. To install wind turbine/platform, prop up the end on a taller pallet.

**Note:** When ready to install with crane, make sure rigging is done with points that can support the weight. (i.e., outside platform members may not be rated to support weight of full tower. Attach straps to the tower)



## Assembly Instructions

1. Before lifting, double check that all leveling nuts are level.



2. Work with the Crane Operator to lift the tower into place.



3. Once the baseplate is close to the correct position, slowly lower tower on to anchor bolts. Guide by hand onto the anchor bolts.



## Assembly Instructions

1. Fasten all anchor bolts down with the washer and nuts.
2. After all anchor bolt nuts are in place, tighten each to meet recommended bolt torque specifications found on last page of this manual.





## Recommended Bolt Torque

Recommended Bolt Torque for Grade 8.8 Connection Bolts						
Bolt Size (mm)	Width Across Flats (mm)	Net Area (mm <sup>2</sup> )	Yield Stress (Mpa)	Tension Force (N)	Recommended Torque N*m	Pretension Force (N)
10	16	58	640 (8.8)	37120	37 (27 lb. ft.)	18560
12	18	84	641 (8.8)	53952	65 (48 lb. ft.)	26976
16	24	157	642 (8.8)	100480	161 (119 lb. ft.)	50240
20	30	245	643 (8.8)	156672	313 (231 lb. ft.)	78336
24	36	353	644 (8.8)	225600	541 (400 lb. ft.)	112800
27	41	459	645 (8.8)	294016	794 (586 lb. ft.)	147008
30	46	561	646 (8.8)	358784	1076 (795 lb. ft.)	1179392
33	50	694	647 (8.8)	444160	1466 (1083 lb. ft.)	222080
36	55	817	648 (8.8)	522688	1882 (1390 lb. ft.)	261344
42	65	1121	649 (8.8)	717440	3013 (2225 lb. ft.)	358720
48	75	1473	650 (8.8)	942720	4525 (3342 lb. ft.)	471360
56	85	2030	651 (8.8)	1299200	7276 (5373 lb. ft.)	469600
Recommended Bolt Torque for Anchor Bolts						
Bolt Size (mm)	Width Across Flats (mm)	Net Area (mm <sup>2</sup> )	Yield Stress (Mpa)	Tension Force (N)	Recommended Torque (N*m)	Pretension Force (N)
20	30	245	355 (45#)	86904	174 (128 lb. ft.)	43452
24	36	353	356 (45#)	125138	300 (222 lb. ft.)	62569
27	41	459	357 (45#)	163087	440 (325 lb. ft.)	81544
30	46	561	358 (45#)	199013	597 (441 lb. ft.)	99507
33	50	694	380 (GR55)	263720	870 (643 lb. ft.)	131860
36	55	817	358 (45#)	289929	1044 (777 lb. ft.)	144964
42	65	1121	359 (45#)	397955	1671 (1234 lb. ft.)	198978
48	75	1473	360 (45#)	522915	2510 (1854 lb. ft.)	261458
56	85	2030	361 (45#)	720650	4036 (2981 lb. ft.)	360325

### Notes:

- In our experience, we would prefer to apply 50% of maximum tension of the bolt as pretension force
- Pretension Torque:  $T_c = k \cdot D \cdot P_c$   
 $K = 0.2$  (According to the Machine Design Handbook)  
 $D$  – Bolt Diameter  
 $P_c$  – Pretension force

# Interseal® 670HS

## Surface Tolerant Epoxy



### PRODUCT DESCRIPTION

A low VOC, two component high build, high solids surface tolerant epoxy maintenance coating.

### INTENDED USES

For application to a wide variety of substrates including hand prepared rusty steel, abrasive blast cleaned and hydroblasted steel, and a wide range of intact, aged coatings.

Provides excellent anti-corrosive protection in industrial, coastal structures, pulp and paper plants, bridges and offshore environments in both atmospheric exposure and immersion service

### PRACTICAL INFORMATION FOR INTERSEAL 670HS

<b>Colour</b>	Available in a wide range of colours including Aluminium
<b>Gloss Level</b>	Semi-gloss (Aluminium is eggshell)
<b>Volume Solids</b>	82% ± 3% (depends on colour)
<b>Typical Thickness</b>	100-250 microns (4-10 mils) dry equivalent to 122-305 microns (4.9-12.2 mils) wet
<b>Theoretical Coverage</b>	6.56 m <sup>2</sup> /litre at 125 microns d.f.t and stated volume solids 263 sq.ft/US gallon at 5 mils d.f.t and stated volume solids
<b>Practical Coverage</b>	Allow appropriate loss factors
<b>Method of Application</b>	Airless spray, Air spray, Brush, Roller

### Drying Time ▲

Temperature	Touch Dry	Hard Dry	Overcoating Interval Interseal 670HS with Self			Overcoating Interval with recommended topcoats		
			Min	Max ●	Max †	Min	Max ●	Max †#
10°C (50°F)	8 hours	32 hours	32 hours	6 weeks	Extended*	20 hours	21 days	12 weeks
15°C (59°F)	7 hours	26 hours	26 hours	4 weeks	Extended*	14 hours	14 days	8 weeks
25°C (77°F)	5 hours	18 hours	18 hours	14 days	Extended*	10 hours	7 days	4 weeks
40°C (104°F)	2 hours	6 hours	6 hours	7 days	Extended*	4 hours	3 days	2 weeks

▲ For curing at low temperatures, an alternative curing agent is available. See Product Characteristics for details.

● Refers to situations where immersion is likely to occur

† Refer to atmospheric service only

\* See International Protective Coatings Definitions & Abbreviations

# Maximum overcoating intervals are shorter when using polysiloxane topcoats.  
Consult International Protective Coatings for further details.

### REGULATORY DATA

<b>Flash Point (Typical)</b>	Base (Part A) 36°C (97°F) Curing Agent (Part B) 56°C (133°F) Mixed 33°C (91°F)	
<b>Product Weight</b>	1.6 kg/l (13.3 lb/gal)	
<b>VOC</b>	114 g/kg 2.00 lb/gal (240 g/l) 151 g/l	EU Solvent Emissions Directive (Council Directive 1999/13/EC) EPA Method 24 Chinese National Standard GB23985

### SURFACE PREPARATION

The performance of this product will depend upon the degree of surface preparation. The surface to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Accumulated dirt and soluble salts must be removed. Dry bristle brushing will normally be adequate for accumulated dirt. Soluble salts should be removed by fresh water washing.

#### Abrasive Blast Cleaning

For immersion service, Interseal 670HS must be applied to surfaces blast cleaned to Sa2.5 (ISO 8501-1:2007) or SSPC-SP10. However, for atmospheric exposure best performance will be achieved when Interseal 670HS is applied to surfaces prepared to a minimum of Sa2.5 (ISO 8501-1:2007) or SSPC-SP6.

Surface defects revealed by the blast cleaning process, should be ground, filled, or treated in the appropriate manner.

A surface profile of 50-75 microns (2-3 mils) is recommended.

#### Hand or Power Tool Preparation

Hand or power tool clean to a minimum St2 (ISO 8501-1:2007) or SSPC-SP2.

Note, all scale must be removed and areas which cannot be prepared adequately by chipping or needle gun should be spot blasted to a minimum standard of Sa2 (ISO 8501-1:2007) or SSPC-SP6. Typically this would apply to C or D grade rusting in this standard.

#### Ultra High Pressure Hydroblasting/Abrasive Wet Blasting

May be applied to surfaces prepared to Sa2.5 (ISO 8501-1:2007) or SSPC-SP6 which have flash rusted to no worse than Grade HB2.5M (refer to International Hydroblasting Standards) or Grade SB2.5M (refer to International Slurry blasting Standards). It is also possible to apply to damp surfaces in some circumstances. Further information is available from International Protective Coatings.

#### Aged Coatings

Interseal 670HS is suitable for overcoating a limited range of intact, tightly adherent aged coatings. Loose or flaking coatings should be removed back to a firm edge. Glossy finishes may require light abrasion to provide a physical 'key'. See Product Characteristics section for further information.

### APPLICATION

<b>Mixing</b>	Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified. (1) Agitate Base (Part A) with a power agitator. (2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.								
<b>Mix Ratio</b>	5.67 parts : 1.00 part by volume								
<b>Working Pot Life</b>	<table border="0"> <tr> <td>10°C (50°F)</td> <td>15°C (59°F)</td> <td>25°C (77°F)</td> <td>40°C (104°F)</td> </tr> <tr> <td>5 hours</td> <td>3 hours</td> <td>2 hours</td> <td>1 hour</td> </tr> </table>	10°C (50°F)	15°C (59°F)	25°C (77°F)	40°C (104°F)	5 hours	3 hours	2 hours	1 hour
10°C (50°F)	15°C (59°F)	25°C (77°F)	40°C (104°F)						
5 hours	3 hours	2 hours	1 hour						
<b>Airless Spray</b>	Recommended Tip range 0.45-0.58 mm (18-23 thou) Total output fluid pressure at spray tip not less than 176 kg/cm <sup>2</sup> (2,500 p.s.i.)								
<b>Air Spray (Pressure Pot)</b>	Recommended Gun DeVilbiss MBC or JGA Air Cap 704 or 765 Fluid Tip E								
<b>Brush</b>	Recommended Typically 100-125 microns (4-5 mils) can be achieved								
<b>Roller</b>	Recommended Typically 75-100 microns (3-4 mils) can be achieved								
<b>Thinner</b>	International GTA220 Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.								
<b>Cleaner</b>	International GTA822 (or GTA415)								
<b>Work Stoppages</b>	Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.								
<b>Clean Up</b>	Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays. All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.								

## Surface Tolerant Epoxy

### PRODUCT CHARACTERISTICS

For water immersion service, surface preparation to a minimum of Sa2.5 (ISO 8501-1:2007) or SSPC-SP10 followed by application of multi-coats of Interseal 670HS to a total minimum dry film thickness of 250 microns (10 mils) is required.

Colours derived from chromascan bases as the first coat of a specification for immersion service is not recommended.

Maximum film build in one coat is best attained by airless spray. When applying by methods other than airless spray, the required film build is unlikely to be achieved. Application by air spray may require a multiple cross spray pattern to attain maximum film build. Low or high temperatures may require specific application techniques to achieve maximum film build.

If salt water is used in the wet blast process the resulting surface must be thoroughly washed with fresh water before application of Interseal 670HS. With freshly blasted surfaces a slight degree of flash rusting is allowable, and is preferable to the surface being too wet. Puddles, ponding and accumulations of water must be removed.

Interseal 670HS may be applied to suitably sealed or primed concrete; contact International Protective Coatings for further advice on specification and primers.

Interseal 670HS is suitable for overcoating intact, aged alkyd, epoxy and polyurethane systems. However, this product is not recommended where thermoplastic coatings such as chlorinated rubbers and vinyls have previously been used. Please consult International Protective Coatings for alternative recommendations.

Surface temperature must always be a minimum of 3°C (5°F) above dew point.

Level of sheen and surface finish is dependent on application method. Avoid using a mixture of application methods whenever possible.

In common with all epoxies Interseal 670HS will chalk and discolour on exterior exposure. However, these phenomena are not detrimental to anti-corrosive performance.

Premature exposure to ponding water will cause a colour change, especially in dark colours.

Interseal 670HS can be used as a non-skid deck system by modification with addition of GMA132 (crushed flint) aggregate. Application should then be to a suitably primed surface. Typical thicknesses will be between 500-1,000 microns (20-40 mils). Preferred application is by a suitable large tip hopper gun (e.g. Sagofa 429 or Air texture gun fitted with a 5-10 mm nozzle). Trowel or roller can be used for small areas. Alternatively, a broadcast method of application can be used. Consult International Protective Coatings for further details.

#### Low Temperature Curing

A winter grade curing agent is also available to enable more rapid cure at temperatures less than 10°C (50°F), however this curing agent will give an initial shade variation and more rapid discoloration on weathering.

Interseal 670HS is capable of curing at temperatures below 0°C (32°F). However, this product should not be applied at temperatures below 0°C (32°F) where there is a possibility of ice formation on the substrate.

Temperature	Touch Dry	Hard Dry	Overcoating Interval Interseal 670HS with Self			Overcoating Interval with recommended topcoats		
			Min	Max ●	Max †	Min	Max ●	Max †
-5°C (23°F)	24 hours	72 hours	72 hours	12 weeks	Extended*	72 hours	84 hours	12 weeks
0°C (32°F)	16 hours	56 hours	56 hours	10 weeks	Extended*	42 hours	54 hours	10 weeks
5°C (41°F)	9 hours	36 hours	36 hours	8 weeks	Extended*	36 hours	48 hours	8 weeks
10°C (50°F)	5 hours	24 hours	24 hours	6 weeks	Extended*	16 hours	24 hours	6 weeks

● Refers to situations where immersion is likely to occur

† Refer to atmospheric service only

\* See International Protective Coatings Definitions & Abbreviations

Touch dry times shown above are actual drying times due to chemical cure, rather than physical set due to solidification of the coating film at temperatures below 0°C (32°F).

Note: VOC values quoted are based on maximum possible for the product taking into account variations due to colour differences and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24

### SYSTEMS COMPATIBILITY

Interseal 670HS will normally be applied to correctly prepared steel substrates. However, it can be used over suitably primed surfaces. Suitable primers are:

- Intercure 200
- Interzinc 315
- Interplus 356
- Interplus 256
- Intergard 269

Where a cosmetically acceptable topcoat is required the following products are recommended:

- Intercryl 530
- Interfine 878
- Intergard 740
- Interthane 990
- Interfine 629HS
- Interfine 979
- Interthane 870

Other suitable primers/topcoats are available. Consult International Protective Coatings.

## Surface Tolerant Epoxy

### ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at [www.international-pc.com](http://www.international-pc.com).

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

### SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

PACK SIZE	Unit Size		Part A		Part B	
		Vol	Pack	Vol	Pack	
	20 litre	17 litre	20 litre	3 litre	3.7 litre	
	5 US gal	4.25 US Gal	5 US Gal	0.75 US Gal	1 US gal	

For availability of other pack sizes, contact International Protective Coatings

SHIPPING WEIGHT (TYPICAL)	Unit Size	Part A	Part B
	20 litre	30.8 kg	3.5 kg
5 US gal	64.9 lb	6.8 lb	

STORAGE	Shelf Life	
		12 months minimum at 25°C (77°F). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition. Protect from frost.

### Important Note

*The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local representative that this data sheet is current prior to using the product.*

*This Technical Data Sheet is available on our website at [www.international-marine.com](http://www.international-marine.com) or [www.international-pc.com](http://www.international-pc.com), and should be the same as this document. Should there be any discrepancies between this document and the version of the Technical Data Sheet that appears on the website, then the version on the website will take precedence.*

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[www.international-pc.com](http://www.international-pc.com)

**PRODUCT DESCRIPTION**

A two component, high build, acrylic polyurethane finish giving excellent durability and long term recoatability.

**INTENDED USES**

Suitable for use in both new construction and as an industrial maintenance finish which can be used in a wide variety of environments including offshore structures, petrochemical facilities, bridges, pulp and paper mills, and in the power industry.

Particularly designed for use in areas where a high gloss is either not desired or where a semi-gloss is the preferred option.

Provides a versatile option where overcoating of intermediates in one coat is not possible using conventional high gloss polyurethane finishes.

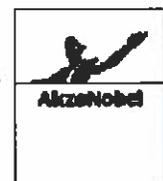
**PRACTICAL INFORMATION FOR INTERTHANE 870**

<b>Colour</b>	Wide range via the Chromascan system			
<b>Gloss Level</b>	Semi Gloss			
<b>Volume Solids</b>	56% ± 3% (depends on colour)			
<b>Typical Thickness</b>	75-125 microns (3-5 mils) dry equivalent to 134-223 microns (5.4-8.9 mils) wet			
<b>Theoretical Coverage</b>	4.50 m <sup>2</sup> /litre at 125 microns d.f.t and stated volume solids 180 sq.ft/US gallon at 5 mils d.f.t and stated volume solids			
<b>Practical Coverage</b>	Allow appropriate loss factors			
<b>Method of Application</b>	Airless Spray, Air Spray, Brush, Roller			
<b>Drying Time</b>	Overcoating Interval with recommended topcoats			
<b>Temperature</b>	<b>Touch Dry</b>	<b>Hard Dry</b>	<b>Minimum</b>	<b>Maximum</b>
5°C (41°F)	90 minutes	30 hours	30 hours	Extended <sup>1</sup>
15°C (59°F)	75 minutes	16 hours	16 hours	Extended <sup>1</sup>
25°C (77°F)	60 minutes	5 hours	5 hours	Extended <sup>1</sup>
40°C (104°F)	45 minutes	2.5 hours	2.5 hours	Extended <sup>1</sup>

<sup>1</sup> See International Protective Coatings Definitions and Abbreviations

**REGULATORY DATA**

<b>Flash Point</b>	Part A 35°C (95°F); Part B 50°C (122°F); Mixed 35°C (95°F)		
<b>Product Weight</b>	1.38 kg/l (11.5 lb/gal)		
<b>VOC</b>	3.14 lb/gal (377 g/l) 280 g/kg	EPA Method 24 EU Solvent Emissions Directive (Council Directive 1999/13/EC)	
See Product Characteristics section for further details			



**SURFACE  
PREPARATION**

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

**Primed Surfaces**

Interthane 870 should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination and Interthane 870 must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. Sa2½ (ISO 8501-1:2007) or SSPC-SP6, Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Interthane 870.

**APPLICATION**

<b>Mixing</b>	Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.			
	(1) Agitate Base (Part A) with a power agitator.			
	(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.			
<b>Mix Ratio</b>	7 part(s) : 1 part(s) by volume			
<b>Working Pot Life</b>	5°C (41°F) 7 hours	15°C (59°F) 3.5 hours	25°C (77°F) 2 hours	40°C (104°F) 45 minutes
<b>Airless Spray</b>	Recommended	Tip Range 0.43-0.58 mm (17-23 thou) Total output fluid pressure at spray tip not less than 155 kg/cm² (2204 p.s.i.)		
<b>Air Spray (Pressure Pot)</b>	Recommended	Gun Air Cap Fluid Tip	DeVilbiss MBC or JGA 704 or 765 E	
<b>Air Spray (Conventional)</b>	Suitable	Use suitable proprietary equipment		
<b>Brush</b>	Suitable	Typically 50-75 microns (2.0-3.0 mils) can be achieved		
<b>Roller</b>	Suitable	Typically 50-75 microns (2.0-3.0 mils) can be achieved		
<b>Thinner</b>	International GTA713 or International GTA733 (or International GTA056)	Do not thin more than allowed by local environmental legislation		
<b>Cleaner</b>	International GTA713, International GTA733 or International GTA056			
<b>Work Stoppages</b>	Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA713. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.			
<b>Clean Up</b>	Clean all equipment immediately after use with International GTA713. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.			
	All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.			

## PRODUCT CHARACTERISTICS

Level of sheen and surface finish are dependent on application method. Avoid using a mixture of application methods whenever possible.

Maximum film build in one coat is best attained by airless spray. When applying by methods other than airless spray, the required film build is unlikely to be achieved. Application by air spray may require a multiple cross spray pattern to attain maximum film build. Low or high temperatures may require specific application techniques to achieve maximum film build.

If application in one coat using brush and roller is desired then the undercoat shade should be chosen to match the final coat shade. Dark coloured and MIO undercoats will typically require 2 coats of Interthane 870.

When applying Interthane 870 by brush or roller, it may be necessary to apply multiple coats to achieve the total specified system dry film thickness.

Applicators should be aware that the ability to apply Interthane 870 in one coat will be affected by the temperature of the substrate. At higher steel temperatures, lower film builds and thinner coats are likely to be achieved.

This product must only be thinned using the recommended International thinners. The use of alternative thinners, particularly those containing alcohols, can severely inhibit the curing mechanism of the coating.

Do not apply at steel temperatures below 5°C (41°F).

When applying Interthane 870 in confined spaces ensure adequate ventilation.

When overcoating after weathering or ageing, ensure the coating is fully cleaned to remove all surface contamination such as oil, grease, salt crystals and traffic fumes, before application of a further coat of Interthane 870.

Condensation occurring during or immediately after application may result in a matt finish and an inferior film.

Premature exposure to ponding water will cause colour change, especially in dark colours and at low temperatures.

Absolute measured adhesion of topcoats to aged Interthane 870 is less than that to fresh material, however, it is adequate for the specified end use.

This product is not recommended for use in immersion conditions. When severe chemical or solvent splashing is likely to occur contact International Protective Coatings for information regarding suitability.

Note: VOC values are typical and are provided for guidance purpose only. These may be subject to variation depending on factors such as differences in colour and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

## SYSTEMS COMPATIBILITY

The following primers/intermediates are recommended for Interthane 870:

Intercure 200	Interplus 356
Intercure 200HS	Interseal 670HS
Intercure 420	Interzinc 52
Intercure 420HS	Interzinc 52HS
Intergard 251	Interzinc 315
Intergard 475HS	Interzone 505
Interplus 256	Interzone 954

Interthane 870 is designed only to be topcoated with itself.

For other suitable primers/intermediates, consult International Protective Coatings.

## ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at [www.international-pc.com](http://www.international-pc.com):

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

## SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

**Warning: Contains isocyanate. Wear air-fed hood for spray application.**



## Important Note

*The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local International Paint representative that this data sheet is current prior to using the product.*

Issue date: 07/07/2009

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[www.international-pc.com](http://www.international-pc.com)





ROHN Products, LLC  
● www.rohntower.com  
☎ 309-566-3000  
✉ P.O. BOX 5999 Peoria, IL 61601-5999  
📍 1 Fairholm Avenue Peoria, IL 61603-2319

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## QUOTATION Q25-11123

November 4, 2025

Rochelle Municipal Utilities

Thank you for the opportunity to meet the supply requirements of your current need. ROHN is pleased to supply the attached quotation. We have carefully reviewed your requirements and believe our proposal meets those requirements, unless otherwise noted. Please note the validity period and related terms and conditions as attached.

Please carefully review the quotation supplied. We would be happy to supply any further information you may need, which will receive our prompt and careful attention. ROHN believes you, as our valued client, should have a single point of contact for your business with ROHN. That is normally your sales contact person. Your contact can assist you by answering a wide variety of questions and bringing in additional resources as required.

**Primary Sales Contact**  
Jeff Arends  
j.arends@rohntower.com  
309-566-3004

Lastly, the entire ROHN team is here to serve your needs and requirements. Please call on any of us to assist you as needed. ROHN values both our relationship and your business.

Sincerely,

Janelle Houge  
ROHN Quotation Team  
j.houge@rohntower.com  
309-566-3017



Configuration Number:

**CU-25366**

Quotation Number:

**Q25-11123**

Quote Date: 11/04/2025

Quote Valid for: 30 Days

**Project Name: Ritchie to Centerpoint 34.5 Kv Line**

**Total Price: \$2,115,800.00**

**Total Weight: 635,607lbs.**

**Total Number of Structures: 54**

See attached page for quote details.

*Any applicable state sales tax is not included in the prices quoted (unless specified). Please provide sales tax exemption form if applicable.*

**Please note: Lead Times are estimated based on current information and can fluctuate due to production capacity. The lead times are reassessed upon receiving the Purchase Order and can vary often. Please contact ROHN to verify current lead times or if a better delivery date is possible when placing order.**

**Estimated Current Lead Time (ARO):**

**42-46 Weeks**

**Notes:**

- F.O.B: Freight allowed and pre-paid to the job site Rochelle, IL

**Quotation Number: Q25-11123**

*Please Reference this Quotation Number in Future Correspondence*



## Quotation Specific Terms:

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1. This proposal is valid for 30 days from the quotation date, unless specifically stated on quote. Please refer to ROHN Products, LLC's proposal number when submitting a purchase order.
2. Terms for materials: ROHN Product's, LLC's terms for material purchases are: net (30) days
3. This proposal is subject to the attached terms and conditions of sale.
4. Unless otherwise stated, quoted prices do not include taxes. Refer to terms and conditions of sale. Taxes will be invoiced unless an exemption certificate is provided with the order.
5. Delivery schedules are contingent upon customer's written approvals to begin fabrication and the backlog at the time of order and the availability of materials.
6. Certification of ROHN Products, LLC's product designs based on specifications provided to Rohn Products, LLC and do not include serving as a project's prime professional or engineer of record for the purposes of reviewing and coordinating documents submitted for a building permit, including deferred submittals and documents prepared by others. ROHN Products, LLC has not verified that the design parameters provided to ROHN Products, LLC for this proposal meet the requirements for the intended application or meet the requirements of the appropriate regulatory agencies. Price adjustments may apply for requirements in addition to those stated in this proposal.
7. Materials and services placed on hold for more than 15 days after placement of an order will be subject to a price review upon notification to proceed with the order. This may result in an increase to the quoted prices.
8. For structures to be shipped by the customer at the point of manufacturing, dunnage and loading charges of \$350 may apply and will be invoiced with the structure.
9. Storage charges will be .02% of invoiced amount per day with a minimum charge of \$8.00 a day. These charges will be invoiced on a monthly basis for material requested to be withheld from shipment starting 30 days from the initial notification from ROHN Products, LLC, that the material was available for shipment.
10. Additional freight may apply for optional items ordered. Prices for optional items are based on the optional items being ordered with the structure.
11. Acceptance of an order will be contingent on customer credit approval. Terms, as noted above, may be subject to change based on findings.
12. Design profile provided at time of quotation is preliminary and is subject to change based upon final design.
13. This quotation is proprietary, confidential, and a trade secret of ROHN Products LLC. This proposal is being provided for the exclusive use of our customer and is not to be disclosed to third parties.
14. Unless noted above, ROHN Products, LLC general terms and conditions (attached) apply.
15. Purchaser agrees to accept delivery on the mutually agreed upon delivery date. If this date passes, and the product is completed and staged for delivery, the purchaser acknowledges that it has accepted title to the goods.
16. ROHN Products, LLC will not be responsible for customer contractor delays during construction due to delivery delays or delivery of poles in nonsequential order or for any other contractor or construction related charges.
17. ROHN Products, LLC reserves the right to pass any tariff-induced price increases on raw steel products to the purchaser.

Quotation Number: Q25-11123

*Please Reference this Quotation Number in Future Correspondence*



11/5/2025

## Q25-11123 STRUCTURE DETAILS

Rochelle Municipal Utilities

Structure	Quantity	Unit Weight	Total Weight	Unit Price	Extended Price
STR # 1-MOD	1	11,912	11,912	\$40,500.00	\$40,500.00
Anchor Cage	1	3,594	3,594	\$9,800.00	\$9,800.00
STR # 1	1	18,415	18,415	\$62,600.00	\$62,600.00
Anchor Cage	1	3,597	3,597	\$9,800.00	\$9,800.00
STR # 7	1	18,638	18,638	\$63,350.00	\$63,350.00
Anchor Cage	1	3,597	3,597	\$9,800.00	\$9,800.00
STR # 8	1	18,415	18,415	\$62,600.00	\$62,600.00
Anchor Cage	1	3,597	3,597	\$9,800.00	\$9,800.00
Str # 14	1	16,260	16,260	\$55,250.00	\$55,250.00
Anchor Cage	1	3,496	3,496	\$9,550.00	\$9,550.00
STR # 18	1	17,141	17,141	\$58,250.00	\$58,250.00
Anchor Cage	1	3,589	3,589	\$9,800.00	\$9,800.00
STR # 19	1	19,889	19,889	\$67,600.00	\$67,600.00
Anchor Cage	1	3,602	3,602	\$9,800.00	\$9,800.00
STR # 20	1	30,891	30,891	\$104,950.00	\$104,950.00
Anchor Cage	1	5,222	5,222	\$14,200.00	\$14,200.00
STR # 21	1	12,697	12,697	\$43,150.00	\$43,150.00
Anchor Cage	1	3,471	3,471	\$9,450.00	\$9,450.00
STR #22	1	12,697	12,697	\$43,150.00	\$43,150.00
Anchor Cage	1	2,471	2,471	\$6,750.00	\$6,750.00
STR # 24	1	12,697	12,697	\$43,150.00	\$43,150.00
Anchor Cage	1	2,471	2,471	\$6,750.00	\$6,750.00
STR # 25	1	16,618	16,618	\$56,450.00	\$56,450.00
Anchor Cage	1	2,738	2,738	\$7,450.00	\$7,450.00
STR # 26	1	12,619	12,619	\$42,900.00	\$42,900.00
Anchor Cage	1	3,562	3,562	\$9,700.00	\$9,700.00
STR # 33	1	22,502	22,502	\$76,450.00	\$76,450.00
Anchor Cage	1	4,407	4,407	\$12,000.00	\$12,000.00
STR # 35	1	21,584	21,584	\$73,350.00	\$73,350.00
Anchor Cage	1	3,613	3,613	\$9,850.00	\$9,850.00
STR # 36	1	21,689	21,689	\$73,700.00	\$73,700.00
Anchor Cage	1	3,613	3,613	\$9,850.00	\$9,850.00
STR # 45	1	31,212	31,212	\$106,050.00	\$106,050.00
Anchor Cage	1	5,305	5,305	\$14,450.00	\$14,450.00
STR # 51	1	24,701	24,701	\$83,950.00	\$83,950.00
Anchor Cage	1	4,419	4,419	\$12,050.00	\$12,050.00
STR # 2	1	3,601	3,601	\$12,250.00	\$12,250.00
STR # 3	1	3,601	3,601	\$12,250.00	\$12,250.00
STR # 4	1	3,869	3,869	\$13,150.00	\$13,150.00
STR # 5	1	3,869	3,869	\$13,150.00	\$13,150.00
STR # 6	1	3,869	3,869	\$13,150.00	\$13,150.00
STR # 9	1	5,655	5,655	\$19,250.00	\$19,250.00
STR # 10	1	6,740	6,740	\$22,900.00	\$22,900.00
STR # 11	1	4,132	4,132	\$14,050.00	\$14,050.00
STR # 12	1	3,601	3,601	\$12,250.00	\$12,250.00
STR # 13	1	3,601	3,601	\$12,250.00	\$12,250.00
STR # 15	1	3,459	3,459	\$11,750.00	\$11,750.00

STR # 16	1	6,386	6,386	\$21,700.00	\$21,700.00
STR # 17	1	6,386	6,386	\$21,700.00	\$21,700.00
STR # 23	1	7,608	7,608	\$25,850.00	\$25,850.00
STR # 27	1	7,776	7,776	\$26,450.00	\$26,450.00
STR # 28	1	9,232	9,232	\$31,400.00	\$31,400.00
STR # 29	1	9,232	9,232	\$31,400.00	\$31,400.00
STR # 30	1	9,232	9,232	\$31,400.00	\$31,400.00
STR # 31	1	9,232	9,232	\$31,400.00	\$31,400.00
STR # 32	1	9,232	9,232	\$31,400.00	\$31,400.00
STR # 34	1	6,400	6,400	\$21,750.00	\$21,750.00
STR # 37	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 38	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 39	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 40	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 41	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 42	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 43	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 44	1	8,001	8,001	\$27,200.00	\$27,200.00
STR # 46	1	5,023	5,023	\$17,100.00	\$17,100.00
STR # 47	1	5,023	5,023	\$17,100.00	\$17,100.00
STR # 48	1	5,023	5,023	\$17,100.00	\$17,100.00
STR # 49	1	5,023	5,023	\$17,100.00	\$17,100.00
STR # 50	1	4,425	4,425	\$15,050.00	\$15,050.00
STR # 52	1	7,353	7,353	\$25,000.00	\$25,000.00
STR # 51 TP	1	6,075	6,075	\$20,650.00	\$20,650.00
<b>Total</b>	<b>72</b>		<b>635,607</b>		<b>\$2,115,800</b>



## ROHN Products LLC Terms and Conditions Relating to All Sales

1. All quotations, proposals, prices, or other terms are made for acceptance within 30 days (after 30 days, prices in effect at time of shipment will apply) and shipment within 30 days of purchase order date, unless otherwise stated. They are subject to change without notice; however, ROHN invites your request for an extension. Prices are also subject to review prior to acceptance of any order due to raw material price fluctuations. No other price protection is available. Any order placed on hold will have the price reviewed and adjusted upon release.
2. Every effort will be made to maintain shipping schedules, either on ROHN equipment or via common carrier. ROHN cannot be responsible for delays in shipping caused by state or local agencies with regard to permits, routing, weather, detours, etc. All deliveries and schedules are contingent on availability of raw materials, fuel, and transportation. ROHN will not be liable for damages on account of any delays or abnormalities caused in shipping due to causes beyond our reasonable control. ROHN reserves the right to make partial shipments and to submit invoices accordingly.
3. Changes or modifications to orders can be made only by written agreement executed by all parties affected thereby, which agreement shall include any price modification.
4. ROHN's responsibility ceases upon delivery of all shipments to the carrier. Prior to unloading the carrier, the buyer must visually inspect the product for any damage that may have occurred during shipment. Damages that are not noted by the buyer on ROHN's signed Bill of Lading will be the buyer's responsibility.
5. ROHN will ship monopoles and towers on dedicated flatbed trailers. The carrier's driver will determine whether the site is accessible for delivery, if the driver determines that it is impossible to reach the site without damaging the material, truck or trailer, the buyer is responsible for finding an alternative site for unloading. Buyer is liable for cost incurred because of delayed delivery beyond the control of ROHN.
6. After unloading the material, the buyer must inventory the shipment against the Bill of Material provided by ROHN and make all claims for shortages within 48 hours of delivery. ROHN will not be responsible for claims made after 48 hours of delivery.
7. The buyer will have 2 hours from the arrival time to unload the shipment. If the carrier is delayed longer than 2 hours, an additional freight charge may apply.
8. No federal, state, or local taxes are included in quoted prices. All quotations, proposals, prices, or other terms are subject to increase without notification by the amount of any sales, excise, or other tax levied or charged to seller by any governmental agency and any such tax will be passed onto purchaser as a tax or as an addition to the selling price. This also applies to all costs incurred due to local statutes or governmental regulations.
9. Orders are not subject to cancellation by Buyer except by written agreement with seller. Any order canceled, after any work has been done by ROHN, such as drawings, production, etc., will have a cancellation charge, to be determined solely at the discretion of ROHN for whatever work has been performed with a minimum of 25% of the purchase order price. If Buyer so chooses, he shall have the right to receive the material already performed at time of cancellation at the quoted price. If an order is canceled before any work has been done by ROHN, a \$200 cancellation charge will apply.
10. Material received may not be returned by Buyer except by written agreement with seller. In all cases, permission must be secured from ROHN prior to the returning of any goods for credit. All returned goods are subject to a minimum service charge of 25%, plus all transportation charges, and are subject to inspection by ROHN. Returned goods will be offered and paid for only upon proof of purchase (i.e. invoice no.) and credit will be issued against invoice value. ROHN reserves the sole right to determine the amount of credit to be issued on all goods returned for credit. Only standard, currently manufactured ROHN products may be considered for return and credit. Unsalvageable products will be scrapped and no credit will be received. If returned goods are determined to have no value and Buyer wishes them returned, the Buyer will be charged return freight. Safety equipment, erection equipment, insulators, transformers, nuts and bolts are not returnable.
11. ROHN warrants the commercial items of its manufacture only, to be reasonably fit for the purpose for which they are manufactured and sold, provided, however, that this warranty shall be effective only if purchaser installs all material according to ROHN's recommendations and specifications and that purchaser during the warranty period shall regularly, not less than semi-annually, inspect and properly maintain all items. Any item found unfit for its purpose within 12 months from date of delivery will be repaired or replaced free of charge, F.O.B. ROHN's plant. ROHN shall be immediately notified in writing of such unfitness. ROHN reserves the sole right to determine if any material is to be repaired or replaced free of charge or to be supplied at ROHN's standard prices. Such obligation shall be limited to parts returned for inspection, properly packed and expenses prepaid, and providing inspection shall satisfactorily indicate defects. The warranty herein made is in lieu of all other warranties and, except as expressly stated herein, ROHN does not make and there are no warranties or obligations of any kind or nature whatsoever either expressed or implied including, but not restricted to, warranty or obligations as to product, material, workmanship, or manufacture or as to the use of the items covered hereby. ROHN shall not under any circumstances be liable to third persons for any claims for damages including direct, special, indirect, or consequential damages for any reason. The Buyer agrees to indemnify and to hold ROHN harmless for, of, and from any loss, claims, damages, expenses and attorney's fees, including but not limited to, any fines, penalties and corrective measures ROHN may sustain by reason of Buyer's failure to comply with said laws, rules, and regulations in connection with the

performance of this sale. The above warranty applies only to items manufactured by ROHN. Items not manufactured by ROHN are guaranteed only to the extent and in the manner warranted and guaranteed to ROHN by the manufacturer of such items and then only to the extent ROHN is liable to enforce such warranty or guarantee. ROHN will assume no responsibility for the adequacy of any product if material is used which is not totally supplied by ROHN. The above sets forth the only warranty made by ROHN in connection with items manufactured or sold by it, and any provisions in any proposals, specifications, advertising, or other provisions hereof, are merely descriptive and are not to be construed as warranties made by ROHN. All warranties are void on drawings made by others, whether by a professional engineer, sealed or not, that are not rechecked by ROHN and approved by ROHN. ROHN assumes no liability for the adequacy of the drawings or the product. Without limiting the generality of the foregoing, the Buyer hereby indemnifies ROHN and holds ROHN harmless from any and all claims and/or damages (including direct, special, indirect or consequential damages, attorneys' fees and costs) relating to or arising out of any highway structure or component not designed by ROHN. ROHN hereby disclaims any and all warranties, including express or implied warranties of merchantability and fitness for any particular purpose, relating to or arising out of metal fatigue.

12. ROHN reserves the right to change or modify the product and construction of any product manufactured by ROHN and to substitute material equal to or superior to that originally specified.
13. Buyer agrees not to disclose or make available to any third-party processes, drawings, specifications, reports, photographs, data and other technical or proprietary information relating to ROHN products without obtaining prior written consent of ROHN.
14. No proposal, order, quotation, or acceptance may be changed or varied by verbal agreement, and all orders are accepted only under the provisions set forth herein.
15. Purchase orders and requests for quotations must be submitted in writing to ROHN. It is the responsibility of the Buyer or Buyer Representative to provide ROHN design criteria (environmental loads, equipment loads, operational limitations, geotechnical information, etc.) based on site-specific data. In designing the product for the Buyer, ROHN relies solely and entirely on design criteria provided by the Buyer to ROHN. Without limiting the generality of the indemnities in these Terms & Conditions, the Buyer hereby indemnifies ROHN and holds ROHN harmless from and against any and all claims and/or damages (including direct, special, indirect or consequential damages, attorneys' fees and costs) relating to or arising out of any inaccuracy or incompleteness in design criteria provided to ROHN by the Buyer, and the Buyer waives all claims against ROHN for same.
16. If outside source inspection, assembly, etc. is required prior to shipment of an order, \$50.00 per man hour (plus equipment time, if applicable) is chargeable, with \$300.00 as a minimum.
17. Any welding inspection required by Buyer or Buyer's specifications must be done at ROHN's plant prior to packing and shipment of material from ROHN's plant.
18. A minimum charge of \$25.00 will be billed for special handling and preparation of material for air shipments.
19. ROHN reserves the right to apply all remittances and credit memos to the oldest outstanding billing in your account. No credits will be issued for any reason against a purchase order whose balance is more than 90 days old. Buyer corrections or complaints must be made within this period of time.
20. Standard catalog prices do not include special drawings or product evaluations. If any are required, there will be a charge.
21. ROHN at all times reserves the right to take pictures of any or all of its products after installation for advertising purposes, except those which are under classified governmental control.
22. The Buyer will be responsible for any extra charges incurred on prepaid shipments.
23. A service charge not to exceed 2% per month or maximum allowable per State law will be billed on all accounts not paid within 30 days of invoice date.
24. Minimum total net worth of merchandise which can be ordered is \$100.00. Any orders placed for less will be billed at \$100.00.
25. Storage charges will be 0.02% of the invoice amount per day with a minimum charge of \$8.00 a day. These charges will be invoiced monthly for material requested to be withheld from shipment. Storage will begin 30 days from the date the buyer is notified that the shipment is ready for pickup or delivery.
26. All CIA requirements must be met with certified checks or money orders to insure prompt shipment.
27. Should it become necessary for ROHN to enforce the provisions of this contract, a purchase order or an invoice through pre-suit negotiations, or by instituting or participating in any legal (including bankruptcy) proceedings, including but not limited to injunctive or other equitable/legal relief, including any appeals associated with the foregoing, ROHN shall be entitled to recover for reasonable attorney's fees, costs of collection and court costs incurred whether the attorney's fees are incurred for the purpose of negotiation, trial, appellate or other legal services.
28. Once the equipment is ready for pickup or has been shipped, an invoice for payment in full shall be issued by ROHN.
29. Orders that are paid by credit card will incur a 3% surcharge processing fee at time of payment.

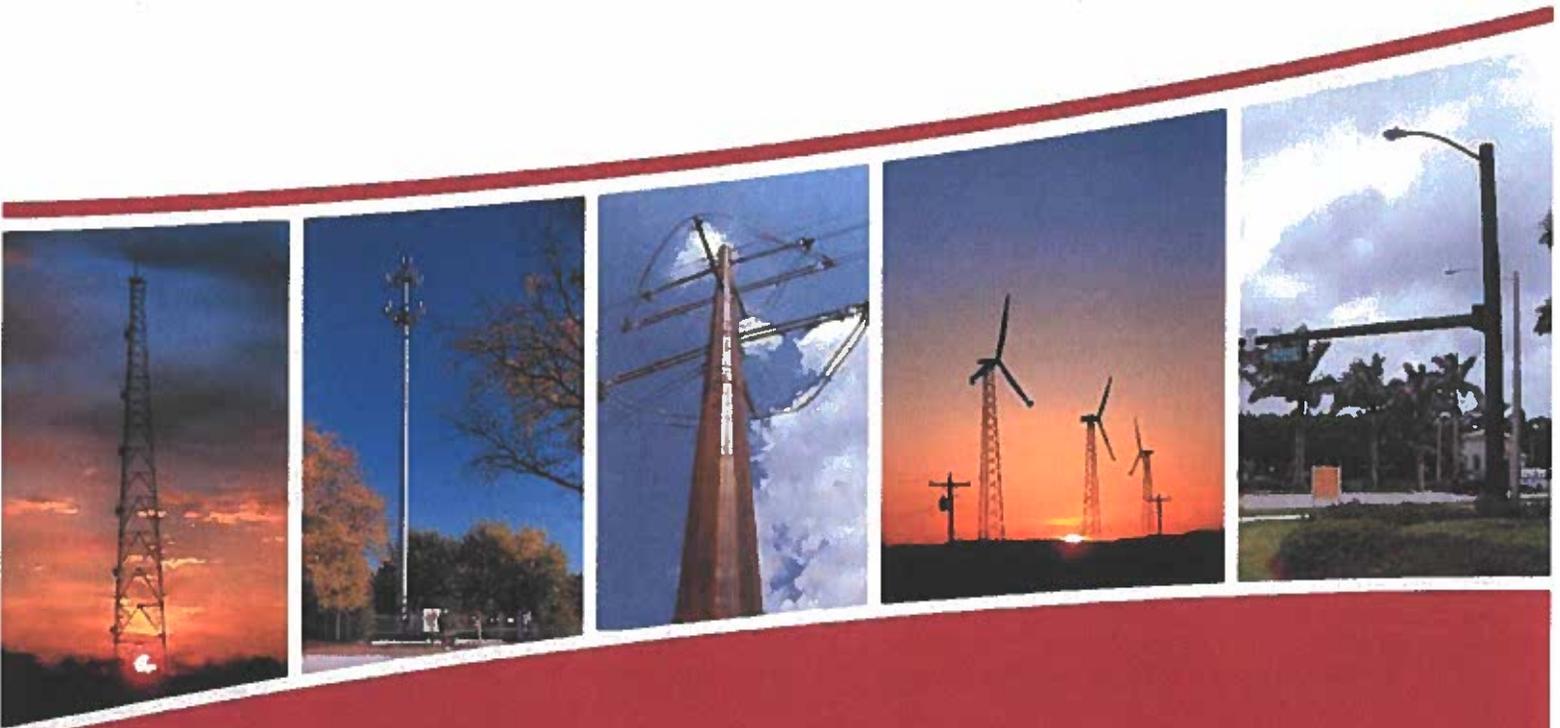
04012025

Quotation Number: Q25-11123

Please Reference this Quotation Number in Future Correspondence



# Statement of Qualifications



#1 Fairholm Avenue  
Peoria, IL 61603  
(800) 727-7646  
[www.rohnnet.com](http://www.rohnnet.com)

broadcast | wireless | sports lighting | utility | wind | transportation

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#1 Fairholm Avenue  
Peoria, IL 61603  
(800) 727-7646  
www.rohnet.com

## *Statement of Qualifications*

### **History**

ROHN has been the world leader in tower design and manufacturing for more than six decades. We continue to meet the demands of our customers with innovation in design, continuous process improvement and a drive to employ the talent and knowledge leaders in the industry. ROHN maintains one of the largest manufacturing and staging facilities in the tower industry.

Our products are used in an almost infinite array of structural applications. Below we have identified some of the markets that apply our products in very high volumes. If you have a need for a structural steel support, chances are, we have a product that will work.

#### **Communications**

ROHN towers are some of the tallest structures in the world, and we build each tower in accordance with our exacting standards for quality, performance and structural integrity. Our tall towers are helping change the way the world receives and views television signals. ROHN also offers a variety of monopole types to meet your specific communication needs. Our tapered and flanged steel poles feature designs that are aesthetically pleasing and blend well into the environment while requiring minimal space for installation. All of our steel poles are hot-dip galvanized after fabrication to ensure years of corrosion free use.

#### **Wind Energy**

ROHN Products has extensive experience in manufacturing meteorological towers in support of wind energy applications. Whatever the requirement, tapered steel poles or self-supporting towers, ROHN has the answer. ROHN provides extensive analysis on wind turbine structures, including the examination of extreme wind, extreme ice, yawing, fatigue, vibration and more. The dynamic nature of a wind turbine requires an additional investment in the analysis of the support structure to ensure the structures perform safely and efficiently.

#### **Sports Lighting**

Whatever your application - from little league baseball to a major league sports stadium, ROHN has a steel pole to do the job. Poles are available with the traditional anchor base or for direct embedment. ROHN's engineering staff will select the proper pole based on your specific requirements, considering wind speed, luminaire size, weight and quantity.

#### **Transportation Structures**

For years, ROHN has been a reliable manufacturer of high mast lighting poles for state D.O.T. projects, prisons, port authorities and other commercial projects across the country. ROHN is considered the quality leader to state, county and municipal buyers of mast arm structures. ROHN mast arms are in service at intersections as wide as 88'. In applications where a very long span is needed, and a more decorative appearance is desired, some state departments of transportation will specify monotube assemblies for tubular signal structures and sign bridge applications. ROHN also has the capability to manufacture sign structures including: overhead sign trusses, cantilever structures, butterfly structures and DMS sign structures.

#### **Utility**

ROHN fabricates transmission, distribution and substation steel - allowing the entire build to be supplied by ROHN. ROHN can accommodate transmission structures for projects ranging from light-duty in-line poles up to the largest diameter of dead-end structures. ROHN provides structures in support of power distribution with pre-engineered steel structures and larger distribution structures that can either be flanged at the base or direct embed. ROHN can supply all cross arms, uprights, H-frames and any steel frame or support to complete a substation. ROHN also fabricates switch steel structures including all static masts, buss supports, arrestor structures and all other steel components making up the switch.

## Facilities

ROHN sits on over 110 acres that is used for both material storage and staging of finished products. We have over 300,000 square feet of covered space used for manufacturing and storage. To minimize production time, we have steel vendors located on-site, keeping raw material flowing quickly into our processes.

ROHN products are hot-dip galvanized in molten zinc at temperatures above 840° at an on-site galvanizing facility. By adjusting dip time, we ensure a minimum of 2 ounces per square foot of zinc bonds to the steel.



## Manufacturing

ROHN fabricates our towers from the highest quality steel. We maintain mill certification on all raw materials that we receive to verify the material composition of each structural member. With a focus on quality, our fabrication facility has been awarded Certification by the American Institute of Steel Construction, as well as, the Canadian Welding Bureau. We are also authorized fabricators for the City of Los Angeles, CA and Clark County, NV.

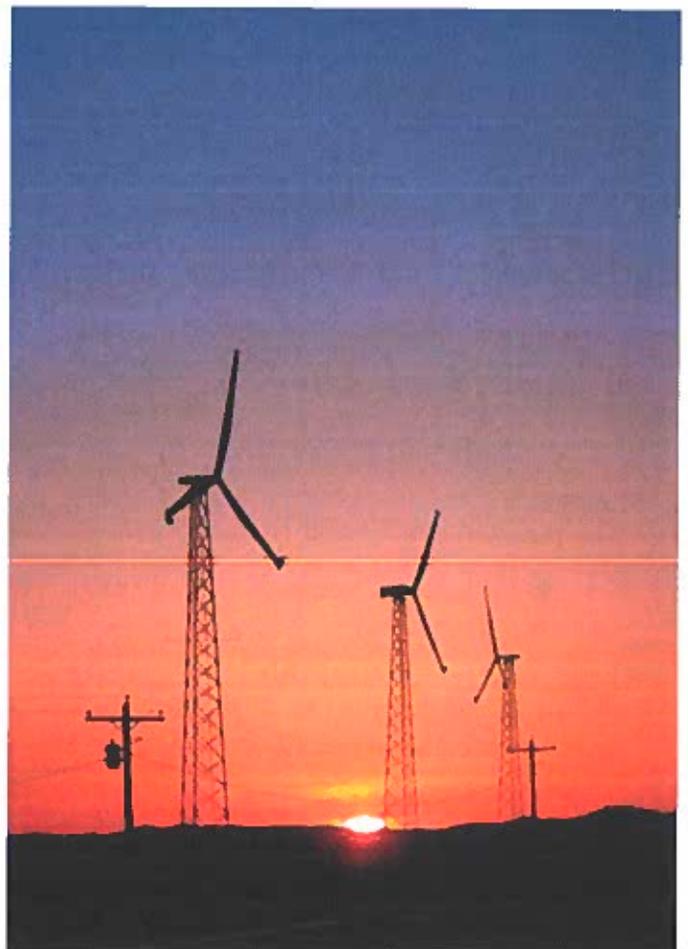
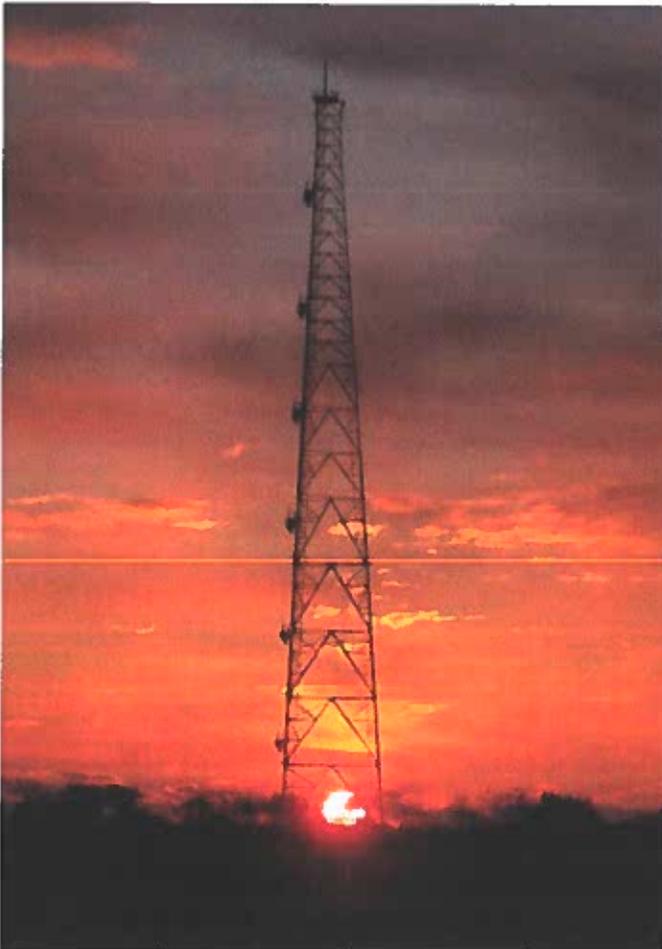
Certified welders fabricate our tower and pole steel (AWS/CWB/AISC Certification). The process includes acquiring all Mill Certifications, pre-heating select steel members prior to welding and often includes blast cleaning. ROHN uses a low-hydrogen heating process in order to achieve the best weld penetration.



## Engineering

ROHN has extensive experience in the design, fabrication and installation of poles, self-supporting towers and guyed masts. ROHN performs in-house tower and pole design, as well as in-house drafting. We hold Professional Engineering seals in 49 states, as well as the ability to certify international designs. ROHN maintains a strong presence on the EIA code board, ensuring that we are on top of the latest design standards. Professional Drafting staff prepares fabrication and construction drawings in AutoCAD. The final designs can be submitted in both hard copy format and electronically, if desired.

ROHN has designed and built unique structures including poles up to 250 feet, self-supporting towers up to 900 feet and guyed masts up to 2,000 feet. ROHN also designs and installs foundations for these types of structures.



## Quality Control

Quality control is provided by our in-house Quality Control Department. Inbound inspection of all materials prevent mis-fabricated or out-of-spec steel from entering our production process. Routine setup and process check points have been established to provide a continuous quality monitoring program for each phase of production. ROHN also performs one final inspection of steel products, prior to release.

### Qualifications:

- SNT Certified in UT & MT Inspectors
- In-house AWS, CWI Inspectors
- In-house SQB, CWI Inspectors
- In-house NDT
- Level II UT & MT
- Retained NDT Level III Support
- Mill Certification Evaluation Process

## Production & Shipping

The ROHN design consists of pre-engineered, standard tower parts that are combined to build nearly infinite options of individual tower sections and tower designs. This allows us to maintain a consistent part and kit numbering system that is easy to understand and use when erecting towers.

ROHN has used this standard design concept and process to produce towers and poles that have exceeded 100 loads shipped in one week. In one recent fiscal year, ROHN averaged over 75 loads of towers shipping from our facility per week.





#1 Fairholm Avenue  
Peoria, IL 61603  
(800) 727-7646  
[www.rohnnet.com](http://www.rohnnet.com)

*Statement of Qualifications*

---

## Contact Information

### ROHN Products, LLC

#### Headquarters

#1 Fairholm Avenue  
Peoria, IL 61603  
(309) 566-3000

#### Production Location

6718 W. Plank Road  
Peoria, IL 61604

[www.rohnnet.com](http://www.rohnnet.com)

[sales@rohnnet.com](mailto:sales@rohnnet.com)

**BID FORM**  
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**This Bid is submitted by:** ROHN Products, LLC

## Bid Form

### ARTICLE 1 - BID RECIPIENT

1.01 This Bid is submitted to:

**Rochelle Municipal Utilities  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in the Bidding Documents to furnish the Goods and Special Services as specified or indicated in the Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Bidding Documents.

### ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

### ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date
<u>1</u>	<u>10/30/2025</u>
_____	_____

B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress, or the furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations in effect as of the date of the Bid that may affect cost, progress, and the furnishing of Goods and Special Services.

(b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition.

3. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels.
4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

#### ARTICLE 5 - BASIS OF BID

5.01 **Proposal No. 1** - Bidder will furnish and deliver the equipment described in the Plans, Specifications, and Construction Drawings for the following price:

<b>Lump Sum Total Bid Price for Proposal No. 1</b>	<b>\$ 2,115,800.00</b>
--	------------------------

- A. Refer to Appendix 1 – Itemized Proposal used for tabulating unit and total price.
- B. Refer to Appendix 2 – Pole Data Summary Table for specifications on each pole.
- C. Refer to Appendix 3 – Underbuild Appurtenances Table for underbuild specification on each pole.

#### ARTICLE 6 - TIME OF COMPLETION

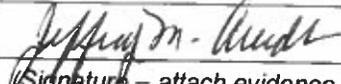
- 6.01 Bidder agrees that the material will be delivered no later than August 31, 2026, and will be completed and ready for final payment in accordance with Paragraph 14.07B of the General Conditions on or before 30 days after the delivery date of August 31, 2026.
- 6.02 The time of delivery shall be extended for any reasonable delay due extensively to causes beyond control and without the fault of the Bidder, including but not limited to acts of God, fires, strikes and floods.
- 6.03 Bidder accepts the provisions of the Agreement as to liquidated damages.

A Limited Liability Company (LLC)

LLC Name: ROHN Products, LLC

State in which organized: Illinois

By:



*(Signature - attach evidence of authority to sign)*

Name: *(typed or printed)*

Jeffrey M. Arends

Business Address:

1 Fairholm Avenue

Peoria, IL 61603

Phone:

(309) 453-1701

Email:

j.arends@rohntower.com

### Non-Collusion Affidavit

The Municipality reserves the right, before any award of contract is made, to require any bidder to whom it may make an award of the Principal Contract, to sign a non-collusion affidavit in the form designated below:

STATE OF Illinois

COUNTY OF Peoria

Jeffrey M. Arends

, being first duly sworn, deposes and says that he is Utility Sales Manager \* (sole owner, partner, president, secretary, etc.) of the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any bidder to fix any overhead, profit or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further, that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, or any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

Signed: *Jeffrey M. Arends*  
Title: Utility Sales Manager

Subscribed and sworn to before me this 10th day of November 2025

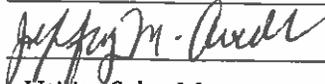
Seal of Notary:

*Tina M. Francis*  
Notary Public



\* In making out this form, the title that is not applicable should be struck out. For example, if the Contractor is a corporation and this form is to be executed by its president, the words "Sole Owner, a partner, secretary", etc. should be struck out.

2.06 SIGNATURES

Firm Name:	ROHN Products, LLC
Federal Taxpayer Identification Number:	26-2698400
By:	
Title:	Utility Sales Manager
By:	
Title:	

**Note:** If the Bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if the Bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if the Bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or member of a partnership, the power of attorney must be submitted with the bid.

**PART 3 – EXECUTION NOT USED**

3. Under penalty of perjury, the Bidder certifies that the Federal Taxpayer Identification Number noted below is correct and the Bidder is doing business as a (please check one):

- |   |  |
|---|--|
| <input type="checkbox"/> Individual             | <input type="checkbox"/> Real Estate Agent |
| <input type="checkbox"/> Partnership            | <input type="checkbox"/> Government Entity |
| <input checked="" type="checkbox"/> Corporation | <input type="checkbox"/> Trust or Estate   |

4. Bidder, if an individual, is not in default on an educational loan.

## 2.05 REFERENCES

- A. Bidder shall submit a minimum of three (3) written letters of recommendation with references' signatures and contact information to the Engineer.
- B. These References shall be from the Owner, Project Manager, or other individual who is knowledgeable on the project, or recent previous Projects with very similar Scope of Work completed under the current Bidder's name.
- C. Bidder shall submit a minimum of three (3) company brochures, or company information sheets, along with list of completed equivalent projects.



1 Fairholm Ave  
Peoria IL 61603 USA  
Phone 309-566-3000  
FAX 309-566-3079  
Toll Free 800-727-ROHN

References	Product lines
<p>Shaun Pierce Tarheel Electric Municipal District Strategic Sourcing Manager <a href="mailto:shaun.pierce@ncemcs.com">shaun.pierce@ncemcs.com</a></p>	<p>Pre-Engineered and Tapered Tubular Structures</p>
<p>Luke McKinney PE Hoosier Energy Engineer (812) 929-9867 <a href="mailto:LMckinney@hepn.com">LMckinney@hepn.com</a></p>	<p>Pre-Engineered and Tapered Tubular Structures</p>
<p>Jeremy Johnson PE Prairie Power Electric Cooperative Transmission &amp; Substation Engineer (217) 245-6161 <a href="mailto:jjohnson@ppi.coop">jjohnson@ppi.coop</a></p>	<p>Transmission (Tapered Tubular Structures)</p>
<p>Mike Chalfan South Central Power Transmission Engineer (740) 689-6168 <a href="mailto:Chalfan@southcentralpower.com">Chalfan@southcentralpower.com</a></p>	<p>Transmission Structures</p>
<p>Jason Repke PE Alpena Power Company Engineering Director (989) 884-3837 <a href="mailto:jr@alpenapower.com">jr@alpenapower.com</a></p>	<p>Transmission Structures</p>
<p>Randy G. Venhaus PE Ameren Services Project Engineer (314) 554-3695 <a href="mailto:Rvenhaus@ameren.com">Rvenhaus@ameren.com</a></p>	<p>Substation Steel (Tapered Tubular &amp; Std. Shapes)</p>



1 Farholm Ave  
Peoria, IL 61603 USA  
Phone 309-566-3000  
FAX 309-566-3079  
Toll Free 800-727-ROHN

References	Product lines
Shaun Pierce Tarheel Electric Municipal District Strategic Sourcing Manager <a href="mailto:shaun.pierce@ncemcs.com">shaun.pierce@ncemcs.com</a>	Pre-Engineered and Tapered Tubular Structures
Luke McKinney PE Hoosier Energy Engineer (812) 929-9867 <a href="mailto:LMckinney@hepn.com">LMckinney@hepn.com</a>	Pre-Engineered and Tapered Tubular Structures
Jeremy Johnson PE Prairie Power Electric Cooperative Transmission & Substation Engineer (217) 245-6161 <a href="mailto:jjohnson@ppi.coop">jjohnson@ppi.coop</a>	Transmission (Tapered Tubular Structures)
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Jason Repke PE Alpena Power Company Engineering Director (989) 884-3837 <a href="mailto:jr@alpenapower.com">jr@alpenapower.com</a>	Transmission Structures
Randy G. Venhaus PE Ameren Services Project Engineer (314) 554-3695 <a href="mailto:Rvenhaus@ameren.com">Rvenhaus@ameren.com</a>	Substation Steel (Tapered Tubular & Std. Shapes)



AMERICAN INSTITUTE OF STEEL CONSTRUCTION  
**CERTIFICATION PROGRAMS**

PROUDLY RECOGNIZE THAT

**Rohn Products LLC Plank Road  
Facilities**

2018-8-31-3165F

MAINTAINS OPERATIONS LOCATED AT

**6800 Plank Road  
Peoria, IL 61604**

THAT SUCCESSFULLY MEET THE QUALITY CERTIFICATION REQUIREMENTS FOR  
**Building Fabricator**

CERTIFICATION NUMBER    C-00025738  
ISSUED                        November 19, 2024  
VALID THROUGH            January 31, 2026

  
PRESIDENT



AMERICAN INSTITUTE OF STEEL CONSTRUCTION  
**CERTIFICATION PROGRAMS**

PROUDLY RECOGNIZE THAT

**Rohn Products, L.L.C.**

2018-8-31-3166F

MAINTAINS OPERATIONS LOCATED AT

**#1 Fairholm Ave**

**Peoria, IL 61603 USA**

THAT SUCCESSFULLY MEET THE QUALITY CERTIFICATION REQUIREMENTS FOR  
**Building Fabricator**

CERTIFICATION NUMBER    **C-00025740**  
ISSUED    **November 19, 2024**  
VALID THROUGH    **January 31, 2026**

  
PRESIDENT

# American Welding Society

*Certifies that*

## **Rohn Products LLC – Plank Road Facilities**

6800 West Plank Road  
Peoria, IL 61604

*Fabricator's welding program was audited to AWS B5.17 Specification for the Qualification of Welding Fabricators, AWS QC17 Specification for AWS Accreditation of Certified Welding Fabricators, D1.1 - Structural Welding Code-Steel, and D1.3 - Structural Welding Code-Sheet Steel excluding weldment design*

*has complied with the requirements of the AWS B5.17 and QC17 Standards for the Qualification and Certification of AWS Welding Fabricators.*

**240107F**

Certificate Number

**January 1, 2026**

Expiration Date



AWS President

*Robert Dinos*

Chair, Qualification and  
Certification Committee



# American Welding Society

*Certifies that*

**Rohn Products, L.L.C.**

1 Fairholm Avenue  
Peoria, IL 61603 USA

*Fabricator's welding program was audited to AWS B5.17 Specification for the Qualification of Welding Fabricators, AWS QC17 Specification for AWS Accreditation of Certified Welding Fabricators, D1.1 - Structural Welding Code-Steel, and D1.3 - Structural Welding Code-Sheet Steel excluding weldment design*

*has complied with the requirements of the AWS B5.17 and QC17 Standards for the Qualification and Certification of AWS Welding Fabricators.*

**240106F**

Certificate Number

**January 1, 2026**

Expiration Date



AWS President

*Michael Spivack*

Chair, Qualification and  
Certification Committee

*Robert D'Arco*



**BID BOND**

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

**BIDDER (Name and Address):**

Rohn Products, LLC  
PO Box 5999  
Peoria, IL 61601

**SURETY (Name and Address of Principal Place of Business):**

Amerisure Mutual Insurance Company  
26777 Halsted Road  
Farmington Hills, MI 48331

**OWNER (Name and Address):** **City of Rochelle**  
**420 N. 6<sup>th</sup> Street**  
**Rochelle, IL 61068**

**BID**

Bid Due Date: November 13, 2025  
Project: Ritchie to Centerpoint 34.5kV Line - Steel Pole Procurement

**BOND**

Bond Number: 11132025  
Date (Not later than Bid due date): 11/10/2025

Penal sum Five Percent of the Amount Bid 5%  
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

**BIDDER**

**SURETY**

Rohn Products, LLC Seal  
Bidder's Name and Corporate Seal

Amerisure Mutual Insurance Company Seal  
Surety's Name and Corporate Seal

By: Jeffrey M. Mendenhall, V.P. by Order of  
Signature and Title

By: Timothy Foley  
Signature and Title  
(Attach Power of Attorney) Timothy Foley, Attorney-In-Fact



Attest: Thyl Meyer - Project Manager  
Signature and Title

Attest: Christina Foley  
Signature and Title Account Manager

Note: Above addresses are to be used for giving required notice.

PENAL SUM FORM

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents,
  - 3.2. All Bids are rejected by Owner
  - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.



AMERISURE MUTUAL INSURANCE COMPANY  
AMERISURE INSURANCE COMPANY  
AMERISURE PARTNERS INSURANCE COMPANY

**POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That Amerisure Mutual Insurance Company, Amerisure Insurance Company and Amerisure Partners Insurance Company are corporations duly organized under the laws of the State of Michigan (herein collectively the "Companies"), and that the Companies do hereby make, constitute and appoint:

LUKAS SCHRODER, KURT FELLER, ROBERT KOLLSMITH,

JASON SMITH, JAMES SMITH, DORA B. STEVENS, DEBORAH KLING, TIMOTHY FOLEY

MASON STICKNEY, LAURI MENEUGH, CHRISTY RITCHIE AND CINDY BLAND

of TrueNorth Companies, LC, its true and lawful Attorney(s)-in Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge, for and on its behalf and as its act and deed, bonds or others writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts or suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

ONE HUNDRED MILLION (\$100,000,000.00) DOLLARS

This Power of Attorney is granted and signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of Amerisure Mutual Insurance Company, Amerisure Insurance Company and Amerisure Partners Insurance Company at meetings duly called and held on February 17, 2022.

"RESOLVED, that any two of the President & Chief Executive Officer, the Chief Financial Officer & Treasurer, the Senior Vice President Surety, the Vice President Surety, or the General Counsel & Corporate Secretary be, and each or any of them hereby is authorized to execute, a Power of Attorney qualifying the attorney-in-fact named in the given Power of Attorney to execute on behalf of the Company bonds, undertakings and all contracts of surety, and that President & Chief Executive Officer, Chief Financial Officer & Treasurer or General Counsel & Corporate Secretary each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Company;

FURTHER RESOLVED, that the signature of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto electronically/digitally or by facsimile, and any such Power of Attorney or certificate bearing such electronic/digital or facsimile signatures or electronic/digital or facsimile seal shall be binding upon the Company when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached;

FURTHER RESOLVED, that any work carried out by the attorney-in-fact pursuant to this resolution shall be valid and binding upon the Company."



By: [Signature]  
Michael A. Ito, Senior Vice President Surety

By: [Signature]  
Aaron Green, Vice President Surety



IN WITNESS WHEREOF, Amerisure Mutual Insurance Company, Amerisure Insurance Company and Amerisure Partners Insurance Company have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers this 7th day of November, 2025.

**Amerisure Mutual Insurance Company  
Amerisure Insurance Company  
Amerisure Partners Insurance Company**

State of Michigan  
County of Oakland

On this 7th day of November, 2025, before me, a Notary Public personally appeared Michael A. Ito, of Amerisure Mutual Insurance Company, Amerisure Insurance Company and Amerisure Partners Insurance Company and Aaron Green of Amerisure Mutual Insurance Company, Amerisure Insurance Company and Amerisure Partners Insurance Company, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.



KAY L. AIRTON  
My Commission Expires  
August 18, 2021  
County of Livingston  
Acting in the County of OAKLAND

[Signature]  
Kay Airton, Notary Public

I, Christopher M. Spaude, the duly elected Chief Financial Officer & Treasurer of Amerisure Mutual Insurance Company, Amerisure Insurance Company and Amerisure Partners Insurance Company, do hereby certify and attest that the above and foregoing is a true and correct copy of a Power of Attorney executed by said Companies, which remains in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 10th day of November, 2025.

[Signature]

Christopher M. Spaude, Chief Financial Officer & Treasurer

TAPP Quote # 25-2577

Rochelle Municipal Utilities

Request for Quotation for:  
Ritchie to Centerpoint 34.5kV Line



QUALITY STEEL POLES. DELIVERED.

**TransAmerican Power Products, Inc**

25700 Interstate 45 N, Suite 315, Spring, TX 77386

Phone: 281-444-8277 Fax: 281-444-7270

sales@tappinc.com www.tappinc.com



**ROCHELLE MUNICIPAL  
UTILITIES**

**RITCHIE TO CENTERPOINT  
34.5KV LINE**

**STEEL POLE PROCUREMENT**

**2200 K001**

**October 17, 2025**



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2200-TBP-69GB-STL	Vertical Braced Post Tangent/Light Angle
2200-TBP-69GB-ENG-DDA	Vertical Braced Post Tangent/Light Angle on Drilled Pier W/ Double Davit Arms
2200-TS-4G-ENG	I-String Running Angle on Drilled Pier
2200-TS-4G-1-MOD-ENG	Modified I-String Running Angle on Drilled Pier
2200-TS-69DE-UG-ENG	In-Line Deadend on Drilled Pier W/ 34.5kV Termination
2200-TS-RISER-STL	In-Line Deadend on Arms W/ 34.5kV Termination
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2200-TM-3V-VERT-STL	Vertical 69kV Switch
2200-DETAILS	Steel Details

## SUPPLEMENTAL DRAWINGS

B2901054B11074AX	MacLean Braced Post Insulator Assembly
S14080038MXSS019	MacLean Transmission Suspension Insulator Assembly
H29C10031MXSS016	MacLean Line Post Insulator Assembly
P250043S1020	Hubble Quadri-Sil Line Post Series 250
1GL069203SN	SEECO 69kV One-Way Switch W/ SUMO Operator
TB----144SPX-	PUPI Tangent Assembly – 12FT
DA4000144E4SPX-	PUPI 4000 Deadend Assembly – 12FT

## Seals and Signatures

	<p>I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed professional under the laws of the State of Illinois.</p>
	<p>Reid Aebischer</p> <p></p> <p>Signature _____ Date <u>10/17/2025</u></p> <p>Discipline: Engineer, Illinois License #: 062.076713 License Expires: 11/30/2025</p>

## **INVITATION FOR BIDS**

Rochelle Municipal Utilities, Ogle County, Illinois will receive sealed bids for:

Ritchie to Centerpoint 34.5kV Line  
Steel Pole Procurement

until 2:00 p.m. local time on November 6, 2025, at the City of Rochelle, 420 N. 6<sup>th</sup> Street, Rochelle, IL 61068.

The plans and specifications are on file with the said City of Rochelle for viewing purposes only.

Copies of the documents may be acquired from BHMG Engineers, Inc., 9735 Landmark Parkway Suite 110A, St. Louis, Missouri 63127, Consulting Engineers for the said Board. Please email Amy Wooldridge, [AWooldridge@bhmg.com](mailto:AWooldridge@bhmg.com) with request.

Bids shall be received for the aforementioned items.

A certified check or bank draft on a responsible, solvent bank, or a satisfactory bid bond executed by the bidder and an acceptable surety company, payable to the City of Rochelle, John Bearrows, Mayor or Government Bonds or cash in the amount of not less than five percent (5%) of bid, shall be submitted with each bid.

The bid shall be marked to identify bid package contents, reference specification 2200 K001.

The successful bidder will be required to:

- Register as a bidder for this project.
- Furnish **in duplicate** the following executed documents:
  - Non-Collusion Affidavit
  - Bid Form
  - Bid Bond, Certified Check or Money Order
  - And any other documents as required by the specifications.

No bid shall be withdrawn after the opening of bids without the consent of the Utility for a period of sixty (60) days after the scheduled time of closing bids.

The said City of Rochelle reserves the right to reject any or all bids and to waive any informalities in bidding, and to determine and accept the bid most advantageous to the Utility.

Date: October 17, 2025

City of Rochelle, Illinois  
John Bearrows, Mayor

## **Instructions to Bidders**

### **ARTICLE 1 - DEFINED TERMS**

- 1.01 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below.
  - A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

### **ARTICLE 2 - BIDS RECEIVED**

- 2.01 Refer to Article 14 of this section for information on receipt of Bids.

### **ARTICLE 3 - COPIES OF BIDDING DOCUMENTS**

- 3.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office.
- 3.02 Complete sets of the Bidding Documents shall be used in preparing Bids; neither Buyer nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 3.03 Buyer and Engineer have made copies of Bidding Documents available on the above terms only for the purpose of obtaining Bids for furnishing Goods and Special Services and do not authorize or confer a license for any other use.

### **ARTICLE 4 - QUALIFICATIONS OF BIDDERS**

- 4.01 To demonstrate Bidder's qualifications to furnish Goods and Special Services, within five days of Buyer's request Bidder shall submit written evidence, such as financial data and previous experience.
- 4.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

## **ARTICLE 5 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND POINT OF DESTINATION**

- 5.01 Upon request, the Buyer will provide Bidder access to the Point of Destination and the site where Goods are to be installed, or Special Services are to be provided so that Bidder may conduct such investigations, examinations, tests, and studies as Bidder deems necessary for submission of a Bid.
- 5.02 It is the responsibility of each Bidder before submitting a Bid to:
- A. Examine and carefully study the Bidding Documents, including any Addenda, and the related data identified in the Bidding Documents.
  - B. Visit the Point of Destination and the site where the Goods are to be installed and Special Services are to be provided to become familiar with the local conditions if required by the Bidding Documents to do so, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.
  - C. Become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, or the furnishing of the Goods and Special Services
  - D. Carefully study, consider, and correlate the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods are to be installed or Special Services are to be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Contract Documents.
  - E. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution (if any) thereof by Engineer is acceptable to Bidder.
  - F. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

- 5.03 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 5, that without exception the Bid is premised upon furnishing Goods and Special Services required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions (if any) thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

**ARTICLE 6 - PRE-BID CONFERENCE** *Not Used*

**ARTICLE 7 - INTERPRETATIONS AND ADDENDA**

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids will not be answered. Only answers in the Addenda will be binding. Oral statements, interpretations, and clarifications may not be relied upon and will not be binding or legally effective.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Buyer or Engineer.

**ARTICLE 8 - BID SECURITY** *Not Used*

**ARTICLE 9 - CONTRACT TIMES** *Not Used*

**ARTICLE 10 - LIQUIDATED DAMAGES**

- 10.01 Any provisions for liquidated damages, such as those for *Seller's* failure to attain a Milestone, or to deliver the Goods or furnish Special Services within the Contract Times, are set forth in the Agreement.

**ARTICLE 11 - "OR-EQUAL" ITEMS**

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, including the Addenda. Bidders may propose "or equal" materials and equipment, which if approved by Engineer will be identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function, and quality to be met by any proposed "or-equal" item. No item of material or equipment will be considered by Engineer as an "or-equal" unless written request for approval has been submitted by Bidder and has

been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 5.04 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. Bidders shall not rely upon approvals unless set forth in an Addendum.

## **ARTICLE 12 - PREPARATION OF BID**

- 12.01 The Bid Form is included with the Bidding Documents. Additional copies of Bidding Documents may be obtained from the Issuing Office.
- 12.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each item listed therein. In the case of optional alternates, the words "No Bid," "No Change," or "Not Applicable" may be entered.
- 12.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 12.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 12.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 12.06 A Bid by an individual shall show the Bidder's name and official address.
- 12.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 12.08 All names must be typed or printed in ink below the signature.
- 12.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 12.10 Each Bidder shall list the postal address, e-mail address, and telephone number for communications regarding the Bid.

## **ARTICLE 13 - BASIS OF BID; COMPARISON OF BIDS**

### **13.01 Lump Sum**

- A. Bidder shall submit a Bid on a lump sum basis as set forth in the Bid Form.
- B. For determination of the apparent low Bidder, Bids will be compared on the basis of the lump sum.

## **ARTICLE 14 - SUBMITTAL OF BID**

14.01 The Bid Form is to be completed and submitted with the following documents:

- A. Non-Collusion Affidavit.
- B. Bidder Qualifications.
- C. List of Proposed Suppliers.
- D. List of References.

14.02 Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked envelope with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and the name and address of Bidder and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED". A mailed Bid shall be addressed to:

**City of Rochelle  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068  
2200 K001**

## **ARTICLE 15 - MODIFICATION OR WITHDRAWAL OF BID**

15.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

- 15.02 If, within 24 hours after Bids are opened, any Bidder files a duly signed written notice with Buyer and promptly thereafter demonstrates to the reasonable satisfaction of Buyer that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Goods and Special Services are rebid, that Bidder will be disqualified from further bidding on the Goods and Special Services.

#### **ARTICLE 16 - OPENING OF BIDS**

- 16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the Base Bids and Alternate Bids, if any, will be made available to Bidders after the opening of Bids.

#### **ARTICLE 17 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

- 17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Buyer may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

#### **ARTICLE 18 - EVALUATION OF BIDS AND AWARD OF CONTRACT**

- 18.01 Buyer reserves the right to reject any and all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Buyer further reserves the right to reject the Bid of any Bidder that Buyer finds, after reasonable inquiry and evaluation, to be nonresponsive. Buyer may also reject the Bid of any Bidder if Buyer believes that it would not be in the best interest of the Project to make an award to that Bidder. Buyer also reserves the right to waive all informalities not involving price, time, or changes in the Goods and Special Services, and to negotiate contract terms with the Successful Bidder.
- 18.02 More than one Bid for the same Goods and Special Services from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Goods and Special Services shall be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 18.03 In evaluating Bids, Buyer will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data as may be requested in the Bid Form or may be requested from Bidders prior to a Notice of Award.
- 18.04 Buyer may conduct such investigations as Buyer deems necessary to establish the responsibility, qualifications, and financial ability of Bidder.

18.05 If the contract is to be awarded, Buyer will award the Contract to the Bidder whose Bid is in the best interest of the Project.

#### **ARTICLE 19 - CONTRACT SECURITY AND INSURANCE**

19.01 Article 4 of the General Conditions and Article 4 of the Supplementary Conditions set forth Buyer's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Buyer, it must be accompanied by such bonds.

#### **ARTICLE 20 - SIGNING OF AGREEMENT**

20.01 When Buyer issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents that are to be identified in the Agreement and attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Buyer. Within 10 days thereafter, Buyer shall deliver one fully signed counterpart to Successful Bidder with a complete set of Drawings with appropriate identification.

#### **ARTICLE 21 - SALES AND USE TAXES**

21.01 Owner is exempt from Illinois State sales and use taxes on materials and equipment to be incorporated in the Work, Exemption No. E99941376. Said taxes shall not be included in the Bid.

#### **ARTICLE 22 - RETAINAGE**

22.01 Provisions concerning Seller's rights to deposit securities in lieu of retainage are set forth in the Agreement.

#### **ARTICLE 23 - CONTRACT TO BE ASSIGNED**      *Not Used*

### Non-Collusion Affidavit

The Municipality reserves the right, before any award of contract is made, to require any bidder to whom it may make an award of the Principal Contract, to sign a non-collusion affidavit in the form designated below:

STATE OF     Texas    

COUNTY OF     Spring    

I Igor Lubisco, being first duly sworn, deposes and says that he is VP of Strategy and Execution \* (sole owner, partner, president, secretary, etc.) of the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any bidder to fix any overhead, profit or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further, that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, or any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

Signed: 

Title: Igor Lubisco | VP of Strategy and Execution

Subscribed and sworn to before me this            day of            20     

Seal of Notary:

\_\_\_\_\_  
Notary Public

\* In making out this form, the title that is not applicable should be struck out. For example, if the Contractor is a corporation and this form is to be executed by its president, the words "Sole Owner, a partner, secretary", etc. should be struck out.

**BID FORM**  
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**This Bid is submitted by:** Igor Lubisco | VP of Strategy and Execution

## **Bid Form**

### **ARTICLE 1 - BID RECIPIENT**

1.01 This Bid is submitted to:

**Rochelle Municipal Utilities  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in the Bidding Documents to furnish the Goods and Special Services as specified or indicated in the Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Bidding Documents.

### **ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS**

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

### **ARTICLE 3 - BIDDER'S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
<u>1</u>	<u>October 30, 2025</u>
<u>                    </u>	<u>                                    </u>

B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress, or the furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations in effect as of the date of the Bid that may affect cost, progress, and the furnishing of Goods and Special Services.

- D. Bidder has carefully studied, considered, and correlated the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods will be installed or Special Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Bidding Documents.
- E. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution (if any) thereof by Engineer is acceptable to Bidder.
- F. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing the Goods and Special Services for which this Bid is submitted.

#### **ARTICLE 4 - BIDDER'S CERTIFICATIONS**

##### **4.01 Bidder certifies that:**

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding.
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
  - 2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer,

- (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition.
3. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels.
  4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

**ARTICLE 5 - BASIS OF BID**

5.01 **Proposal No. 1** - Bidder will furnish and deliver the equipment described in the Plans, Specifications, and Construction Drawings for the following price:

<b>Lump Sum Total Bid Price for Proposal No. 1</b>	<b>\$ 1,475,246.00</b>
--	------------------------

- A. Refer to Appendix 1 – Itemized Proposal used for tabulating unit and total price.
- B. Refer to Appendix 2 – Pole Data Summary Table for specifications on each pole.
- C. Refer to Appendix 3 – Underbuild Appurtenances Table for underbuild specification on each pole.

**ARTICLE 6 - TIME OF COMPLETION**

- 6.01 Bidder agrees that the material will be delivered no later than August 31, 2026, and will be completed and ready for final payment in accordance with Paragraph 14.07B of the General Conditions on or before 30 days after the delivery date of August 31, 2026. **TAPP will not be able to meet these lead times. Please refer to the TAPP Customer Report for additional information.**
- 6.02 The time of delivery shall be extended for any reasonable delay due extensively to causes beyond control and without the fault of the Bidder, including but not limited to acts of God, fires, strikes and floods.
- 6.03 Bidder accepts the provisions of the Agreement as to liquidated damages.

## **ARTICLE 7 - ATTACHMENTS TO THIS BID**

7.01 The following documents are attached to and made a condition of this Bid:

- A. List of Proposed Major Suppliers.
- B. Itemized Proposal.
- C. Affidavit of Non-Collusion.
- D. List of Project References.
- E. Bidder's Qualifications.

## **ARTICLE 8 - DEFINED TERMS**

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders and the General Conditions.

**ARTICLE 9 - BID SUBMITTAL**

9.01 This Bid submitted by:

If Bidder is:

A Corporation

Corporation Name: TransAmerican Power Products, Inc.

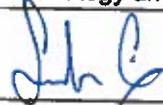
State of Incorporation: Texas

Type: Corporation  
*(General Business, Professional, Service, Other)*

By:   
*(Signature - attach evidence of authority to sign)*

Name: *(typed or printed)* Igor Lubisco

Title: VP of Strategy and Execution

Attest:  (Corporate Seal)  
*(Signature of Corporate Secretary)*

Business Address: 25700 Interstate 45 N, Suite 315, Spring, Texas 77386

Phone: 281-444-8277

Email Address: tapprfq@tappinc.com

A Limited Liability Company (LLC)

LLC Name:

State in which organized:

By:

*(Signature – attach evidence of authority to sign)*

Name: *(typed or printed)*

Business Address:

Phone:

Email:

## SECTION 00420

### Qualifications

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Appointment of Counsel.
- B. Pre-qualifications.
- C. Bidder's Qualifications.
- D. Certifications.
- E. References.
- F. Signatures.

##### 1.02 AWARD OF BID

- A. Failure of Bidder to meet all qualification criteria as stated in these Specifications shall disqualify Bidder from consideration for the Project.
- B. The Owner reserves the right to exclude Bidder from consideration due to the Bidder's failure to present with written documentation his experience and capability to complete the project to the Owner's expectations.

#### PART 2 – QUALIFICATIONS

##### 2.01 APPOINTMENT OF COUNSEL – NON-RESIDENT

- A. Bidder has appointed Robert Kruckemeyer, whose address is 244 Malone Street Houston TX 77007, as the agent of Bidder for service of process in the event any litigation or controversy results between the Bidder and Owner arising out of the contractual relationship created by the acceptance of this Bid. Bidder agrees that the courts of the State in which the project is located will have jurisdiction over Bidder for all such purposes to the same extent as though Bidder were a resident of the State.

## 2.02 PRE-QUALIFICATION

- A. Failure of Bidder to meet the Pre-qualification requirements as stated in the Instruction to Bidders Bid shall disqualify Bidder from consideration for the Project.

## 2.03 BIDDER'S QUALIFICATIONS

- A. Bidder shall prove to the Owner's satisfaction Bidder's experience in completing similar projects, thus demonstrating the ability of the Bidder to complete the Project to the Owner's Satisfaction.
- B. Bidder shall submit written proof and abide by the written proof that the Bidder will complete a minimum of (30) thirty percent of the overall project by his own company and workers.
- C. Bidder shall submit documentation proving that the Bidder is capable of funding the Project and is not in financial hardship.
- D. Bidder shall submit documentation proving that the Bidder uses only qualified, licensed workers experienced in the line of work.
- E. Bidder's subcontractors shall be the responsibility of the Bidder and shall be considered part of the Bidder's company and shall meet qualification requirements for all aspects of the Project.

## 2.04 CERTIFICATIONS

- A. The Bidder certifies the following as required by law:
  - 1. Bidder has not been convicted of bribery or attempting to bribe an officer or employee of the State, nor has the Bidder made an admission of guilt of such conduct which is a matter of record, nor has an official, agent or employee of the Bidder been so convicted or made such admission of bribery on its behalf and pursuant to the direction or authorization of a responsible official thereof.
  - 2. Bidder is not barred from bidding with any unit of state or local government as a result of unlawful bid rigging.

3. Under penalty of perjury, the Bidder certifies that the Federal Taxpayer Identification Number noted below is correct and the Bidder is doing business as a (please check one):

<input type="checkbox"/> Individual	<input type="checkbox"/> Real Estate Agent
<input type="checkbox"/> Partnership	<input type="checkbox"/> Government Entity
<input checked="" type="checkbox"/> Corporation	<input type="checkbox"/> Trust or Estate

4. Bidder, if an individual, is not in default on an educational loan.

## 2.05 REFERENCES

- A. Bidder shall submit a minimum of three (3) written letters of recommendation with references' signatures and contact information to the Engineer.
- B. These References shall be from the Owner, Project Manager, or other individual who is knowledgeable on the project, or recent previous Projects with very similar Scope of Work completed under the current Bidder's name.
- C. Bidder shall submit a minimum of three (3) company brochures, or company information sheets, along with list of completed equivalent projects.

## 2.06 SIGNATURES

Firm Name:	TransAmerican Power Products, Inc.
Federal Taxpayer Identification Number:	76-0289068
By:	Igor Lubisco
Title:	VP of Strategy and Execution
By:	Maria Gomez
Title:	Contract Administrator

Note: If the Bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if the Bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if the Bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or member of a partnership, the power of attorney must be submitted with the bid.

### **PART 3 – EXECUTION    NOT USED**

**BID BOND**

PENAL SUM FORM

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable

**BIDDER (Name and Address):** Transamerican Power Products, Inc.  
25700 I-45 N, Suite 315  
Spring, TX 77386

**SURETY (Name and Address of Principal Place of Business):** Travelers Casualty and Surety Company of America  
Claims Address: Travelers Bond, Attn: Claims  
1500 Market Street, W. Tower, Suite 2900  
Philadelphia, PA 19102  
One Tower Square  
Hartford, CT 06183

**OWNER (Name and Address):** City of Rochelle  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068

**BID**

Bid Due Date: November 13, 2025  
Project: Ritchie to Centerpoint 34.5kV Line - Steel Pole Procurement

**BOND**

Bond Number: N/A - Bid Bond  
Date (Not later than Bid due date): November 13, 2025

Penal sum Five Percent of the Greatest Amount Bid \$5% G.A.B.  
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

**BIDDER**

Transamerican Power Products, Inc. Seal  
Bidder's Name and Corporate Seal

By: \_\_\_\_\_  
Signature and Title

Attest: \_\_\_\_\_  
Signature and Title

**SURETY**

Travelers Casualty and Surety Company of America Seal  
Surety's Name and Corporate Seal

By: David T. Miclette  
Signature and Title David T. Miclette, Attorney-in-Fact  
(Attach Power of Attorney)

Attest: Sandra Villegas  
Signature and Title Sandra Villegas, Witness

Note: Above addresses are to be used for giving required notice.

PENAL SUM FORM

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
  - 3.2. All Bids are rejected by Owner
  - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.



**Travelers Casualty and Surety Company of America  
Travelers Casualty and Surety Company  
St. Paul Fire and Marine Insurance Company**

**POWER OF ATTORNEY**

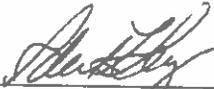
KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **DAVID T MICLETTE** of **HOUSTON, Texas** their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this 21st day of April, 2021.



State of Connecticut

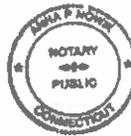
City of Hartford ss.

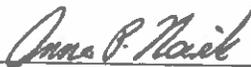
By   
Robert L. Raney, Senior Vice President

On this the 21st day of April, 2021, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the 30th day of June, 2026



  
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

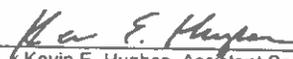
**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary, or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 13th day of November, 2025



  
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.  
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.

## **Agreement**

THIS AGREEMENT is by and between

**Rochelle Municipal Utilities**

**420 N. 6<sup>th</sup> Street, Rochelle, IL 61068**

\_\_\_\_\_  
("Buyer") and

**TransAmerican Power Products, Inc.**

\_\_\_\_\_  
("Seller")

Buyer and Seller hereby agree as follows:

### **ARTICLE 1 – GOODS AND SPECIAL SERVICES**

1.01 Seller shall furnish the Goods and Special Services as specified or indicated in the Contract Documents.

### **ARTICLE 2 – THE PROJECT**

2.01 The Project, of which the Goods and Special Services may be the whole or only a part, is identified as follows: Steel Pole Procurement.

### **ARTICLE 3 – ENGINEER**

3.01 The Contract Documents for the Goods and Special Services have been prepared by BHMGE Engineers, Inc. ("Engineer"), which is to act as Buyer's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with Seller's furnishing of Goods and Special Services.

### **ARTICLE 4 – POINT OF DESTINATION**

4.01 The Point of Destination is 1015 S Caron Road, Rochelle, IL 61068.

### **ARTICLE 5 – CONTRACT TIMES**

5.01 *Time of the Essence*

A. All time limits for Milestones, if any, including the submittal of Shop Drawings and Samples, the delivery of Goods, and the furnishing of Special Services as stated in the Contract Documents, are of the essence of the Contract.

5.02 *Milestones*

A. Days for Submittal of Shop Drawings and Samples: Seller shall submit all Shop Drawings and Samples required by the Contract Documents to Buyer

for Engineer's review and approval within 8 weeks after the date when the Contract Times commence to run as provided in Paragraph 2.04 of the General Conditions. It is the intent of the parties that (1) Engineer conduct such review and issue its approval, or a denial accompanied by substantive comments regarding information needed to gain approval, within 14 days of Seller's submittal of such Shop Drawings and Samples; and (2) resubmittals be limited whenever possible. If more than one resubmittal is necessary for reasons not the fault and beyond the control of Seller, then Seller shall be entitled to seek appropriate relief under Paragraph 7.02.B of the General Conditions.

- B. *Days to Achieve Delivery of Goods:* The Goods are to be delivered to the Point of Destination and ready for Buyer's receipt of delivery no later than August 31, 2026.

5.03 *Buyer's Final Inspection*

- A. *Days to Achieve Final Inspection:* Buyer shall make its final inspection of the Goods pursuant to Paragraph 8.01.C of the General Conditions within 10 days after Buyer's acknowledgement of receipt of delivery of the Goods and Seller's completion of furnishing Special Services, if any.

5.04 *Liquidated Damages*

- A. See Supplementary Conditions for Details.

**ARTICLE 6 – CONTRACT PRICE**

- 6.01 Buyer shall pay Seller for furnishing the Goods and Special Services in accordance with the Contract Documents as follows:

- A. A Lump Sum of  
\$ 1,475,246.00

**ARTICLE 7 – PAYMENT PROCEDURES**

7.01 *Submittal and Processing of Payment*

- A. Seller shall submit Applications for Payment in accordance with Article 10 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

## 7.02 *Progress Payments; Retainage*

- A. Buyer shall make progress payments on account of the Contract Price on the basis of Seller's Applications for Payment as follows:
1. Upon receipt of the first Application for Payment submitted in accordance with Paragraph 10.01.A.1 of the General Conditions and accompanied by Engineer's recommendation of payment in accordance with Paragraph 10.02.A of the General Conditions, an amount equal to 10% of the Contract Price, less such amounts as Engineer may determine in accordance with Paragraph 10.02.A.3 of the General Conditions.
  2. Upon receipt of the second such Application for Payment accompanied by Engineer's recommendation of payment in accordance with Paragraph 10.01.A.2 of the General Conditions, an amount sufficient to increase total payments to Seller to 90% of the Contract Price, less such amounts as Engineer may determine in accordance with Paragraph 10.02.A.3 of the General Conditions.

## 7.03 *Final Payment*

- A. Upon receipt of the final Application for Payment accompanied by Engineer's recommendation of payment, Buyer shall pay Seller the amount recommended by Engineer, less any sum Buyer is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages.

## **ARTICLE 8 – INTEREST**

- 8.01 All monies not paid when due as provided in Article 10 of the General Conditions shall bear interest at the statutory rate.

## **ARTICLE 9 – SELLER'S REPRESENTATIONS**

- 9.01 In order to induce Buyer to enter into this Agreement, Seller makes the following representations:
- A. Seller has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents, as applicable to Seller's obligations identified in Article 1 above.
  - B. If required by the Bidding Documents to visit the Point of Destination and site where the Goods are to be installed or Special Services will be provided, or if, in Seller's judgment, any local condition may affect cost, progress or the furnishing of the Goods and Special Services, Seller has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is

- satisfied as to the observable local conditions that may affect cost, progress and the furnishing of the Goods and Special Services.
- C. Seller is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and the furnishing of the Goods and Special Services.
  - D. Seller has carefully studied, considered, and correlated the information known to Seller; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Seller's visits, if any, to the Point of Destination and site where the Goods are to be installed or Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Contract Documents.
  - E. Seller has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Seller has discovered in the Contract Documents, and the written resolution (if any) thereof by Engineer is acceptable to Seller.
  - F. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

## **ARTICLE 10 – CONTRACT DOCUMENTS**

### *10.01 Contents*

- A. The Contract Documents consist of the following:
  - 1. This Agreement
  - 2. General Conditions
  - 3. Bid Bond
  - 4. Appendix 1 – Itemized Proposal
  - 5. Appendix 2 – Pole Data Summary Table
  - 6. Appendix 3 – Underbuild Appurtenances Table

7. Drawings, consisting of a cover sheet and sheets, with each sheet bearing the following general title: TBD
  8. Addenda (Numbers 1 to 1, inclusive)
  9. Specifications as listed in table of contents of the Project Manual
  10. Exhibits to this Agreement (enumerated as follows):
    - a. Seller's Bid, solely as to the prices set forth therein
    - b. Documentation submitted by Seller prior to Notice of Award
  11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
    - a. Notice to Proceed
    - b. Change Order(s)
    - c. Work Change Directive(s).
- B. The documents listed in Paragraph 10.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 10.
- D. The Contract Documents may only be amended or supplemented as provided in Paragraph 3.04 of the General Conditions.

## **ARTICLE 11 – MISCELLANEOUS**

### **11.01 Terms**

- A. Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

### **11.02 Assignment of Contract**

- A. No other assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound. Specifically, but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by Laws and Regulations). Unless specifically stated to the contrary in any written consent to such an assignment, such

an assignment will not release or discharge the assignor from any duty or responsibility under the Contract Documents.

#### 11.03 *Successors and Assigns*

- A. Buyer and Seller each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

#### 11.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Buyer and Seller. The Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

#### 11.05 *Seller's Certifications*

- A. Seller certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 11.05:
  - 1. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution.
  - 2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Buyer, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition.
  - 3. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish Bid prices at artificial, non-competitive levels.
  - 4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

### 11.06 *Limitations*

- A. Buyer and Seller waive against each other, and against the other's officers, directors, members, partners, employees, agents, consultants, and subcontractors, any and all claims for or entitlement to incidental, indirect, or consequential damages arising out of, resulting from, or related to the Contract. Upon assignment the terms of this Paragraph 11.06.A shall be binding upon the assignee with respect to Seller and assignor. The terms of this mutual waiver do not apply to or limit any claim by either Buyer or Seller against the other based on any of the following: (a) contribution or indemnification, (b) costs, losses, or damages attributable to personal or bodily injury, sickness, disease, or death, or to injury to or destruction of the tangible property of others, (c) intentional or reckless wrongful conduct, or (d) rights conferred by any bond provided by Seller under this Contract.
- B. Upon assignment the terms of this Paragraph 11.06.B shall be binding upon both the assignor and assignee with respect to Seller's liability, and upon Seller with respect to both assignor's and assignee's liabilities. The terms of this mutual limitation do not apply to or limit any claim by either Buyer or Seller against the other based on any of the following: (a) contribution or indemnification with respect to third-party claims, losses, and damages; (b) costs, losses, or damages attributable to personal or bodily injury, sickness, disease, or death, or to injury to or destruction of the tangible property of others, (c) intentional or reckless wrongful conduct, or (d) rights conferred by any bond provided by Seller under this Contract.

IN WITNESS WHEREOF, Buyer and Seller have signed this Agreement. Counterparts have been delivered to Buyer and Seller. All portions of the Contract Documents have been signed or identified by Buyer and Seller or on their behalf.

This Agreement will be effective on November 12, 2025  
(which is the Effective Date of the Agreement).

BUYER:

SELLER:

Rochelle Municipal Utilities

TransAmerican Power Products, Inc.

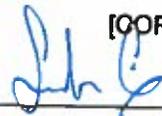
By: \_\_\_\_\_

By: Igor Lubisco | VP of Strategy and Execution

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: \_\_\_\_\_

Attest: 

Address for giving notices:

Address for giving notices:

Rochelle Municipal Utilities  
420 N. 6<sup>th</sup> Street  
Rochelle, IL 61068

25700 Interstate 45 N, Suite 315,  
Spring, Texas 77386

(If Buyer is a corporation, attach evidence of authority to sign. If Buyer is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Buyer-Seller Agreement.)

Agent for service of process:  
\_\_\_\_\_  
\_\_\_\_\_

(If Seller is a corporation or a partnership, attach evidence of authority to sign.)

Designated Representative:

Designated Representative:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

Name: Igor Lubisco  
Title: VP of Strategy and Execution  
Address: 25700 Interstate 45 N, Suite 315  
Phone: 281-444-8277  
Email: tapprfq@tappinc.com

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

## STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

Prepared by



and

Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES

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AMERICAN SOCIETY OF CIVIL ENGINEERS

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ASSOCIATED GENERAL CONTRACTORS OF AMERICA

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*A Practice Division of the*  
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

These Standard General Conditions for Procurement Contracts have been prepared for use with the Suggested Instructions to Bidders for Procurement Contracts (EJCDC P-200, 2010 Edition), the Agreement Between Buyer and Seller for Procurement Contracts (EJCDC P-520, 2010 Edition), and the Guide to Preparation of Supplementary Conditions for Procurement Contracts (EJCDC P-800, 2010 Edition). Their provisions are interrelated and a change in one may necessitate a change in the others. Additional information concerning the use of the EJCDC Procurement Documents may be found in the Commentary on Procurement Documents (EJCDC P-001, 2010 Edition).

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(800) 548-2723  
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## STANDARD GENERAL CONDITIONS FOR PROCUREMENT CONTRACTS

### ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

#### 1.01 *Defined Terms*

- A. Whenever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to the singular or plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument signed by both Buyer and Seller covering the Goods and Special Services and which lists the Contract Documents in existence on the Effective Date of the Agreement.
  3. *Application for Payment*—The form acceptable to Buyer which is used by Seller in requesting progress and final payments and which is accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*— The offer or proposal of a Seller submitted on the prescribed form setting forth the prices for the Goods and Special Services to be provided.
  5. *Bidder*—The individual or entity that submits a Bid directly to Buyer.
  6. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and Bid Form with any supplements.
  8. *Buyer*—The individual or entity purchasing the Goods and Special Services.
  9. *Change Order*—A document which is signed by Seller and Buyer and authorizes an addition, deletion, or revision to the Contract Documents or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement. Change Orders may be the result of mutual agreement by Buyer and Seller, or of resolution of a Claim.
  10. *Claim*—A demand or assertion by Buyer or Seller seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between Buyer and Seller concerning the Goods and Special Services. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
12. *Contract Documents*—Those items so designated in the Agreement. Shop Drawings and other Seller submittals are not Contract Documents, even if accepted, reviewed, or approved by Engineer or Buyer.
13. *Contract Price*—The moneys payable by Buyer to Seller for furnishing the Goods and Special Services in accordance with the Contract Documents as stated in the Agreement.
14. *Contract Times*—The times stated in the Agreement by which the Goods must be delivered and Special Services must be furnished.
15. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Goods and Special Services to be furnished by Seller. Shop Drawings and other Seller submittals are not Drawings as so defined.
16. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
17. *Engineer*—The individual or entity designated as such in the Agreement.
18. *Field Order*—A written order issued by Engineer which requires minor changes in the Goods or Special Services but which does not involve a change in the Contract Price or Contract Times.
19. *General Requirements*—Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
20. *Goods*—The tangible and movable personal property that is described in the Contract Documents, regardless of whether the property is to be later attached to realty.
21. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, including Goods, as defined herein, and Special Services, if any, as defined herein. This term refers to both the Goods and the Special Services, or to either the Goods or the Special Services, and to any portion of the Goods or the Special Services, as the context requires.
22. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
23. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to the Contract Times.

24. **Notice of Award**—The written notice by Buyer to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Buyer will sign and deliver the Agreement.
25. **Notice to Proceed**—A written notice given by Buyer to Seller fixing the date on which the Contract Times commence to run and on which Seller shall start to perform under the Contract.
26. **Point of Destination**—The specific address of the location where delivery of the Goods shall be made, as stated in the Agreement.
27. **Project**—The total undertaking of which the Goods and Special Services may be the whole, or only a part.
28. **Project Manual**—The documentary information prepared for bidding and furnishing the Goods and Special Services. A listing of the contents of the Project Manual is contained in its table of contents.
29. **Samples**—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Goods and Special Services and which establish the standards by which such portion of the Goods and Special Services will be judged.
30. **Seller**—The individual or entity furnishing the Goods and Special Services.
31. **Shop Drawings**—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Seller and submitted by Seller to illustrate some portion of the Goods and Special Services.
32. **Special Services**—Services associated with the Goods to be furnished by Seller as required by the Contract Documents.
33. **Specifications**—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the furnishing of the Goods and Special Services, and certain administrative requirements and procedural matters applicable thereto.
34. **Successful Bidder**—The Bidder submitting a responsive Bid, to whom Buyer makes an award.
35. **Supplementary Conditions**—That part of the Contract Documents which amends or supplements these General Conditions.
36. **Work Change Directive**—A written statement to Seller issued on or after the Effective Date of the Agreement and signed by Buyer ordering an addition, deletion, or other revision in the Contract Documents with respect to the Goods and Special Services. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a

subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B and 1.02.C are not defined but have the indicated meanings when used in the Bidding Requirements or Contract Documents.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Goods and Special Services. It is intended that such exercise of professional judgment, action, or determination will be commercially reasonable and will be solely to evaluate, in general, the Goods and Special Services for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing of Goods or Special Services or any duty or authority to undertake responsibility contrary to any other provision of the Contract Documents.
  2. The word "non-conforming" when modifying the words "Goods and Special Services," "Goods," or "Special Services," refers to Goods and Special Services that fail to conform to the Contract Documents.
  3. The word "receipt" when referring to the Goods, shall mean the physical taking and possession by the Buyer under the conditions specified in Paragraph 8.01.B.3.
  4. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.
  5. The word "furnish," when used in connection with the Goods and Special Services shall mean to supply and deliver said Goods to the Point of Destination (or some other specified location) and to perform said Special Services fully, all in accordance with the Contract Documents.
- C. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## ARTICLE 2 - PRELIMINARY MATTERS

### 2.01 *Delivery of Bonds*

- A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller also shall deliver such bonds as Seller may be required to furnish.

### 2.02 *Evidence of Insurance*

- A. When Seller delivers the executed counterparts of the Agreement to Buyer, Seller shall deliver to Buyer, with copies to each additional insured identified by name in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Seller is required to purchase and maintain in accordance with Article 4.

### 2.03 *Copies of Documents*

- A. Buyer shall furnish Seller up to five printed or hard copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

### 2.04 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

### 2.05 *Designated Representatives*

- A. Buyer and Seller shall each designate its representative at the time the Agreement is signed. Each representative shall have full authority to act on behalf of and make binding decisions in any matter arising out of or relating to the Contract.

### 2.06 *Progress Schedule*

- A. Within 15 days after the Contract Times start to run, Seller shall submit to Buyer and Engineer an acceptable progress schedule of activities, including at a minimum, Shop Drawing and Sample submittals, tests, and deliveries as required by the Contract Documents. No progress payment will be made to Seller until an acceptable schedule is submitted to Buyer and Engineer.
- B. The progress schedule will be acceptable to Buyer and Engineer if it provides an orderly progression of the submittals, tests, and deliveries to completion within the specified Milestones and the Contract Times. Such acceptance will not impose on Buyer or Engineer responsibility for the progress schedule, for sequencing, scheduling, or progress of the work nor interfere with or relieve Seller from Seller's full responsibility

therefor. Such acceptance shall not be deemed to acknowledge the reasonableness and attainability of the schedule.

2.07 *Preliminary Conference*

- A. Within 20 days after the Contract Times start to run, a conference attended by Seller, Buyer, Engineer and others as appropriate will be held to establish a working understanding among the parties as to the Goods and Special Services and to discuss the schedule referred to in Paragraph 2.06.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.08 *Safety*

- A. Buyer and Seller shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss. When Seller's personnel, or the personnel of any subcontractor to Seller, are present at the Point of Destination or any work area or site controlled by Buyer, the Seller shall be responsible for the compliance by such personnel with any applicable requirements of Buyer's safety programs that are made known to Seller.

**ARTICLE 3 - CONTRACT DOCUMENTS: INTENT AND AMENDING**

3.01 *Intent*

- A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
- B. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce or furnish the indicated Goods and Special Services will be provided, whether or not specifically called for, at no additional cost to Buyer.
- C. Clarifications and interpretations of, or notifications of minor variations and deviations in, the Contract Documents, will be issued by Engineer as provided in Article 9.

3.02 *Standards, Specifications, Codes, Laws and Regulations*

- A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws and Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws and Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
- B. No provision of any such standard, specification, manual or code, or any instruction of a supplier shall be effective to change the duties or responsibilities of Buyer or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to

assign to Buyer or Engineer, or any of their consultants, agents, or employees any duty or authority to supervise or direct the performance of Seller's obligations or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### 3.03 *Reporting and Resolving Discrepancies*

#### A. *Reporting Discrepancies:*

1. *Seller's Review of Contract Documents Before the Performance of the Contract:* Before performance of the Contract, Seller shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Seller shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Seller discovers or has actual knowledge of and shall obtain a written interpretation or clarification from Engineer before proceeding with the furnishing of any Goods and Special Services affected thereby.
2. *Seller's Review of Contract Documents During the Performance of the Contract:* If, during the performance of the Contract, Seller discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Contract, any standard, specification, manual or code, or of any instruction of any Supplier, Seller shall promptly report it to Engineer in writing. Seller shall not proceed with the furnishing of the Goods and Special Services affected thereby until an amendment to or clarification of the Contract Documents has been issued.
3. Seller shall not be liable to Buyer or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Seller had actual knowledge thereof.

#### B. *Resolving Discrepancies:* Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

1. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
2. the provisions of any Laws or Regulations applicable to the furnishing of the Goods and Special Services (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

### 3.04 *Amending and Clarifying Contract Documents*

- #### A. The Contract Documents may be amended to provide for additions, deletions, and revisions to the Goods and Special Services or to modify contractual terms and conditions by a Change Order.

- B. Buyer may issue a Work Change Directive providing for additions, deletions, or revisions to the Goods and Special Services, in which case (1) the Contract Price shall be equitably adjusted to account for any reasonable and necessary credits to Buyer for any such deletion, or for costs (including reasonable overhead and profit) incurred by Seller to accommodate such an addition or revision and (2) the Contract Times shall be equitably adjusted to account for any impact on progress and completion of performance. Such adjustments subsequently shall be duly set forth in a Change Order.
- C. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Goods and Special Services may be authorized, by one or more of the following ways:
  - 1. A Field Order.
  - 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 5.06.D.3); or
  - 3. Engineer's written interpretation or clarification.

#### **ARTICLE 4 - BONDS AND INSURANCE**

##### **4.01 Bonds**

- A. Seller shall furnish to Buyer performance and payment bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Seller's obligations under the Contract Documents. These bonds shall remain in effect until 1) one year after the date when final payment becomes due or 2) completion of the correction period specified in Paragraph 8.03, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Seller shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Seller is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 4.01.B, Seller shall promptly notify Buyer and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 4.01.B and 4.02.

#### 4.02 *Insurance*

- A. Seller shall provide insurance of the types and coverages and in the amounts stipulated in the Supplementary Conditions.
- B. Failure of Buyer to demand certificates of insurance or other evidence of Seller's full compliance with these insurance requirements or failure of Buyer to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Seller's obligation to maintain such insurance.
- C. Upon assignment of this Contract, Seller shall comply with the written request of assignee to provide certificates of insurance to assignee.
- D. Buyer does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Seller.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Seller's liability under the indemnities granted to Buyer in the Contract Documents.

#### 4.03 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Buyer or Seller shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

### **ARTICLE 5 - SELLER'S RESPONSIBILITIES**

#### 5.01 *Supervision and Superintendence*

- A. Seller shall supervise, inspect, and direct the furnishing of the Goods and Special Services competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform its obligations in accordance with the Contract Documents. Seller shall be solely responsible for the means, methods, techniques, sequences, and procedures necessary to perform its obligations in accordance with the Contract Documents. Seller shall not be responsible for the negligence of Buyer or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure that is shown or indicated in and expressly required by the Contract Documents.

#### 5.02 *Labor, Materials and Equipment*

- A. Seller shall provide competent, qualified and trained personnel in all aspects of its performance of the Contract.
- B. All Goods, and all equipment and material incorporated into the Goods, shall be as specified, and unless specified otherwise in the Contract Documents, shall be:

1. new, and of good quality.
2. protected, assembled, connected, cleaned, and conditioned in accordance with the original manufacturer's instructions; and
3. shop assembled to the greatest extent practicable.

#### 5.03 *Laws and Regulations*

- A. Seller shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of its obligations in accordance with the Contract Documents. Except where otherwise expressly required by such Laws and Regulations, neither Buyer nor Engineer shall be responsible for monitoring Seller's compliance with any Laws or Regulations.
- B. If Seller furnishes Goods and Special Services knowing or having reason to know that such furnishing is contrary to Laws or Regulations, Seller shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such performance. It shall not be Seller's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this provision shall not relieve Seller of Seller's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance shall be the subject of an adjustment in Contract Price or Contract Times. If Buyer and Seller are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 9.06.

#### 5.04 *Or Equals*

- A. Whenever the Goods, or an item of material or equipment to be incorporated into the Goods, are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier or manufacturer, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item is permitted, other items of material or equipment or material or equipment of other suppliers or manufacturers may be submitted to Buyer for Engineer's review.
  1. If in Engineer's sole discretion, such an item of material or equipment proposed by Seller is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or-equal" item.
  2. For the purposes of this paragraph, a proposed item of material or equipment may be considered functionally equal to an item so named only if:

- a. in the exercise of reasonable judgment, Engineer determines that: 1) it is at least equal in quality, durability, appearance, strength, and design characteristics; 2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; 3) it has an acceptable record of performance and availability of responsive service; and
  - b. Seller certifies that if approved: 1) there will be no increase in any cost, including capital, installation or operating costs, to Buyer; and 2) the proposed item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraph 5.04.A. Engineer will be the sole judge of whether to accept or reject such a proposal or submittal. No "or-equal" will be ordered, manufactured or utilized until Engineer's review is complete, which will be evidenced by an approved Shop Drawing. Engineer will advise Buyer and Seller in writing of any negative determination. Notwithstanding Engineer's approval of an "or-equal" item, Seller shall remain obligated to comply with the requirements of the Contract Documents.
- C. *Special Guarantee:* Buyer may require Seller to furnish at Seller's expense a special performance guarantee or other surety with respect to any such proposed "or-equal."
- D. *Data:* Seller shall provide all data in support of any such proposed "or-equal" at Seller's expense.
- 5.05 *Taxes*
- A. Seller shall be responsible for all taxes and duties arising out of the sale of the Goods and the furnishing of Special Services. All taxes are included in the Contract Price, except as noted in the Supplementary Conditions.
- 5.06 *Shop Drawings and Samples*
- A. Seller shall submit Shop Drawings and Samples to Buyer for Engineer's review and approval in accordance with the schedule required in Paragraph 2.06.A. All submittals will be identified as required and furnished in the number of copies specified in the Contract Documents. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Seller proposes to provide.
  - B. Where a Shop Drawing or Sample is required by the Contract Documents, any related work performed prior to Engineer's approval of the pertinent submittal will be at the sole expense and responsibility of Seller.

**C. Submittal Procedures:**

1. Before submitting each Shop Drawing or Sample, Seller shall have determined and verified:
  - a. all field measurements (if required), quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto; and
  - b. that all materials are suitable with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the furnishing of Goods and Special Services.
2. Seller shall also have reviewed and coordinated each Shop Drawing or Sample with the Contract Documents.
3. Each submittal shall bear a stamp or include a written certification from Seller that Seller has reviewed the subject submittal and confirmed that it is in compliance with the requirements of the Contract Documents. Both Buyer and Engineer shall be entitled to rely on such certification from Seller.
4. With each submittal, Seller shall give Buyer and Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both in a written communication separate from the submittal and by specific notation on each Shop Drawing or Sample.

**D. Engineer's Review:**

1. Engineer will provide timely review of Shop Drawings and Samples.
2. Engineer's review and approval will be only to determine if the Goods and Special Services covered by the submittals will, after installation or incorporation in the Project, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole.
3. Engineer's review and approval shall not relieve Seller from responsibility for any variation from the requirements of the Contract Documents unless Seller has complied with the requirements of Paragraph 5.06.C.4 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Seller from responsibility for complying with the requirements of Paragraph 5.06.C.1.

**E. Resubmittal Procedures:**

1. Seller shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Seller shall direct specific attention in writing to any revisions other than the corrections called for by Engineer on previous submittals.

**5.07 Continuing Performance**

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06.A., and the Goods shall be delivered and the Special Services furnished within the Contract Times specified in the Agreement.
- B. Seller shall carry on furnishing of the Goods and Special Services and adhere to the progress schedule during all disputes or disagreements with Buyer. No furnishing of Goods and Special Services shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraphs 11.03 or 11.04, or as Buyer and Seller may otherwise agree in writing.

**5.08 Seller's Warranties and Guarantees**

- A. Seller warrants and guarantees to Buyer that the title to the Goods conveyed shall be proper, its transfer rightful, and free from any security interest, lien, or other encumbrance. Seller shall defend, indemnify, and hold Buyer harmless against any liens, claims, or demands contesting or affecting title of the Goods conveyed.
- B. Seller warrants and guarantees to Buyer that all Goods and Special Services will conform with the Contract Documents, and with the standards established by any Samples approved by Engineer. Engineer shall be entitled to rely on Seller's warranty and guarantee. If the Contract Documents do not otherwise specify the characteristics or the quality of the Goods, the Goods shall comply with the requirements of Paragraph 5.02.B.
- C. Seller's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, improper modification, improper maintenance, or improper operation by persons other than Seller; or
  2. corrosion or chemical attack, unless corrosive or chemically-damaging conditions were disclosed by Buyer in the Contract Documents and the Contract Documents required the Goods to withstand such conditions.
  3. use in a manner contrary to Seller's written instructions for installation, operation, and maintenance; or
  4. normal wear and tear under normal usage.

D. Seller's obligation to furnish the Goods and Special Services in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Goods and Special Services that are non-conforming, or a release of Seller's obligation to furnish the Goods and Special Services in accordance with the Contract Documents:

1. observations by Buyer or Engineer.
2. recommendation by Engineer or payment by Buyer of any progress or final payment.
3. use of the Goods by Buyer.
4. any acceptance by Buyer (subject to the provisions of Paragraph 8.02.D.1) or any failure to do so.
5. the issuance of a notice of acceptance by Buyer pursuant to the provisions of Article 8.
6. any inspection, test or approval by others; or
7. any correction of non-conforming Goods and Special Services by Buyer.

E. Buyer shall promptly notify Seller of any breach of Seller's warranties or guarantees.

F. Seller makes no implied warranties under this Contract.

5.09 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer and Engineer, and the officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of Seller's obligations under the Contract Documents, provided that any such claim, cost, loss, or damages attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Goods themselves), including the loss of use resulting therefrom, but only to the extent cause by any negligent act or omission of Seller, or any individual or entity directly or indirectly employed by Seller or anyone for whose acts Seller may be liable.
- B. In any and all claims against Buyer or Engineer or any of their respective assignees, consultants, agents, officers, directors, members, partners, employees, agents, consultants, contractors, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Seller, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to furnish any of the Goods and Special Services, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 5.09.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for

seller or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- C. The indemnification obligations of Seller under Paragraph 5.09.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, and consultants arising out of:
1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

5.10 *Delegation of Professional Design Services*

- A. Seller will not be required to provide professional design services unless such services are specifically required by the Contract Documents or unless such services are required to carry out Seller's responsibilities for furnishing the Goods and Special Services. Seller shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to the Goods and Special Services are specifically required of Seller by the Contract Documents, Buyer and Engineer will specify all performance and design criteria that such services must satisfy. Seller shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Goods and Special Services designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Buyer and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Buyer and Engineer have specified to Seller all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 5.10, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 5.06.D.2.
- E. Seller shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

## ARTICLE 6 - SHIPPING AND DELIVERY

### 6.01 *Shipping*

- A. Seller shall select the carrier and bear all costs of packaging, transportation, insurance, special handling and any other costs associated with shipment and delivery.

### 6.02 *Delivery*

- A. Seller shall deliver the Goods F.O.B. the Point of Destination in accordance with the Contract Times set forth in the Agreement, or other date agreed to by Buyer and Seller.
- B. Seller shall provide written notice to Buyer at least 10 days before shipment of the manner of shipment and the anticipated delivery date. The notice shall also include any instructions concerning special equipment or services required at the Point of Destination to unload and care for the Goods. Seller shall also require the carrier to give Buyer at least 24 hours notice by telephone prior to the anticipated time of delivery.
- C. Buyer will be responsible and bear all costs for unloading the Goods from carrier.
- D. Buyer will assure that adequate facilities are available to receive delivery of the Goods during the Contract Times for delivery set forth in the Agreement, or another date agreed by Buyer and Seller.
- E. No partial deliveries shall be allowed, unless permitted or required by the Contract Documents or agreed to in writing by Buyer.

### 6.03 *Risk of Loss*

- A. Risk of loss and insurable interests transfer from Seller to Buyer upon Buyer's receipt of the Goods.
- B. Notwithstanding the provisions of Paragraph 6.03.A, if Buyer rejects the Goods as non-conforming, the risk of loss on such Goods shall remain with Seller until Seller corrects the non-conformity or Buyer accepts the Goods. If rejected Goods remain at the Point of Destination pending modification and acceptance, then Seller shall be responsible for arranging adequate protection and maintenance of the Goods at Seller's expense.

### 6.04 *Progress Schedule*

- A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.06 as it may be adjusted from time to time as provided below.
  - 1. Seller shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.06) proposed adjustments in the progress schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 7. Adjustments in Contract Times may only be made by a Change Order.

## **ARTICLE 7 - CHANGES: SCHEDULE AND DELAY**

### **7.01 *Changes in the Goods and Special Services***

- A. Buyer may at any time, without notice to any surety, make an addition, deletion, or other revision to the Contract Documents with respect to the Goods and Services, within the general scope of the Contract, by a Change Order or Work Change Directive. Upon receipt of any such document, Seller shall promptly proceed with performance pursuant to the revised Contract Documents (except as otherwise specifically provided).
- B. If Seller concludes that a Work Change Directive issued by Buyer affects the Contract Price or Contract Times, then Seller shall notify Buyer within 15 days after Seller has received the Work Change Directive and submit written supporting data to Buyer within 45 days after such receipt. If Seller fails to notify Buyer within 15 days, Seller waives any Claim for such adjustment. If Buyer and Seller are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 9.06.
- C. Seller shall not suspend performance while Buyer and Seller are in the process of making such changes and any related adjustments to Contract Price or Contract Times.

### **7.02 *Changing Contract Price or Contract Times***

- A. The Contract Price or Contract Times may only be changed by a Change Order.
- B. Any Claim for an adjustment in the Contract Price or Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 9.06.
- C. If Seller is prevented from delivering the Goods or performing the Special Services within the Contract Times for any unforeseen reason beyond its control and not attributable to its actions or inactions, then Seller shall be entitled to an adjustment of the Contract Times to the extent attributable to such reason. Such reasons include but are not limited to acts or neglect by Buyer, inspection delays, fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters. If such an event occurs and delays Seller's performance, Seller shall notify Buyer in writing within 15 days of knowing or having reason to know of the beginning of the event causing the delay, stating the reason therefor.
- D. Seller shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Seller. Delays attributable to and within the control of Seller's subcontractors or suppliers shall be deemed to be delays within the control of Seller.
- E. If Seller is prevented from delivering the Goods or furnishing the Special Services within the Contract Times due to the actions or inactions of Buyer, Seller shall be entitled to

any reasonable and necessary additional costs arising out of such delay to the extent directly attributable to Buyer.

- F. Neither Buyer nor Seller shall be entitled to any damages arising from delays which are beyond the control of both Buyer and Seller, including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, and other like matters.

## **ARTICLE 8 - BUYER'S RIGHTS**

### **8.01 *Inspections and Testing***

#### **A. *General:***

1. The Contract Documents specify required inspections and tests. Buyer shall have the right to perform, or cause to be performed, reasonable inspections and require reasonable tests of the Goods at Seller's facility, and at the Point of Destination. Seller shall allow Buyer a reasonable time to perform such inspections or tests.
2. Seller shall reimburse Buyer for all expenses, except for travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, for inspections and tests specified in the Contract Documents. If as the result of any such specified testing the Goods are determined to be non-conforming, then Seller shall also bear the travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, and all expenses of re-inspection or retesting.
3. Buyer shall bear all expenses of inspections and tests that are not specified in the Contract Documents (other than any re-inspection or retesting resulting from a determination of non-conformity, as set forth in Paragraph 8.01.A.2 immediately above); provided, however, that if as the result of any such non-specified inspections or testing the Goods are determined to be non-conforming, then Seller shall bear all expenses of such inspections and testing, and of any necessary re-inspection and retesting.
4. Seller shall provide Buyer timely written notice of the readiness of the Goods for all inspections, tests, or approvals which the Contract Documents specify are to be observed by Buyer prior to shipment.
5. Buyer will give Seller timely notice of all specified tests, inspections, and approvals of the Goods which are to be conducted at the Point of Destination.
6. If, on the basis of any inspections or testing, the Goods appear to be conforming, Buyer will give Seller prompt notice thereof. If on the basis of said inspections or testing, the Goods appear to be non-conforming, Buyer will give Seller prompt notice thereof and will advise Seller of the remedy Buyer elects under the provisions of Paragraph 8.02.
7. Neither payment made by Buyer to Seller prior to any tests or inspections, nor any tests or inspections shall constitute acceptance of non-conforming Goods, or prejudice Buyer's rights under the Contract.

**B. Inspection on Delivery:**

1. Buyer or Engineer will visually inspect the Goods upon delivery solely for purposes of identifying the Goods and general verification of quantities and observation of apparent condition in order to provide a basis for a progress payment. Such visual inspection will not be construed as final or as receipt of any Goods and Special Services that, as a result of subsequent inspections and tests, are determined to be non-conforming.
2. Within ten days of such visual inspection, Buyer shall provide Seller with written notice of Buyer's determination regarding conformity of the Goods. In the event Buyer does not provide such notice, it will be presumed that the Goods appear to be conforming and that Buyer has acknowledged their receipt upon delivery.
3. If, on the basis of the visual inspection specified in Paragraph 8.01.B.1, the Goods appear to be conforming, Buyer's notice thereof to Seller will acknowledge receipt of the Goods.

**C. Final Inspection:**

1. After all of the Goods have been incorporated into the Project, tested in accordance with such testing requirements as are specified, and are functioning as indicated, Buyer or Engineer will make a final inspection.
2. If, on the basis of the final inspection, the Goods are conforming, Buyer's notice thereof will constitute Buyer's acceptance of the Goods.
3. If, on the basis of the final inspection, the Goods are non-conforming, Buyer will identify the non-conformity in writing.

**8.02 *Non-Conforming Goods and Special Services***

- A. If, on the basis of inspections and testing prior to delivery, the Goods and Special Services are found to be non-conforming, or if at any time after Buyer has acknowledged receipt of delivery and before the expiration of the correction period described in Paragraph 8.03, Buyer determines that the Goods and Special Services are non-conforming, then Seller shall promptly, without cost to Buyer and in response to written instructions from Buyer, either correct such non-conforming Goods and Special Services, or, if Goods are rejected by Buyer, remove and replace the non-conforming Goods with conforming Goods, including all work required for reinstallation.

**B. Buyer's Rejection of Non-Conforming Goods:**

1. If Buyer elects to reject the Goods in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Goods. If Goods have been delivered to Buyer, Seller shall promptly, and within the Contract Times, remove and replace the rejected Goods.
2. Seller shall bear all costs, losses and damages attributable to the removal and replacement of the non-conforming Goods as provided in Paragraph 8.02.E.

3. Upon rejection of the Goods, Buyer retains a security interest in the Goods to the extent of any payments made and expenses incurred in their testing and inspection.

**C. Remedying Non-Conforming Goods and Special Services:**

1. If Buyer elects to permit the Seller to modify the Goods to correct the non-conformance, then Seller shall promptly provide a schedule for such modifications and shall make the Goods conforming within a reasonable time.
2. If Buyer notifies Seller in writing that any of the Special Services are non-conforming, Seller shall promptly provide conforming services acceptable to Buyer. If Seller fails to do so, Buyer may delete the Special Services and reduce the Contract Price a commensurate amount.

**D. Buyer's Acceptance of Non-Conforming Goods:**

Instead of requiring correction or removal and replacement of non-conforming Goods discovered either before or after final payment, Buyer may accept the non-conforming Goods. Seller shall bear all reasonable costs, losses, and damages attributable to Buyer's evaluation of and determination to accept such non-conforming Goods as provided in Paragraph 8.02.E.

- E.** Seller shall pay all claims, costs, losses, and damages, including but not limited to all fees and charges for re-inspection, retesting and for any engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs arising out of or relating to the non-conforming Goods and Special Services. Seller's obligations shall include the costs of the correction or removal and replacement of the non-conforming Goods and the replacement of property of Buyer and others destroyed by the correction or removal and replacement of the non-conforming Goods, and obtaining conforming Special Services from others.

**F. Buyer's Rejection of Conforming Goods:**

If Buyer asserts that Goods and Special Services are non-conforming and such Goods and Special Services are determined to be conforming, or if Buyer rejects as non-conforming Goods and Special Services that are later determined to be conforming, then Seller shall be entitled to reimbursement from Buyer of costs incurred by Seller in inspecting, testing, correcting, removing, or replacing the conforming Goods and Special Services, including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs associated with the incorrect assertion of non-conformance or rejection of conforming Goods and Special Services.

**8.03 Correction Period**

- A.** Seller's responsibility for correcting all non-conformities in the Goods and Special Services will extend for a period of one year after the earlier of the date on which Buyer has placed the Goods in continuous service or the date of final payment, or for such longer period of

time as may be prescribed by Laws or Regulations or by the terms of any specific provisions of the Contract Documents.

## **ARTICLE 9 - ROLE OF ENGINEER**

### **9.01 Duties and Responsibilities**

- A. The duties and responsibilities and the limitations of authority of Engineer are set forth in the Contract Documents.

### **9.02 Clarifications and Interpretations**

- A. Engineer will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents as Engineer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Such written clarifications and interpretations will be binding on Buyer and Seller. If either Buyer or Seller believes that a written clarification or interpretation justifies an adjustment in the Contract Price or Contract Times, either may make a Claim therefor.

### **9.03 Authorized Variations**

- A. Engineer may authorize minor deviations or variations in the Contract Documents by: 1) written approval of specific variations set forth in Shop Drawings when Seller has duly noted such variations as required in Paragraph 5.06.C.4, or 2) a Field Order.

### **9.04 Rejecting Non-Conforming Goods and Special Services**

- A. Engineer will have the authority to disapprove or reject Goods and Special Services that Engineer believes to be non-conforming. Engineer will also have authority to require special inspection or testing of the Goods or Special Services as provided in Paragraph 8.01 whether or not the Goods are fabricated or installed, or the Special Services are completed.

### **9.05 Decisions on Requirements of Contract Documents**

- A. Engineer will be the initial interpreter of the Contract Documents and judge of the acceptability of the Goods and Special Services. Claims, disputes and other matters relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to Seller's performance will be referred initially to Engineer in writing with a request for a formal decision in accordance with this paragraph.
- B. When functioning as interpreter and judge under this Paragraph 9.05, Engineer will not show partiality to Buyer or Seller and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Engineer pursuant to this Paragraph 9.05 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 10.07) will be a condition precedent to any exercise by Buyer or Seller of such rights or remedies as either may otherwise have under the Contract

Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

#### 9.06 *Claims and Disputes*

- A. **Notice:** Written notice of each Claim relating to the acceptability of the Goods and Special Services or the interpretation of the requirements of the Contract Documents pertaining to either party's performance shall be delivered by the claimant to Engineer and the other party to the Agreement within 15 days after the occurrence of the event giving rise thereto, and written supporting data shall be submitted to Engineer and the other party within 45 days after such occurrence unless Engineer allows an additional period of time to ascertain more accurate data.
- B. **Engineer's Decision:** Engineer will review each such Claim and render a decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.
- C. If Engineer does not render a formal written decision on a Claim within the time stated in Paragraph 9.06.B., Engineer shall be deemed to have issued a decision denying the Claim in its entirety 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.
- D. Engineer's written decision on such Claim or a decision denying the Claim in its entirety that is deemed to have been issued pursuant to Paragraph 9.06.C, will be final and binding upon Buyer and Seller 30 days after it is issued unless within 30 days of issuance Buyer or Seller appeals Engineer's decision by initiating the mediation of such Claim in accordance with the dispute resolution procedures set forth in Article 13.
- E. If Article 13 has been amended to delete the mediation requirement, then Buyer or Seller may appeal Engineer's decision within 30 days of issuance by following the alternative dispute resolution process set forth in Article 13, as amended; or if no such alternative dispute resolution process has been set forth, Buyer or Seller may appeal Engineer's decision by 1) delivering to the other party within 30 days of the date of such decision a written notice of intent to submit the Claim to a court of competent jurisdiction, and 2) within 60 days after the date of such decision instituting a formal proceeding in a court of competent jurisdiction.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 9.06.
- G. The parties agree to endeavor to avoid or resolve Claims through direct, good faith discussions and negotiations whenever practicable. Such discussions and negotiations should at the outset address whether the parties mutually agree to suspend the time periods established in this Paragraph 9.06; if so, a written record of such mutual agreement should be made and jointly executed.

## ARTICLE 10 - PAYMENT

### 10.01 *Applications for Progress Payments*

- A. Seller shall submit to Buyer for Engineer's review Applications for Payment filled out and signed by Seller and accompanied by such supporting documentation as is required by the Contract Documents and also as Buyer or Engineer may reasonably require. The timing and amounts of progress payments shall be as stipulated in the Agreement.
1. The first application for Payment will be submitted after review and approval by Engineer of all Shop Drawings and of all Samples required by the Contract Documents.
  2. The second Application for Payment will be submitted after receipt of the Goods has been acknowledged in accordance with Paragraph 8.01.B and will be accompanied by a bill of sale, invoice, or other documentation reasonably satisfactory to Buyer warranting that Buyer has rightfully received good title to the Goods from Seller and that, upon payment, the Goods will be free and clear of all liens. Such documentation will include releases and waivers from all parties with viable lien rights. In the case of multiple deliveries of Goods, additional Applications for Payment accompanied by the required documentation will be submitted as Buyer acknowledges receipt of additional items of the Goods.

### 10.02 *Review of Applications for Progress Payments*

- A. Engineer will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Buyer or return the Application to Seller indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Seller may make the necessary corrections and resubmit the Application.
1. Engineer's recommendation of payment requested in the first Application for Payment will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data, that the Shop Drawings and Samples have been reviewed and approved as required by the Contract Documents and Seller is entitled to payment of the amount recommended.
  2. Engineer's recommendation of payment requested in the Application for Payment submitted upon Buyer's acknowledgment of receipt of the Goods will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data Seller is entitled to payment of the amount recommended. Such recommendation will not constitute a representation that Engineer has made a final inspection of the Goods, that the Goods are free from non-conformities, acceptable or in conformance with the Contract Documents, that Engineer has made any investigation as to Buyer's title to the Goods, that exhaustive or continuous inspections have been made to check the quality or the quantity of the Goods beyond the responsibilities specifically assigned to Engineer in the Contract Documents or that there may not be other matters or issues

between the parties that might entitle Seller to additional payments by Buyer or Buyer to withhold payment to Seller.

3. Engineer may refuse to recommend that all or any part of a progress payment be made, or Engineer may nullify all or any part of any payment previously recommended if, in Engineer's opinion, such recommendation would be incorrect or if on the basis of subsequently discovered evidence or subsequent inspections or tests Engineer considers such refusal or nullification necessary to protect Buyer from loss because the Contract Price has been reduced, Goods are found to be non-conforming, or Seller has failed to furnish acceptable Special Services.

#### 10.03 *Amount and Timing of Progress Payments*

- A. Subject to Paragraph 10.02.A., the amounts of the progress payments will be as provided in the Agreement. Buyer shall within 30 days after receipt of each Application for Payment with Engineer's recommendation pay Seller the amount recommended; but, in the case of the Application for Payment upon Buyer's acknowledgment of receipt of the Goods, said 30-day period may be extended for so long as is necessary (but in no event more than 60 days) for Buyer to examine the bill of sale and other documentation submitted therewith. Buyer shall notify Seller promptly of any deficiency in the documentation and shall not unreasonably withhold payment.

#### 10.04 *Suspension of or Reduction in Payment*

- A. Buyer may suspend or reduce the amount of progress payments, even though recommended for payment by Engineer, under the following circumstances:
  1. Buyer has reasonable grounds to conclude that Seller will not furnish the Goods or the Special Services in accordance with the Contract Documents, and
  2. Buyer has requested in writing assurances from Seller that the Goods and Special Services will be delivered or furnished in accordance with the Contract Documents, and Seller has failed to provide adequate assurances within ten days of Buyer's written request.
- B. If Buyer refuses to make payment of the full amount recommended by Engineer, Buyer will provide Seller and Engineer immediate written notice stating the reason for such action and promptly pay Seller any amount remaining after deduction of the amount withheld. Buyer shall promptly pay Seller the amount withheld when Seller corrects the reason for such action to Buyer's satisfaction.

#### 10.05 *Final Application for Payment*

- A. After Seller has corrected all non-conformities to the reasonable satisfaction of Buyer and Engineer, furnished all Special Services, and delivered all documents required by the Contract Documents, Engineer will issue to Buyer and Seller a notice of acceptance. Seller may then make application for final payment following the procedure for progress payments. The final Application for Payment will be accompanied by all documentation

called for in the Contract Documents, a list of all unsettled Claims, and such other data and information as Buyer or Engineer may reasonably require.

#### 10.06 *Final Payment*

- A. If, on the basis of final inspection and the review of the final Application for Payment and accompanying documentation, Engineer is reasonably satisfied that Seller has furnished the Goods and Special Services in accordance with the Contract Documents, and that Seller's has fulfilled all other obligations under the Contract Documents, then Engineer will, within ten days after receipt of the final Application for Payment, recommend in writing final payment subject to the provisions of Paragraph 10.07 and present the Application to Buyer. Otherwise, Engineer will return the Application to Seller, indicating the reasons for refusing to recommend final payment, in which case Seller shall make the necessary corrections and resubmit the Application for payment. If the Application and accompanying documentation are appropriate as to form and substance, Buyer shall, within 30 days after receipt thereof, pay Seller the amount recommended by Engineer, less any sum Buyer is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages to which Buyer is entitled.

#### 10.07 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by Buyer against Seller, except Claims arising from unsettled liens from non-conformities in the Goods or Special Services appearing after final payment, from Seller's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Seller's continuing obligations under the Contract Documents; and
  2. a waiver of all Claims by Seller against Buyer (other than those previously made in accordance with the requirements herein and listed by Seller as unsettled as required in Paragraph 10.05.A, and not resolved in writing).

### **ARTICLE 11 - CANCELLATION, SUSPENSION, AND TERMINATION**

#### 11.01 *Cancellation*

- A. Buyer has the right to cancel the Contract, without cause, at any time prior to delivery of the Goods by written notice. Cancellation pursuant to the terms of this paragraph shall not constitute a breach of contract by Buyer. Upon cancellation:
1. Buyer shall pay Seller for the direct costs incurred in producing any Goods that Seller has specially manufactured for the Project, plus a fair and reasonable amount for overhead and profit.
  2. For Goods that are not specially manufactured for the Project, Seller shall be entitled to a restocking charge of 10 percent of the unpaid Contract Price of such Goods.

11.02 *Suspension of Performance by Buyer*

- A. Buyer has the right to suspend performance of the Contract for up to a maximum of ninety days, without cause, by written notice. Upon suspension under this paragraph, Seller shall be entitled to an increase in the Contract Times and Contract Price caused by the suspension, provided that performance would not have been suspended or delayed for causes attributable to Seller.

11.03 *Suspension of Performance by Seller*

- A. Subject to the provisions of Paragraph 5.07.B, Seller may suspend the furnishing of the Goods and Special Services only under the following circumstance:
1. Seller has reasonable grounds to conclude that Buyer will not perform its future payment obligations under the Contract; and,
  2. Seller has requested in writing assurances from Buyer that future payments will be made in accordance with the Contract, and Buyer has failed to provide such assurances within ten days of Seller's written request.

11.04 *Breach and Termination*

A. Buyer's Breach:

1. Buyer shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including but not limited to:
  - a. wrongful rejection or revocation of Buyer's acceptance of the Goods,
  - b. failure to make payments in accordance with the Contract Documents, or
  - c. wrongful repudiation of the Contract.
2. Seller shall have the right to terminate the Contract for cause by declaring a breach should Buyer fail to comply with any material provisions of the Contract. Upon termination, Seller shall be entitled to all remedies provided by Laws and Regulations.
  - a. In the event Seller believes Buyer is in breach of its obligations under the Contract, Seller shall provide Buyer with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Buyer shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Seller may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.

**B. Seller's Breach:**

1. Seller shall be deemed in breach of the Contract if it fails to comply with any material provision of the Contract Documents, including, but not limited to:
  - a. failure to deliver the Goods or perform the Special Services in accordance with the Contract Documents,
  - b. wrongful repudiation of the Contract, or
  - c. delivery or furnishing of non-conforming Goods and Special Services.
2. Buyer may terminate Seller's right to perform the Contract for cause by declaring a breach should Seller fail to comply with any material provision of the Contract Documents. Upon termination, Buyer shall be entitled to all remedies provided by Laws and Regulations.
  - a. In the event Buyer believes Seller is in breach of its obligations under the Contract, and except as provided in Paragraph 11.04.B.2.b, Buyer shall provide Seller with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Seller shall have seven days from receipt of the written notice declaring the breach (or such longer period of time as Buyer may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.
  - b. If and to the extent that Seller has provided a performance bond under the provisions of Paragraph 4.01, the notice and cure procedures of that bond, if any, shall supersede the notice and cure procedures of Paragraph 11.04.B.2.a.

**ARTICLE 12 - LICENSES AND FEES**

**12.01 *Intellectual Property and License Fees***

- A. Unless specifically stated elsewhere in the Contract Documents, Seller is not transferring any intellectual property rights, patent rights, or licenses for the Goods delivered. However, in the event the Seller is manufacturing to Buyer's design, Buyer retains all intellectual property rights in such design.
- B. Seller shall pay all license fees and royalties and assume all costs incident to the use or the furnishing of the Goods, unless specified otherwise by the Contract Documents.

**12.02 *Seller's Infringement***

- A. Subject to Paragraph 12.01.A, Seller shall indemnify and hold harmless Buyer, Engineer and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of

any United States or foreign patent or copyright by any of the Goods as delivered hereunder.

- B. In the event of suit or threat of suit for intellectual property infringement, Buyer will promptly notify Seller of receiving notice thereof.
- C. Seller shall promptly defend the claim or suit, including negotiating a settlement. Seller shall have control over such claim or suit, provided that Seller agrees to bear all expenses and to satisfy any adverse judgment thereof.
  - 1. If Seller fails to defend such suit or claim after written notice by Buyer, Seller will be bound in any subsequent suit or claim against Seller by Buyer by any factual determination in the prior suit or claim.
  - 2. If Buyer fails to provide Seller the opportunity to defend such suit or claim after written notice by Seller, Buyer shall be barred from any remedy against Seller for such suit or claim.
- D. If a determination is made that Seller has infringed upon intellectual property rights of another, Seller may obtain the necessary licenses for Buyer's benefit, or replace the Goods and provide related design and construction as necessary to avoid the infringement at Seller's own expense.

#### 12.03 *Buyer's Infringement*

- A. Buyer shall indemnify and hold harmless Seller, and its officers, directors, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of any United States or foreign patent or copyright caused by Seller's compliance with Buyer's design of the Goods or Buyer's use of the Goods in combination with other materials or equipment in any process (unless intent of such use was known to Seller and Seller had reason to know such infringement would result).
- B. In the event of suit or threat of suit for intellectual property infringement, Seller must after receiving notice thereof promptly notify Buyer.
- C. Upon written notice from Seller, Buyer shall be given the opportunity to defend the claim or suit, including negotiating a settlement. Buyer shall have control over such claim or suit, provided that Buyer agrees to bear all expenses and to satisfy any adverse judgment thereof.
  - 1. If Buyer fails to defend such suit or claim after written notice by Seller, Buyer will be bound in any subsequent suit or claim against Buyer by Seller by any factual determination in the prior suit or claim.

2. If Seller fails to provide Buyer the opportunity to defend such suit or claim after written notice by Buyer, Seller shall be barred from any remedy against Buyer for such suit or claim.

#### 12.04 *Reuse of Documents*

- A. Neither Seller nor any other person furnishing any of the Goods and Special Services under a direct or indirect contract with Seller shall: (1) acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions; or (2) reuse any of such Drawings, Specifications, other documents, or copies thereof on any other project without written consent of Buyer and Engineer and specific written verification or adaptation by Engineer. This prohibition will survive termination or completion of the Contract. Nothing herein shall preclude Seller from retaining copies of the Contract Documents for record purposes.

#### 12.05 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, copies of data furnished by Buyer or Engineer to Seller, or by Seller to Buyer or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. The transferring party will correct any errors detected within the 60-day acceptance period.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

### **ARTICLE 13 - DISPUTE RESOLUTION**

#### 13.01 *Dispute Resolution Method*

- A. Either Buyer or Seller may initiate the mediation of any Claim decided in writing by Engineer under Paragraph 9.06.B or 9.06.C before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the Engineer's decision from becoming final and binding.

- B. Buyer and Seller shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the mediation process does not result in resolution of the Claim, then Engineer's written decision under Paragraph 9.06.B or a denial pursuant to Paragraph 9.06.C shall become final and binding 30 days after termination of the mediation unless, within that time period, Buyer or Seller:
  - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or
  - 2. agrees with the other party to submit the Claim to another dispute resolution process, or
  - 3. if no dispute resolution process has been provided for in the Supplementary Conditions, delivers to the other party written notice of the intent to submit the Claim to a court of competent jurisdiction, and within 60 days of the termination of the mediation institutes such formal proceeding.

## **ARTICLE 14 - MISCELLANEOUS**

### **14.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if: 1) 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 2) if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

### **14.02 *Controlling Law***

- A. This Contract is to be governed by the law of the state in which the Point of Destination is located.
- B. In the case of any conflict between the express terms of this Contract and the Uniform Commercial Code, as adopted in the state whose law governs, it is the intent of the parties that the express terms of this Contract shall apply.

### **14.03 *Computation of Time***

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day shall be omitted from the computation.

### **14.04 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be

construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

14.05 *Survival of Obligations*

- A. All representations, indemnifications, warranties and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Goods and Special Services and termination or completion of the Agreement.

14.06 *Entire Agreement*

- A. Buyer and Seller agree that this Agreement is the complete and final agreement between them, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may not be altered, modified, or amended except in writing signed by an authorized representative of both parties.

## **Supplementary Conditions**

**These Supplementary Conditions amend or supplement the Standard General Conditions for Procurement Contracts, EJCDC P-700 (2010 Edition), and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.**

**The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.**

**SC-4.01      Change Paragraph A:**

- A.      Payment bond is not required.

**SC-4.02      Add the following new paragraphs immediately after Paragraph 4.02.E:**

- F.      Seller shall purchase and maintain such liability and other insurance as is appropriate for the furnishing of Goods and Special Services and as will provide protection from claims set forth below which may arise out of or result from Seller's furnishing of the Goods or Special Services and Seller's other obligations under the Contract Documents, whether the furnishing of Goods and Special Services or other obligations are to be performed by Seller, any subcontractor or supplier, or by anyone directly or indirectly employed by any of them to furnish the Goods and Special Services, or by anyone for whose acts any of them may be liable:
1.      Claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  2.      Claims for damages because of bodily injury, occupational sickness or disease, or death of Seller's employees.
  3.      Claims for damages because of bodily injury, sickness or disease, or death of any person other than Seller's employees.
  4.      Claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by Seller, or (ii) by any other person for any other reason.

5. Claims for damages, other than to the Goods, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
  6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- G. The policies of insurance so required by this Paragraph 4.02 to be purchased and maintained shall:
1. With respect to insurance required by Paragraphs SC-4.02.F.3 through SC-4.02.F.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) Buyer, Engineer, their consultants, and [*Here list by name, (not Project role) other persons or entities to be included on policy as additional insureds*] all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
  2. Include at least the specific coverages and be written for not less than the limits of liability provided below or required by Laws or Regulations, whichever is greater.
  3. Include completed operations insurance.
  4. Include contractual liability insurance covering Seller's indemnity obligations under Paragraphs 5.09 and 12.02.
  5. Contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to Buyer and Seller and to each other additional insured identified in these Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Seller pursuant to Paragraph SC-4.02.I will so provide).
  6. Remain in effect at least until final payment and at all times thereafter when Seller may be correcting, removing, or replacing non-conforming Goods in accordance with Paragraph 8.03.

7. With respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and Seller shall furnish Buyer and each other additional insured identified in these Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Buyer and any such additional insured of continuation of such insurance at final payment and one year thereafter); and
  8. With respect to any delegation of professional design services to Seller pursuant to Paragraph 5.10 of the General Conditions, include professional liability coverage by endorsement or otherwise.
- H. The limits of liability for the insurance required by Paragraph SC-4.02.F shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
1. Workers' Compensation, and related coverages under Paragraphs SC-4.02.F.1 and F.2:
    - a. State: Statutory
    - b. Applicable Federal (e.g., Longshoreman's): Statutory
    - c. Employer's Liability: \$1,500,000.00
  2. Seller's General Liability under Paragraphs SC-4.02.F.3 through F.6 which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Seller:
    - a. General Aggregate \$1,500,000.00
    - b. Products - Completed
      - 1) Operations Aggregate \$1,500,000.00
    - c. Personal and Advertising
      - 1) Injury \$1,500,000.00
      - 2) Each Occurrence (Bodily Injury and Property Damage) \$1,500,000.00

- d. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.
  - e. Excess or Umbrella Liability
    - 1) General Aggregate \$5,000,000.00
    - 2) Each Occurrence \$5,000,000.00
  - 3. Automobile Liability under Paragraph SC-4.02.F.6:
    - a. Bodily Injury:
      - 1) Each person \$15,000.00
      - 2) Each Accident \$1,500,000.00
    - b. Property Damage:
      - 1) Each Accident \$1,500,000.00
      - 2) Combined Single Limit of \$1,500,000.00
  - 4. Professional Liability  
(if professional services have been delegated to Seller pursuant to Paragraph 5.10): \$1,500,000.00
  - I. Seller shall deliver to Buyer, with copies to each additional insured identified in these Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Buyer or any other additional insured) which Seller is required to purchase and maintain.
  - J. If Buyer has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained on the basis of non-conformance with the Contract Documents, Buyer shall notify Seller in writing within 10 days after receipt of the certificates or other evidence required by Paragraph SC-4.02.E. Seller shall provide such additional information in respect to insurance as Buyer shall reasonably request.
- SC-5.05 Add the following new paragraph immediately after Paragraph 5.05A:**
- B. Owner is exempt from payment of sales and local options taxes of the State of Illinois and of cities and counties thereof on all materials to be incorporated into the Work.

**SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.E:**

- F. Seller shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Seller shall reimburse Buyer for Engineer's charges for such time.
- G. In the event that Seller requests a change of a previously approved item, Seller shall reimburse Buyer for Engineer's charges for its review time unless the need for such change is beyond the control of Seller.

**Other Provisions**

**1.01 Liquidated Damages**

- A. This project is It is hereby fully understood and agreed that time is of the essence in the performance of this contract. For each and every calendar day that elapses after the Contract Completion Date and before the date on which the work covered by such Contract is actually completed, the Contractor shall pay to the Owner as liquidated damages, and not as a penalty, the sum of Five Hundred dollars (\$500.00). The total amount so payable by the Contractor as liquidated damages, either may be deducted from any moneys due or payable to the Contractor by the owner or so much thereof as is not so deducted shall be chargeable to and will be payable promptly by such Contractor and his Surety, or either of them, to compensate, at least in part, the Owner for (1) the administration of the work covered by such contract and any other contract or contracts beyond the Contract Completion Date, including the additional expense to the Owner for supervision, inspection, and superintendence; (2) expenditures resulting from the inability of the Owner (and the general public) to use the improvement being constructed from and after the Contract Completion Date until the actual date of completion; (3) other miscellaneous obligations and expenditures incurred by the Owner directly as a result of the failure to complete the Work covered by such Owner directly as a result of the failure to complete the Work covered by such contract on or before the Contract Completion Date; but, said liquidated damages shall not include the cost of litigation that may result from action taken by the Owner against the Contract.

**Note: LDs shall be capped at 10% of the total amount.**

## **SECTION 01027**

### **Applications for Payment**

#### **PART 1 – GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this Section.

##### **1.2 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of input to the Construction Schedule.
  - 1. Construction Schedule
  - 2. Application for Payment forms, including Continuation Sheets
  - 3. List of subcontractors
  - 4. List of products
  - 5. List of principal suppliers and fabricators
  - 6. Schedule of submittals
  - 7. Submit the Schedule of Values to the Engineer at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Application for Payment.
- B. Format and Content: Provide at least one line item for each major schedule activity or for each Specification Section.
  - 1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location
    - b. Name of the engineer
    - c. Project number

- d. Contractor's name and address
- e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
  - a. Related Specification Section or Division
  - b. Description of Work
  - c. Name of subcontractor
  - d. Name of manufacturer or fabricator
  - e. Name of supplier
  - f. Change Orders (numbers) that affect value
  - g. Dollar value
  - h. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased, or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.
6. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### 1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid for by the Owner.
  - 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment-Application Times: The date for each progress payment is open to the contractor's discretion, keeping in mind that city councils typically meet bi-monthly. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends upon completion of a minimum additional 15% of the project.
- C. Payment-Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment.
- D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Engineer will return incomplete applications without action.
  - 1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
  - 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit two signed and notarized original copies of each Application for Payment to the Engineer by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.
- F. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.
  - 1. Submit partial waivers on each item for the amount requested, prior to deduction for retention, on each item.
  - 2. When an application shows completion of an item, submit final or full waivers.

3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Forms: Submit waivers of lien on forms and executed in a manner acceptable to the Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
1. List of subcontractors
  2. List of principal supplier and fabricators
  3. Schedule of Values
  4. Schedule of principal products
  5. List of Contractor's principal consultants
  6. Copies of building permits
  7. Copies of authorizations and licenses from governing authorities for performance of the Work
  8. Initial progress report
  9. Certificates of insurance and insurance policies
  10. Performance and payment bonds, if required
  11. Data needed to acquire the Owner's insurance.
- H. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
  2. Administrative actions and submittals that shall precede or coincide with this application include:
    - a. Occupancy permits and similar approvals

- b. Warranties (guarantees) and maintenance agreements
  - c. Maintenance instructions
  - d. Startup performance reports
  - e. Changeover information related to Owner's occupancy, use, operation, and maintenance
  - f. Final cleaning
  - g. Application for reduction of retention and consent of surety.
  - h. Advice on shifting insurance coverage
  - i. List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion.
- I. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
- 1. Completion of Project closeout requirements
  - 2. Completion of items specified for completion after Substantial Completion
  - 3. Assurance that unsettled claims will be settled
  - 4. Assurance that incomplete Work is not accepted and will be completed without undue delay
  - 5. Transmittal of required Project construction records to the Owner
  - 6. Proof that taxes, fees, and similar obligations were paid
  - 7. Removal of temporary facilities and services
  - 8. Removal of surplus materials, rubbish, and similar elements.

**PART 2 – PRODUCTS**    *Not Used*

**PART 3 – EXECUTION**    *Not Used*

END OF SECTION

## SECTION 01340

### Shop Drawings, Product Data and Samples

#### PART 1 – GENERAL

##### 1.1 REQUIREMENTS INCLUDE

- A. Contractor shall make submittals to Engineer.
- B. Contractor:
  - 1. Verify field dimensions
  - 2. Verify compliance with Contract requirements
  - 3. Certify review
  - 4. Transmit reviewed submittals to Engineer.

##### 1.2 DEFINITIONS

- A. Shop Drawings: Shop drawings are original drawings prepared by Contractor, subcontractor, sub-subcontractor, supplier or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.
  - 1. Prepared by qualified detailer
  - 2. Identify details by reference to sheet and detail numbers shown on contract drawings
  - 3. Drawn at scale of 3 inches per foot or larger
  - 4. Maximum sheet size: 24" x 36"
  - 5. Reprints of Engineer's drawings are not acceptable for shop drawings.
- B. Product Data:
  - 1. Manufacturer's standard schematic drawings edited to fit this project.

2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.
  3.
    - a. Clearly mark each copy to identify pertinent materials, products or models.
    - b. Show wiring diagrams and controls.
    - c. Show performance characteristics and capacities.
- C. Samples: Physical samples to illustrate materials, equipment or workmanship. Approved samples establish standards by which complete work is judged. Maintain at site as directed. Protect until no longer needed.
1. Office samples: Of sufficient size to clearly illustrate:
    - a. Functional characteristics of product or material.
    - b. Full range of color samples.
    - c. After review, samples may be used on construction of project.
  2. Field samples and mock-ups:
    - a. Erect at project site at location approved by Contractor and Owner.
    - b. Construct each sample or mock-up complete, including work of all crafts required in finished work.
    - c. Remove as directed.

### 1.3 SPECIFIED PRODUCT LIST AND SAMPLES

- A. Submit to Engineer within 20 business days after Notice to Proceed date, a list of product manufacturers and full range of color samples for each manufacturer, and full range of color samples for each manufacturer's product proposed for installation. No colors will be selected prior to submittal of all products requiring a color selection.
- B. Tabulate list of each specification section.

- C. For products specified under reference standards, include with listing of each products:
  - 1. Name and address of manufacturer
  - 2. Trade name
  - 3. Model or catalog number
  - 4. Manufacturer's data
    - a. Performance and test data
    - b. Reference standards.
- D. Subcontractors' names shall be included in list and must coincide with approved subcontractor list.

#### 1.4 CONTRACTOR RESPONSIBILITIES

- A. Contractor shall review and stamp all shop drawings, product data and samples prior to submission. Failure to follow any or all established procedures set forth shall result in submittals being returned without review, at Contractor's expense.
- B. Contractor shall verify:
  - 1. Field measurements
  - 2. Field construction criteria
  - 3. Catalog numbers and similar data.
- C. Contractor shall coordinate each submittal with requirements of work and contract documents.
- D. Contractor's responsibility for errors and omissions shall not be relieved by Engineer's review of submittal.
- E. Contractor's responsibility for deviations in submittals from requirements of contract documents shall not be relieved by Engineer's review unless written acceptance by Engineer of specific deviations is issued.
- F. Contractor shall notify Engineer in writing at time of submission of deviations within submittal from requirements of contract documents.

- G. Contractor shall begin no work that requires shop drawings or product data submittals until return of submittals bearing Engineer's or professional consultant's stamp and initials or signature.
- H. After Engineer's review, distribute shop drawings and/or product data to appropriate suppliers and subcontractors.

#### 1.5 SUBMISSION REQUIREMENTS

- A. **A completed cover sheet provided at the end of this section shall accompany each individual submittal.**
- B. All submittals shall include:
  - 1. Date and revision dates
  - 2. Project title and number
  - 3. Names of:
    - a. Engineer
    - b. Subcontractor
    - c. Sub-subcontractor
    - d. Supplier
    - e. Manufacturer
    - f. Separate detailer when pertinent.
  - 4. Identification of product or material
  - 5. Relation to adjacent structure or material
  - 6. Field dimensions clearly identified as such
  - 7. Specification section and page number, one specification section per submittal
  - 8. Specified standards, such as ASTM number or ANSI
  - 9. Identification of previously approved deviations from contract documents

10. Engineer will not review submittals unless cover sheet is attached to each individual submittal, signed and stamped by the Contractor.
- C. Allow adequate space on submittal cover sheet for Engineer to affix his stamp.

#### 1.6 RESUBMISSION REQUIREMENTS

- A. Shop Drawings:
  1. Contractor shall revise initial drawings as required and resubmit as specified for initial submission.
  2. Contractor shall indicate on drawings any changes, which may have been made, other than those required by Engineer.
- B. Product Data and Samples:
  1. Submit new data and samples as required for initial submission.
- C. Make all resubmittals within 15 days after Engineer's previous review.

#### 1.7 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute copies of shop drawings and product data bearing Engineer's or professional consultant's stamp to:
  1. Contractor
  2. Project site file
  3. Other concerned subcontractors
  4. Supplier/fabricator.
- B. Contractor shall distribute samples as directed.

#### 1.8 ENGINEER'S REVIEW

- A. Engineer will review all submittals with reasonable promptness.
- B. Engineer will review for:
  1. Conformance with design concept of project.
  2. Information contained in contract documents.

- C. Engineer's review of a separate item does not constitute review of an assembly within which item functions.
- D. Engineer's or professional consultant's stamp, initials or signature certifying to review of submittal will be affixed.
- E. Engineer will return submittals to contractor for distribution.

**PART 2 - PRODUCTS**     *Not Used*

**PART 3 - EXECUTION**     *Not Used*

END OF SECTION

## SHOP DRAWING SUBMITTAL

Date: \_\_\_\_\_

PROJECT: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

BHMG Project No: \_\_\_\_\_

Contractor: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Presented By: \_\_\_\_\_  
Company Name

Address \_\_\_\_\_

Phone/Fax \_\_\_\_\_

Contact Person \_\_\_\_\_

E-Mail Address \_\_\_\_\_

Item: \_\_\_\_\_

Spec Section: \_\_\_\_\_

By approving and submitting these shop drawings, product data and samples, we represent that we have determined and verified all materials, field measurements and field construction criteria related thereto, or will do so, and that we have checked and coordinated information contained within submittal with requirements of the work and contract documents.

\_\_\_\_\_  
Contractor's Signature

\_\_\_\_\_  
Date

## **SECTION 01450**

### **Quality Control**

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Quality Assurance – Control of Installation
- B. Welding
- C. Tolerances
- D. References.

##### **1.2 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 fully with manufacturer's instructions, including each step in sequence.
- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as a 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.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
- G. The Contractor is the quality control inspector for the project. The Contractor shall review the work and verify that it is in conformance with the contract documents. Any work found not to be in conformance shall be corrected by the Contractor, so that it does conform. As a minimum, the Contractor shall reply within seven days of the discovery of work found not to be in conformance with the contract documents, with a written plan of the corrective action required to bring this work into conformance.

- H. The Engineer and the Owner will make periodic inspections to verify quality control measures.

### 1.3 WELDING

#### A. Welding Requirements

1. Welding shall be performed by qualified welding operators using procedures qualified in accordance with specified applicable codes and standards.

#### B. Procedure Qualification

1. Contractor, subcontractor, or fabricator performing welding under jurisdiction of referenced codes shall be responsible for obtaining and qualifying welding procedures. Structural welding procedures that conform to AWS D1.1 are prequalified as defined in AWS D1.1.
2. Contractor shall keep and maintain records and make available to Engineer, if requested, certifying procedure qualification tests have been completed successfully.

#### C. Welding Certificates

1. After Notice of Award, submit to Engineer, if requested, one copy for each person assigned to do field welding of materials installed for this project.
2. Show on certificates that each person has passed tests specified by AWS.
3. Submit certificates prior to execution of any welding. Certificates are not required for nonstructural tack welding.

#### D. Performance Qualification

1. Contractor, subcontractor, or fabricator performing welding under jurisdiction of referenced codes shall be responsible for testing and qualifying welding operators in accordance with applicable procedures.
2. Unless welding operators have been qualified previously by Contractor (within past six months) and have been continuously employed as welders by Contractor following qualification, requalification tests must be completed.
3. Engineer reserves the right to require any welder to retake tests

when, in the opinion of Engineer, work of welder creates reasonable doubt as to welder's proficiency. Engineer may witness any required retesting. Tests shall be at no expense to Owner.

#### 1.4 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable work. Do not permit tolerances to accumulate.
- B. Comply with manufacturer's tolerances. Should manufacturer's 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 the requirements of the standard, except where 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, except where a specified date is established by code.
- C. Obtain copies of standards when required by product specification sections.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract and those of the Engineer shall not be altered from the Contract Documents by mention or interference otherwise in any reference document.

**PART 2 – PRODUCT**      *Not Used*

**PART 3 – EXECUTION**      *Not Used*

END OF SECTION

## **SECTION 01610**

### **Product Requirements**

#### **PART 1 – GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Products
- B. Transportation and Handling
- C. Storage and Protection
- D. Product Selection
- E. Product Options.

##### **1.2 PRODUCTS**

- A. "Products" means: new material, machinery, components, equipment, fixtures, and systems forming the work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract documents.
- C. Provide interchangeable components of the same manufacturer for components being replaced.

##### **1.3 TRANSPORTATION AND HANDLING**

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

#### 1.4 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions with seals and labels intact and legible.
- B. Store sensitive products in weather-tight, climate-controlled enclosures.
- C. Fabricated products requiring exterior storage shall be placed on sloped supports, above ground.
- D. Provide bonded, off-site storage and protection when site does not permit on-site storage or protection.
- E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of product.
- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

#### 1.5 PRODUCT SELECTION

- A. Provide products that comply with the requirements of the Contract Documents, that are undamaged and, unless otherwise noted, unused at the time of installation.
- B. Provide products complete with accessories, trim, finish, safety guards and other devices and details needed for the installation and for the intended use and effect.
- C. Standard Products: Provide standard products of types that have been produced and used successfully in similar conditions on other projects.
- D. Proprietary Specification Requirements: Where only a single product or manufacturer is named, or where "No Substitution" is indicated, provide the product indicated. No substitutions will be permitted.
- E. Semi-Proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

- F. Where products are specified by name, accompanied by the term "or approved equivalent," comply with provisions for "substitutions" to obtain approval for use of an unnamed product.
- G. Descriptive Specification Requirements: Where specifications describe a product, listing characteristics required without use of a brand name, furnish a product that provides the characteristics and otherwise complies with requirements.
- H. Performance Specification Requirements: Where specifications stipulate compliance with performance requirements, provide products that comply and are recommended for the application. Manufacturer's recommendations may be contained in product literature, or by certification of performance.
- I. Visual Selection: Where requirements include the phrase "as selected from manufacturer's standard colors, patterns, textures" or a similar phrase, provide a product that complies with designated requirements. The Engineer will select color, pattern, and texture from the approved product line.
- J. Compliance with Standards: Where specifications require compliance with a standard, select a product that complies with the standard specified.
- K. Visual Matching: Where specifications require matching a sample, the Engineer's decision on whether a proposed product matches will be final. Where no product matches and complies with other requirements, comply with provisions for "Product Substitutions" for selection of a matching product in another category.

#### 1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

**PART 2 - PRODUCTS     *Not Used***

**PART 3 – EXECUTION     *Not Used***

END OF SECTION

## **SECTION 01700**

### **Contract Closeout**

#### **PART 1 – GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

##### **1.2 SUMMARY**

- A. This section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
  - 1. Inspection procedures
  - 2. Project record document submittal
  - 3. Operation and maintenance manual submittal
  - 4. Submittal of warranties
  - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate sections.

##### **1.3 SUBSTANTIAL COMPLETION**

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
  - 1. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.
  - 2. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

#### 1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
  2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
  3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, endorsed and dated by the Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Engineer.
  4. Submit consent of surety to final payment.
  5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Re-inspection Procedure: The Engineer will reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Engineer.
1. Upon completion of reinspection, the Engineer will prepare a certificate of final acceptance. If the work is incomplete, the Engineer will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

#### 1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark which drawing is most capable of showing

conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
  2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
- C. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch (51-mm) 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions
  2. Spare parts list
  3. Copies of warranties
  4. Wiring diagrams
  5. Recommended "turn-around" cycles
  6. Inspection and adjustment procedures
  7. Shop Drawings and Product Data.

## **PART 2 – PRODUCTS    *Not Used***

## **PART 3 – EXECUTION**

### **3.1 CLOSEOUT PROCEDURES**

- A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

1. Maintenance manuals
  2. Record documents
  3. Spare parts and materials
  4. Identification systems
  5. Control sequences
  6. Warranties and bonds.
- B. As part of instruction for operating equipment, demonstrate the following procedures:
1. Startup
  2. Shutdown
  3. Emergency operations.

### 3.2 FINAL CLEANING

- A. **Cleaning:** Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
    - a. Remove labels that are not permanent labels.
    - b. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    - c. Clean the site of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits.
- B. **Removal of Protection:** Remove temporary protection and facilities installed for protection of the work during construction.

- C. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.
1. Where extra materials of value remain after completion of associated work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION

**1 - Itemized Proposal**

Ritchie to Centerpoint Engineered Poles							
Str #	Length (Ft)	Framing	Qty	Unith Weight (Lb)	Unit Price	Extended Price	
14	60	TS-5G-ENG	1	16,627	\$ 46,199.00	\$ 46,199.00	
18	65	TS-69DE-UG-ENG	1	15,314	\$ 48,525.00	\$ 48,525.00	
1, 8	70	TS-69DE-UG-ENG	2	16,461	\$ 51,142.00	\$ 102,284.00	
7	70	TS-69DE-UG-ENG	1	16,659	\$ 52,340.00	\$ 52,340.00	
19	75	TS-69DE-UG-ENG	1	18,361	\$ 57,649.00	\$ 57,649.00	
20	80	TS-5G-ENG	1	33,464	\$ 97,573.00	\$ 97,573.00	
45	80	TS-5G-ENG	1	30,450	\$ 83,420.00	\$ 83,420.00	
25	80	TS-4G-1-MOD-ENG	1	15,450	\$ 42,436.00	\$ 42,436.00	
33	80	TS-5GA-ENG	1	21,195	\$ 60,194.00	\$ 60,194.00	
35	80	TS-69DE-UG-ENG	1	19,825	\$ 61,363.00	\$ 61,363.00	
36	80	TS-69DE-UG-ENG	1	19,825	\$ 61,363.00	\$ 61,363.00	
51	80	TS-5GG-MOD-ENG	1	20,447	\$ 56,899.00	\$ 56,899.00	
21, 22, 24	85	TBP-69GB-ENG-DDA	3	12,300	\$ 35,548.00	\$ 106,644.00	
26	85	TS-4G-ENG	1	12,191	\$ 34,478.00	\$ 34,478.00	
<b>Centerpoint to Twombly Engineered Poles</b>							
Str #	Length (Ft)	Framing	Qty	Unith Weight (Lb)	Unit Price	Extended Price	
1	80	TS-5GG-MOD-ENG	1	20,663	\$ 57,976.00	\$ 57,976.00	
				Engineered Poles Total	\$	969,343.00	
<b>Ritchie to Centerpoint Standard Class Poles</b>							
Str #	Length (Ft)	Class	Framing	Qty	Unith Weight (Lb)	Unit Price	Extended Price
13	75	H2	TBP-69GB-STL	1	2,886	\$ 8,998.00	\$ 8,998.00
TP-51	75	H2	TS-RISER-STL	1	2,834	\$ 10,007.00	\$ 10,007.00
2, 3, 12	75	H3	TBP-69GB-STL	3	3,051	\$ 9,317.00	\$ 27,951.00
15	80	H1	TBP-69GB-STL	1	2,880	\$ 9,153.00	\$ 9,153.00
4, 5	80	H3	TBP-69GB-STL	2	3,306	\$ 10,045.00	\$ 20,090.00
6	80	H3	TBP-69G-STL	1	3,306	\$ 10,145.00	\$ 10,145.00
11	85	H3	TBP-69GB-STL	1	3,563	\$ 10,935.00	\$ 10,935.00
9	85	H7	TBP-69GB-STL	1	4,818	\$ 13,881.00	\$ 13,881.00
50	90	H3	TBP-69GB-STL	1	3,843	\$ 11,581.00	\$ 11,581.00
17	90	H7	TBP-69GB-STL	1	5,180	\$ 14,969.00	\$ 14,969.00
16	90	H8	TBP-69GB-STL	1	5,528	\$ 15,849.00	\$ 15,849.00
10	90	H9	TBP-69GB-STL	1	6,136	\$ 16,836.00	\$ 16,836.00
52	95	H1	TM-3V-VERT-STL	1	4,040	\$ 14,164.00	\$ 14,164.00
46, 47, 48, 49	95	H4	TBP-69GB-STL	4	4,454	\$ 13,173.00	\$ 52,692.00
34	100	H5	TBP-69G-STL	1	5,412	\$ 15,552.00	\$ 15,552.00
37, 38, 39, 40, 41, 42, 43, 44	105	H4	TBP-69G-STL	8	5,298	\$ 15,271.00	\$ 122,168.00
28, 29, 30, 31, 32	105	H5	TBP-69G-STL	5	5,964	\$ 16,637.00	\$ 83,185.00
23	105	H7	TBP-69GB-STL	1	6,630	\$ 18,734.00	\$ 18,734.00
27	110	H6	TBP-69G-STL	1	6,763	\$ 19,006.00	\$ 19,006.00
<b>Centerpoint to Twombly Standard Class Poles</b>							
Str #	Length (Ft)	Class	Framing	Qty	Unith Weight (Lb)	Unit Price	Extended Price
TP-1	75	H2	TS-RISER-STL	1	2834	\$ 10,007.00	\$ 10,007.00
				Standard Poles Total	\$	505,903.00	
					<b>TOTAL BID</b>	\$	<b>1,475,246.00</b>



QUALITY STEEL POLES. DELIVERED.

2427 Kelly Lane, Houston, TX 77066

www.tappinc.com

Phone: +1 (281) 444-8277

Fax: +1 (281) 444-7270

Customer	Rochelle Municipal Utilities	Submittal Date	2025/11/12
Freight Terms	FOB : Rochelle, IL 61068	Leadtime	Structures: 62 to 63 weeks
Quote	25-2577	Payment Terms	ZC02 - Credit NET 15 days
Project Name	Ritchie to Centerpoint 34.5kV Line	Valid until	2025/11/27

Item	Qty	Description	Unit Wt (lb)	Unit Price (USD)	Total Wt (lb)	Total Price (USD)
1	3	Eng   TBP-69GB-ENG-DOA   Oal 85 Ft	12,300.00	\$ 35,548.00	36,900.00	\$ 106,644.00
2	1	Eng   TS-4G-ENG   Oal 85 Ft	12,191.00	\$ 34,478.00	12,191.00	\$ 34,478.00
3	1	Eng   TS-4G-1-MOD-ENG   Oal 80 Ft	15,450.00	\$ 42,436.00	15,450.00	\$ 42,436.00
4	2	Eng   TS-69DE-UG-ENG   Oal 70 Ft	16,461.00	\$ 51,142.00	32,922.00	\$ 102,284.00
5	1	Eng   TS-69DE-UG-ENG   Oal 75 Ft	18,361.00	\$ 57,649.00	18,361.00	\$ 57,649.00
6	1	Eng   TS-69DE-UG-ENG   Oal 65 Ft	15,314.00	\$ 48,525.00	15,314.00	\$ 48,525.00
7	1	Eng   TS-69DE-UG-ENG   Oal 70 Ft	16,659.00	\$ 52,340.00	16,659.00	\$ 52,340.00
8	1	Eng   TS-69DE-UG-ENG   Oal 80 Ft	19,825.00	\$ 61,363.00	19,825.00	\$ 61,363.00
9	1	Eng   TS-69DE-UG-ENG   Oal 80 Ft	19,825.00	\$ 61,363.00	19,825.00	\$ 61,363.00
10	1	Eng   TS-5G-ENG   Oal 60 Ft	16,627.00	\$ 46,199.00	16,627.00	\$ 46,199.00
11	1	Eng   TS-5G-ENG   Oal 80 Ft	33,464.00	\$ 97,573.00	33,464.00	\$ 97,573.00
12	1	Eng   TS-5G-ENG   Oal 80 Ft	30,450.00	\$ 83,420.00	30,450.00	\$ 83,420.00
13	1	Eng   TS-5GA-ENG   Oal 80 Ft	21,195.00	\$ 60,194.00	21,195.00	\$ 60,194.00
14	1	Eng   TS-5GG-MOD-ENG   Oal 80 Ft	20,447.00	\$ 56,899.00	20,447.00	\$ 56,899.00
15	1	Eng   TS-5GG-MOD-ENG   Oal 80 Ft	20,663.00	\$ 57,976.00	20,663.00	\$ 57,976.00
16	1	Class Pole   H2-75   TBP-69GB-STL   Oal 75 Ft   Emb 10.5 Ft	2,886.00	\$ 8,998.00	2,886.00	\$ 8,998.00
17	2	Class Pole   H2-75   TS-RISER-STL   Oal 75 Ft   Emb 15 Ft	2,834.00	\$ 10,007.00	5,668.00	\$ 20,014.00
18	3	Class Pole   H3-75   TBP-69GB-STL   Oal 75 Ft   Emb 10.5 Ft	3,051.00	\$ 9,317.00	9,153.00	\$ 27,951.00
19	1	Class Pole   H3-80   TBP-69GB-STL   Oal 80 Ft   Emb 13 Ft	2,880.00	\$ 9,153.00	2,880.00	\$ 9,153.00
20	2	Class Pole   H3-80   TBP-69GB-STL   Oal 80 Ft   Emb 11 Ft	3,306.00	\$ 10,045.00	6,612.00	\$ 20,090.00
21	1	Class Pole   H3-80   TBP-69GB-STL   Oal 80 Ft   Emb 11 Ft	3,306.00	\$ 10,145.00	3,306.00	\$ 10,145.00
22	1	Class Pole   H3-85   TBP-69GB-STL   Oal 85 Ft   Emb 14.5 Ft	3,563.00	\$ 10,935.00	3,563.00	\$ 10,935.00
23	1	Class Pole   H7-85   TBP-69GB-STL   Oal 85 Ft   Emb 16 Ft	4,818.00	\$ 13,881.00	4,818.00	\$ 13,881.00
24	1	Class Pole   H3-90   TBP-69GB-STL   Oal 90 Ft   Emb 12 Ft	3,843.00	\$ 11,581.00	3,843.00	\$ 11,581.00
25	1	Class Pole   H7-90   TBP-69GB-STL   Oal 90 Ft   Emb 21 Ft	5,180.00	\$ 14,969.00	5,180.00	\$ 14,969.00
26	1	Class Pole   H8-90   TBP-69GB-STL   Oal 90 Ft   Emb 21 Ft	5,528.00	\$ 15,849.00	5,528.00	\$ 15,849.00
27	1	Class Pole   H9-90   TBP-69GB-STL   Oal 90 Ft   Emb 16.5 Ft	6,136.00	\$ 16,836.00	6,136.00	\$ 16,836.00
28	1	Class Pole   H1-95   TM-3V-VERT-STL   Oal 95 Ft   Emb 12.5 Ft	4,040.00	\$ 14,164.00	4,040.00	\$ 14,164.00
29	4	Class Pole   H4-95   TBP-69GB-STL   Oal 95 Ft   Emb 17 Ft	4,454.00	\$ 13,173.00	17,816.00	\$ 52,692.00
30	1	Class Pole   H5-100   TBP-69GB-STL   Oal 100 Ft   Emb 17.5 Ft	5,412.00	\$ 15,552.00	5,412.00	\$ 15,552.00
31	8	Class Pole   H4-105   TBP-69GB-STL   Oal 105 Ft   Emb 18 Ft	5,798.00	\$ 15,271.00	42,384.00	\$ 122,168.00
32	5	Class Pole   H5-105   TBP-69GB-STL   Oal 105 Ft   Emb 18 Ft	5,964.00	\$ 18,637.00	29,820.00	\$ 83,185.00
33	1	Class Pole   H7-105   TBP-69GB-STL   Oal 105 Ft   Emb 22.5 Ft	6,630.00	\$ 18,734.00	6,630.00	\$ 18,734.00
34	1	Class Pole   H6-110   TBP-69GB-STL   Oal 110 Ft   Emb 18.5 Ft	6,763.00	\$ 19,006.00	6,763.00	\$ 19,006.00

TOTAL ORDER	502,731.00	\$	1,475,246.00
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INCLUDED	NOT INCLUDED
Material of coil and plate for the structures is A572. Anchor Bolts, shipping assembled. (Items 1-15) Ground Sleeves 3ft x 3/16in thk. (Items 16-34) Polyurethane Coating 20 mist thick & UV, applied 1.5 ft. above ground line to butt plate of pole. Conductor Arms, attachments and detailing. Minimum of 10 thru holes, pattern TBD; Thru pipes/thru sleeves for thru holes. Step Clips and their bolts as specified. Grounding provisions and name plates. Touch up kit: PE STAMP (Items 1-15); Plastic Plugs.	Interchangeable Sections; Lacking device; Hardware A354, A449; full scale test Lifting Vangs. Any additional government tariffs, TAPP is closely monitoring the situation. Delivery terms: Sequential, Off-Loading, drop at stake, storage, ROW, special loading requirements.

**TAPP PROPOSAL NOTES**  
 Galvanized finish per ASTM-123.  
 Legal truck load cost is estimated at (16) trucks with a price of \$4,500 each. Quantity and price shall be updated at time of shipping.  
 Embedment as specified. (Items 16-34)  
 Proposal is based on preliminary designs provided in this quotation, if any change occurs it will result in a fair adjustment to the price.  
 TAPP proposes that we may request price escalation/de-escalation per index of the quoted base price.

**TAPP STANDARD NOTES**  
 1. All of our products carry a one (1) year warranty from the Delivery date. Warranty covers only manufacturing defects. At TAPP's discretion, parts may be repaired or replaced.  
 2. This proposal is valid for all information, designs and weights listed within the proposal; and the provided engineering calculations part of this package referencing dimensions of the material quoted.  
 3. Please consult your sales representative concerning changes initiated or requested by the customer as they may affect the leadtime and price. A Change Order form signed by customer may be required.  
 4. Changes to the designs after issuing of PO, will null and void the proposed schedule (leadtime) and may affect price. TAPP and its representative are not responsible for delays caused by such changes.  
 5. If changes are due to errors and/or misinterpretation by TAPP, every effort will be taken not to affect original delivery schedule.  
 6. Anchor Bolts (AB) will be invoiced separately from poles upon delivery. AB drawings will start being available for review 2 weeks ARO, delivery start of AB is estimated to be 20 weeks after AB drawing approval.  
 7. Design Calculations submitted at time of quotation are assumed to be approved in full unless noted at time of purchase. Changes requested after issue of purchase order, will null and void the proposed schedule.  
 8. Drawings: Approval Drawings will start being provided for review 12 weeks after engineering calculations approval and allow 1 week for approval.  
 9. Fabrication lead time: is estimated to be 50 weeks after receipt of approved drawings. Lead time for Structures to start being delivered ARO is estimated to be : 62 to 63 weeks  
 10. TAPP and its representatives are not responsible for unloading or delivery of product to the Right-of-Way.  
 11. This quotation is valid until 2025/11/27  
 12. Sales tax not included in price.  
 13. Embedment depths shall be verified by the owner based on the existing site conditions and soil analysis  
 14. All balance not paid as per payment terms will be subject to an interest rate of 1.5% per month.



Ritchie to Centerpoint Underbuild Appurtenances				
Structure #	Structure Types	Distance from Top of Pole (ft)	Flats - Orientation Angle	Notes
16	TBP-69GB-STL	38.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		39.5		
		41	1	NEMA 2 Hole Grounding Pad
		42.5	3-9	1" ID sleeved holes for PUPI crossarm mounting
		43.5		
		45	3	NEMA 2 Hole Grounding Pad
		45	3-9	1" ID sleeved hole for bolt-through assemblies
		45.5	1-7	1" ID sleeved hole for bolt-through assemblies
		50	4-10	1" ID sleeved hole for bolt-through assemblies
17	TBP-69GB-STL	39.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		40.5		
		42	1	NEMA 2 Hole Grounding Pad
		43.5	4-10	1" ID sleeved holes for PUPI crossarm mounting
		44.5		
		46	4	NEMA 2 Hole Grounding Pad
50	4-10	1" ID sleeved hole for bolt-through assemblies		
20	TS-5G-ENG	33	45°-225°	Davit Arm Thru Vang (See Detail 15)
		35	2 & 8	NEMA 2 Hole Grounding Pad
		37	135°-315°	Davit Arm Thru Vang (See Detail 15)
		39	6 & 11	NEMA 2 Hole Grounding Pad
		41	45°-225°	Davit Arm Thru Vang (See Detail 15)
		43	2 & 8	NEMA 2 Hole Grounding Pad
		45	135°-315°	Davit Arm Thru Vang (See Detail 15)
		47	6 & 11	NEMA 2 Hole Grounding Pad
		52	6-12	1" ID sleeved hole for bolt-through assemblies
		52.5	3-9	1" ID sleeved hole for bolt-through assemblies
		53	6-12	1" ID sleeved hole for bolt-through assemblies
		54	6-12	1" ID sleeved hole for bolt-through assemblies
		21	TBP-69GB-ENG-DDA	47
49	1 & 7			NEMA 2 Hole Grounding Pad
51	0°-180°			Davit Arm Thru Vang (See Detail 15)
53	1 & 7			NEMA 2 Hole Grounding Pad
60	4-10			1" ID sleeved hole for bolt-through assemblies
61	4-10			1" ID sleeved hole for bolt-through assemblies
62	4-10			1" ID sleeved hole for bolt-through assemblies
22	TBP-69GB-ENG-DDA	47	0°-180°	Davit Arm Thru Vang (See Detail 15)
		49	1 & 7	NEMA 2 Hole Grounding Pad
		51	0°-180°	Davit Arm Thru Vang (See Detail 15)
		53	1 & 7	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
		62	4-10	1" ID sleeved hole for bolt-through assemblies
23	TBP-69GB-STL	42	1-7	1" ID sleeved holes for PUPI crossarm mounting
		43		
		45	1	NEMA 2 Hole Grounding Pad
		46	1-7	1" ID sleeved holes for PUPI crossarm mounting
		47		
		49	1	NEMA 2 Hole Grounding Pad
		55.5	4-10	1" ID sleeved hole for bolt-through assemblies
		56.5	4-10	1" ID sleeved hole for bolt-through assemblies
57.5	4-10	1" ID sleeved hole for bolt-through assemblies		

Ritchie to Centerpoint Underbuild Appurtenances				
Structure #	Structure Types	Distance from Top of Pole (ft)	Flats - Orientation Angle	Notes
24	TBP-69GB-ENG-DDA	47	0°-180°	Davit Arm Thru Vang (See Detail 15)
		49	1 & 7	NEMA 2 Hole Grounding Pad
		51	0°-180°	Davit Arm Thru Vang (See Detail 15)
		53	1 & 7	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
		62	4-10	1" ID sleeved hole for bolt-through assemblies
26	TS-4G-ENG	47	10°-190°	Davit Arm Thru Vang (See Detail 15)
		49	1 & 7	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
27	TBP-69G-STL	51	1-7	1" ID sleeved holes for PUPI crossarm mounting
		52		
		53.5	1	NEMA 2 Hole Grounding Pad
		64.5	4-10	1" ID sleeved hole for bolt-through assemblies
		65.5	4-10	1" ID sleeved hole for bolt-through assemblies
28	TBP-69G-STL	46.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		47.5		
		49	1	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
29	TBP-69G-STL	46.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		47.5		
		49	1	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
30	TBP-69G-STL	46.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		47.5		
		49	1	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
31	TBP-69G-STL	46.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		47.5		
		49	1	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
32	TBP-69G-STL	46.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		47.5		
		49	1	NEMA 2 Hole Grounding Pad
		60	4-10	1" ID sleeved hole for bolt-through assemblies
		61	4-10	1" ID sleeved hole for bolt-through assemblies
33	TS-5GA-ENG	44	160°-340°	Davit Arm Thru Vang (See Detail 15)
		46	1 & 7	NEMA 2 Hole Grounding Pad
		48	20°-200°	Davit Arm Thru Vang (See Detail 15)
		50	1 & 7	NEMA 2 Hole Grounding Pad
		55	6-12	1" ID sleeved hole for bolt-through assemblies
		55.5	2-8	1" ID sleeved hole for bolt-through assemblies
		56	6-12	1" ID sleeved hole for bolt-through assemblies
		56.5	2-8	1" ID sleeved hole for bolt-through assemblies
34	TBP-69G-STL	44	1-7	1" ID sleeved holes for PUPI crossarm mounting
		45		
		46.5	1	NEMA 2 Hole Grounding Pad
		55.5	4-10	1" ID sleeved hole for bolt-through assemblies
		56.5	4-10	1" ID sleeved hole for bolt-through assemblies

Ritchie to Centerpoint Underbuild Appurtenances				
Structure #	Structure Types	Distance from Top of Pole (ft)	Flats - Orientation Angle	Notes
36	TS-69DE-UG-ENG	52	1-7	1" ID sleeved hole for bolt-through assemblies
		54	11	NEMA 2 Hole Grounding Pad
		59	4-10	1" ID sleeved hole for bolt-through assemblies
		60	4-10	1" ID sleeved hole for bolt-through assemblies
37	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
38	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
39	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
40	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
41	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
42	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
43	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
44	TBP-69G-STL	54.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		55.5		
		57	1	NEMA 2 Hole Grounding Pad
		63	4-10	1" ID sleeved hole for bolt-through assemblies
		64	4-10	1" ID sleeved hole for bolt-through assemblies
45	TS-5G-ENG	46	45°-225°	Davit Arm Thru Vang (See Detail 15)
		48	2 & 8	NEMA 2 Hole Grounding Pad
		50	135°-315°	Davit Arm Thru Vang (See Detail 15)
		52	6 & 12	NEMA 2 Hole Grounding Pad
		57	3-9	1" ID sleeved hole for bolt-through assemblies
		58	3-9	1" ID sleeved hole for bolt-through assemblies
46	TBP-69GB-STL	45.5	1-7	1" ID sleeved holes for PUPI crossarm mounting
		46.5		
		48	1	NEMA 2 Hole Grounding Pad

Ritchie to Centerpoint Underbuild Appurtenances				
Structure #	Structure Types	Distance from Top of Pole (ft)	Flats - Orientation Angle	Notes
47	TBP-69GB-STL	45.5	1-7	1" ID sleeved holes for PUPJ crossarm mounting
		46.5		
		48	1	NEMA 2 Hole Grounding Pad
48	TBP-69GB-STL	45.5	1-7	1" ID sleeved holes for PUPJ crossarm mounting
		46.5		
		48	1	NEMA 2 Hole Grounding Pad
49	TBP-69GB-STL	45.5	1-7	1" ID sleeved holes for PUPJ crossarm mounting
		46.5		
		48	1	NEMA 2 Hole Grounding Pad
50	TBP-69GB-STL	45.5	1-7	1" ID sleeved holes for PUPJ crossarm mounting
		46.5		
		48	1	NEMA 2 Hole Grounding Pad
51	TS-5GG-MOD-ENG	50	0°-180°	Davit Arm Thru Vang (See Detail 15)
		52	1 & 7	NEMA 2 Hole Grounding Pad
52	TM-3V-VERT-STL	50	1-7	1" ID sleeved holes for PUPJ crossarm mounting
		51		
		52.5	1	NEMA 2 Hole Grounding Pad

Centerpoint to Twombly Underbuild Appurtenances				
Structure #	Structure Type	Distance from Top of Pole (ft)	Flats / Orientation Angle	Notes
1	TS-5GG-MOD-ENG	50	0°-180°	Davit Arm Thru Vang (See Detail 15)
		52	1 & 7	NEMA 2 Hole Grounding Pad

## **General Specifications & Requirements For:**

The manufacturer and delivery of steel poles for Ritchie to Centerpoint 34.5kV Line. The bid submitted by the manufacturer shall include all field bolts, locknuts, vangs, coatings, attachment provisions, base plates, and other necessary items to make a complete structure as described in the following specifications and drawings.

### **General Specifications:**

1. Engineered poles shall be fabricated and delivered in accordance with technical specifications found in RUS Bulletin 1724E-204.
2. Standard class steel poles shall be furnished in accordance with RUS Bulletin 1724E-214.
3. The manufacturer will provide shop drawings to the owner and engineer prior to fabrication for review.
4. The manufacture's bid shall include delivery of poles to 1015 S. Caron Road, Rochelle, IL 61068. Poles are delivered once they are lifted from the trailer. Owner will provide all equipment and labor to take ownership of poles once lifted from the trailer at staked drop locations.
5. The design and design calculations for engineered structure shall be the responsibility of the manufacturer.
6. Poles shall be designed to the loads specified on the attached drawings.
7. Poles shall be designed with a maximum taper of 0.45 inch/ft.
8. Manufacturer shall supply PLS-Pole.bak files for engineered poles.
9. Manufacturer shall supply PLS-Pole steel pole library (.spp) for all structures in this proposal.
10. Manufacturer shall palletize material such that each structure has an associated hardware kit as required. Include 10% spare hardware in each kit.
11. The manufacturer shall design and supply anchor cages, bolts, & hardware for pole with pier foundations. Design of pier foundations to be done by others.
12. The manufacturer will provide all drawings and instructions required for erection of poles including acceptable jacking forces, maximum bolt torque, etc.

Disclaimer: The contents of this guidance document does not have the force and effect of law and is not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Utilities Service

**BULLETIN 1724E-204**

**RD-GD-2019-95**

**SUBJECT:** Guide Specifications for Steel Single Pole and H-Frame Structures

**TO:** RUS Electric Borrowers, Consulting Engineers, and RUS Electric Program Staff

**EFFECTIVE DATE:** Date of Approval

**OFFICE OF PRIMARY INTEREST:** Engineering Standards Branch; Electric Program  
**FILING INSTRUCTIONS:** This bulletin replaces Bulletin 1724E-204, "Guide Specification for Steel Single Pole and H-Frame Structures" issued November 17, 2016.

**AVAILABILITY:** This bulletin can be accessed via the Internet at:  
<https://www.rd.usda.gov/publications/regulations-guidelines/bulletins/electric>

**PURPOSE:** This bulletin provides guidance that should assist borrowers in procuring steel pole and steel H-frame structures.

**JAMES ELLIOTT** Digitally signed by JAMES ELLIOTT  
Date: 2019.04.09 11:31:43 -04 03

\_\_\_\_\_  
Christopher A. McLean  
Assistant Administrator,  
Electric Program

April 9, 2019

Date

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## ACKNOWLEDGMENTS

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Ballard, Dominic, **East Kentucky Power Coop.**, Winchester, KY  
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Bertelsen, James, **Dairyland Power Cooperative**, La Crosse, WI  
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Harvey, Gary, **East Kentucky Power Cooperative**, Winchester, KY  
Johnson, Wilson, **USDA, Rural Utilities Service, Electric Program**, Washington, DC  
Kahanek, Bil, **McCord Engineering, Inc.**, College Station, TX  
Lukkarila, Charles, **Great River Energy**, Maple Grove, MN  
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**Appendix A - Commentary**

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**Appendix C - Selected SI-Metric Conversions**

**ABBREVIATIONS**

ACI	American Concrete Institute
ANCO	American Nut Company
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
DFT	Dry Film Thickness
D/t	Diameter of a circular section to plate thickness
Eq. F	Equivalency Factor
ksi	kips (1000 lb.) per square inch
kV	kilovolt
mph	miles per hour
LF	Load factor
NESC	National Electrical Safety Code
NEMA	National Electrical Manufacturers Association
SSPC	Steel Structure Painting Council
OHGW	Overhead ground wire
psf	pounds per square foot
psi	pounds per square inch
UNC	Unified Coarse threads

**DEFINITIONS**

*Borrower* – An entity which borrows or seeks to borrow money from or arranges financing with the assistance of the Rural Utilities Service through guarantees, lien accommodations or lien subordinations.

*Rural Utilities Service (RUS)* – An Agency of the United States Department of Agriculture, under Rural Development.

*RUS Electric Program Forms* – All forms and bulletins referred to in this bulletin are Rural Utilities Service Electric Program forms and bulletins, unless otherwise noted.

*Form 198* – Equipment Contract.

**INDEX:**

Poles: Steel

Materials and Equipment: Guide Specifications for Steel Pole Structures

Specifications and Standards: Guide Specifications for Steel Pole Structures

Transmission Facilities: Poles (Steel)

## **INSTRUCTIONS**

### **1. PURPOSE**

*The intent of this guide specification is to provide Rural Utilities Service Electric Program borrowers with a basis for procuring adequate single pole and H-frame steel transmission line structures. Use of this specification should help eliminate ambiguities that might arise in the evaluation process of competitively bid steel pole procurements.*

*Borrowers or their engineering representatives will need to complete and add to this specification as appropriate. Modifications to this specification may be necessary to consider special applications or preferences of the owner.*

### **2. SCOPE**

*This suggested purchase specification covers the technical aspects of design, materials, welding, inspection, delivery, and protective coatings of single circuit steel pole and steel H-frame structures, 115 kV to 230 kV. This specification does not include contract (front-end) documents or specifications for construction. The user of this specification should add these documents, including general conditions and any supplemental instructions to the bidders. This specification may be expanded to include double circuit structures, and structures over 230 kV.*

### **3. INITIAL DESIGN CONSIDERATIONS**

*There are engineering decisions that should be made before completing the specifications. Some examples include:*

- *Amount of foundation rotation to consider for incorporating P-delta moments;*
- *Location of point of fixity;*
- *Embedment depths;*
- *Load cases to be considered in addition to those required by the National Electrical Safety Code (NESC);*
- *Deflection limitations; and*
- *Guy wire modulus of elasticity*

### **4. INFORMATION TO BE COMPLETED BY THE OWNER OR OWNER'S REPRESENTATIVE**

*Users of this guide specification should detach the instructions and appendices and complete the following:*

- a. *Documents and general information to be added to the specification: A number of front-end documents and general information need to be added to the specification:*

- *Form 198 Equipment Contract(Recommended for competitive bidding)*
- *Supplemental Instructions to Bidders*
- *General Conditions*

*When there is competitive bidding, it is recommended that Form 198 be used. This form covers Notice and Instructions to Bidders, Proposal, and Equipment Contract. For item b above, Supplemental Information, the user may want to add such items as Bid Submission, Bid Price and Schedule, Bid Acceptance Period, Bid Requirements, and Bid Data. A section on General Conditions could include such items as Definition of Terms, Interpretation of Bid Documents, Addenda to the Bid Documents, Insurance, Method of Payment (if Form 198 is not used), Quantities, and Tabulation of Unit Prices.*

b. *Requirements to the technical specifications to be added or completed by the owner or owner's representative and supplied to the bidders include:*

- (1) *Configuration Requirements and Other Information (Attachment A of the Specification, or equivalent, to be added)*
  - *Structure dimensions*
  - *Conductor support locations*
  - *Overhead ground wire (OHGW) support location(s)*
  - *Underbuild support location(s)*
  - *Guy attachment locations*
  - *General load information*

*Transmission pole assemblies with steel Upswept arms on single Steel pole are named as TUS series. On the TUS-series single pole drawing on Pages xi, xii and xiii in these instructions, minimum acceptable dimensions are recommended. Specific project designs may require greater values than the minimum to improve insulator swing or galloping performance. The distance shown on the TUS-series drawing from the top phase conductor attachment point to the static wire attachment point provides for a 30° shielding angle. For further information on the lightning protection, see Bulletin 1724E-200 for details. For areas of high isokeraunic levels, high ground resistance, or high contamination, specify insulators with the number of bells detailed in the second column under each voltage level in Tables 1 and 2 of the TUS-series drawing in these instructions. Drawings TM-S1 and TM-S2 in these instructions suggest typical structure details.*

*Guide drawings for H-frame structures and double circuit structures have not been included in this bulletin.*

- (2) *Structural Requirements*
- (a) *Design loads, with and without load factors (Attachment B of the Specification to be added)*
- Minimum loads should meet appropriate NESC District Loads, NESC extreme wind loads, NESC extreme ice with concurrent winds, any extreme ice conditions and local code loads with the appropriate load factors.*
- All structures should have sufficient strength before conductor stringing to withstand the extreme wind velocity multiplied by an appropriate gust factor. The structures should be capable of withstanding this load from any direction. The vertical, transverse, and longitudinal loads with wind on the structure and the dead weight of the structure for any given condition should be applied simultaneously.*
- The loads without load factors for 60 °F, no wind, should be specified so that proper arm design and/or camber design can be made. Loads without load factors are required so that the manufacturer will supply appropriate base reactions with and without load factors (item 6.2.d) for foundation design purposes.*
- (b) *Pole deflection limitations, if any, Attachment C of the Specification, to be completed. If deflection limitations are required, specify the loading condition(s) without load factors, and acceptable means of achieving (raking, cambering, stiffening).*
- (c) *Desired foundation type (direct embedded or anchor bolt type), Attachment C of the Specification, to be completed. If embedded, the embedment lengths should be furnished. If anchor bolt type, strength of the concrete should be specified. The engineer has the option of specifying the maximum anticipated foundation rotation and groundline deflection in Attachment B. If different for individual loading cases, indicate quantities in the loading tables (Attachment B).*
- (d) *Location, orientation, slope, type, size, strength of guys, (Attachment A of the Specification, to be added), and modulus of elasticity of guys, Attachment C of the Specification.*
- (3) *Application Requirements (Attachment C of the Specification, to be completed).*
- (a) *Special Charpy requirements.*

- (b) *Diameter and taper limitations, if any (flat-to-flat diameter for other than a round cross section).*
  - (c) *Desired method of surface protection. If a special corrosion problem exists, this should be mentioned, along with the recommended solution.*
  - (d) *Preference of climbing ladders, working ladders or step bolts. Also, quantity of removable ladders or step bolts to be supplied with the total order of poles should be specified.*
  - (e) *Component weight and/or length restrictions, if any.*
  - (f) *Delivery schedule and free on board (FOB) destination, and owners' contact.*
  - (g) *Miscellaneous. (Additional items such as special attachment requirements, grounding requirements, climbing devices, hot line maintenance requirements.)*
  - (h) *Structures to be tested, if any, and number of load cases for each structure test.*
- (4) *Structure drawing details (Attachment D of the Specification, to be added by owner).*

*Drawings TUS series, TM-S1, and TM-S2 on pages xi, xii, and xiii of these instructions are provided as guidance drawings for development of Attachment D of the Specification.*

## **5. INFORMATION TO BE COMPLETED BY THE MANUFACTURER**

- a. *The owner or owner's representative should have the following information completed by the bidders and submitted with the manufacturer's proposal. Attachment E of the Specification is a sample bid summary which includes this information.*
- (1) *Calculated shipping weight of each structure, subassemblies, and components, excluding anchor bolts.*
  - (2) *Calculated shipping weight of anchor bolts.*
  - (3) *Maximum groundline reactions (moments, shears, and axial loads, including load factors) in poles and guy wires.*
  - (4) *Anchor bolt sizes, projections, lengths, layout and locations.*
  - (5) *Type of material and finish of major components, American Society of Testing and Materials (ASTM) number and grade.*

- (6) *Description of pole shaft, including thickness, length, diameter, cross-sectional geometry, and method of fastening each shaft component.*
  - (7) *Method of attaching arms, braces, hardware, and miscellaneous appurtenances to structure.*
  - (8) *Design exceptions.*
- b. *Documentation which the successful bidder needs to supply for approval by owner or owner's representative prior to manufacture include:*
- (1) *Final design calculations for pole shaft, base plate, anchor bolts, arms, and other appurtenances, including their connections for all structures.*
  - (2) *The following specific items need to be supplied:*
    - (a) *For each loading case, the total shears and axial forces, moments, stresses, deflections, section moduli, cross-sectional area, safety factors (allowable stress/actual combined stresses); the w/t's for polygonal and D/t's for round cross sections at all attachment points, at top and bottom, and at least every ten (10) feet along the pole shall be supplied.*
    - (b) *Guy reactions for each loading case.*
    - (c) *For the critical loading case, shears and axial forces, moments, stresses, section modulus, cross-sectional area, and safety factor at the arm connections. Deflections at the end of the arm should also be given.*
    - (d) *Anticipated deflection at the top of the pole and at the end of the arms for each pole for the no wind load case at 60 °F without load factors.*
    - (e) *For all specified loading cases, all reactions and groundline moments with and without the load factors.*
    - (f) *Complete design/erection reproducible drawings for each structure type.*
    - (g) *Identification and weight of each structure - include the weight of components and a bill of materials for each structure.*
    - (h) *Assembly instructions.*
- c. *Final documentation (as built) after construction.*
- d. *Test reports (as requested).*

**TABLE 1 - MINIMUM DIMENSIONS (FEET)**

VOLTAGE	115 KV		138 KV		161 KV		181 KV		230 KV	
	7	8	8	9	9	10	10	11	12	13
A	8.0	7.0	7.0	7.5	8.5	9.0	9.0	10.0	10.0	10.5
B	7.0	8.0	8.0	8.5	9.5	10.0	11.0	11.0	11.0	11.5
C	8.0	9.0	9.0	10.0	11.0	12.0	13.0	14.0	14.0	14.0
D	5.5	6.5	6.5	7.5	8.0	8.0	9.0	10.0	10.0	11.0
E	AS REQUIRED (BY ENGINEER)									
F	AS REQUIRED (BY ENGINEER)									
G	AS REQUIRED (BY ENGINEER)									

**TABLE 2 - MINIMUM CLEARANCES (INCHES)**

VOLTAGE	115 KV		138 KV		161 KV		181 KV		230 KV	
	7	8	8	9	10	10	11	11	12	13
NO WIND	42	48	48	54	60	65	71	77	77	77
6 PSF WIND	28	30	30	35	35	35	35	35	35	35
EXTREME WIND	10	10	12	12	14	14	14	14	20	20

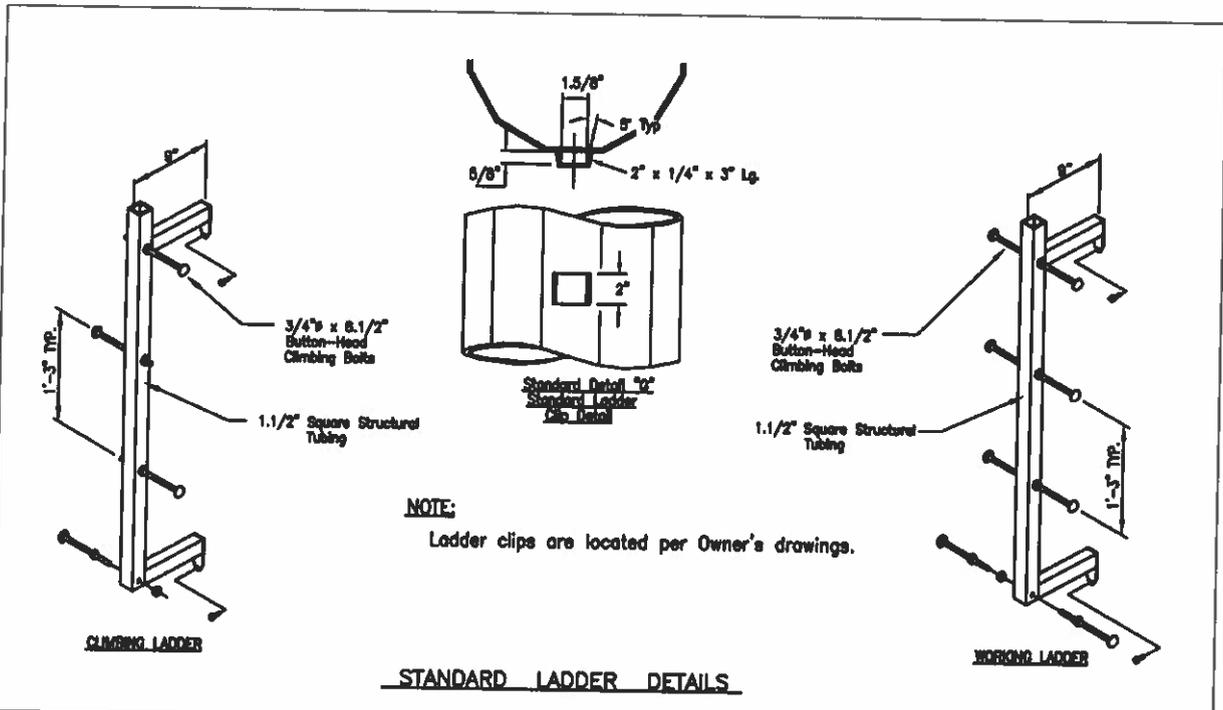
**NOTES:**

- Dimensions and clearances in tables are minimums and based on the use of porcelain bells. Greater dimensions may be required to improve insulator string galloping performance, or mechanical requirements. A 30 degree shielding angle is assumed. For structures of heights greater than 75 feet, the shield angle should be decreased. For high insulator levels, high contamination areas, or high ground resistance, use the larger number of insulators (second column for each voltage).
- A maximum altitude of 3300 feet above M.S.L. is assumed. For higher altitudes, clearances in Table 2 should be increased.
- The number of insulators in Table 2 are for largest and small angle structures. For angle structures (TUS-3 and 4), one additional insulator bell should be used. For the deadend structures (TUS-5, TUS-1A, and TUS-1AB), the additional bells should be used.
- If crossarms are used for OHW support, dimension 'D' may be reduced as long as an adequate shielding angle is maintained.
- Arm length is from face of pole to end of arm shaft. Vertical dimensions between arms are from centerline to centerline of bottom attachment holes.
- Type and pitch for crossarms are to be used with TUS-1 and TUS-1A. Type 2 poles are to be used with TUS-1B and TUS-1AB. See drawing 7A-S1, detail 'C'.
- For structures TUS-1B and TUS-1C, the length of the crossarms to the inside of the pole may be less than the indicated minimum dimensions in Table 1.

**TRANSMISSION LINE STRUCTURE**  
**GUIDE FOR STEEL POLE STRUCTURE DIMENSIONS**  
 (115 KV - 230 KV)

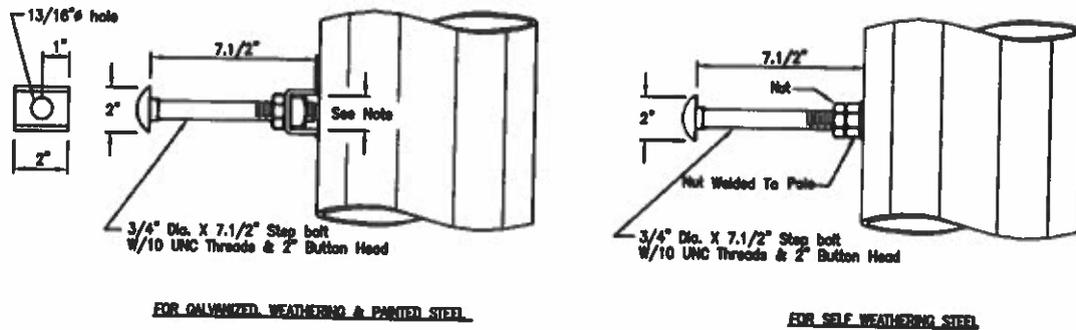
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 DATE: JANUARY '97  
 TUS (Series)



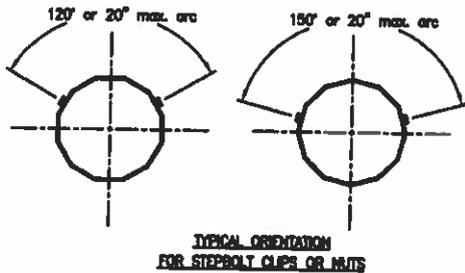


**NOTE:**

1. Step bolt clip shall be designed and fabricated to prevent square nut rotation while step bolt is installed.
2. Step bolts are located per owner's drawings.



**STANDARD STEP BOLT DETAILS**



TRANSMISSION LINE STRUCTURE	
GUIDE FOR STEEL POLE STRUCTURE	
DETAILS	
SCALE:	DATE: JANUARY '97
N.T.S.	TM-S2

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## SPECIFICATIONS FOR STEEL SINGLE POLE AND H-FRAME STRUCTURES

### 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 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

**Camber** - Pole curvature, induce in fabrication, used to counteract predetermined pole deflection, such that the pole will appear straight under a specified load condition.

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

**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.

**Factored load** - The maximum design load which includes the appropriate load factor specified.

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

**Load factors (LF)** - a multiplier which is applied to each of the vertical, transverse and longitudinal structure loads to obtain a factored load.

**P-delta (P- $\Delta$ ) moment** - secondary moment created by the vertical loads acting on the structure when the structure deflects from its unloaded position.

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

**Pole twist** - spiral rotation of a pole section relative to the pole end. It is caused by the residual stress in the steel as received from the mill, the clamping force holding the tube shells together and the heat applied during the seam welding process.

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

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

**UNC** - Unified Coarse Threads

### 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 Society of Civil Engineers (ASCE) Standard, Design of Steel Transmission Pole Structures, ASCE 48, latest edition.
- b. American Society for Testing and Materials (ASTM), various standards, latest revision.
- c. American Concrete Institute (ACI), Building Code Requirements for Reinforced Concrete, ACI 318, latest edition.
- d. American Welding Society (AWS), Structural Welding Code, AWS D1.1, latest edition.
- e. American National Standards Institute (ANSI), National Electrical Safety Code, ANSI C2, latest edition.
- f. Society for Protective Coatings (SSPC, formerly Steel Structure Painting Council)/ National Association of Corrosion Engineers (NACE) Surface Preparations Specification, SSPC/NACE SP-6/NACE 3.

### 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 the case of conflict between several referenced documents, the more stringent requirement shall be followed. If a conflict exists between this specification or the referenced documents and the attached drawings, the attached drawings shall be followed. If clarification is necessary, contact the owner or owner's representative.

### 5. GENERAL REQUIREMENTS

The design, fabrication, allowable stresses, processes, tolerances, and inspection shall conform to the ASCE Standard, Design of Steel Transmission Pole Structures (ASCE 48), latest edition, with the following additions and/or exceptions:

- a. Design
  - (1) Pole designs shall be prepared from the attached configuration drawings (Attachments A and B of this Specification) and design loads (Attachment B of this Specification). The structure shall be capable of withstanding all

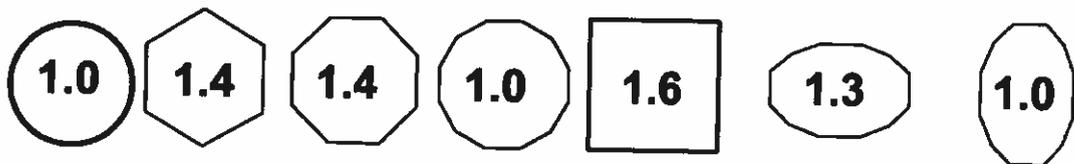
specified loading cases including secondary stresses from foundation movements and pole deflection (P-Δ) when specified in Attachment B of this Specification but not considering the possible restraining effect of conductors or shield wires. The structure shall withstand the loads without failure, permanent distortion, or exceeding any specified deflection limitations.

- (2) 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:

$$p = W \times C_d$$

Where  $p$  = pressure on projected area of the pole normal to wind,  $W$  = wind pressure, and  $C_d$  = shape (or drag) factor.

Shape factors for computing the wind on poles are:



- (3) 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 load factors.
- (4) 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. Bolted flange joints shall be used for medium angle and heavy angle guyed structures and X-braced H-frame structures. 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 joints, step nuts, ladder clips, 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) The factored load in guys shall not exceed 65 percent of the rated breaking strength of the guy.

- (6) Design of anchor bolts shall be in accordance with the ACI-318, latest Edition, Building Code Requirements for Reinforced Concrete, assuming a concrete strength as specified by the owner.

When anchor bolts are specified, they shall have the top 2 feet galvanized. 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.

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 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.

- (7) Minimum plate thickness for all pole components shall be 3/16 inch.
- (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.

Galvanized poles shall have a drain hole at the bottom. The drain hole shall not be more than 20% of the bottom plate surface area. When a painted finish is specified, poles shall be hermetically sealed. Ground sleeves shall have a minimum length of 3 feet for single pole structures and 4 feet for H-frames.

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.

- (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.
- (10) Poles with elliptical cross sections shall have a minor axis dimension equal to at least 75 percent of the major axis dimension.
- (11) All unguyed angle poles or unguyed tangent deadends shall be precambered to remain plumb when the calculated deflection at the top of the pole exceeds 1.5 percent of the pole height under an initial conductor tension loading of 60°F, no wind, and no load factors. Pole height shall be the height of the pole from the top of the baseplate, or designated groundline, to the top. Tangent poles with unbalanced vertical loadings shall be precambered for the previously stated conditions.
- (12) Arms shall be designed so the end of the arm is at the specified height under a loading of initial conductor tension, 60°F, no wind, and no-load factors. Arms shall not deflect vertically more than 12 inches at the end of the arm under heavy ice conditions (without any load factors applied).

Arms shall be upswept or straight, tapered, steel tubular members, of any cross-sectional type, which meet the dimensions shown on the attached drawings (Attachment D of this Specification).

Arm end plate connection details for hardware attachment shall be typical of those shown on the attached drawings. The arms shall be hermetically sealed when a painted finish is specified. Galvanized arms shall have drain holes where appropriate. If weathering steel is used for the arms, attachments and the arm shall be designed to avoid trapping or holding moisture.
- (13) Lifting lugs are optional. The manufacturer shall supply all instructions for handling and erection of poles and arms.
- (14) 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.
- (15) 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, structure number, factored groundline moment, owner name, and date manufactured. The method of identification shall be approved by the owner.
- (16) Weathering steel structures shall be designed to eliminate water and refuse traps.

Tubular sections shall be sealed from moisture entering the inside of the pole. Factory drilled pole holes shall be plugged to prevent moisture intrusion during shipping. For field drilled poles and factory drilled poles, manufacturer shall provide silicon sealant to seal all through-bolt holes. Nondrilled poles when assembled shall be effectively sealed to prevent moisture intrusion.

Connections shall be designed to reduce the effect of pack-out by preventing moisture from entering the joint or by designing the connection to allow moisture to easily drain off.

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

(17) Application requirements: (See Attachment C of this Specification)

b. Materials

- (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.
- (2) Poles, arms and conductor brackets shall conform with ASTM A36, ASTM A572, ASTM A588, ASTM A871 or ASTM A595.
- (3) Base plate shall conform with ASTM A572, ASTM A588, ASTM A633, or ASTM A595.
- (4) Anchor bolts shall conform to ASTM A615, Grade 60 or 75.
- (5) Other bolts and nuts shall conform, as applicable, to ASTM A307, ASTM A325, ASTM A354, or ASTM A394. Locknuts shall be provided for each structure bolt, or American Nut Company (ANCO) type self-locking nuts may be used. Locknuts shall be the galvanized MF type or ANCO type.
- (6) Anchor bolts, structural plate, and weld material shall meet ASCE requirements for Charpy tests.
- (7) For galvanized structures, steel used for the pole shaft and arms shall have a silicon content less than .06 percent.

c. Fabrication

- (1) All welding shall be in accordance with the AWS D1.1, latest edition. Welders shall be qualified in accordance with AWS D1.1 welding procedures.

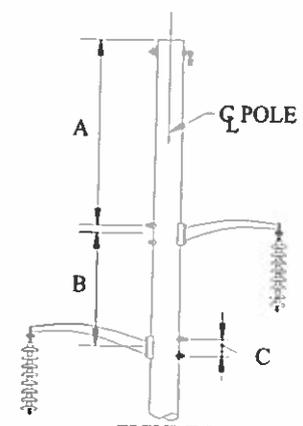
- (2) One hundred percent penetration welds shall be required in, but not limited to, the following areas:
  - circumferential welds (C-welds) joining structural members;
  - longitudinal welds in the female portion of the joint within the slip joint area;
  - welds at the butt joints of back-up strips; and
  - base plate to shaft weld.
  - longitudinal welds within 3 inches of C-welds, flange welds, base welds and ends of tubes.
- (3) Full penetration or equivalent 90 percent partial penetration with fillet overlay shall be used for arm-to-arm base, vang-to-plate shaft, and arm box joints.
- (4) Quality and acceptability of every inch of the full penetration welds shall be determined by visual and ultrasonic inspection.
- (5) All other penetration welds shall have 60 percent minimum penetration. Quality and acceptability of all welds other than full penetration welds shall be determined by visual inspection, supplemented by magnetic particle, ultrasonic or dye penetrant inspection.
- (6) All weld back-up strips shall be continuous the full length of the welds. Care shall be exercised in the design of welded connections to avoid areas of high stress concentration which could be subject to fatigue or brittle fractures.
- (7) Field welding shall not be permitted except with owner's approval and the manufacturer's direction in repairing a pole.
- (8) 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.
- (9) 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 damage the metal.
- (10) 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.

- (11) All forming or bending during fabrication shall be done by methods that will prevent embrittlement or loss of strength in the material being worked.
- (12) 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.
- (13) Holes in steel plates which are punched must be smooth and cylindrical without excessive tear out or depressions. Any burrs that remain after punching shall be removed by grinding, reaming, etc.
- (14) Holes of any diameter may be drilled in plate of any thickness. Care shall be taken to maintain accuracy when drilling stacks of plates.
- (15) Holes may be made by use of a machine guided oxygen torch. Flame cut edges shall be reasonably smooth and suitable for the stresses transmitted to them.
- (16) Field drilled holes must be approved by the owner. If the manufacturer is aware of the owner's intent to field drill holes, the manufacture must supply a galvanizing touch-up kit for galvanized poles or a silicon sealant for weathering steel poles.

d. Tolerances

Manufacturing tolerances shall be limited to the following:

Pole Length	<u>One piece</u> : $\pm 2$ inches, or $\pm 1$ inch $\pm 1/8$ inch per 10 feet of length, whichever is greater (i.e. - 120 foot pole shall have a length of 120 feet $\pm 2\frac{1}{2}$ inches)
	<u>Assembled pole with flange connections</u> : same as for one piece <u>Assembled pole with slip joint connections</u> : The accumulation of the slip joint tolerances not to exceed $-6''$ , $+12''$
Pole Diameter	$-0$ inch, $+1/4$ inch
Pole End Squareness	$\pm 1/2$ inch per foot of pole diameter
Pole Sweep	$1/8$ inch per 10 feet of pole length
Pole Twist	Limit twist to $1^\circ/10'$ of length, not to exceed $4^\circ$ /tube segment. Overall structure twist shall be limited to $10^\circ$ for embedded and $6^\circ$ for base plated structures. Connections for all appurtenances to the pole shall account for the pole twist and should align vertically.
Slip Joint tolerances	Tolerances per manufacturer's recommendations and total pole length requirements above.

Location of Groups of Bolt Holes from Top of Pole	$\pm 1.0$ inches (tolerance to dimension 'A', Figure 2)	 <p>FIGURE 2</p>
Location of Centerline Between Groups of Bolt Holes	$\pm 1.0$ inch (tolerance to dimension 'B', Figure 2)	
Location of Holes Within a Group of Bolt Holes	$\pm 1/8$ inch (tolerance to dimension 'C', Figure 2)	
Bolt Hole Alignment	Not to vary from the longitudinal pole centerline of that group of holes by more than 1/16 inch	
Location of Identification Plate	$\pm 2.0$ inch	

e. Grounding

- (1) A grounding connection shall be welded to the pole shaft, 18 inches above the groundline or 6 inches above the ground collar. The grounding connection will be either the two-hole NEMA pad, or a nut, or a threaded insert installed in the pole, or an approved alternative.
- (2) Grounding pad face shall not be painted or covered with other coatings. The grounding nut thread and grounding pad threads shall be protected from coatings.
- (3) Threaded inserts installed for grounding shall be made of Type 316 stainless steel and provided with standard 1/2 inch, 13 UNC threads. Threads shall be protected from coatings.

f. Climbing Devices

(1) Design Loads

- (a) Step Bolts and removable steps: The step bolts, removable steps and attachment to the pole shall be designed to support a minimum of a 300-pound worker and equipment multiplied by a load factor as

defined in paragraph 5.f.(2). The load shall be at the outer edge of the step or bolt.

- (b) **Removable Ladders:** The ladder and each attachment to the pole shall be designed to support a minimum of a 300-pound worker and equipment multiplied by a load factor as defined in paragraph 5.f.(2). The load shall be at the outer edge of the step or bolt.

(2) **Load Factor**

A load factor of 2.0 shall be applied to the design loads in 5.6.1. These loads shall be supported without permanent deformation.

(3) **Location**

Climbing devices shall start 8 feet above groundline and extend to the pole top unless specified by the owner. The climbing device shall be spaced such that each step is 1 foot 6 inches apart and orientated to provide maximum ease of climbing. They shall be located to avoid interference with other attachments

g. **Finishes**

- (1) The following finishes are acceptable: galvanizing, zinc primer and painting, 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 ASTM A143. Poles made of ASTM A588 steel shall not be galvanized due to the high silicon content of the steel. One gallon of zinc enriched paint shall be provided with each five poles.

- (b) **Zinc Primer and Painting** - Poles which are to be painted shall be hermetically sealed to prevent corrosion of interior surfaces. After shot or sand blasting and cleaning in accordance with the surface preparations specification, SSPC/NACE SP-6/NACE 3, a zinc primer of 3 mils dry film thickness (DFT) and two coats of finish paint, each 3 mils DFT shall be applied to all exterior surfaces in accordance with the paint supplier's recommendations. One gallon each of primer and finish paint shall be supplied with each five poles. A guarantee against flaking or fading of the paint for a minimum of 5 years shall be provided.

- (c) **Weathering Steel** - 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.

(d) 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.

(2) Bolts and nuts with yield strengths under 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.

(3) Compliance with coating thickness requirements shall be checked with a magnetic thickness gauge.

h. Inspection and Testing

(1) 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.

(2) Steel members which are bent or warped or otherwise improperly fabricated shall be properly repaired or replaced.

(3) 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.

(4) The manufacturer shall make tests in accordance with ASTM A370 and ASTM A673 to verify that the material used in the structures meets the impact properties.

(5) 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.

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

- (7) Welders or welding operators shall be qualified in accordance with the provisions of AWS D1.1.
- (8) The manufacturer shall make certified welding reports for each structure. The reports covering welding shall include all welds of each 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.

i. Structure Testing

- (1) The structures which are to have full-scale load tests performed on them are listed in Attachment C of this Specification.
- (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.
- (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.
- (4) Material procurement for test poles shall be identical to material procurement procedures for regular production run poles.
- (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.
- (6) 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.

j. Shipping

- (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.
- (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.

- (3) The anchor bolts shall be welded to the holding plate in the bottom of the cage. A removable template shall be used at the top of the cage and 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 so proper alignment can be made. 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.
- (4) Unless otherwise agreed to by the owner, the anchor bolt cage shall be shipped at least 30 days prior to pole shipment.
- (5) Salt-treated wood blocking and urethane foams shall not be used when shipping or storing steel poles.

## 6. INFORMATION TO BE SUPPLIED BY THE MANUFACTURER

- a. Information to be supplied with the proposal (Attachment E of this Specification).
  - (1) Calculated shipping weight of each structure excluding anchor bolts. Separate weights shall be given for arms and poles.
  - (2) Calculated shipping weight of anchor bolts.
  - (3) Factored groundline reactions in poles and guy wires.
  - (4) Anchor bolt size, length and locations (bolt circle diameters).
  - (5) Type of material of major components (ASTM number).
  - (6) Description of pole shaft, including thickness, length, diameter, cross-sectional geometry, and method of fastening each shaft component.
  - (7) Data showing the design of the arm, arm connections, arm attachment plates and brackets.
  - (8) Sketches or draft drawings of structure and structure attachments.
- b. 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:

- (1) For the loading cases with load 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.
  - (2) 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.
  - (3) Anticipated deflections at the top of the pole and at the ends of the arms shall be indicated for each pole for the normal, everyday loading condition of 60°F, no wind, no load factors.
  - (4) For all specified loading cases, reactions and groundline moments shall be supplied.
  - (5) Detail drawings for each structure type giving weights of structure components, dimensions, and bill of materials.
  - (6) Assembly instructions and erection drawings. Slip joint lengths and allowable tolerances. Special handling instructions.
- c. Final Documents shall be supplied to the owner for the items in Section 6.b.(5), after erection of all structures and prior to final payment.
- d. Test Reports (as requested).
- (1) Certified mill test reports for all structural material.
  - (2) Certified welding reports for each structure.
  - (3) Impact property test reports showing that the material used in the structures meets the impact properties.
  - (4) Test reports on coating thickness.
  - (5) Report of structure testing, when required, including photographs, diagrams, load trees, etc.

## **7. APPROVAL, ACCEPTANCE, AND OWNERSHIP**

- a. Final designs must be approved by the owner or owner's representative before material ordering and fabrication. Material ordering and fabrication prior to approval will be at supplier's risk. It is understood that award of this contract does not constitute acceptance of design calculations submitted with the bid, if corrections are required in the final structure designs due to manufacturer's errors, omissions, or misinterpretations of the specifications, the quoted price shall not change. Approval of the drawings and calculations by the owner or the owner's representative does not relieve the supplier of responsibility for the adequacy of the

design, correctness of dimensions, details on the drawings, and the proper fit of parts.

- b. After delivery, the poles will be inspected and shall be free of dirt, oil blisters, flux, black spots, dross, tear-drop edges, flaking paint or zinc; and in general, shall be smooth, attractive, and unscarred. Poles not meeting this requirement shall be repaired or replaced by the fabricator at no additional cost to the owner.
- c. 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.

#### **8. LIST OF ATTACHMENTS TO THIS SPECIFICATION**

- Attachment A, Structure Dimensions and Other Information (to be completed by the engineer)
- Attachment B, Design Loads (to be completed by the engineer)
- Attachment C, Application Requirements (to be completed by the engineer)
- Attachment D, Drawings (to be completed by the engineer)
- Attachment E, Bid Summary-Design Information, Weights, and Costs (to be completed by the manufacturer and submitted with proposal)



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**Attachment C. Application Requirements**

1. Pole deflection limitations
  - a. Means of achieving..... Pole Strength
  - b. Amount of..... See Drawings
  - c. Loading conditions for..... See Drawings
2. Foundation type..... Direct Embed & Concrete Pier
  - a. Design concrete compressive strength (psi).. TBD
  - b. Maximum anticipated foundation rotation measured from the vertical axis(degrees) and maximum anticipated deflection at the groundline (inches)..... N/A
3. Special Charpy requirements..... N/A
4. Maximum diameter (flat-to-flat) at groundline (inches).....
  - a. Tangent: Not Specified
  - b. Angle: Not Specified
  - c. Deadend: Not Specified
5. Maximum taper (inches/foot) based on total difference between top and bottom diameters. 0.45 inches/ft
6. Guy wire modulus of elasticity..... N/A
7. a. Surface protection desired..... N/A
  - b. If painted, color desire..... N/A
8. a. Climbing device desired..... Step Bolts
  - b. Quantity of removable ladders or step bolts. Determined By Vendor
9. Unguyed angle poles to be raked or precambered..... N/A
10. Unguyed tangent deadends to be raked or precambered..... N/A
11. Grounding plate or nut..... NEMA 2 Hole Pad

**Attachment C. Application Requirements  
(Cont'd)**

- 12. Component weight restrictions..... N/A
- 13. Pole length restrictions..... N/A
- 14. Delivery schedule..... TBD
- 15. Free on board destination..... Yes

16. Structures to be tested:

Structure Type	Load Cases to be Tested
a.	See Load Tables in Structure Drawings
b.	
c.	

17. Miscellaneous

**Attachment D. Drawings (To be added by owner)**

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**Attachment E. Bid Summary-Design Information, Weights, and Costs**  
(To be completed by the manufacturer and submitted with proposal)

POLE DESIGN										
DESCRIPTION		STRUCTURE HEIGHT								
DIAMETER TAPER (IN/FT), 1ST SECT.										
DIAMETER TAPER (IN/FT), 2ND SECT.										
BOTTOM DIAMETER										
TOP DIAMETER										
CROSS SECTION TYPE										
MATERIAL THICKNESS (IN), 1ST SEC										
MATERIAL THICKNESS (IN), 2ND SEC										
ASTM	MATERIAL GRADE									
GOVERNING LOAD CASE(S)										
MAX. MOMENT AT GROUNDLINE										
MAX. SHEAR AT GROUNDLINE										
MAX. AXIAL LOAD AT GROUNDLINE										
MAX. LOAD IN GUY										
ANCHOR BOLTS	SIZE/SPACING									
	LENGTH									
	CAGE DIAMETER									
ARM DESIGN										
DESCRIPTION		ARM TYPE AND DATA								
		A	B	C	D	E	F			OHW
TAPER (IN/FT)										
END DIAMETER (IN)										
DIAMETER AT POLE (IN)										
CROSS SECTION TYPE										
ASTM	MATERIAL GRADE									
GOVERNING LOAD CASE(S)										
MOMENT AT THE POLE (KIP-FT)										
GOVERNING LOAD CASE(S)										
MOMENT AT THE POLE (KIP-FT)										
SUMMARY										
ITEMS		STRUCTURE HEIGHTS								
WEIGHT OF ARMS (TOTAL)										
WEIGHT OF POLE										
WEIGHT OF ANCHOR BOLTS										
TOTAL WEIGHT PER STRUCTURE										
TOTAL COST PER STRUCTURE										
NUMBER OF STRUCTURES										
TOTAL WEIGHTS										
TOTAL COSTS										
COMMENTS		<b>TRANSMISSION LINE STRUCTURE</b>								
		<b>ATTACHMENT E</b>								
		<b>BID SUMMARY - DESIGN, WEIGHTS, AND COSTS</b>								
		(information to be supplied with proposal)								

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**APPENDIX A**  
**COMMENTARY**

## APPENDIX A

### COMMENTARY ON GUIDE SPECIFICATIONS FOR STEEL POLE STRUCTURES

#### 1. General

The necessity of a clear bid specification for the purchase of steel poles is very important to the bid evaluation process and the acquisition of structurally adequate poles. The specification should contain sufficient requirements and information so that all bids can be evaluated equally and so that the fabricator clearly understands what is expected.

The basis of the technical specification is the American Society of Civil Engineers (ASCE) standard on Design of Steel Transmission Pole Structures, with additions and/or exceptions made to the specification. There are several items in the specification which need further explanation. The section references in the commentary refer to the section in the Specifications.

#### 2. Section 5.a - Design Requirements

##### Loads - Section 5.a. (1)

The primary loads for transmission pole structures are weather loads and erection loads. Erection loads in the handling of the steel poles are determined by the manufacturer and included in the manufacturer's design. Erection loads incurred in the construction of the line should be determined by the owner and specified in the loading trees. Weather loads must be clearly specified by the owner. The location and direction of loads should be indicated in a loading agenda or loading trees, and should have units of Newton's, pounds, or kips (or for uniform wind loads on the structure, Pascal's, lb./ft.<sup>2</sup>, or kips/ft.<sup>2</sup>). The specifying of loads in the form of general environmental criteria such as wind velocity or radial thickness of ice, is insufficient. Not only is there difficulty in evaluating bids, but there also is a greater possibility of error in calculated design loads.

ASCE Publication on the Guidelines for Electrical Transmission Line Structural Loadings, (Manual 74), describes different load conditions. Load factors for NESC light, medium, and heavy loading districts should be at least equal to those given in the latest edition of NESC for Grade B construction. Load factors for extreme ice and extreme wind should be at least 1.1. The load factors suggested for extreme conditions are made with the idea that testing of the structure will be to the calculated loads with a load factor of 1.0. Extreme wind loads for recurrence intervals greater than 50 years should also be considered. An appropriate gust factor should be applied to the wind velocity when considering wind on the structure. Arms should be able to sustain a minimum working load of 500 pounds for a lineman in addition to conductor and insulator design loads.

The normal load for 60°F no wind should be given as one of the loading cases so that davit arms and/or camber of a pole can be properly designed.

### **P-delta (P-Δ) Moments**

The specification requires the fabricator to include in its analysis the secondary moment due to the unbalanced vertical load. Whenever there is a transverse or longitudinal load, the pole will deflect in the direction of the load. As a result, the vertical loads are no longer in its original position. The vertical loads have moved over as the pole deflects, causing additional moments (sometimes called P-Δ moments). This specification requires this deflection related moment to be included in the analysis. The deflection and resulting P-Δ moment should be calculated for the loads (including load factors) indicated in the loading agenda.

### **Foundation Rotation and Deflection**

This specification allows the user the option of specifying a foundation rotation, either as a maximum for all load cases or as a certain amount for each load case. For purposes of bidding and design, the owner or owner's engineer also has the option to simply specify a fixed base with no foundation rotation or deflection.

When specifying the maximum value for the foundation rotation and deflection for all load cases, the engineer establishes performance requirements for the steel pole and foundation. In determining this value, aesthetics, phase-to-structure clearances, phase-to-ground clearances, or even the ability to replumb a structure should be considered.

The specifying of a rotation and deflection for each load case is a refinement in analysis and design which allows the user to match types and probability of loads with foundation response. For instance, under a 50-year extreme wind load, one may allow more foundation deflection and rotation than under NESC heavy loading district loads.

In the case where foundation rotation-deflection is specified, the manufacturer should include such effects in calculations of final deflected pole stresses (P-Δ effects). The rotation and deflections when specified should be for the respective loads with load factors.

### **Longitudinal Loads**

Because steel poles are flexible structures, there may be a reduction in induced moments in a pole under some types of longitudinal loads due to the restraining effect of the overhead ground wires. Traditionally, static longitudinal loads are specified due to the complexity of calculating the influence of structure flexibility. Reducing these loads because of the restraining effects of the static wires presents certain difficulties in bid evaluation.

In order to be certain that steel pole bids can be evaluated on an equal basis, this specification requires that all longitudinal loads specified in the loading agenda are not to be reduced due to flexibility of the structure. If the owner wishes to take advantage of structure flexibility, then the owner's engineer should estimate structure and line parameters. The "reduced" longitudinal design loads should then be specified on the loading trees.

This approach is better than having the steel pole manufacturers account for structure flexibility since: (1) not all manufacturers have the capability to perform such an analysis, (2) the owner or owner's engineer will have to evaluate the manufacturer's design anyway, and (3) plan and profile drawings would have to be included in the contract documents so that proper evaluation of the effect of longitudinal loads between deadends can be made.

#### **Shape Factors - Section 5.a.(2)**

Shape factors (drag coefficients) have been established for various pole cross sections so that manufacturers will be designing on the same basis. These drag coefficients are a function of wind velocity, diameter, and shape of the member. If the user modifies this section of the specification in order to reflect more refined drag coefficients, the user should be certain to provide all additional information needed to clearly and precisely define the loads.

#### **Guy Wires - Section 5.a.(5)**

Any time a steel pole structure is guyed, the guy type, size, modulus of elasticity and guy slope or angle must be specified by the owner. The manufacturer needs this information to properly analyze the structure. This specification limits the load in the guy to 65 percent of its ASTM rated breaking strength. The manufacturer should design the pole and guy wire(s) as a system. The manufacturer may wish to reduce pole capacity by using a larger than specified guy wire size. This action should be avoided unless the owner approves the use of a larger guy size, and subsequent anchor changes.

In design, the loads with the respective load factors are applied at appropriate locations on the guyed structure.

The guy modulus of elasticity can increase from a minimum value at the time of manufacture, to a maximum value which results from periodic stretching and relaxing during the load cycles. Ranges from 19,000 ksi to 28,000 ksi have been stated. The ASCE 48 Design of Steel Transmission Pole Structures has suggested a guy wire modulus of elasticity of 23,000 ksi be used by the pole designer whenever it is not specified.

#### **Ratio of Minor to Major Axis - Section 5.a.(10)**

Longitudinal loads are sometimes difficult to determine. In order to reduce the chances of a cascading failure in a tangent structure, this specification requires the minor axis of an elliptical or rectangular section to be not less than 75 percent of the major axis. This requirement will provide inherent longitudinal strength for steel pole tangent structures. In most instances, this inherent longitudinal strength is naturally provided in the design process.

#### **Wind Induced Vibrations**

Members of all types of transmission structures may occasionally be subject to wind induced vibrations.

The manufacturer should detail each structure using good design practices considering this possibility. If vibrations are experienced, the owner should add additional damping to the structure. Damping may be particularly important on structures which are to be installed without conductors for an extended period of time.

#### **Direct Embedded Steel Poles - Section 5.a.(8)**

There may be problems associated with requiring a base/bearing plate for direct embedded poles where soil conditions require the use of driller's mud during the augering process. When installing the pole, the pole may float and it is impossible to set it in the foundation unless the water is removed from the hole, which may cause the sides of the hole to collapse. Specifying galvanized poles with a 6 to 12-inch diameter hole in the base plate may be necessary. Once crushed rock is placed in the bottom of the hole, the pole lowered, the drillers mud and water can be pumped out of the hole as the pole is set. The remaining water in the pole will drain out of the bottom of the pole through the crushed rock. If weathering steel poles are used and a hole is placed in the bearing plate, the embedded portion of the pole should be coated inside and outside.

Use of direct embedded steel poles should be evaluated for the first two spans outside of a substation or generating plant. The large amount of copper used in a substation grounding grid may create a galvanic corrosion cell, with the steel of the pole sacrificing itself. Anodes or extra subsurface protection may be needed.

### **3. Section 5.b - Materials**

#### **Charpy Requirements - Section 5.b.(6)**

A Charpy test is a notch-bar impact test used to compare notch sensitivities of materials. The impact values cannot be converted into energy figures for use directly in engineering design. The impact value from the notch-bar impact test is used only as a comparison test. For example, if a type of steel has been found to have a good notch toughness in

service and its impact value is known, it is assumed that other types of steel having the same impact value will also have the same notch toughness. The ASCE design standard for steel poles has established impact values for the Charpy notch-bar impact test. These values are a function of yield stress, plate or bar thickness, and temperature.

Notch-bar impact tests are used to help determine if a normally ductile material might behave in a brittle manner. Three main factors which influence if a material will behave in a brittle or ductile manner are triaxiality, strain rate, and temperature. Ductile materials tend to become more brittle as triaxiality increases, strain rate increases, or temperature decreases. Since brittle materials require far less energy for fracture than ductile materials of the same strength, one can realize the importance of the Charpy test for steel poles used on transmission lines.

The tendency is to reduce temperature requirements of the Charpy test for structures to be in service in warm climates such as Louisiana or Florida. This is not recommended. However, for locations in which temperatures may be extremely low, lower temperature values may need to be specified.

The ASCE design standard specification contains Charpy requirements for structural plate, anchor bolts, and weld materials. The material used for making welds is required to meet the impact requirements for the lowest toughness requirements of the plates being joined.

**4. Section 5.c - Fabrication (no comments)**

**5. Section 5.d - Finishes**

**Weathering Steel**

There are environments where weathering steel is not recommended in a bare, uncoated condition because the protective, tight oxide will not form properly. These environments include: (1) atmospheres containing concentrated corrosive industrial fumes, (2) marine locations subject to salt-water spray or salt-laden fogs, or (3) applications where the steel may be continuously submerged in water (salt or fresh) or buried (bare) in soil. Use of weathering steel poles near roads that are salted during the winter should be avoided.

In general, weathering steel is intended for and is most often used in a bare, uncoated condition. However, those surfaces that will not be boldly exposed to the weather or subjected to a wet-dry cycle should be protected from corrosion. Flat, horizontal surfaces are particularly vulnerable. Also, in areas where ground cover will grow to a height where it will contact the pole and rub the protective weathering steel coat off, or in areas where the vegetation will keep the pole moist, the steel surface should be protected from corrosion by application of a coating. For direct embedded steel poles, the polyurethane coating may have to be extended above the top of the ground sleeve to protect the weathering steel pole from moisture entrapped by vegetation or rubbing by groundcover.

If the pole is to be embedded in concrete, the interface between the pole, concrete, and the atmosphere should be protected in such a way as to prevent water leakage between the concrete and steel. Otherwise, moisture would remain and possibly cause corrosion at the same rate as carbon steel.

Blast cleaning after fabrication of a weathering steel pole will help to assure a cleaner, more uniform, weathering appearance in a shorter period of time.

### **Grounding**

When poles are direct embedded, this specification requires a polyurethane coating to be applied to the exterior surface of the embedded portion of the pole. This coating will tend to insulate the pole from the ground and as such, supplemental grounding is necessary. When the pole is galvanized and there is no coating on the embedded portion of the pole, the pole may be used as the pole ground. If the foundation is a concrete caisson, a separate ground should be installed.

Use of copper or copper clad ground wire and rods should be avoided with direct embedded poles.

### **Additional Protection**

The owner or owner's representative should determine if the embedded poles should be protected by anodes. If it is necessary, requirements for sacrificial anodes and their installation should be incorporated in the construction specification.

#### **6. Section 5.h - Inspection And Testing (no comments)**

#### **7. Section 5.i - Structure Testing**

An option is available in the specification for full-scale testing of a structure or structures. For a manufacturer which has been designing and fabricating steel poles with the same processes for a number of years, the need for testing of a steel pole is questionable. Structure testing may be appropriate in cases where there are unusual requirements, new fabrication techniques, or where there are numerous tangent structures of the same or similar design.

#### **8. Section 5.j - Shipping**

The owner may wish to order 5 percent overage of all fastening hardware.

Lumber treated with salts (Ammoniacal copper arsenate, ACA, Ammoniacal copper zinc arsenate, ACZA, and Chromated copper arsenate, CCA) to retard "decay or fire" will chemically attack the steel. Urethane foam or some foams containing fire retardants should also not be used in packaging and shipping. When these materials become wet, they become very corrosive.

**9. Section 6 - Information To Be Supplied By The Manufacturer With The Proposal**

In order to properly evaluate bids, the specification requires certain information to be supplied with the bid. This information may be supplied on the preliminary drawings from the bidder. If the forms in Attachment B are used, one will be able to quickly review the information on the forms and simultaneously compare the information from the different manufacturers.

**10. Section 7 - Approval, Acceptance, and Ownership (no comments)**

**APPENDIX B**  
**EXAMPLES OF ATTACHMENTS A & B**  
**OF THE SPECIFICATIONS**



**ATTACHMENT "B" DESIGN LOADS** (CONDUCTOR 795, 26/7 ACSR OHGW 7/16 E.H.S. V.S. 1200' H.S. 900')  
a. LOADS WITH OLF

DESCRIPTION OF LOAD	TEMP °F	LOADS IN KIPS (INCLUDES L.F.)												#	psf	Δg	θui		
		V1	T1	L1	V2	T2	L2	V3	T3	L3	VG	TG	LG						
1. NESC Heavy	0	5.27	1.58	2.31	5.27	1.58	2.31	5.27	1.58	2.31	5.27	1.58	2.31	1.76	1.08	0.00	10.0	0	0
2. High Wind (21 psf)	60	2.10	1.92	---	2.10	1.92	---	2.10	1.92	---	2.10	1.92	---	0.53	0.75	---	39.0	0	0
3. Ext. Ice & wind (1", 4psf)	32	5.56	1.03	---	5.56	1.03	---	5.56	1.03	---	5.56	1.03	---	2.88	0.80	---	4.0	0	0
4. Unbalanced ice (cond)	32	3.83	---	3.41	5.84	---	---	5.84	---	---	5.84	---	---	2.88	---	---	---	0	0
5. Unbalanced ice (OHGW)	32	5.89	---	---	5.84	---	---	5.84	---	---	5.84	---	---	1.70	---	2.43	---	0	0
6. High Wind (no cond)	60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	39.0	0	0

b. LOADS WITHOUT OLF

DESCRIPTION OF LOAD	TEMP °F	LOADS IN KIPS (DOES NOT INCLUDE L.F.)												#	psf	Δg	θg		
		V1	T1	L1	V2	T2	L2	V3	T3	L3	VG	TG	LG						
1. NESC Load	0	3.36	0.63	1.40	3.36	0.63	1.40	3.36	0.63	1.40	3.36	0.63	1.40	1.18	0.43	0.00	4.0	0	0
2. High Wind (21 psf)	60	1.80	1.75	---	1.80	1.75	---	1.80	1.75	---	1.80	1.75	---	0.48	0.68	---	35.5	0	0
3. Ext. Ice & wind (1", 4psf)	32	5.06	0.93	---	5.06	0.93	---	5.06	0.93	---	5.06	0.93	---	2.62	0.73	---	4.0	0	0
7. No Load	60	1.31	0.00	---	1.31	0.00	---	1.31	0.00	---	1.31	0.00	---	---	---	---	---	0	0

**COMMENTS:**

- "w" is for a shape factor of 1.0.
- Loads "T" and "L" are reversible.
- High wind from load case "6" is from any direction.
- Load case "4" is for any conductor position.
- Refer to Drwg. on Att. A for load location.

CROWDER TAP

**TRANSMISSION LINE STRUCTURE**

TANGENT SUSPENSION  
161 KV

Scale	Rural Cooperative	9/1/2007
None		TUS-1



**APPENDIX C**  
**SELECTED SI-METRIC CONVERSIONS**

**Selected SI-Metric Conversions**

**AREA**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
circular mil (cmil)	square meter (m <sup>2</sup> )	5.067075 E-10
square centimeter (cm <sup>2</sup> )	square meter (m <sup>2</sup> )	*1.000 E-04
square foot (ft <sup>2</sup> )	square meter (m <sup>2</sup> )	*9.290304 E-02
square inch (in <sup>2</sup> )	square meter (m <sup>2</sup> )	*6.451600 E-04
square kilometer (km <sup>2</sup> )	square meter (m <sup>2</sup> )	*1.000 E+06
square mile (mi <sup>2</sup> )	square meter (m <sup>2</sup> )	2.589988 E+06

**FORCE**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kilogram force (kgf)	Newton (N)	*9.806650
kip	Newton (N)	4.448222 E+03
pound force (lbf)	Newton (N)	4.44822

**FORCE PER LENGTH**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kilogram force per meter (kgf/m)	Newton per meter (N/m)	*9.806650
pound per foot (lb/ft)	Newton per meter (N/m)	1.459390 E+01

**DENSITY**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
pound per cubic inch (lb/in <sup>3</sup> )	kilogram per cubic meter (kg/m <sup>3</sup> )	2.767990 E+04
pound per cubic foot (lb/ft <sup>3</sup> )	kilogram per cubic meter (kg/m <sup>3</sup> )	1.601846 E+01

**LENGTH**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
foot (ft)	meter (m)	3.048 E-01
inch (in)	meter (m)	*2.540 E-02
kilometer (km)	meter (m)	*1.000 E+03
mile (mi)	meter (m)	*1.609344 E+03

\*Exact Conversion

**Selected SI-Metric Conversions (Cont.)**

**LOAD CONCENTRATION**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
pound per square inch (lb/in <sup>2</sup> )	kilograms per square meter (kg/m <sup>2</sup> )	7.030696 E+02
pound per square foot (lb/ft <sup>2</sup> )	kilograms per square meter (kg/m <sup>2</sup> )	4.788026
ton per square foot (ton/ft <sup>2</sup> )	kilograms per square meter (kg/m <sup>2</sup> )	9.071847 E+02

**PRESSURE**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kip per square inch (kip/in <sup>2</sup> )	Pascal (Pa)	6.894757 E+06
kip per square foot (kip/ft <sup>2</sup> )	Pascal (Pa)	4.788026 E+04
Newton per square meter (N/m <sup>2</sup> )	Pascal (Pa)	*1.000
pound per square foot (lb/ft <sup>2</sup> )	Pascal (Pa)	4.788026 E+01
pound per square inch (lb/in <sup>2</sup> )	Pascal (Pa)	6.894757 E+03

**BENDING MOMENT**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kilogram force meter (kgf-m)	Newton meter (N-m)	*9.806650
kip-foot (kip-ft)	Newton meter (N-m)	1.355818 E+02
pound-foot (lb-ft)	Newton meter (N-m)	1.355818

**VELOCITY**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
foot per second(ft/s)	meter per second (m/s)	*3.048 E-01
kilometer per hour (km/h)	meter per second (m/s)	2.777778 E-01
mile per hour(mi/h)	meter per second (m/s)	4.437030 E-01
meter per hour(m/h)	meter per second (m/s)	2.777778 E-04

\*Exact Conversion.

Disclaimer: The contents of this guidance document does not have the force and effect of law and is not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Utilities Service

**BULLETIN 1724E-214**

**RD-GD-2019-96**

**SUBJECT:** Guide Specification for Standard Class Steel Transmission Poles

**TO:** RUS Electric Borrowers, Consulting Engineers, and RUS Electric Program Staff

**EFFECTIVE DATE:** Date of Approval

**OFFICE OF PRIMARY INTEREST:** Engineering Standards Branch, Electric Program

**FILING INSTRUCTIONS:** This bulletin replaces RUS Bulletin 1724E-214, "Guide Specification for Standard Class Steel Transmission Poles" issued March 23, 2017.

**AVAILABILITY:** This bulletin can be accessed via the Internet at:  
<https://www.rd.usda.gov/publications/regulations-guidelines/bulletins/electric>

**PURPOSE:** This bulletin provides guidance for procuring standard class steel poles for transmission applications.

JAMES ELLIOTT Digitally signed by JAMES ELLIOTT  
Date: 2019.04.09 11:32:43 -0400

Christopher A. McLean  
Assistant Administrator,  
Electric Program

April 9, 2019

Date

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Ballard, Dominic, **East Kentucky Power Coop.**, Winchester, KY  
Beadle, Bob, **North Carolina EMC**, Raleigh, NC  
Beckett, Thomas, **TL Beckett Consulting Engineers**, Marietta, GA  
Bertelsen, James, **Dairyland Power Cooperative**, La Crosse, WI  
Caldwell, Art, **Georgia Transmission Corporation**, Tucker, GA  
Harvey, Gary, **East Kentucky Power Cooperative**, Winchester, KY  
Johnson, Wilson, **USDA, Rural Utilities Service, Electric Program**, Washington, DC  
Kahanek, Bil, **McCord Engineering, Inc.**, College Station, TX  
Lukkarila, Charles, **Great River Energy**, Maple Grove, MN  
McAndrew, Jeremy, **South Mississippi Electric Power Assoc.**, Hattiesburg, MS  
Metro, Patti, **National Rural Electric Cooperative Association**, Arlington, VA  
Nordin, Bryan, **Tri-State Generation & Transmission Association, Inc.**, Denver, CO  
Ruggeri, Erik, **Power Engineers**, Hailey, ID  
Shambrock, Aaron, **South Central Power Company**, Lancaster, OH  
Twitty, John, **PowerSouth Energy Cooperative**, Andalusia, AL  
Woodruff, Paul, **Great River Energy**, Maple Grove, MN  
Zhang, Chendi, **USDA, Rural Utilities Service, Electric Program**, Washington, DC

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**ABBREVIATIONS**

ACA	Ammoniacal Copper Arsenate
ACSR	Aluminum conductor steel reinforced
ACZA	Ammoniacal Copper Zinc Arsenate
ANCO	American Nut Company
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CCA	Chromated Copper Arsenate
DFT	Dry Film Thickness
Eq. F	Equivalency Factor
HSS	High Strength Steel
kV	kilovolt
ksi	kips (1000 lb.) per square inch
mph	miles per hour
LF	Load factor
NACE	National Association of Corrosion Engineers
NESC	National Electrical Safety Code
NEMA	National Electrical Manufacturers Association
OHWG	Overhead ground wire
psf	pounds per square foot
psi	pounds per square inch
UNC	unified coarse threads
RUS	Rural Utilities Service
SSPC	Steel Structure Painting Council

**DEFINITIONS**

*Borrower* – An entity which borrows or seeks to borrow money from or arranges financing with the assistance of the Rural Utilities Service through guarantees, lien accommodations or lien subordinations.

*RUS Form 198* – *Equipment Contract*.

*Rural Utilities Service (RUS)* – An Agency of the United States Department of Agriculture, under Rural Development.

**INDEX:**

**Materials and Equipment: Guide Specifications for Standard Class Steel Poles**

**Poles: Steel**

**Specifications and Standards: Guide Specifications for Standard Class Steel Poles.**

**Transmission Facilities: Poles (Steel)**

**INSTRUCTIONS WHEN USING THE GUIDE SPECIFICATIONS  
FOR STANDARD CLASS STEEL TRANSMISSION POLES**

**1. PURPOSE**

*The intent of this guide specification is to provide Rural Utilities Service (RUS) Electric Program borrowers a basis for procuring standard class steel poles for transmission applications. Use of this specification should help eliminate ambiguities that might arise in the evaluation process of competitively bid standard class steel poles procurements.*

*Borrowers or their engineering representatives will need to complete this specification and add documents as appropriate. Modifications to this specification may be necessary to consider special applications or preferences of the owner.*

**2. SCOPE**

*This suggested purchase specification covers the technical aspects of design, materials, manufacturing, inspection, testing, and delivery of direct embedded standard class steel poles. It is recommended that this specification be limited to single poles that are not guyed, not subjected to unbalanced lateral loads, or do not have unusual deflection or other special limitations. For applications that consider these items, it is recommended that the owner use "Guide Specifications for Steel Single Pole and H-Frame Structures," RUS Bulletin [1724E-204](#).*

*This guide specification does not include contract (front-end) documents or specifications for construction. The user of this specification should add these documents, including general conditions and any supplemental instructions to the bidders. This specification may be expanded to include H-frame structures.*

**3. INITIAL DESIGN CONSIDERATIONS**

*There are engineering decisions required of the user of this specification to determine which standard class steel poles to specify. Some examples include, but are not limited to:*

- *Amount of foundation rotation in contributing to P-delta moments;*
- *Location of point of fixity;*
- *Embedment depths;*
- *Load cases to be considered in addition to those required by the National Electrical Safety Code (NESC); and*
- *Deflection limitations.*

*Prior to the selection of a standard class pole, the user should perform the engineering required for these types of issues or employ an engineering consultant to do so. See Appendix A of this bulletin for a discussion of some of these items.*

**4. INFORMATION TO BE COMPLETED BY THE OWNER**

*Users of these specifications should detach the instructions and the Appendices, and add or complete the following:*

- a. *Documents and general information to be added to the technical specification: Front-end documents and general information which need to be added to this technical specification.*
- *RUS Form 198, Equipment Contract (Recommended for competitive bidding)*
  - *Supplemental Instructions to Bidders*
  - *General Conditions*

*When there is competitive bidding, it is recommended that RUS Form 198 be used. This form covers Notice and Instructions to Bidders, Proposal, and Equipment Contract. For the 2<sup>nd</sup> item above, Supplemental Instructions, the user may want to add such items as Bid Submission, Bid Price and Schedule, Bid Acceptance Period, Bid Requirements, and Bid Data. A section on General Conditions could include such items as Definition of Terms, Interpretation of Bid Documents, Addenda to the Bid Documents, Insurance, Method of Payment (if RUS Form 198 is not used), Quantities, and Tabulation of Unit Prices.*

- b. *Requirements to the technical specifications to be added or completed by the owner or owner's representative and supplied to the bidders include:*

- (1) *Configuration requirements and other information (Attachment A of the Specification or equivalent):*
- *Pole Length*
  - *Pole Class*
  - *Pole Framing (Pole attachment requirements)*
  - *Embedment Depths*
- (2) *Strength requirements and standard class designations for steel poles*

*This specification establishes standard steel pole sizes. The engineer in the design process needs to select the appropriate standard class pole from Table 1 based on loading requirements and a calculated load 2 feet from the top.*

*Minimum design loads have to meet NESC requirements which are appropriate for the loading district, the NESC extreme wind load provisions, NESC extreme ice with concurrent wind and any necessary extreme ice and wind conditions with the appropriate load factors and any local codes. The design loads account for all loading cases, including wind on pole and secondary stresses from foundation deflection and rotation, and from vertical loads acting on lateral pole deflection (P-delta effect).*

*The American Society of Civil Engineers (ASCE) Guidelines for Electrical Transmission Line Structural Loading can be used for developing loads produced by climate, accidents, construction and maintenance. Calculations need to include the vertical, transverse, and longitudinal loads with wind on the structure and the dead weight of the structure for any given loading condition applied simultaneously. All loads require appropriate load factors.*

- (3) *Application Requirements (Attachment B of the Specification to be completed by the owner.)*
- *Type of pole finish.*
  - *Special Charpy requirements.*
  - *Desired method of surface protection.*
  - *Preference of climbing ladders, steps or stepbolts. Also, quantity of removable ladders, steps or step bolts to be supplied with the total order of poles should be specified.*
  - *Location of climbing and /or working ladders or step bolts.*
  - *Ground collar*
  - *Pole grounding method.*
  - *Delivery schedule, and free on board destination, and owner's contact.*
  - *Miscellaneous additional items such as special attachments requirements, climbing devices, hot line maintenance requirements switch operating mechanisms, location of bolt holes for other equipment requirements.*
  - *Pole tests (if required).*

## **5. INFORMATION TO BE COMPLETED BY THE MANUFACTURER**

- a. *The owner or owner's representative should have the following information completed and submitted by each bidder (Attachment C of this specification or equivalent).*
- (1) *Design information (Pole Framing Drawing and length). This will demonstrate conformance with the design needs.*
  - (2) *For each standard class steel pole, provide the diameter at the top, at the ground line, and at the bottom, plus the pole taper. This will demonstrate conformance with the requirements of paragraph 5.a.(2)(c).*
  - (3) *For each standard class steel pole, provide the following general information: the weight of each pole; the tip load of each pole class; the location of the point of fixity; the type of steel according to American Society of Testing and Materials (ASTM) number and yield; the pole cross sectional shape; and the connection details for multiple piece poles*

- (slip/flange joints). This will demonstrate conformance with the requirements of paragraphs 5.a.(1), 5.a.(2), 5.a.(3), and 5.a.(6).*
- (4) For each standard class steel pole, provide the following calculations at the ground line: Moment, Shear, Axial load, and Cross-sectional area. This will demonstrate conformance with the requirements of section 5.a.*
  - (5) For each standard class steel pole, provide the following calculations at the point of fixity: Moment, Shear, Axial load, and Cross-sectional area. This will demonstrate conformance with the requirements of section 5.a.*
  - (6) For each standard class steel pole, provide the wall thickness at the pole top, ground line, and bottom. This may be provided in catalog form.*
  - (7) For each standard class steel pole provide the pole top deflection due to design load.*
- b. Documentation which the successful bidder needs to supply for approval by owner or owner's representative prior to manufacture of the pole include:*
- (1) Description of pole including geometry, thickness, length, diameter, taper, and hole locations.*
  - (2) Complete design/erection reproducible drawings for each pole class.*
  - (3) Anticipated deflection of pole at specified tip load.*
  - (4) Connection and Assembly Details on multiple piece poles.*
- c. Test reports (as requested by the owner).*

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## **SPECIFICATIONS FOR STANDARD CLASS STEEL TRANSMISSION POLES**

1. **SCOPE:** This specification covers the design, materials, welding, inspection, protective coatings, drawings and delivery of unguyed standard class, direct embedded, steel transmission poles. The poles are to be used in single pole, unguyed situations.

2. **DEFINITIONS**

**Appurtenance** – Any hardware or structural members that are attached to the pole to make a complete structure.

**Bearing Plate** – A plate at the base of the pole that is intended to transfer the vertical loads of the pole.

**Charpy Impact** – The impact properties of the material which are used to evaluate the susceptibility of structural steel to brittle fracture. See ASTM A370 and ASCE 48 for details.

**Crook** – A localized deviation from straightness that causes the centerline of one section of the pole not to align with the centerline of another section of the pole.

**Circumferential Weld /C-weld** – A weld perpendicular to the long axis of a structural member.

**D/t** – The ratio of the diameter of a tubular pole to the plate thickness.

**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.

**Ground Collar** – An additional steel plate jacket that encapsulates the portion of the buried pole immediately above and below the *groundline*.

**Group of Bolt Holes** – All of the holes in which an appurtenance will be attached.

**Guyed Structure** – A structure in which cable supports are used to increase its lateral load resistance.

**Groundline** – A designated location on the pole where the surface of the ground will be after installation of a direct embedded pole. The groundline location will be used to locate the *ground collar* and other attachments to the pole.

**Flanged Connection/splice** – A bolted type connection.

**Factored Load** – The maximum design load that includes the appropriate load factor specified.

- In-Line Face** – The face of the pole which “faces” an adjacent structure in the line.
- Longitudinal Weld** – A weld parallel to the long axis of a structural member.
- Manufacturer** – The company responsible for the fabrication of the poles. The manufacturer fabricates the poles based on the design drawings developed by the structural designer, which is the manufacturer’s engineer responsible for the structural design of the poles.
- Load Factors (LF)** – A multiplier, which is applied to each of the vertical, transverse and longitudinal structure loads to obtain a *factored load*.
- Owner** – The Rural Utilities Service borrower or owner's representative.
- P-delta (P- $\Delta$ ) Moment** – A measure of the increase in bending moment resulting from a structure’s displacement under load.
- Pole Height** – For this bulletin, this term is used interchangeably with *pole length*.
- Pole Length** – The length from the pole top to the bearing plate on the pole bottom.
- Pole Sweep** – The measure of deviation from straightness along the length of the pole.
- Point of Fixity** – The point where the maximum moment occurs. The actual location of this point is dependent on the characteristics of soils around the embedded portion of the pole. For this specification it will be assumed to be equal to 7 percent of the pole length.
- Pole Twist** – spiral rotation of a pole section relative to the pole end. It is caused by the residual stress in the steel as received from the mill, the clamping force holding the tube shells together and the heat applied during the seam welding process.
- Slip Connection/splice** – A telescoping type connection of two tapered tubular pole sections.
- Standard Class Pole** – A direct embedded steel pole that is designed according to a standardized strength and loading criteria established by the owner.
- Taper** – The change in diameter of a tubular section from its base to its top.
- Tip Load** – The horizontal load that is applied to the standard class pole at a distance of 2 feet from the pole top.
- Yield Strength** – The minimum stress at which a material will start to physically deform without further increase in the load or which produces a permanent 0.2 percent deformation. This is also known as the elastic limit of the material.

**Ultimate Moment Capacity** – The moment that is developed in the pole at the time the yield strength of the pole is realized.

**w/t** – Ratio of a flat width of a multisided pole to the thickness of the steel plate.

**Weathering Steel** – Steel that conforms to ASTM A588 or A871. This steel forms a natural protective oxide layer on the surface.

### 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 Institute of Steel Construction (AISC), “Specification for the Design, Fabrication and Erection of Structural Steel for Buildings,” latest edition.
- b. American Society of Civil Engineers (ASCE) Standard, “Design of Steel Transmission Pole Structures,” ASCE 48, latest edition.
- c. American Society of Testing and Materials (ASTM), various standards, latest revision. Referenced ASTM specifications:

A6/A6M	Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
A36/A36M	Specification for Carbon Structural Steel
A123/A123M	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A143	Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
A153/153M	Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A325	Specification for High-Strength Bolts for Structural Steel Joints
A354	Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners
A370	Test Methods and Definitions for Mechanical Testing of Steel Products

- A384 Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
- A570/A570M Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality
- A572/A572M Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- A588/588M Specification for High Strength Low-Alloy Structural Steel with 50 ksi Minimum Yield Point to 4 in. Thick
- A595 Specification for Steel Tubes, Low-Carbon, Tapered for Structural Use
- A607 Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, columbium or Vanadium, or Both, Hot-Rolled and Cold-Rolled
- A673/A673M Specification for Sampling Procedure for Impact Testing of Structural Steel
- A871/A871M Specification for High Strength Low-Alloy Structural Steel Plate with Atmospheric Corrosion Resistance
- B695 Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
- B696 Specification for Coatings of Cadmium Mechanically Deposited
- d. American Welding society (AWS), Structural Welding Code, AWS D1.1, latest edition.
- e. American National Standards Institute (ANSI), National Electrical Safety Code, ANSI C2, latest edition.
- f. Society for Protective Coatings (SSPC, formerly Steel Structure Painting Council)/ National Association of Corrosion Engineers (NACE) Surface Preparations Specification, SSPC/NACE SP-6/NACE 3.

**4. CONFLICT BETWEEN THIS SPECIFICATION, DRAWINGS, AND REFERENCES DOCUMENTS**

In the event of conflict between this specification and the above referenced documents, the requirements of this specification shall take precedence. In the case of conflict between several referenced documents, the most stringent requirement shall be followed. If a conflict exists between this specification or the referenced documents and the attached drawings, the attached drawings shall be followed. If clarification is necessary, contact the owner.

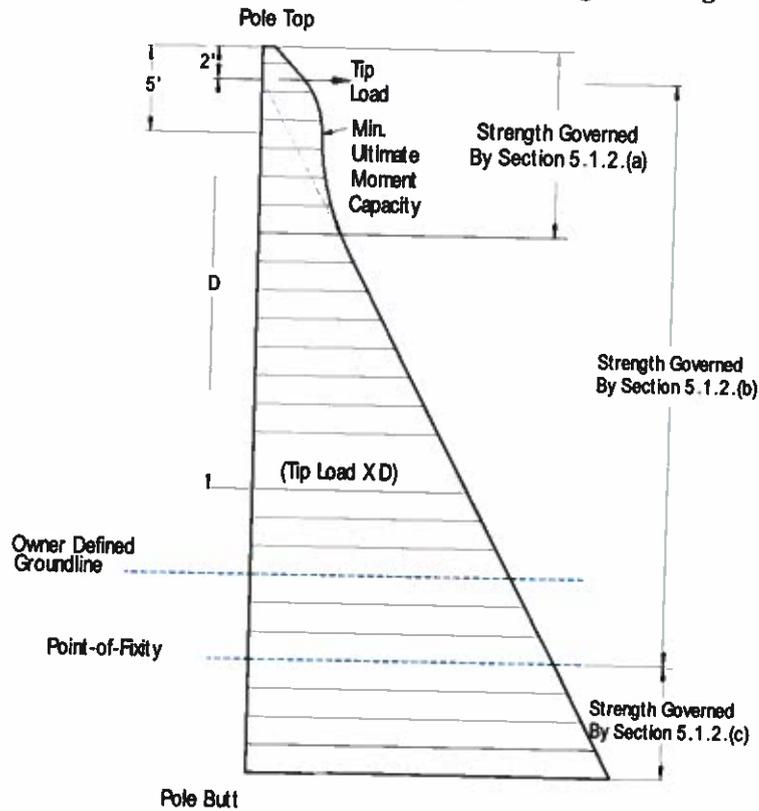
**5. GENERAL REQUIREMENTS**

The design, fabrication, allowable stresses, processes, tolerances, and inspection shall conform to ASCE Standard, "Design of Steel Transmission Pole Structures" (ASCE 48), latest edition, with the following additions and/or exceptions:

a. Design Requirements

- (1) Pole designs shall be prepared for the attached Standard Class design loads. The poles shall be designed to meet ASCE 48, "Design of Steel Transmission Pole Structures", design methods. The point-of-fixity shall be considered to be located at a distance from the pole bottom that is equal to 7 percent of the pole length. The pole shall be symmetrically designed such that the strength required in any one direction shall be required in all directions about the longitudinal axis.
- (2) Using the corresponding values in Table 1, the poles shall be designed for the following requirements as illustrated by Figure 1.
  - (a) The pole shall develop the minimum ultimate moment capacity required in Table 1 at a distance of five feet from the pole top.
  - (b) The pole shall develop the minimum ultimate moment capacity above the point-of-fixity that is calculated by multiplying the tip load in Table 1 by the distance to the tip load.
  - (c) The geometry and taper of the pole shall be uniform throughout their entire length (top to butt).

**Figure 1**  
**Minimum Ultimate Moment Capacity Diagram along the Pole**



- (3) The poles shall be designed to withstand the specified tip loading in Table 1 without exceeding a pole deflection of 15 percent of the pole length above the point of fixity when tested in accordance with ASCE 48.
- (4) Overall length of poles shall be designed and manufactured in incremental lengths of 5 feet.

**Table 1  
Strength Requirements**

Standard Class Designations for Steel Poles	Minimum Ultimate Moment Capacity At Five Feet From Pole Top (Ft.-Kip)	Horizontal Tip Load Applied 2 Ft from Pole Top (Lbs.)
S-12.0	96	12,000
S-11.0	88	11,000
S-10.0	80	10,000
S-09.0	72	9,000
S-08.0	64	8,000
S-07.4	57	7,410
S-06.5	50	6,500
S-05.7	44	5,655
S-04.9	38	4,875
S-04.2	32	4,160
S-03.5	27	3,510
S-02.9	23	2,925
S-02.4	19	2,405
S-02.0	15	1,950

- (5) Poles shall be designed for the loads generated from handling and erecting without causing permanent deformation or damage to the pole when handled according to the manufacturer's instructions. Handling and erecting loads shall include but not be limited to, a one-point (tilting) pickup and a two-point (horizontal) pickup.
- (6) 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 load factors.
- (7) Minimum plate thickness for all pole components shall be 3/16 inch.
- (8) The owner shall provide the pole manufacturer with the load capabilities, attachment method, and attachment location of the appurtenances. The pole manufacture shall verify that the pole will not have a localized strength problem at the attachment point.
- (9) All poles shall have bearing plates. Bearing plates shall have diameter not more than 2 inches greater than the maximum diameter at the pole butt.
- (10) Galvanized poles shall have a drain hole at the bottom. This hole shall not be greater than 20 percent of the bottom plate surface area.

- (11) Grade and type of steel shall be uniform for the poles.
- (12) Ground collars to protect the pole groundline area from corrosive environments are required per Attachment B. Length of the ground collar shall be as specified ~~in Attachment B.~~  
**Per Structure Drawings**
- (13) Ground collars shall have a minimum thickness of 3/16 inch; shall be centered at the groundline; and shall not be considered in strength calculations. A seal weld shall be provided around the ground collar at the top and bottom of the ground collar.
- (14) The top of the pole shall be permanently covered with a structural steel plate that is bolted or otherwise permanently attached to the pole. The pole shall be delivered with the pole cover attached in place.
- (15) Lifting lugs are optional. The manufacturer shall supply all guidelines for handling and erection of poles and arms.
- (16) 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.
- (17) Weathering steel structures shall be designed to eliminate water and refuse traps. The tubular sections shall be sealed from moisture entering the inside of the pole. Factory drilled holes shall be plugged to prevent moisture intrusion during shipping. Connections shall be designed to reduce the effect of pack-out by preventing moisture from entering the joint or by designing the connection to allow moisture to easily drain off.
- (18) Plastic plugs shall be installed in all nuts welded to the structure and all tapped holes.
- (19) Pole design and design calculations shall be the responsibility of the manufacturer.
- (20) Poles shall be designed with the minimum number of joints.
- (21) Field welding is not normally permitted. In rare instances, it will be permitted to make minor repairs. All welds must be approved by the owner and must follow the manufacturer's direction.
- (22) Flange connections for weathering steel poles shall be designed to avoid pack-out.
- (23) Application requirements: (See Attachment B of this Specification)

b. **Materials**

- (1) All materials shall comply with the applicable requirements of ASTM specifications. Any modifications from ASTM specifications must be approved by the owner or the owner's representative.
- (2) Steel utilized for the purposes of making poles shall conform with the following ASTM Specifications: ASTM A36, ASTM A570, ASTM A572, ASTM 588, ASTM A607, ASTM A871 or ASTM A595, and must be qualified to the requirements contained in ASTM A6/A6M-96b.
- (3) Structural plate, and weld material, shall conform to ASTM A370 and ASCE 48. Plates shall be heat-treated in conformance with ASTM A 673 Charpy V-Notch Impact test for properties of 15 ft-lbs. at -20°F.
- (4) For galvanized structures, steel used for the pole shaft and arms shall have a silicon content less than .06 percent.
- (5) Bolts and nuts shall conform, as applicable to ASTM A307, ASTM A325, and ASTM A354. Locknuts or American Nut Company (ANCO) type self-locking nut shall be provided for each bolt. Locknuts shall be the galvanized MF type or ANCO type. Other types of nut locking devices must be approved by the owner.

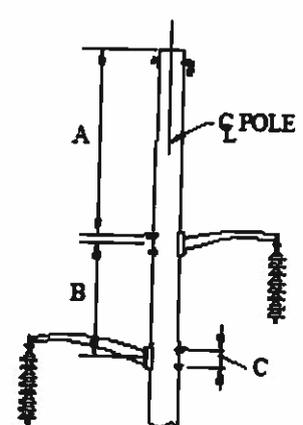
c. **Fabrication**

- (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.
- (2) One hundred percent 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 plus 6 inches;
  - Welds at butt joints with back-up strips; and
  - Longitudinal welds within 3 inches of C-welds, flange welds, base welds and ends of tubes.
- (3) Full penetration, or equivalent 90 percent partial penetration with fillet overlay to develop the shaft capacity, shall be used for arm-to-arm brackets, vang-to-plate reinforcement, and arm box joints.

- (4) Quality and acceptability along the entire length of full penetration welds shall be determined by visual and ultrasonic inspection.
- (5) All other penetration welds shall have 60 percent minimum penetration. Quality and acceptability of all welds other than full penetration welds shall be determined by visual inspection, supplemented by magnetic particle, ultrasonic, or dye penetrant inspection.
- (6) All weld back-up strips shall be welded continuous for the length of the welds. Care shall be exercised in the design of welded connections to avoid areas of high stress concentration that could be subject to fatigue or brittle fractures.
- (7) Field welding shall not be permitted except with owners, or owner's representative's approval, and the manufacturer's direction in repairing the pole.
- (8) All parts of the pole 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.
- (9) 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 compromise the steel.
- (10) Shearing and cutting shall be performed carefully and all portions of the work shall be finished neatly. Copes and re-entrant cuts shall be finished neatly.
- (11) All forming or bending during fabrication shall be done by methods that will prevent embrittlement or loss of strength in the material being worked.
- (12) Holes for connection bolts shall be 1/8 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. The details of all connections and splices shall be subject to the approval of the owner or the owner's representative.
- (13) Holes in steel plates which are punched must be smooth and cylindrical without excessive tear out or depressions. Any burrs that remain after punching shall be removed by grinding, reaming, etc.
- (14) Holes of any diameter may be drilled in plate of any thickness. Care shall be taken to maintain accuracy when drilling stacks of plates.
- (15) Holes may be made by use of a machine guided oxygen torch. Flame cut edges shall be reasonably smooth to minimize stress concentrations.
- (16) Field drilled holes must be approved by the owner. If the manufacturer is aware of the owner's intent to field drill holes, the manufacture must supply a galvanizing touch-up kit for galvanized poles or a silicon sealant for weathering steel poles.

## d. Tolerances

Manufacturing tolerances shall be limited to the following:

Pole Length	One piece: $\pm 2$ inches, or $\pm 1$ inch $\pm 1/8$ inch per 10 feet of length, whichever is greater (i.e. - 120-foot pole shall have a length of 120 feet $\pm 2\frac{1}{2}$ inches)	
	Assembled pole with flange connections: same as for one piece Assembled pole with slip joint connections: The accumulation of the slip joint tolerances not to exceed - 6-inch, +12 inch	
Pole Diameter	-0 inch, +1/4 inch	
Pole End Squareness	$\pm 1/2$ inch per foot of pole diameter	
Pole Sweep	1/8 inch per 10 feet of pole length	
Pole Twist	Limit twist to $1^\circ/10'$ of length, not to exceed $4^\circ$ /tube segment. Overall structure twist shall be limited to $10^\circ$ for embedded and $6^\circ$ for base plated structures. Connections for all appurtenances to the pole shall account for the pole twist and should align vertically.	
Slip Joint tolerances	Tolerances per manufacturer's recommendations and total pole length requirements above. See Paragraph 5.g.	
Pole Taper	See paragraph 5.a.(2)(c) .	
Location of Groups of Bolt Holes from Top of Pole	$\pm 1.0$ inches (tolerance to dimension A, Figure 2)	 <p>FIGURE 2</p>
Location of Centerline Between Groups of Bolt Holes	$\pm 1.0$ inch (tolerance to dimension B, Figure 2)	
Location of Holes Within a Group of Bolt Holes	$\pm 1/8$ inch (tolerance to dimension C, Figure 2)	
Bolt Hole Diameter	See Paragraph 5.c.(12) for hole diameters	
Bolt Hole Alignment	Not to vary from the longitudinal pole centerline of that group of holes by more than 1/16 inch	
Location of Identification Plate	$\pm 2.0$ inch	

e. Grounding

- (1) A grounding connection shall be welded to the pole shaft, 18 inches above the groundline or 6 inches above the ground collar. The grounding connection will be either the two-hole National Electrical Manufacturers Association (NEMA) pad, or a nut, or a threaded insert installed in the pole, or an approved alternative.
- (2) Grounding pad face shall not be painted or covered with other coatings. The grounding nut thread and grounding pad threads shall be protected from coatings.
- (3) Threaded inserts installed for grounding shall be made of Type 316 stainless steel and provided with standard ½ inch, 13 UNC threads (Unified Coarse threads). Threads shall be protected from unapproved coatings.

f. Climbing Devices

- (1) Design Loads:
  - (a) Step Bolts and removable steps: The step bolts, removable steps and attachment to the pole shall be designed to support a minimum of a 300-pound worker and equipment multiplied by a load factor as defined in paragraph 5.f.(2). The load shall be at the outer edge of the step or bolt.
  - (b) Removable Ladders: The ladder and each attachment to the pole shall be designed to support a minimum of a 300-pound worker and equipment multiplied by a load factor as defined in paragraph 5.f.(2). The load shall be at the outer edge of the step or bolt.
- (2) Load Factor: A load factor of 2.0 shall be applied to the design loads in 5.6.1. These loads shall be supported without permanent deformation.
- (3) Location: Climbing devices shall start 8 feet above groundline and extend to the pole top unless specified by the owner. The climbing device shall be spaced such that each step is 1 foot 6 inches apart and orientated to provide maximum ease of climbing. They shall be located to avoid interference with other attachments.
- (4) Finish: Step bolts, removable steps, and removable ladders shall be hot dipped galvanized. For weathering steel poles, step bolts may be weathering steel.

- (5) Intent of steps/ladder: This system is intended for climbing the pole and working on the structure. It is not intended to replace the worker's fall arrest system.

**g. Splices**

- (1) 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 joints shall be designed for a nominal lap that will develop the full required design strength of the pole at that point. The minimum lap shall meet the requirements of ASCE 48. All welds on both sections of the pole, in the area of the splice, shall be complete penetration welds for at least a length equal to the maximum lap dimension.
- (2) Manufacturer shall verify slip joint fit, through dimensional measurement or actual fit-up, before shipment. Joints should not interfere with threaded inserts, step nuts, ladder clips, or jacking nuts.
- (3) Sufficient jacking lugs and permanent orientation marks shall be provided at all slips joints to ensure proper alignment and complete overlap of the joint.
- (4) The axis of the pole shall not be distorted after the pole is mated. Shims shall not be allowed to straighten the pole unless approved by the owner. The owner reserves the right to reject a pole based on the improper mating of a pole splice.

**h. Appurtenances**

- (1) Appurtenance material shall be supplied by the owner. The owner shall provide the pole manufacturer connector and/or member locations, orientations, size, types, and strength capacities.
- (2) The steel pole manufacturer and the owner shall work together to assure design coordination and fit up of all appurtenance connections and members to poles. Also refer to paragraph 5.a.(8) of this specification.

**i. Finishes**

- (1) The following finishes are acceptable: Galvanizing, zinc primer combined with paint, weathering steel, and a below grade coating.
  - (a) Galvanizing – All poles 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. Poles made of ASTM A588 steel shall not be galvanized due to the high silicon content of the steel. One gallon of zinc enriched paint shall be provided with each five poles.

- (b) Zinc Primer and Painting - Poles which are to be painted shall be hermetically sealed to prevent corrosion of interior surfaces. After shot or sand blasting and cleaning in accordance with the surface preparations specification, SSPC/NACE SP-6/NACE 3, a zinc primer of 3 mils dry film thickness (DFT) and two coats of finish paint, each 3 mils DFT shall be applied to all exterior surfaces in accordance with the paint supplier's recommendations. One gallon each of primer and finish paint shall be supplied with each five poles. A guarantee against flaking or fading of the paint for a minimum of 5 years shall be provided.
  - (c) Weathering Steel - 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.
  - (d) Coatings for the Embedded Portion of the Pole A minimum 16 mil DFT of 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 2 inches below the top of the ground collar, or 16 inches above groundline. Other coatings shall be approved by the owner prior to their use. One-quart container of touch up shall be provided with each five poles.
- (2) Bolts and nuts with yield strengths under 100,000 psi shall be hot-dip galvanized per ASTM A153 and ASTM A143, or mechanically coated with zinc in accordance with ASTM B695, 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 B695, Class 50. Bolts and nuts made from weathering steel do not require a galvanizing coating.
  - (3) Compliance with coating thickness requirements shall be checked with a magnetic thickness gauge.

**j. Markings**

- (1) Each Pole shall be permanently marked on the pole shaft 60 inches above groundline and on the bottom side of the bearing plate with the following identifying information, unless specified otherwise by the owner:
  - Manufacturer's name
  - Month and year of manufacture
  - Length and class of pole
  - Ultimate moment capacity of the pole
  - Owner's name
  - Pole weight
- (2) The identification information listed above shall be permanently marked on the transverse side of the pole. The method of identification shall be approved by the owner. The lettering shall be at least 3/4 inch in height.
- (3) Information on the butt of the pole may be with permanent paint applied with a 1/2-inch-wide brush. Paint identification markings may not be used in any other location.
- (4) Each section of a spliced pole shall be marked such that the intended mate section can be easily identified. The markings shall be permanent and legible and contain at least the following information:
  - Pole Length and Class (each section and total pole); and
  - Structure number (if known).

**k. Inspection and Testing**

- (1) The owner and the owner's representative shall have free entry at all times during fabrication, to all parts of the manufacturer's plant to inspect any part of the production of the poles covered by this specification.
- (2) Steel members that are bent or warped or otherwise improperly fabricated shall be properly repaired or replaced at the sole discretion of the owner.
- (3) 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 bid price.
- (4) The manufacturer shall make tests in accordance with ASTM A370 and A673 to verify that the material used in the structures meets the impact properties.

- (5) 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 pole.
- (6) All plates over 1-1/2 inches thick shall be ultrasonically tested to assure against defects that could lead to lamellar tearing.
- (7) Qualification of welders or welding operators will be verified as to conformance with the provisions of AWS D1.1.
- (8) The manufacturer shall make certified welding reports for each pole. The reports covering welding shall include all welds of a pole. 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 pole, the date, and the name and signature of the inspector.

I. Full Scale Structure Testing

- (1) The poles that are to have full-scale load tests performed on them are listed in Attachment B. Cost for such test shall be the responsibility of the owner, shall be separated from the manufacturer's bid, and shall be negotiated in advance of any test preparation.
- (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 the owner's representative.
- (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.
- (4) Material procurement for test poles shall be identical to material procurement procedures for regular production run poles.
- (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.
- (6) The owner or the owner's representative reserves the right to be present during testing and shall be notified 2 weeks prior to the start of pole test.

**6. SHIPPING AND DELIVERY**

a. Shipping

- (1) Each shipment shall be accompanied by a bill of materials, identifiable by pole type and number. Bolts and miscellaneous hardware will be identified by the list for match up with the respective pole shaft. All parts that are required for any one pole shall be in one shipment, if possible.
- (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.
- (3) Salt-treated wood blocking and urethane foams shall not be used when shipping or storing weathering steel poles.
- (4) Transportation and site handling shall be performed with acceptable equipment and methods by qualified personnel. The manufacturer shall exercise precaution to protect poles against damage in transit.
- (5) Handling instructions shall be included with the pole shipment (if special handling is required).

b. Delivery

- (1) The owner may take delivery at a designated location with the delivering carrier's equipment. The manufacturer shall coordinate with the owner to ensure smooth and efficient delivery of poles.
- (2) The owner will provide all labor, equipment, and materials for the unloading of poles at the project site. A pole is considered delivered when the pole is lifted from the trailer or semitrailer of the delivery carrier.

**7. DRAWINGS AND INFORMATION TO BE SUPPLIED BY THE MANUFACTURER**

a. Information to be supplied with the proposal (See Attachment C)

- (1) Pole diameter at the top, groundline, and bottom.
- (2) The pole taper of each pole in inches/foot.
- (3) The calculated weight of each class and length of pole.
- (4) General information about each pole length and class including tip load, location of point of fixity, type of steel used for the pole (ASTM number

- and yield), cross sectional shape, and connection details of multiple piece poles (slip joints/flange joints/welded to be one piece).
- (5) Calculated groundline and point-of-fixity reactions due to the tip loadings (including shear, moment, and axial reactions) in order to demonstrate conformance with the requirements of 5.1.1 and 5.1.2.
  - (6) Description of pole shaft cross section including thickness of the plate at the bottom, groundline, and at the top.
  - (7) For each standard class pole, provide pole top deflection using the specified tip loading in order to demonstrate conformance with the requirements of and 5.1.3.
  - (8) The cost of each pole by size and length. Also, the total order cost for each class and length of pole.
- b. Documentation to be supplied for the Owner's Approval Prior to Fabrication (as requested by the owner): Documentation includes final design calculations for the pole shaft at 5-foot intervals and will be based upon the pole loading shown in Table 1.

The following information shall be supplied:

- Total shear forces
  - Moment
  - Design Stress, Allowable stress, and Stress ratio
  - Section moduli
  - Cross-sectional area
  - Deflection at the pole top due to tip load
  - Detail drawings for each structure type giving weights of structure
  - Bill of materials list (if any)
  - Assembly instructions and erection drawings  
(Slip joint lengths and allowable tolerances)
  - Special handling instructions (if required)
- c. Test Reports (as requested).
- Certified mill test reports for all structural material.
  - Certified welding reports for each pole.
  - Impact property test reports showing that the material used in the poles meets the impact properties.
  - Test reports on coating thickness.
  - Report of pole testing, when required, including photographs, and diagrams.

**8. APPROVALS, ACCEPTANCE AND OWNERSHIP**

- a. Final designs must be approved by the owner or owner's representative before material ordering and fabrication. Material ordering and fabrication prior to approval will be at supplier's risk. It is understood that award of this contract does not constitute acceptance of design calculations submitted with the bid, if corrections are required in the final structure designs due to manufacturer's errors, omissions, or misinterpretations of the specifications, the quoted price shall not change. Approval of the drawings and calculations by the owner or the owner's Representative does not relieve the supplier of responsibility for the adequacy of the design, correctness of dimensions, details on the drawings, and the proper fit of parts.
- b. After delivery, the poles will be inspected and shall be free of dirt, oil blisters, flux, black spots, dross, teardrop edges, flaking paint or zinc; and in general, shall be smooth, attractive, and unscarred. Poles not meeting this requirement shall be repaired or replaced by the manufacturer at no additional cost to the owner. Final decision to repair rather than replace a pole shall be at the owner's sole discretion.
- c. 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.

**9. LIST OF ATTACHMENTS TO THIS SPECIFICATION:**

Attachment A, and B to be completed by the engineer. Attachment C to be completed by the manufacturer.

- ~~Attachment A, Structure Dimensions and Pole Framing Drawings~~ See Structure Drawings
- Attachment B, Application Requirements
- ~~Attachment C, Bid Summary~~  
See Itemized Proposal & Pole Data Summary Tables

**Attachment A**  
**Structure Dimensions and Pole Framing Drawings**  
(To be Completed by the Engineer)

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**Attachment B. Application Requirements**  
(To be Completed by the Engineer)

1. Type of finish of the pole (indicate by checking one)  
Weathering   
Galvanized   
Zinc primer and paint \_\_\_\_\_
2. Special Charpy requirements N/A
3. Surface protection desired for embedded portion of the pole (indicate by checking one or both)  
Polyurethane Coating   
Anodes \_\_\_\_\_
4. Climbing device type (indicate by checking one)  
Step Bolts   
Ladder \_\_\_\_\_  
Removable Steps \_\_\_\_\_
5. Location of climbing device See General Specifications & Structure Drawings
6. Length of ground collar 36" Min.
7. Grounding plate or nut NEMA 2 Hole Pad
8. Delivery schedule TBD. Quote out Estimated Lead Times
9. Free on board destination Yes
10. Pole test (if required) N/A
11. Additional Requirements (below) See Structure Drawings for further Details

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**Attachment C. Standard Class Steel Pole Bid Summary**

Standard Class Steel Pole Bid Summary (Information to be supplied with the bid)					
<b>DESIGN INFORMATION</b>					
Pole framing drawing					
Pole Class					
Pole Length					
<b>POLE DESCRIPTION</b>					
Top Diameter					
Groundline Diameter					
Bottom Diameter					
Taper (in/ft)					
<b>GENERAL</b>					
Pole Wt/ each					
Tip Load					
Point of Fixity Loc					
Steel (ASTM/yield )					
Cross section shape					
Splice joint type					
<b>CALCULATIONS AT THE GROUNDLINE</b>					
Moment					
Shear					
Axial					
Cross Sectional Area					
<b>CALCULATIONS AT THE POINT OF FIXITY</b>					
Moment					
Shear					
Axial					
Cross Sectional Area					
<b>WALL THICKNESS</b>					
Top					
Groundline					
Bottom					
<b>DEFLECTION (Top)</b>					
<b>COST SUMMARY</b>					
COST/POLE					
NUMBER OF POLES					
TOTAL COSTS					
<b>COMMENTS:</b>			<b>TRANSMISSION LINE POLES</b>		
			ATTACHMENT C		
			BID SUMMARY - DESIGN INFORMATION, WEIGHTS, AND PRICE INFORMATION		
			(INFORMATION TO BE SUPPLIED WITH THE PROPOSAL)		

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## APPENDIX A COMMENTARY

### 1. General

The necessity of a clear bid specification for the purchase of standard class steel poles is very important to the bid evaluation process and the acquisition of structurally adequate poles. The specification should contain sufficient requirements and information so that all bids can be evaluated equally and so that the manufacturer clearly understands what is expected of the manufacturer.

#### **Scope**

While use of this standard class steel pole specification is not prohibited to poles which are guyed, which are subjected to unbalanced lateral loads or which have deflection or other special limitations, the owner must be prudent when using this specification in these types of applications.

It is recognized that, with the proper understanding and usage of some computerized structural analysis and transmission line design programs, it is possible to select a standard class steel pole which might otherwise be beyond the scope of this specification. The owner must be sure that combined bending and buckling analysis is performed, and that deflections are properly modeled.

The owner should recognize when the design of a steel pole may be more prudently accomplished using the "Guide Specification for Steel Single Pole and H-Frame Structures," RUS Bulletin 1724E-204, which requires the actual loading conditions to be specified. In using RUS Bulletin 1724E-204, the manufacturer assumes full responsibility in designing and manufacturing a structurally adequate pole.

#### **Standard Class Pole**

In some cases, utilities prefer to specify certain steel poles to be designed according to standardized loading criteria, much like the standard classifications for wood poles.

In utilizing standard class steel poles, a complete structural analysis is still required for all structures. All appropriate loading criteria are considered in the analysis. Once the required steel pole strength is determined, a standard class steel pole that meets the actual loading conditions can be selected. A complete design example is shown in Appendix C.

Without considering all the potential reasons for specifying standard class poles, this specification is developed in order to establish a standard classification system and to assist the owner in procuring a standard class steel pole which is properly designed for the intended loading criteria.

This guide specification attempts to eliminate ambiguity in specifying and purchasing standard class steel poles. Since it has become a widespread practice in the industry to design and manufacture poles which are based on the wood pole classification system of the American National Standards Institute (ANSI 05.1), the steel pole classifications developed in this specification generally follow the wood pole classification system. However, to avoid confusion with the wood pole classifications, the steel pole classifications have a unique naming system.

### **Wood Pole Equivalency**

In some cases, the owner may design a transmission line based on wood pole classifications as described in ANSI 05.1 and then wish to order steel poles which meet the wood pole equivalent loadings. Because of the differences in strength factors applied to wood poles in comparison to steel poles, the owner must be sure that the strength factors are properly accounted for in the design of the steel poles.

“Wood pole equivalent” is a term that may be defined in a number of ways. For purposes of this commentary, the term “wood pole equivalent” is defined as a standard class steel pole which is equated by required factored loading to an ANSI 05.1 standard class wood pole. The equation is made by a ratio of the strength factors applicable for each pole type and loading criteria.

The design and purchase of steel poles as an equivalent to wood poles can be vague even with clear instructions. As such, the owner should be sure that the equivalency is properly determined. Once the equivalency is determined, the owner should specify the standard class steel pole based on the classifications detailed in paragraph 5.a.(2). In doing this, the manufacturer will not be involved in the equivalency process and the ambiguity should be eliminated.

The wood pole equivalency is based on the required ultimate moment capacity of the pole at the groundline based on embedment depths shown in ANSI 05.1. In obtaining a suitable equivalency, the owner must consider factors other than the equivalent groundline moment. For example, the differences in material and section properties of the wood pole versus the steel pole will result in differences in buckling analysis, pole deflections, secondary moments, applied wind forces, etc.

It is impossible to completely equate the steel pole and wood pole at all points along the pole. The owner must be certain that the steel pole selected by equivalency methods will have strength sufficient for the actual application.

### **Equivalency Factor (Eq.F)**

The equivalency factor (Eq.F) is defined as the ratio of the wood pole strength factor to the steel pole strength factor for a given loading condition.

For example, for NESC Grade B district loading, the wood pole strength factor is 0.65 and the steel pole strength factor is 1.00. Thus, the equivalency factor will be  $0.65/1.00 = 0.650$ .

The equivalency factor is a useful concept to understand as the owner requires a wood pole equivalent under various loading conditions and strength factors. Several examples of equivalencies are listed in the following sections.

### **Wood Pole Equivalency – 0.65 TO 1.00 Ratio (0.65 Eq.F)**

For the NESC Grade B district loadings, the NESC allows for a strength factor of 1.00 to be applied to a load on a steel pole while it requires a strength factor of 0.65 to be applied to a load on a wood pole. As such, the ultimate strength requirement for the steel pole will be less than the ultimate strength of the wood pole for the district loading conditions.

For example, the owner designs a transmission line for wood poles based on NESC district wind loading conditions. The owner wishes to purchase a steel pole that is equivalent to a Class 1 wood pole. Based on ANSI 05.1, the Class 1 wood pole groundline strength is derived by applying a horizontal factored load of 4,500 pounds at 2 feet from the pole top based on a simple cantilever. Since the owner had classed the wood pole based on an NESC strength factor of 0.65, the owner wishes to select a steel pole meeting the same NESC district wind loading conditions. To do this, the owner will multiply the required tip loading of 4,500 pounds by  $0.65/1.00$ , which equals 2,925 pounds. The  $0.65/1.00$  ratio (or 0.65 Eq.F) adjusts for the difference between wood and steel strength factors. The owner will then select a standard class steel pole which has an ultimate moment capacity based on the horizontal tip loading of at least 2,925 pounds. From paragraph 5.a.(2), the owner selects a class S-02.9 pole, which has a tip loading of 2,925 pounds.

Based on the method shown in this example, Table A-1 of this Appendix at the end of this section is a tabulation of wood pole equivalencies based on the NESC Grade B district loading.

### **Wood Pole Equivalency - 0.75 to 1.00 Ratio (0.75 Eq.F)**

For the NESC Grade B extreme wind loadings, this specification requires a strength factor of 1.00 to be applied to an extreme wind load on a steel pole while the NESC requires a strength factor of 0.75 to be applied to an extreme wind load on a wood pole. As such, the ultimate strength requirement for the steel pole will be less than the ultimate strength of the wood pole for the NESC extreme wind loading conditions.

For example, the owner designs a transmission line for wood poles based on NESC extreme wind loading conditions. The owner wishes to purchase a steel pole that is equivalent to a Class 1 wood pole. Based on ANSI 05.1, the Class 1 wood pole groundline strength is derived by applying a horizontal factored load of 4,500 pounds at 2 feet from the pole top based on a simple cantilever. Since the owner had classed the wood pole based on an NESC extreme wind strength factor of 0.75, the owner wishes to select a steel pole meeting the same extreme wind loading conditions. To do this, the owner will multiply the required tip loading of 4,500 pounds by 0.75/1.00, which equals 3,375 pounds. The 0.75/1.00 ratio (or 0.75 Eq.F) adjusts for the difference between wood and steel extreme wind strength factors. The owner will then select a standard class steel pole which has an ultimate moment capacity based on the horizontal tip loading of at least 3,375 pounds. From paragraph 5.1.2, the owner selects a class S-03.5 pole, which has a tip loading of 3,510 pounds.

Based on the method shown in this example, Table A-2 at the end of this section is a tabulation of wood pole equivalencies based on the NESC Grade B extreme wind loading.

#### **Wood Pole Equivalency – 1 to 1 Ratio (1.0 Eq.F)**

The owner may wish to order a steel pole that has the same ultimate strength as a specified wood pole class. One common application of this is when the owner designs a transmission line using wood pole properties but utilizing steel pole strength factors. In this case, the owner has accounted for the difference in wood versus steel strength factors during the design of the project.

For example, the owner designs a transmission line for wood poles based on NESC district wind loading conditions. However, for steel poles, the owner uses the NESC district strength factor of 1.00 (applicable to steel poles) in the calculations. The owner selects a wood pole Class 1 at a specific location. Thus, the owner wishes to purchase a steel pole which is equivalent in ultimate strength to a Class 1 wood pole. Based on ANSI 05.1, the Class 1 wood pole groundline strength is derived by applying a horizontal factored load of 4,500 pounds at 2 feet from the pole top based on a simple cantilever. Therefore, the owner will require a steel pole with an ultimate moment capacity based on the same 4,500-pound tip loading. From paragraph 5.a.(2), the owner selects a Class S-04.9 steel pole, which has a tip loading of 4,875 pounds.

Based on the method shown in this example, Table A-3 is a tabulation of wood pole equivalencies based on the ultimate-to-ultimate strength comparison, or 1.0 equivalency factor.

#### **Other Wood Pole Equivalencies**

Using the wood pole equivalency methods described, the owner can develop equivalency tables for other ratios of wood versus steel strength factors.

**TABLE A-1 - WOOD POLE EQUIVALENCY  
 BASED ON 0.65 to 1.00 RATIO**  
 (0.65 Equivalency Factor)  
 (NESC Grade B District Loading)  
 (Equivalencies based on approximate groundline strength)

Design Wood Pole Class 0.65 Strength Factor		Select Steel Pole Class 1.00 Strength Factor
H6		S-07.4
H5		S-06.5
H4		S-05.7
H3		S-04.9
H2		S-04.2
H1		S-03.5
1		S-02.9
2		S-02.4
3		S-02.0

**TABLE A-2 - WOOD POLE EQUIVALENCY  
 BASED ON 0.75 to 1.00 RATIO**  
 (0.75 Equivalency Factor)  
 (NESC Grade B Extreme Loading)  
 (Equivalencies based on approximate groundline strength)

Design Wood Pole Class 0.75 Strength Factor		Select Steel Pole Class 1.00 Strength Factor
H6		S-09.0
H5		S-08.0
H4		S-06.5
H3		S-05.7
H2		S-04.9
H1		S-04.2
1		S-03.5
2		S-02.9
3		S-02.4

**TABLE A-3 - WOOD POLE EQUIVALENCY**  
**BASED on 1:1 RATIO**  
 (1.0 Equivalency Factor)  
 (Ultimate-to-Ultimate Comparison)  
*(Equivalencies based on approximate groundline strength)*

Design Wood Pole Class		Select Steel Pole Class
H6		S-12.0
H5		S-10.0
H4		S-09.0
H3		S-08.0
H2		S-06.5
H1		S-05.7
1		S-04.9
2		S-04.2
3		S-03.5

**2. Design - Section 5**

**Loads - Paragraph 5.a**

The primary loads for steel poles are weather loads. Weather, construction and maintenance loads need to be determined by the owner in order to select the proper standard class pole.

Load factors for NESC light, medium, and heavy loading districts should be at least equal to those given in the applicable edition of NESC for Grade B construction. The load factor for extreme ice and extreme wind is recommended to be at least 1.1.

In addition to using the NESC district loading requirements, the ASCE publication No. 74, "Guidelines for Transmission Line Structure Loading," can be used to provide owners with procedures for the selection of design loads and load factors related to climate, accidents, construction and maintenance.

Once the design loadings have been determined, a design of the structure should be performed by the owner's engineer or structural designer. It is recommended that a nonlinear structural analysis computer program be utilized in order to consider the loadings, secondary moments (p-delta effect), and effects of foundation rotations and deflections. As a minimum, an approximate method for determining the ultimate moment

capacity should be utilized, such as the methods given in the "Design Manual for High Voltage Transmission Lines," RUS Bulletin 1724E-200.

Once the structural analysis has been completed, the owner's engineer or structural designer may select a standard class steel pole which has the ultimate moment capacity greater than the design loading requirements. Consideration should be given for strength requirements at all points along the pole, not just at the groundline.

### **P-Delta Moment**

Prior to selecting a standard class steel pole, the owner should determine the effect of the secondary moments due to the vertical loadings, including the effect of the pole weight, during the transmission line design process.

Whenever there is a transverse or longitudinal load, the pole will deflect in the direction of the load. As a result, the vertical load is no longer in its original position. The vertical load moves over as the pole deflects, causing additional moments in the pole. Also, the pole weight can place secondary moment loads in the pole. The additional stress caused by this secondary moment is dependent on the magnitude of the vertical load and deflected shape of the pole. Many pole designs, particularly tall poles, have to be calculated for the position of equilibrium of forces in the fully displaced position. The solution typically takes many iterations. A full nonlinear analysis will consider the change in orientation of the loads relative to the displaced positions of the structural members.

As a minimum, an approximate method for determining the effect of the secondary moments should be utilized, such as the method given in the RUS Bulletin 1724E-200.

### **Foundation Rotation and Deflection**

Although significant foundation rotation and deflection criteria are considered to be beyond the scope of this standard class steel pole specification, some allowances can be made for these effects. They should be considered during the owner's analysis of the actual loading conditions to apply to the steel pole. Typically, this type of analysis is accomplished by nonlinear structural analysis techniques.

Once the structural analysis has been completed (including foundation rotations and deflections, p-delta effect, etc.), the owner may select a standard class steel pole that has the ultimate moment capacity greater than the design loading requirements.

### **Longitudinal Loads**

It is recommended that RUS Bulletin 1724E-204 be utilized whenever the longitudinal loads may result in a significant unbalanced lateral loading condition.

Because steel poles are flexible structures, there may be a reduction in induced moments in a pole under some types of longitudinal loads due to the restraining effect of the overhead ground wires. Traditionally, static longitudinal loads are specified due to the complexity of calculating the influence of structure flexibility.

### **Guyed Poles and Guy Wires**

It is generally beyond the scope of this standard class steel pole specification to consider guyed poles and guy wires in the design of the structure. It is recommended that RUS Bulletin 1724E-204 be utilized instead.

It is generally agreed that a steel pole has less buckling strength than an equivalently classed wood pole. Wood poles are solid wood and the material in the heart of the pole can resist buckling. Standard class steel poles however, are thin walled, hollow structures with limited buckling strength. The forces resulting from the attachment of the guy wires to the standard class steel pole needs to be carefully analyzed by a structural engineer. The steel pole and guy wire(s) must be designed as a system.

Any time a steel pole structure is guyed, the guy type, size, modulus of elasticity and guy slope or angle has to be determined by the owner and properly modeled in the analysis of the steel structure. The load in the guy wire should be limited to 65 percent of its ASTM rated breaking strength under actual factored loading conditions, as is required by RUS Bulletin 1724E-204. The steel pole and guy wire(s) must be designed as a system. The guy modulus of elasticity can increase from a minimum value at the time of manufacture, to a maximum value that results from periodic stretching and relaxing during the load cycles. Ranges from 19,000 ksi to 28,000 ksi have been stated. The ASCE steel pole specification (ASCE 48) has suggested the engineer use a guy wire modulus of elasticity of 23,000 ksi whenever it is not specified.

The owner should use caution in using this equivalency method of sizing standard class steel poles and its usage should be prudently influenced by the owner's experience in similar applications where actual design loadings were utilized under similar guying conditions. However, a typical situation where the owner may wish to use this specification for guyed poles is when the owner uses a transmission line design computer program, or other structural analysis program, in which minimum strength values are input for each pole type and the program is capable of combined bending and buckling analysis of guyed steel poles.

### **Point of Fixity - Paragraph 5.a.(1)**

Point of fixity for this specification is defined as the location on the pole where maximum moment occurs. Maximum moment is calculated by the pole designer using the loadings provided by the owner and multiplying those loadings by the appropriate moment arms. The existing soil and backfill has to be able to support the pole with these bending moments applied. The location of this point of fixity could be at or below the groundline.

The exact location is theoretical and depends on the soil condition and backfill used to support the pole.

For the standard class pole, the point of fixity should remain at the same location on the pole, regardless of the embedment depth the owner may specify for a given application. Otherwise, the required pole strength could vary as the location of the point of fixity varies. Within the scope of this standard class pole specification, the point of fixity is arbitrarily considered to be located at a distance from the pole butt that is equal to 7 percent of the pole length. This value seems to work quite well over a range of pole lengths and is approximately the same value as a point of fixity located at 1/3 of the distance below the groundline based on an embedment depth of 10 percent of the pole length + 2 feet.

#### **Pole Top Strength (Paragraph 5.a.(2)(a))**

This specification sets minimum ultimate moment capacity requirements near the pole top for each standard pole classification. The similar ANSI 05.1 requirement is generally overlooked, misunderstood or not considered by manufacturers and others who seek to standardize pole sizes based on the wood pole classifications.

Upon a careful study of the ANSI 05.1 wood pole specification, one should understand that the horizontal loading applied at 2 feet from the pole top is for the purpose of determining a required groundline ultimate moment capacity for any length pole of the given class. However, the minimum required wood pole top size is specified apart from the horizontal loading requirement

For example, according to ANSI 05.1, a Class 1 wood pole must have a circumference of 27 inches at the top. When applied to the Douglas Fir or Southern Yellow Pine poles with a fiber stress of 8,000 psi, the resulting top strength is calculated as 41.5 ft-kips for the Class 1 wood pole.

Because the conductors and shield wire supports are typically located on crossarms away from the pole axis, significant moments can be generated in the pole near the top. The moments are greatly increased whenever a braced pole top assembly is utilized. These moments are not accounted for by applying the horizontal factored loading alone. Therefore, in the design of transmission poles, it is critical that a minimum ultimate moment capacity be specified near the pole top. In the absence of a minimum top strength requirement, a steel pole top strength can theoretically be negligible.

The minimum pole top strength required by this specification should be suitable for most transmission line applications. However, the owner must be sure that the top strength is properly evaluated, especially when working with wood pole equivalencies and braced structures.

**Tip Loading** (Paragraph 5.a.(2)(b))

The tip loading is used to develop a required ultimate moment capacity diagram at any point along the pole from 2 feet below the pole top down to the point-of-fixity. This ultimate moment capacity is determined by multiplying the tip load by the moment arm based on a simple cantilever. As a result, the required factored moment diagram is linear in shape. This same method may be utilized in structural analysis and automated transmission line design computer programs to develop an array of factored moment requirements for standard steel pole sizes.

**Pole Deflection** - Paragraph 5.a.(3)

Although significant horizontal pole deflection limitations are considered to be beyond the scope of this standard class steel pole specification, some allowances can be made for these effects. They should be considered during the analysis of the actual loading conditions applied to the steel pole. Typically, this type of analysis should be accomplished by nonlinear structural analysis techniques. Since the electrical clearances must be assured in the operation of transmission lines, deflections must remain within an acceptable range.

This specification limits the allowable pole deflection to 15 percent of the pole height above the point of fixity when the tip load specified in paragraph 5.a.(2) is applied under a horizontal testing procedure.

The owner should recognize that the actual pole deflection for the application will be less than the specified deflection limit of 15 percent of the pole height. With the standard class pole, all of the loading is applied near the pole top. In a typical transmission line application, the actual horizontal loading will be some distance from the pole top. As such, the actual deflection at the conductor under short term factored loading conditions can be expected to be less than 10 percent of the height above ground.

The NESC requires that electrical clearances be maintained under a wind loading of 6 psf. It is expected that the deflection of a standard class pole under this 6 psf loading condition will be less than 3 percent of the height above ground.

For situations where the owner wishes to know the deflection for a standard class pole, the owner should use a suitable structural analysis computer program in which the actual design loading conditions and steel pole properties are input into the program, or the owner should ask the pole manufacturer to provide the analysis.

If the owner has special deflection limitations, it is recommended that RUS Bulletin 1724E-204 be utilized instead of this specification. In doing so, there will be little doubt as to what the actual pole deflections will be under all loading conditions.

**Minimum Plate Thickness - Paragraph 5.a.(7)**

The intent of this guide is not to limit new technology. Use of plate thickness less than 3/16 inch may be possible. However, consensus from the committee members and based on current designs by the manufacturers, transmission size poles will normally require at least a plate thickness of 3/16 inch. If mild corrosion occurs, the percentage of reduced strength will be less the greater the wall thickness of the steel plate. Having the minimum plate thickness of 3/16 inch will also improve strength for mounting of davit arms and guy attachments. If an owner does decide to purchase poles with a wall thickness less than 3/16-inch, extra care should be taken in the field to avoid damage to the pole during storage, handling, and installation. Small nicks in the galvanizing or other protective coating could exaggerate future problems. Also, minor misalignments or poor fit of hardware during construction could cause a major problem. Ground collars on thin wall poles should be considered a necessity. Other sections of this commentary explain why poles purchased with this guide should not be used in guying situations, unless an engineer experienced with guyed steel structures oversees the design. This is especially true for poles of wall thickness less than 3/16 inch.

**Ground Collars - Paragraphs 5.a.(12) and 5.a.(13)**

Attachment B of the specification is set up to allow the owner to alter the requirement for a ground collar by putting "not required" on line 6. Ground collars are recommended for direct embedded weathering steel poles, but they are sometimes optional with galvanized steel poles. If ground collars are used, a length of 4 feet or greater is recommended.

The intent of ground collars on standard class steel poles is similar to the preservative of wood poles. The preservative protects the wood against rot and fungus attack. Similarly, the ground collar protects the steel pole from corrosion and mechanical damage.

The ground collar does not prevent nicks. The ground collar does provide nonstructural steel that can be sacrificed to corrosion. Corrosion can be due to many outside causes over which the owner has no control. A short list of potential causes includes road salt, fertilizer, poor/corrosive soil, and galvanic corrosion from pipeline crossings or underground electric lines. The ground collar also protects the pole from mechanical damage that may occur during construction or later by right-of-way crew or by property owners.

Whereas some utilities feel that galvanized poles with polyurethane coating do not need additional corrosion and mechanical protection, they do feel that weathering steel poles need additional protection to the patina and polyurethane coating. Some manufacturers claim that poles that are galvanized and the embedded portion coated with polyurethane coating (paragraph 5.i.(1)), do not require a ground collar. If nicks do occur to a galvanized pole, the galvanizing will act like a sacrificial anode and protect the nicked steel.

ASCE 48 states that bare weathering steel should not be used below grade due to the potential problems from corrosion. Some utilities add a round collar to all weathering steel poles. Still other utilities in dry climates with non-corrosive soils may not use ground collars. However, since the polyurethane coating can be nicked during construction, it is recommended that round collars be used on all weathering steel poles.

#### **Charpy Requirements - Paragraph 5.b.(3)**

Charpy test is a notch-bar impact test used to compare notch sensitivities of materials. The impact values cannot be converted into energy figures for use directly in engineering design. The impact value from the notch-bar impact test is used only as a comparison test. For example, if a type of steel has been found to have good notch toughness in service and its impact value is known, it is assumed that other types of steel having the same impact value will also have the same notch toughness. The ASCE design standard for steel poles has established impact values for the Charpy notch-bar impact test. These values are a function of yield stress, plate or bar thickness, and temperature.

Notch-bar impact tests are used to help determine if a normally ductile material might behave in a brittle manner. Three main factors that influence if a material will behave in a brittle or ductile manner are triaxiality, strain rate, and temperature. Ductile materials tend to become more brittle as triaxiality increases, strain rate increases, or temperature decreases. Since brittle materials require far less energy for fracture than ductile materials of the same strength, one can realize the importance of the Charpy test for steel poles used on transmission lines.

The tendency is to reduce temperature requirements of the Charpy test for structures to be in service in warm climates such as Louisiana or Florida. This is not recommended. However, for locations in which temperatures may be extremely low, lower temperature values may need to be specified.

The ASCE design standard specification contains Charpy requirements for structural plate, anchor bolts, and weld materials. The material used for making welds is required to meet the impact requirements for the lowest toughness requirements of the plates being joined.

#### **Field Drilled Holes - Paragraph 5.c.(16)**

Drilling holes in a pole during construction allows the maximum flexibility in the use of poles in unexpected situations. However, the cutting of the pole does affect the corrosion protection of the pole. For **galvanized poles and painted galvanized poles**, a drilled hole exposes bare steel to the weather. These holes need to be painted with a zinc rich touch up paint similar to described in paragraph 5.i.(1)(a). For poles made from **weathering steel** the hole can allow rain or ground water into the pole depending on the hole location. Weathering steel poles protect themselves from corrosion by constantly cycling from wet to dry. This cycling creates a water tight oxide layer. Inside the pole or under water the cycling cannot happen. Therefore, there is no corrosion

protection inside the pole. When water enters the pole through the field drilled holes corrosion starts. When field drilled holes are anticipated, the inside of weathering steel pole should be coated similar to the coating described in paragraph 5.i.(1)(d). If coating the inside is not practical then a thick coating of a silicon sealant shall be applied to the bolt and hole. **Field drilling of painted poles should be avoided** if possible. Drilling holes in painted poles destroys the water tightness and allows corrosion to start on the unprotected carbon steel. If holes cannot be avoided then a thick coating of a silicon sealant shall be applied to the bolt and hole.

#### **Field Drilled Holes** (wrong location/drilled in error)

Occasionally a field-drilled hole will end up in the wrong location. A rule of thumb from The American Welding Society (AWS) says a defect or hole location is critical if another hole is spaced within 2.5 times the diameter of the hole in question. (i.e. two 1 inch holes should not be closer than 2 ½ inch edge to edge). A structural analysis of the actual conditions will possibly give a different answer. If the location is critical then a field weld repair is needed by a certified welder.

If the location is not critical then it can be filled with an automotive type freeze plug and painted with touch up paint. The hole should be plugged to keep birds and insects out of the pole and to slow or prevent corrosion to the inside of the pole. The above rule of thumb does not apply to holes that are drilled at the correct elevation but on the wrong face. These poles need to be reviewed by the manufacturer and repaired by a certified welder or these poles need to be replaced.

#### **Pole Materials** (Galvanized Steel vs. Weathering Steel)

Structural grade steel is a great product for many reasons. However it has one definite problem. Mother Nature wants to return it to its natural state of iron ore. Industry has used many ways to slow the corrosion process. In 1836 a chemist patented a means for coating iron with zinc. That process of hot dip galvanizing remains substantially unchanged today. In the 1900's another method was found. By having a relatively high copper content in the raw steel a dense patina oxide coating would form on the steel and act as a tight adhered barrier preventing future atmospheric corrosion. This steel was largely forgotten until the 1960's when US Steel started marketing their version of this steel as "COR-TEN". Today it is commonly called weathering steel.

The formation of dense patina oxide on weathering steel requires a cycling from wet to dry environment - optimally 50 percent wet and 50 percent dry. Departure from the 50/50 ratio will slow the oxide formation. Unfortunately, this limitation was not well understood in the 1960's and weathering steel was used in locations where water and dirt were trapped. The result was the oxide did not form and the corrosion continued as if the steel was normal bare steel. In some cases such as highway bridges and lattice towers the corrosion caused a problem that was given the name "pack-out". In this case the corrosion takes place between two pieces of steel that are bolted together in such a configuration that water is trapped and held. The corrosion products swell.

Ultimately the forces from the swelling can exceed the strength of the bolts. This can cause structural failure. As a result of this problem weathering steel developed a bad reputation. However, with prudent attention to details, weathering steel is being used by many utilities today.

Both galvanized steel and weathering steel have their advantages. Which is better is a question that has not been answered. Weathering steel normally has a cost advantage and can be factory welded to make a one-piece pole of any length. The one-piece length of galvanized poles is limited to the length of the galvanizing tank. Weathering steel becomes a dark brown wood color. A galvanized pole starts out shiny and ends up a dull gray. Some people say that weathering steel should not be used in areas of heavy road salt or in heavily fertilized farm fields. The weathering steel manufacturers found a number of poles in undesirable conditions, tested them and found that the oxide had formed and that corrosion was not a problem. This guide makes no judgment as to which material is better or gives any guidance in the use of one versus the other. If correctly used both will perform very well. If not used as intended, neither will perform as desired. It is recommended that the owner contact the pole supplier to select the best material for the pole's intended application.

### **Painted Poles**

Painted bare steel poles are not recommended. These poles have more construction and maintenance expenses than poles with paint over zinc primer or paint over hot dip galvanizing. The inside surface of bare steel poles is not protected and the poles can corrode from the inside out. Also the outside paint is easily chipped leaving bare steel which may quickly corrode.

### **Weathering Steel Poles - Paragraphs 5.i.(1)(c) and 5.i.(1)(d)**

There are environments where weathering steel is not recommended in a bare, uncoated condition because the protective, tight oxide will not form properly. These environments include: (1) atmospheres containing concentrated corrosive industrial fumes, (2) marine locations subject to salt-water spray or salt-laden fogs, or (3) applications where the steel may be continuously submerged in water (salt or fresh) or buried (bare) in soil. Use of weathering steel poles near roads that are salted during the winter should be avoided.

In general, weathering steel is intended for and is most often used in a bare, uncoated condition. However, those surfaces that will not be exposed to the weather or subjected to a wet-dry cycle should be protected from corrosion. Flat, horizontal surfaces are particularly vulnerable. Also, in areas where ground cover will grow to a height where it will contact the pole and rub the protective weathering steel coat off or in areas where the vegetation will keep the pole moist, the steel surface should be protected from corrosion by application of a coating. For direct embedded steel poles, the polyurethane coating may have to be extended above the top of the ground sleeve to protect the weathering steel pole from moisture entrapped by vegetation or rubbing by groundcover.

**Direct Embedded Poles - Coating General - Paragraph 5.i.(1)(d)**

When poles are direct embedded, this specification requires a polyurethane coating to be applied to the exterior surface of the embedded portion of the pole. The top edge of the coating is not a smooth transition. Water and dirt can get trapped in this area. Therefore, we suggest that the transition be located about 2 inches below the top of the ground collar where there is extra metal. Some poles get set in areas of high vegetation. These poles may require the coating to extend higher on the pole. A full discussion of this is given below.

**Bearing Plate, Coatings, Construction in Wet Areas - Paragraph 5.i.(1)(d)**

There are many problems associated with setting poles in wet areas and or bad soils. Two of these problems are floating poles and bog or swamp shoes. The floating poles can be due to the fact that some poles are designed without drain holes in the bearing plate. When soil conditions require the use of driller's mud during the augering process, the pole may float and it is impossible to set it in the foundation unless the water is removed from the hole, which may cause the sides of the hole to collapse. The pole could be set if there was a hole in the bearing plate to allow the fluid into the pole. Galvanized poles are allowed to have a drain hole in the bearing plate to facilitate the galvanizing process (paragraph 5.a.(10)). Weathering steel poles are not normally allowed to have this same hole due to absence of corrosion protection inside the pole. Weathering steel poles should not be used in areas where water/water table is above the base/bearing plate of a steel pole. The owner may want to coat the inside of galvanized poles with a coating similar to that on the outside of the pole and described in paragraph 5.i.(1)(d).

The problem of swamp or bog shoe is the method of attaching the device to the pole. Normally this is done by drilling a hole through the pole and using a through bolt. The problem is these bolts may be at or below water line. Therefore they let water into the pole. This does not cause a major problem for galvanized poles. For weathering steel the steel needs to cycle from wet to dry to create the corrosion protection. This cannot happen under the above conditions. There are two solutions. One is to have the inside of the pole coated as described above, the other is to have the manufacture install a water tight sleeved hole at the location of the attachment bolts.

**Structure Testing - Paragraph 5.L**

An option is available in the specification for full scale testing of poles. For a manufacturer that has been designing and fabricating steel poles with the same processes for a good number of years, the need for testing of a steel pole is questionable. Pole testing may be appropriate in cases where there are unusual requirements, new fabrication techniques or, when new suppliers are used to validate their design.

**3. MISCELLANEOUS DESIGN INFORMATION**

**Direct Embedded Poles Near Electric Generating Plants and Substations**

Use of direct embedded steel poles should be evaluated for the first two spans outside of a substation or generating plant. The large amount of copper used in a substation grounding grid may create a galvanic corrosion cell, with the steel of the pole sacrificing itself. Anodes or extra subsurface protection may be needed.

**Additional Protection**

The owner or owner's representative should determine if anodes should protect the embedded poles. If it is necessary, requirements for sacrificial anodes and their installation should be incorporated in the construction specification.

**Electrical Grounding and Polyurethane Coating**

When poles are direct embedded, this specification requires a polyurethane coating to be applied to the exterior surface of the embedded portion of the pole. This coating will tend to insulate the pole from the ground and as such, supplemental grounding may be necessary.

**Ground Rods**

Use of copper or copper clad ground wire and rods should be avoided with direct embedded poles. Galvanized rods and couplings are suggested.

**4. SHIPPING - Paragraph 6.a.(3)**

Lumber treated with salts (Ammoniacal copper arsenate, ACA, Ammoniacal copper zinc arsenate, ACZA, and Chromated copper arsenate, CCA) to retard "decay or fire" will chemically attack the steel. Urethane foam or some foam containing fire retardants should not be used in packaging and shipping. When these materials become wet, they become very corrosive.

**5. DRAWINGS AND INFORMATION TO BE SUPPLIED BY THE MANUFACTURER - Section 7**

In order to properly evaluate bids, the specification requires certain information to be supplied with the bid. This information may be supplied on the preliminary drawings from the Bidder. If the forms in Attachment C are used, one will be able to quickly review the information on the sample forms and simultaneously compare the information from the different manufacturers.

**APPENDIX B**

**EXAMPLES OF DRAWINGS**  
(Attachment A of the Specification)

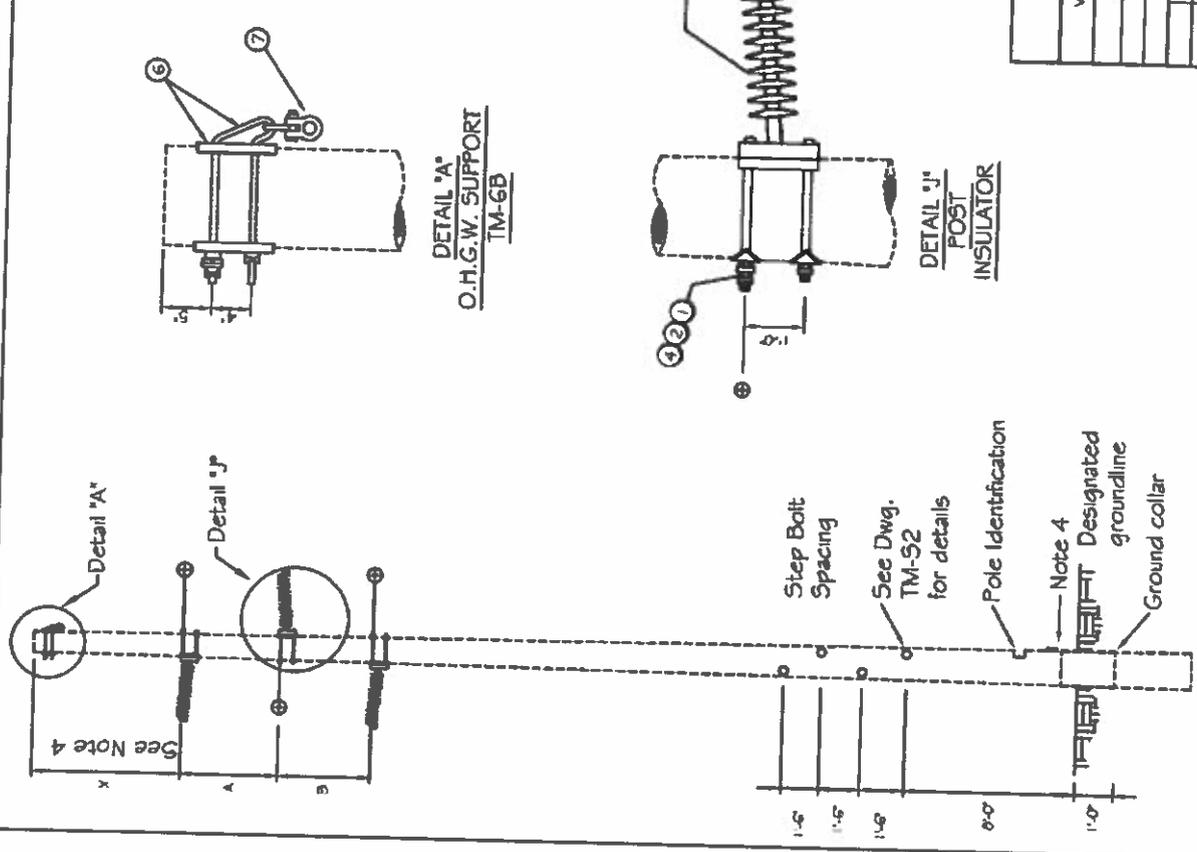
**STRUCTURE DIMENSIONS,  
POLE FRAMING DRAWINGS, AND DETAILS**

LIST OF MATERIALS

DWG REF	QTY	DESCRIPTION	ITEM	DET.	CODE No.
1	6	7/8" Bolt, Machine, by rod length	c		
2	6	Washer, 4/34 x 1/4" (1/8" hole/rod)	d		
3	1	7/8" Clamp, Groundwire + 1 nut	dp		
4	6	7/8" Locknut, MF type	dk		
5	3	Insulator, Line Post, Polymer self-clamp		TM-3P	
6	1	ORIG SUPPORT ASSEMBLY		TM-6B	
7	1	ORIG ASSEMBLY, TANGENT		TM-4	

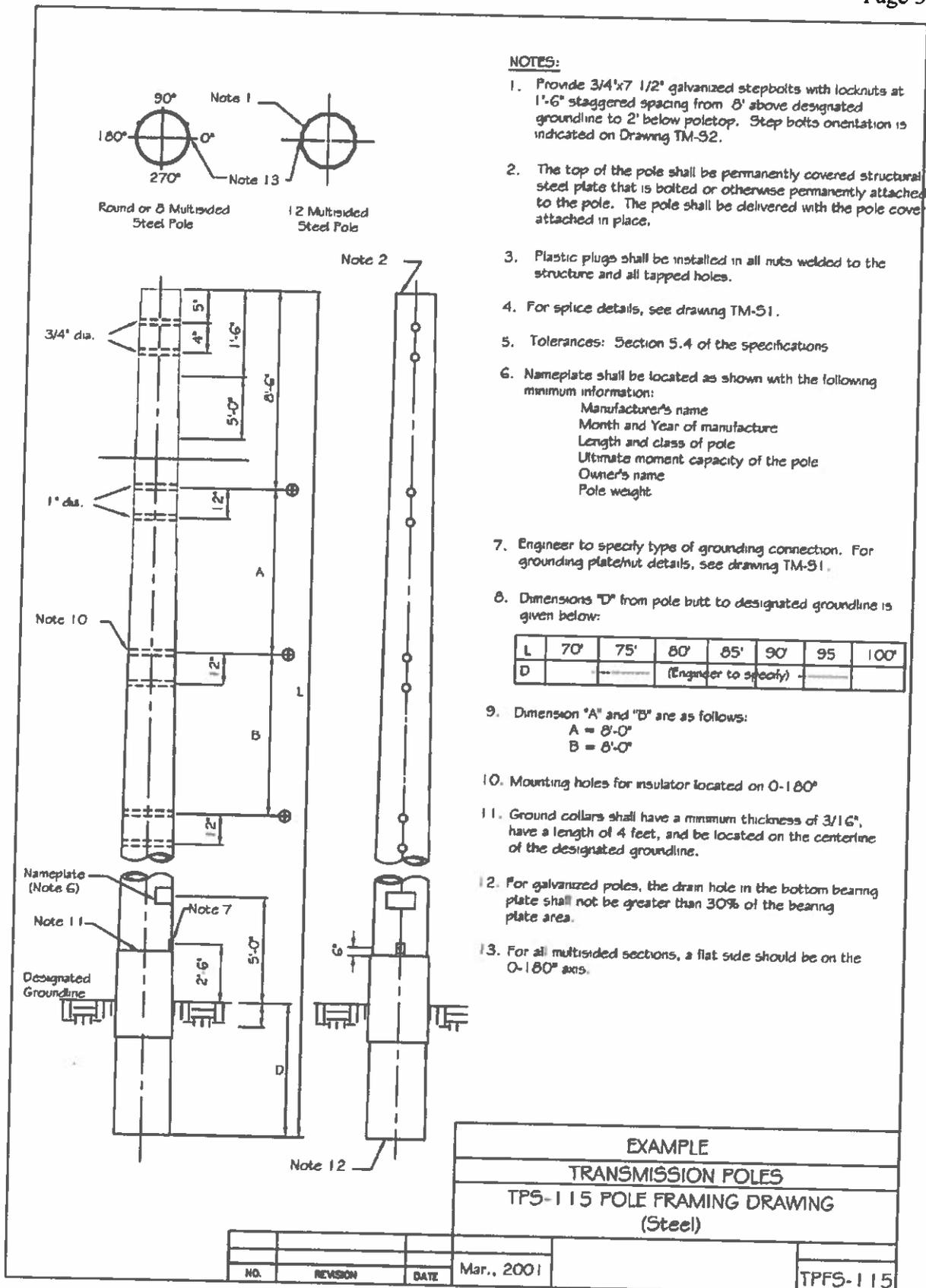
NOTES

- For flat sides of a multisided pole, use a flat washer for item 2 of the List of Materials. For round poles, use a curved washer.
- Orientation of step bolts is indicated on drawing TM-52.
- Groundline location and embedment depths are specified on the POLE FRAMING drawing.
- Location of grounding nut and grounding plate is shown on the POLE FRAMING drawing.
- The following materials are to be specified on the plan and profile drawings and staking sheets: POLES, POLE GROUNDING ASSEMBLY, AND ANY ADDITIONAL FOUNDATION UNITS



INFORMATION FOR POLE MANUFACTURERS

DIMENSION A & D		EXAMPLE	
VOLTAGE	A	TRANSMISSION LINE STRUCTURE	
115 kv	0'-0"	TANGENT HORIZONTAL LINE POST (Steel Pole - 115kv)	
	0'-0"		
NO.	REVISION	DATE	TPS-115
		Mar., 2001	

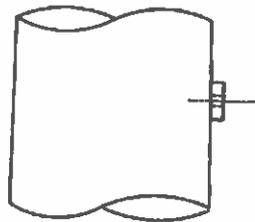


**NOTES:**

1. Provide 3/4"x7 1/2" galvanized stepbolts with locknuts at 1'-6" staggered spacing from 8' above designated groundline to 2' below pole top. Step bolts orientation is indicated on Drawing TM-S2.
  2. The top of the pole shall be permanently covered structural steel plate that is bolted or otherwise permanently attached to the pole. The pole shall be delivered with the pole cover attached in place.
  3. Plastic plugs shall be installed in all nuts welded to the structure and all tapped holes.
  4. For splice details, see drawing TM-S1.
  5. Tolerances: Section 5.4 of the specifications
  6. Nameplate shall be located as shown with the following minimum information:  
 Manufacturer's name  
 Month and Year of manufacture  
 Length and class of pole  
 Ultimate moment capacity of the pole  
 Owner's name  
 Pole weight.
  7. Engineer to specify type of grounding connection. For grounding plate/nut details, see drawing TM-S1.
  8. Dimensions "D" from pole butt to designated groundline is given below:
- |   |     |     |                       |     |     |     |      |
|---|-----|-----|-----------------------|-----|-----|-----|------|
| L | 70' | 75' | 80'                   | 85' | 90' | 95' | 100' |
| D |     |     | (Engineer to specify) |     |     |     |      |
9. Dimension "A" and "B" are as follows:  
 A = 8'-0"  
 B = 8'-0"
  10. Mounting holes for insulator located on 0-180°
  11. Ground collars shall have a minimum thickness of 3/16", have a length of 4 feet, and be located on the centerline of the designated groundline.
  12. For galvanized poles, the drain hole in the bottom bearing plate shall not be greater than 30% of the bearing plate area.
  13. For all multisided sections, a flat side should be on the 0-180° axis.

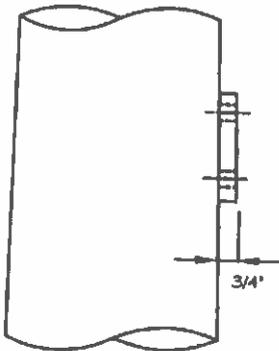
**EXAMPLE**  
**TRANSMISSION POLES**  
**TPS-115 POLE FRAMING DRAWING**  
**(Steel)**

NO.	REVISION	DATE	Mar., 2001			TPFS-115



GROUNDING NUT  
 DETAIL

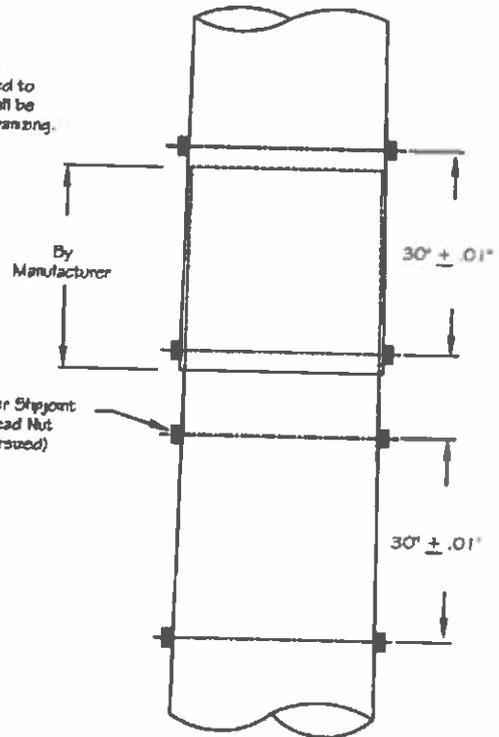
1/2"-13 UNC Threads  
 Sq. or Hex Nut welded to  
 the pole. Threads shall be  
 protected during galvanizing.



GROUNDING PLATE DETAILS  
 STANDARD DETAIL 'F'

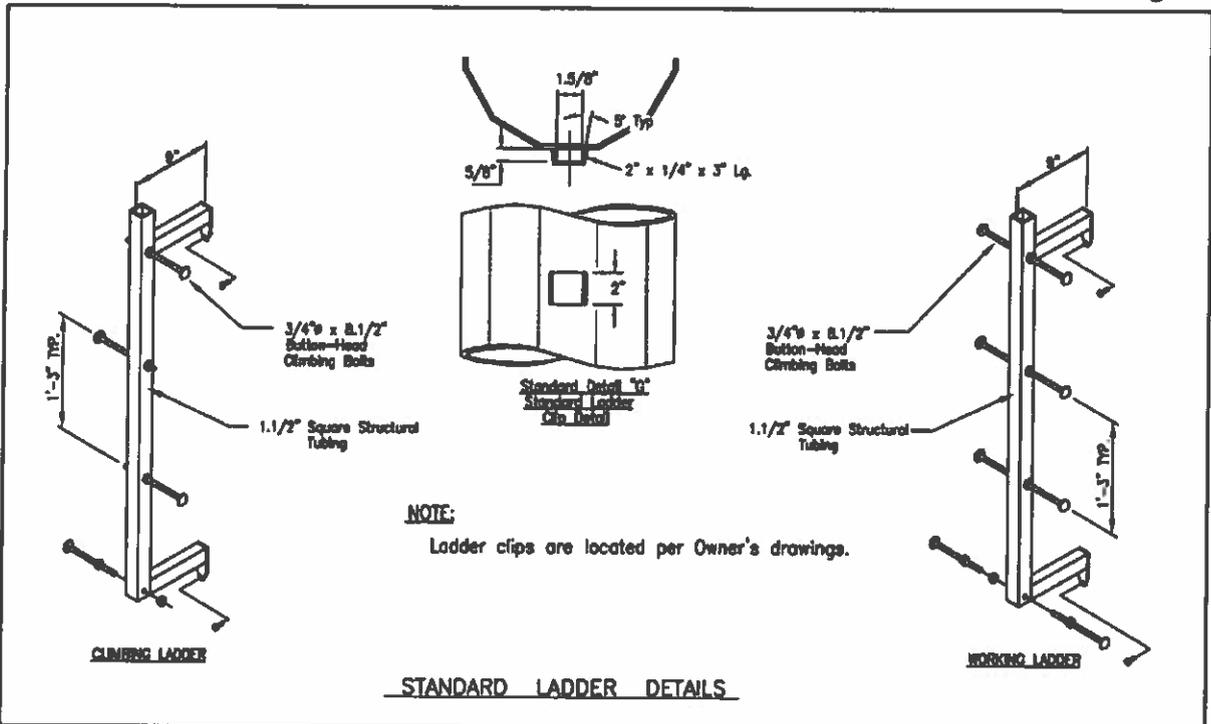
3/4"  
 3/4"  
 3/4"  
 3/4"  
 3/4"  
 3/4"  
 Drill and Tap  
 (2) Holes  
 1/2"-13 UNC  
 Threads  
 Copperclad Steel  
 Plate

(B) Required per Slipjoint:  
 1" Dia. Hexhead Nut  
 (Tapped Oversized)



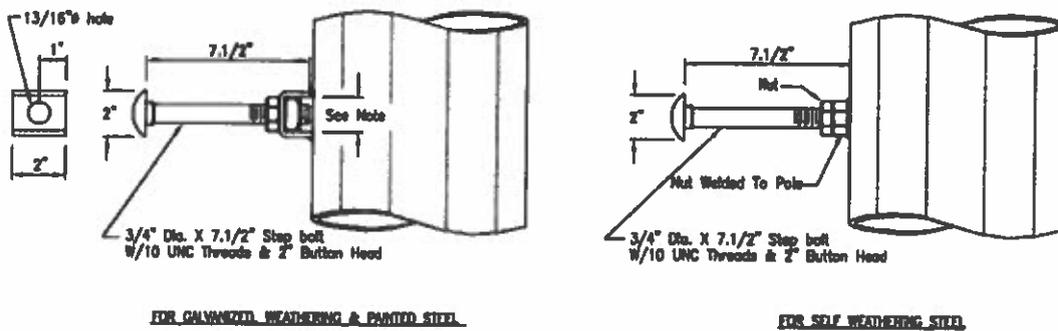
STANDARD JACKING NUT  
 DETAIL FOR SLIP JOINTS

EXAMPLE			
TRANSMISSION LINE STRUCTURE			
STEEL POLE STRUCTURE DETAILS			
NO.	REVISION	DATE	Mar., 2001
			TM-51

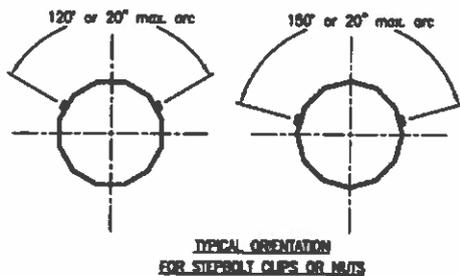


**NOTE:**

1. Step bolt clip shall be designed and fabricated to prevent square nut rotation while step bolt is installed.
2. Step bolts are located per owner's drawings.



**STANDARD STEP BOLT DETAILS**



TRANSMISSION LINE STRUCTURE	
GUIDE FOR STEEL POLE STRUCTURE	
DETAILS	
SCALE:	DATE: JANUARY '97
N.T.S.	TM-S2

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**APPENDIX C. DESIGN EXAMPLES**

**Example 1:** For the TUS-1 pole structure and loading conditions given below, determine the standard class steel pole:

**General information:**

Line voltage: 161 kV  
 Design by: ACME Engineers  
 Structure type: TUS-1 Steel Pole Structures  
 (steel pole with upswept arms)

**Geometry of the structure and location of loads:**

	<u>Distance from Pole Top, Ft.</u>
OHW	0.25
COND-1	9.00
COND-2	15.00
COND-3	21.00
At Gd. Line-assumed	70.00
Pole-End	80.00
Crossarm Dimensions:	
Top arm	8.5 ft
Middle arm	9.5 ft
Bottom arm	9.5 ft

Overall pole length is 80 feet. The above dimensions assume a 10.0 foot embedment depth for the steel pole (using standard rule for wood poles of 10 percent pole length plus 2 feet). Assume top of the pole has a 10 inch diameter, and the groundline diameter is 20 inches.

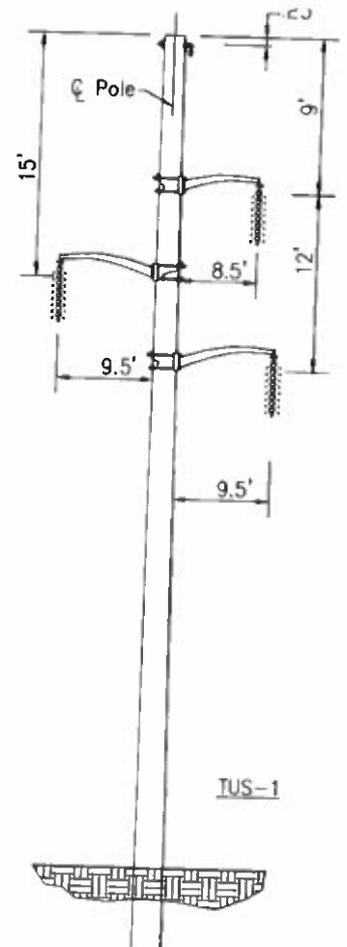
**Load Factors (LFs) used in this example:**

For NESC Light, Medium, or Heavy Loading District Loads

Vertical Loads	1.50
Transverse. Wind Loads	2.50
Transverse. Wire Tension Load at Line Angle	1.65
Longitudinal Loads	1.10
Extreme Wind Loads	1.10
Extreme Ice with Concurrent Wind Loads	1.10

**Conductor and OHGW Data:**

OHW:	3/8" HSS R.B.S = 10,800 lbs
161 kV Conductor:	Drake (795 26/7 ACSR) R.B.S = 31,500 lbs



**Design Span Information:**

Vertical Span	900 ft.
Horizontal Span	750 ft.
Line Angle	0 degrees

**Load Cases:**

- Load Case A: NESC Medium District Loads  
Load Case B: 90 mph Extreme Wind Load (1.1 LF applied)  
Load Case C: 30 mph with 1 inch ice load (1.1 LF applied)

**Loading Information (summary):**

**NESC Medium Loading Data**

		Transverse	Vertical
	<u>Cond. Tension (kips)</u>	<u>lb./ft.</u>	<u>lb./ft.</u>
Drake -795 26/7 ACSR	7.91	.5360	1.5162
OHWG - 3/8 HSS	2.56	.2867	.4626

**Extreme Wind Loading Data (90 mph)**

		Transverse	Vertical
	<u>Cond. Tension (kips)</u>	<u>lb./ft.</u>	<u>lb./ft.</u>
Drake -795 26/7 ACSR	6.54	1.9390	1.0940
OHWG - 3/8 HSS	1.23	.6210	.2730

**Extreme Wind with Concurrent Ice (30 mph wind and 1" ice)**

		Transverse	Vertical
	<u>Cond. Tension (kips)</u>	<u>lb./ft.</u>	<u>lb./ft.</u>
Drake -795 26/7 ACSR	12.54	.5967	3.7154
OHWG - 3/8 HSS	5.27	.4532	1.9642

**Calculate forces and moments at the groundline:** (assumes no pole rotation)

• **NESC Medium District Loading**

	Load Due to Wind on Wire (kips)	Load Due to Line Angle (kips)	Total Transverse Load W/LF (kips)	Moment Arm Feet	Factored Moments Ft. kips @ Groundline
OHWG	.215	0	.538	69.75	37.5
COND-1	.402	0	1.005	61.00	61.3
COND-2	.402	0	1.005	55.00	55.3
COND-3	.402	0	1.005	49.00	49.2
Groundline				0.0	
Total Shear Loads for Wire Loads			3.57		203.4
Wind on the Pole			0.88		27.2
Moments due to unbalanced vertical Wire Load (8.5 ft arm or 9 ft from conductor attachment to center of pole)					18.9
Moment due to deflection for weight of pole and for wires (p-delta moment) Approximated, based on 15 percent of the static moment from wire loads, i.e. $M = .15 \times 203.4$ ft kips)					30.5
Total Transverse Shear @ Groundline			4.45		--
Total Moments @ Groundline			--		279.9

Total Groundline Moment for Medium Loading District = 279.9 ft.-kips

• **Extreme Wind Load and Extreme Ice with Concurrent Wind Load**

Similar calculations are performed for the extreme wind load and extreme ice with concurrent wind loads:

Total Ground Line Moment for Extreme Wind Load = 418 Ft-Kips  
Total Groundline Moments for Extreme Ice with Concurrent Wind Loads = 165ft-kips

• **Conclusions: The Extreme Wind Loading Case controls design.**

**Determine which "standardized" steel pole design to use:**

Distance 2' from top to groundline =  $70' - 2.0' = 68'$

Load 2' from the top to cause a 332 ft.-kip moment at groundline:  $= 417 \text{ ft-kips} / 68' = 6140 \text{ lbs.}$

Based on the above calculated tip load and from **Table 1 of the specification**, use a **S-06.5 pole**

Perform a quick check to verify the assumed embedment depth using RUS Bulletin 1724E-205, "Design Guide: Embedment Depths for Concrete and Steel Poles".

**Discussion:**

Based on the results above, the extreme wind load case controls the design. Results from a computer program which uses finite element analysis are summarized in the table below. The results compare manual linear calculations with an estimate of secondary moments to the results from a computer program which performs a nonlinear analysis.

The NESC allows the use of span factors and height adjustment factors when considering extreme wind loads (refer to RUS Bulletin 1724E-200, Design Manual for High Voltage Transmission Lines, Chapter 11). From the summary below, several conclusions can be made. The results from manual calculations and the computer analysis using finite elements are close, the major difference occurring with the estimate of secondary moments in the manual calculations. Also, the use of span factors and height adjustment factors will impact the design reactions. When using span factors and height adjustment factors, the selected 'standardized' steel pole would be:

Load 2 ft from the top to cause a 334. ft kip moment (nonlinear analysis and span and height adjustment factors) = 4930 lbs.

Based on the above calculated tip load and from **Table 1 of the specification**, use a **S-05.7 pole**

Load Case	Groundline Moments based on manual calculations with an estimate of the secondary moments (15% of static moment)	Groundline Moments based on a nonlinear analysis	Groundline Moments based on a nonlinear analysis and using span and height adjustment factors
Load Case A NESC Medium Loading	279	276	N.A.
Load Case B Extreme Wind Load	417	401	334
Load Case C Extreme Ice with Concurrent Wind	163	176	N.A.

In this example, if span factors and height adjustment factors are applied in calculating the unit loads, the standard size class steel pole will be reduced by one class.

**Example 2: An existing 161 kV single pole line is composed of Douglas Fir wood poles. In several locations, steel poles are to replace wood pecker damaged wood poles. The existing damaged poles are 80 ft class 1 wood poles with the TUS pole top assembly. Determine which standard size steel pole should be used to replace the wood pole. Extreme wind design load is 20.7 psf (90 mph). The line is located in the heavy loading district. The conductor is 795 ACSR Drake and the overhead ground wire is 3/8" HSS.**

NESC heavy district loads with an strength factor of .65 and a load factor of 2.5 controlled the design of the original wood pole line. However, a quick comparison of the unit loads for the extreme wind and the NESC heavy district load with load factors and strength factors for steel, indicates that the extreme wind load will control the design of the steel pole.<sup>1</sup> Because the extreme wind case controls design of the steel replacement pole, the engineer may use Table A-2 for convenience.

Table A-2 indicates that for a class 1 wood pole, a S03.5 may be used. There may be other issues in matching classes of wood poles to steel poles that the engineer may need to consider. This example, however, shows the importance of determining the loading condition that controls the design of the steel pole. If the engineer had assumed that the NESC heavy district load controlled design of the steel pole replacement since it controlled the design of the wood pole when initially installed, then Table A-1 would have been mistakenly used and a S02.9 would have been selected as the replacement pole.

Note 1: Unit loads for extreme wind is 1.9113 lbs./ft, or 2.102 with a 1.1 LF and for the NESC heavy district load, the unit load is 1.7567 lbs./ft (.7027 times 2.5) with a 2.5 LF.

**APPENDIX D**  
**SELECTED METRIC CONVERSIONS**

**Selected SI-Metric Conversions**

**AREA**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
circular mil (cmil)	square meter (m <sup>2</sup> )	5.067075 E-10
square centimeter (cm <sup>2</sup> )	square meter (m <sup>2</sup> )	*1.000 E-04
square foot (ft <sup>2</sup> )	square meter (m <sup>2</sup> )	*9.290304 E-02
square inch (in <sup>2</sup> )	square meter (m <sup>2</sup> )	*6.451600 E-04
square kilometer (km <sup>2</sup> )	square meter (m <sup>2</sup> )	*1.000 E+06
square mile (mi <sup>2</sup> )	square meter (m <sup>2</sup> )	2.589988 E+06

**FORCE**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kilogram force (kgf)	Newton (N)	*9.806650
kip	Newton (N)	4.448222 E+03
pound force (lbf)	Newton (N)	4.44822

**FORCE PER LENGTH**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kilogram force per meter (kgf/m)	Newton per meter (N/m)	*9.806650
pound per foot (lb./ft)	Newton per meter (N/m)	1.459390 E+01

**DENSITY**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
pound per cubic inch (lb/in <sup>3</sup> )	kilogram per cubic meter (kg/m <sup>3</sup> )	2.767990 E+04
pound per cubic foot (lb./ft <sup>3</sup> )	kilogram per cubic meter (kg/m <sup>3</sup> )	1.601846 E+01

**LENGTH**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
foot (ft)	meter (m)	3.048 E-01
inch (in)	meter (m)	*2.540 E-02
kilometer (km)	meter (m)	*1.000 E+03
mile (mi)	meter (m)	*1.609344 E+03

\*Exact Conversion

**Selected SI-Metric Conversions (Cont.)**

**LOAD CONCENTRATION**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
pound per square inch (lb/in <sup>2</sup> )	kilograms per square meter (kg/m <sup>2</sup> )	7.030696 E+02
pound per square foot (lb/ft <sup>2</sup> )	kilograms per square meter (kg/m <sup>2</sup> )	4.788026
ton per square foot (ton/ft <sup>2</sup> )	kilograms per square meter (kg/m <sup>2</sup> )	9.071847 E+02

**PRESSURE**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kip per square inch (kip/in <sup>2</sup> )	Pascal (Pa)	6.894757 E+06
kip per square foot (kip/ft <sup>2</sup> )	Pascal (Pa)	4.788026 E+04
Newton per square meter (N/m <sup>2</sup> )	Pascal (Pa)	*1.000
pound per square foot (lb/ft <sup>2</sup> )	Pascal (Pa)	4.788026 E+01
pound per square inch (lb/in <sup>2</sup> )	Pascal (Pa)	6.894757 E+03

**BENDING MOMENT**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
kilogram force meter (kgf-m)	Newton meter (N-m)	*9.806650
kip-foot (kip-ft)	Newton meter (N-m)	1.355818 E+02
pound-foot (lb-ft)	Newton meter (N-m)	1.355818

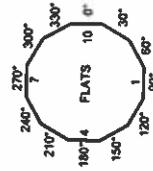
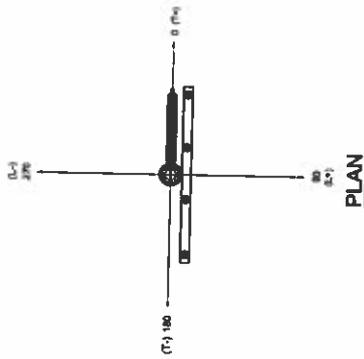
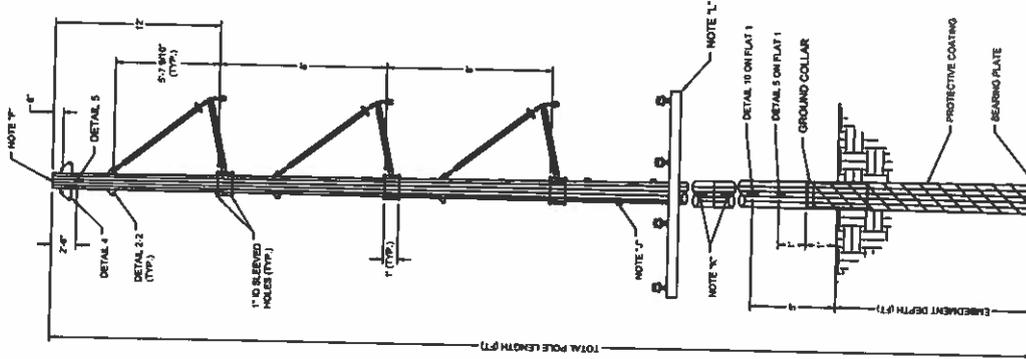
**VELOCITY**

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
foot per second (ft/s)	meter per second (m/s)	*3.048 E-01
kilometer per hour (km/h)	meter per second (m/s)	2.777778 E-01
mile per hour(mi/h)	meter per second (m/s)	4.437030 E-01
meter per hour (m/h)	meter per second (m/s)	2.777778 E-04

\*Exact Conversion.

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**GENERAL NOTES:**

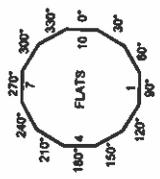
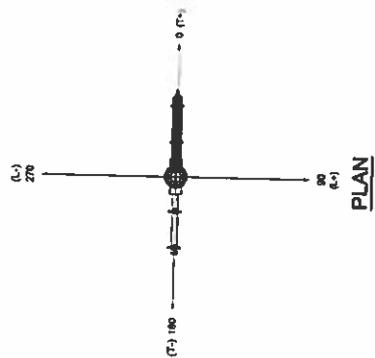
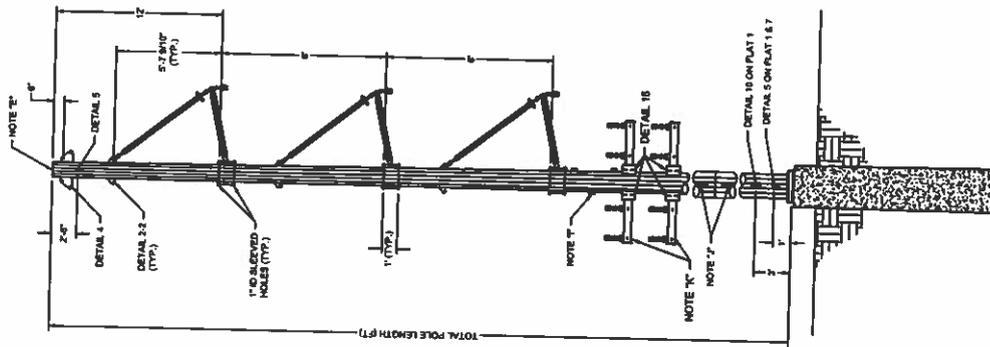
- A. STRUCTURE POLE CLASS, LENGTH, AND EMBEDMENT DEPTH ARE SPECIFIED IN STRUCTURE TABLE PROVIDED WITH I&O.
- B. BRACED POST INSULATOR (BPI) IS MAGLEANS 80010481107MAX. FABRICATOR SHALL FIBRE SLEEVED HOLES ARE SIZED AND SPACED TO ACCOMMODATE BPI.
- C. BRACED POST INSULATOR (BPI) IS MAGLEANS 80010481107MAX. FABRICATOR SHALL FIBRE SLEEVED HOLES ARE SIZED AND SPACED TO ACCOMMODATE BPI.
- D. POLE FABRICATOR TO PROVIDE ALL BOLTS, NUTS, WASHERS, AND OTHER MOUNTING EQUIPMENT.
- E. ALL DETAILS LOCATED ON DRAWING 2200-DETAILS.
- F. THE POLE TOP SHALL BE INSTALLED WITH THE FLAT OR FLATS ATTACHED 3/16\"/>

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REV #	DESCRIPTION	DATE	BY	CHK	APPV
0	ISSUED FOR PROCUREMENT	10/17/2023	MMW	AT	MMW



NO. 104	ROCHELLE MUNICIPAL UTILITIES	LOCATION	DATE
	RTTOME TO CENTERPOINT 24 SVL LINE	APPROVED:	DATE
	VERTICAL BRACED POST TANGENT	DRAWN BY	DATE
		2008-719-0004AT	1 1 1



- GENERAL NOTES:**
- STRUCTURE POLE CLASS, LENGTH, AND EMBEDMENT DEPTH ARE SPECIFIED IN THE LOAD TABLE PROVIDED WITH THIS DRAWING.
  - BRACKET AND SLIP JOINTS SHALL BE CLEANLY BURNISHED 1107/AX. FABRICATOR SHALL ENSURE SLEAVED HOLES ARE SIZED TO ACCOMMODATE ALL EQUIPMENT.
  - POLE FABRICATOR TO PROVIDE ALL BOLTS, NUTS, WASHERS, AND OTHER MOUNTING EQUIPMENT.
  - THE POLE TOP SHALL BE LOCATED ON DRAWING 2200-DETAILS.
  - POLE CAP SHALL BE INSTALLED PERMANENTLY ATTACHED TO THE STEEL PLATE.
  - ALL VANGS AND ATTACHMENTS SUPPORTING CONDUCTOR OR SLEAVE SHALL BE INSTALLED WITH THE CORRECT ORIENTATION TO ACCOMMODATE THE LOADS.
  - CONNECTIONS SHALL HAVE THICKNESS DETERMINED TO ACCOMMODATE THE LOADS.
  - FOR ALL MOUNTING SECTIONS, THE STRUCTURE SHALL BE ON THE 0-180° AXIS.
  - ALL CONNECTIONS FOR ERECTION AND ASSEMBLY SHALL BE BOLTED TYPE, I.E. NO FIELD WELDING PERMITTED.
  - POLE SHALL BE INSTALLED AT 1'-0" STAGGERED SPACING AND SHALL BE ORIENTED TO PROVIDE THE GREATEST CLEARANCE FROM CIRCUIT WIRE. STEP CLIPS SHALL NOT INTERFERE WITH THE STAGGERED SPACING.
  - BRACKETS, SLIP JOINTS ON OTHER POLE FEATURES, STEP CLIPS SHALL START 8" ABOVE GROUND LINE AND STOP 7" BELOW TOP OF POLE.
  - ALL ATTACHMENTS SHALL BE INSTALLED AT POLE JOINTS. REFERENCE DETAIL 11.
  - UNDERBUILD ATTACHMENT REQUIREMENTS.
  - ORIENTATION SHOWN IS FOR POSITIVE LINE ANGLES. FOR STRUCTURES WITH NEGATIVE LINE ANGLES, FLIP ORIENTATION ALONG VERTICAL AXIS.

REV #	DESCRIPTION	DATE	CHK	APP
0	ISSUED FOR PROCUREMENT	10/17/2020	MAN	AT

**BHM**  
BHM ENGINEERING, INC.  
11700 W. ARROYO AVENUE, SUITE 100  
P.O. BOX 100000  
DALLAS, TEXAS 75240-1000

**Rockelle**  
MUNICIPAL UTILITIES  
The City of Rockelle, Texas is the Sole Provider

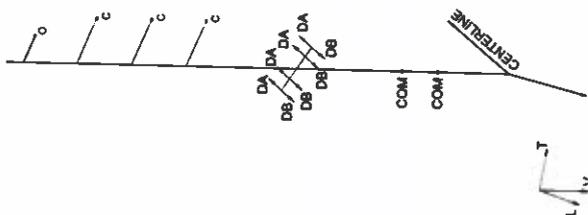
PROJECT	NO. 1	DATE	10/17/2020
CLIENT	ROCHELLE MUNICIPAL UTILITIES	PROJECT NO.	11700-0001
DESCRIPTION	VERTICAL BRACKET FOR MOUNTING CAVIT AND UNDERBUILD	SCALE	1" = 10'
DESIGNED BY	MAN	DATE	10/17/2020
CHECKED BY	AT	DATE	10/17/2020
APPROVED BY	MAN	DATE	10/17/2020
PROJECT NO.	11700-0001	SCALE	1" = 10'

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# LOADING DIAGRAMS



Load Case	Description	Wind / Ice / Temp	Loads (kips)						Load Factor
			O	C	DA	DB	COM		
1	NESC 2008	Temp / AS' / 177	V	0.9	1.8	0.4	0.3	0.6	1.5
			L	2.2	0.8	1.5	-1.1	-0.9	2.5
2	NESC 2008	Temp / 1' / 1877	V	0.8	1.7	0.3	0.2	0.5	1.69
			L	2.0	0.8	1.5	-0.9	-0.7	2.1
3	NESC 2008	Temp / 0.37' / 1777	V	0.2	0.4	0.2	0.2	0.4	1.1
			L	1.0	0.4	0.2	0.2	0.4	1.1
4	Extreme Ice	Temp / 1' / 1877	V	1.2	2.4	0.6	0.4	0.8	2.1
			L	2.8	0.8	0.8	-0.8	-0.8	2.1
5	Light	Temp / 1' / 1877	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1
6	Reflection	Temp / 1' / 1877	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1
7	Maintenance	Temp / 1' / 1877	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1
8	Tributed NESC 2008 (No Wire Back)	Temp / AS' / 177	V	3.7	0.8	1.8	0.8	0.8	2.8
			L	0.2	0.2	-0.4	1.9	-0.2	1
9	Tributed NESC 2008 (No Wire Back)	Temp / 1' / 1877	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1
10	Tributed NESC 2008 (No Wire Back)	Temp / AS' / 177	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1
11	Tributed Extreme Ice (No Wire Back)	Temp / 1' / 1877	V	1.2	2.4	0.6	0.4	0.8	2.1
			L	2.8	0.8	0.8	-0.8	-0.8	2.1
12	Differenced Ice (No Wire Back)	Temp / AS' / 177	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1
13	Differenced Ice (Full Sheet / No Wire Back)	Temp / AS' / 177	V	0.8	0.4	0.2	0.2	0.4	1.1
			L	1.8	0.4	0.2	0.2	0.4	1.1

The maintenance worked load shall be applied to one wire position using a vertical load factor of 1.0 while all other wire positions use a vertical load factor of 0.5. The maximum worked load shall be limited to the rated strength of the wire. The applied vertical load on all attachments and attachments on each side shall be limited to 1.0 kips per foot, as required by OSHA. \*Pressure deflection shall be limited to 1.0% of the pipe height under the deflection load case and 0.5% under all other load cases.

Wire Symbol	Wire Type	NESC HV Tension (lbs)	Building Span (ft)	Weight Span (ft)
O	DMO 13429	5000	516	600
C	17 397.5 37000 11827 ASR	11400	485	600
DA	336.6 10000 1817 1000000 ACB	3400	263	300
DB	336.6 10000 1817 1000000 ACB	3400	263	300
COM	AS55-ALCOA	2000	256	400

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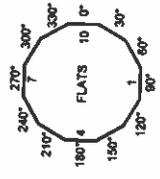
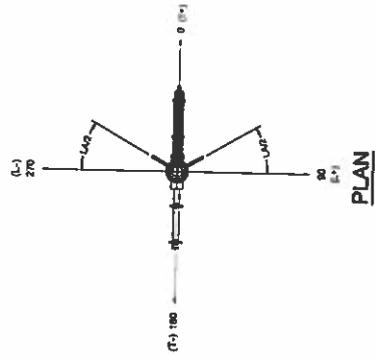
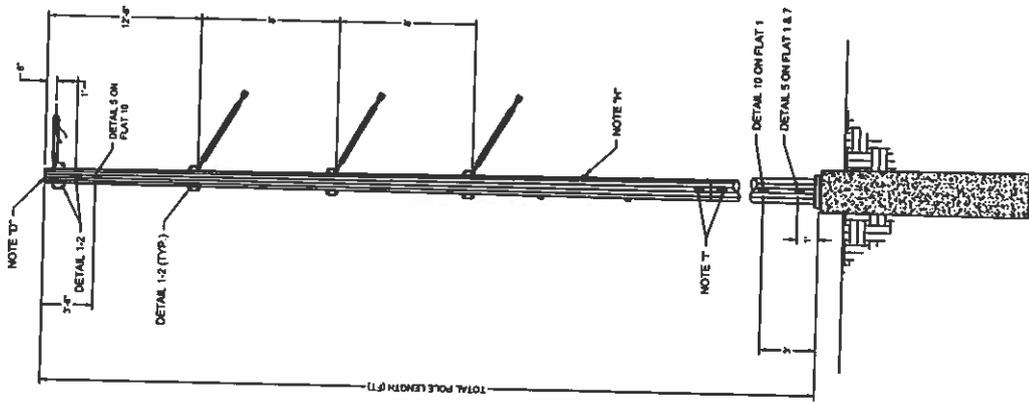
**Rochelle**  
Municipal Utilities



**BHM&G**  
Engineering & Construction

ROCHELLE MUNICIPAL UTILITIES  
RITCHIE TO CHATELAIN TRAIL  
TRAIL-TO-CHATELAIN TRAIL  
N-STRONG RUNNING ANGLE  
OR DRILLED PIER

DATE	10/17/2018	BY	JKL
DESCRIPTION	STR 26	CHK	JKL
DESIGNED BY	JKL	APPR	JKL
DATE	10/17/2018	BY	JKL
DESCRIPTION	STR 26	CHK	JKL
DESIGNED BY	JKL	APPR	JKL



- GENERAL NOTES:**
- STRUCTURE POLE CLASS, LENGTH, AND EMBEDMENT DEPTH ARE SPECIFIED IN DRAWING NOTES.
  - STRUCTURE FABRICATOR TO PROVIDE ALL BOLTS, NUTS, WASHERS, AND OTHER MOUNTING EQUIPMENT.
  - STRUCTURE DETAILS LOCATED ON DRAWING 2200-DETAILS.
  - ALL CONNECTIONS SHALL BE COVERED WITH A PERMANENTLY ATTACHED 3/16" STEEL PLATE POLE CAP. THE POLE CAP SHALL BE INSTALLED WITH THE POLE CAP ATTACHED IN PLACE.
  - ALL WINGS AND ATTACHMENTS SUPPORTING COILS SHALL BE INSTALLED WITH THE COILS ATTACHED IN PLACE. CONNECTIONS SHALL HAVE THICKNESS DETERMINED TO ACCOMMODATE THE LOADS SPECIFIED IN THE STRUCTURE LOADS TABLE.
  - FOR ALL CONNECTIONS, ALL FLAT SHOULD BE ON THE 6-180° AXIS.
  - ALL CONNECTIONS FOR ERECTION AND ASSEMBLY SHALL BE BOLTED TYPE, I.E. NO FIELD WELDING PERMITTED.
  - STEP CLIPS SHALL BE INSTALLED AT 1'-6" STAGGERED SPACING AND SHALL BE ORIENTED TO PROVIDE THE GREATEST DISTANCE FROM CIRCULAR WRES. STEP CLIPS SHALL NOT CLUMBER WITH THE GREATEST DISTANCE FROM CIRCULAR WRES. STEP BRACKETS, SLIP JOINTS OR OTHER POLE ATTACHMENTS. INSULATOR MOUNTING SHALL BE INSTALLED WITH THE INSULATORS ON THE POSITIVE LINE. STEP CLIPS SHALL START 6" ABOVE GROUND LINE AND STOP 2" BELOW TOP OF POLE.
  - ALL CONNECTIONS SHALL BE INSTALLED AT POLE JOINTS. REFERENCE DETAIL 11 FOR CONNECTIONS WITH POSITIVE LINE ANGLES. FOR STRUCTURES WITH NEGATIVE LINE ANGLES, FLIP ORIENTATION ALONG VERTICAL AXIS.

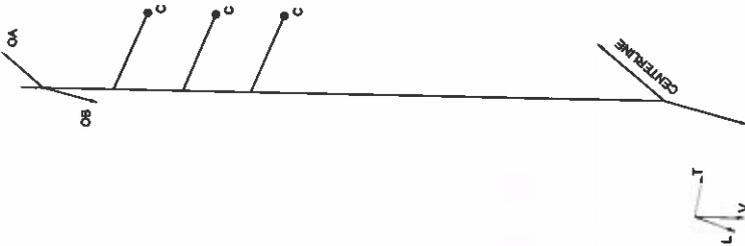
REV #	DESCRIPTION	DATE	BY	CHK	APP
0	ISSUED FOR PROCUREMENT	08/15/2023	AWY	AT	BMG



PROJECT	DATE	SCALE	SHEET
ROCHELLE MUNICIPAL UTILITIES RITCHIE TO 1540 LAMPORT 24 INV LINE 1540 LAMPORT TO 1540 LAMPORT 1540 LAMPORT TO 1540 LAMPORT ON DRILLED PER W/ OPEN DE	08/15/2023	1"=40'	1 OF 2

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# LOADING DIAGRAMS



Load Case	Description	Wind / Ice / Temp	Loads (kips)			Load Factor
			OA	OB	C	
1	MISC 2308	40mph / 0.5" / 80°F	0.4	0.5	1.1	1.5
2	MISC 230C	30mph / 0" / 80°F	0.2	0.2	0.5	1.1
3	MISC 230D	40mph / 0.5" / 15°F	0.4	0.5	1.1	1.5
4	Extreme Ice	0mph / 1" / 30°F	2.4	2.2	10.8	1
5	Uplift	0mph / 0" / -15°F	0.3	-0.1	0.1	1
6	Deflection	0mph / 0" / 80°F	0.3	0.2	0.5	1
7	Maintenance	0mph / 0" / 80°F	0.8	0.7	0.2	1
8	Terminal MISC 2308 (for Wires Back)	40mph / 0.5" / 80°F	0.5	0.6	1.1	1.5
9	Terminal MISC 230C (for Wires Back)	30mph / 0" / 80°F	0.3	0.3	0.5	1.1
10	Terminal MISC 230D (for Wires Back)	40mph / 0.5" / 15°F	0.5	0.6	1.1	1.5
11	Terminal Extreme Ice (for Wires Back)	0mph / 1" / 30°F	2.4	2.2	10.8	1
12	Differential Ice (from ahead / full back)	0mph / 0.5" / 30°F	0.3	0.4	0.7	1
13	Differential Ice (full ahead / none back)	0mph / 0.5" / 30°F	0.3	0.4	0.7	1

\*This substructure vertical load shall be applied to one wire position using a vertical load factor of 3.0 within all other wire positions and a vertical load factor of 1.5 at each wire position shall be observed with the 3.0 vertical load factor.  
 The applied vertical load on all substructures and wire positions shall be no less than 5000 lbs, as required by OSHA.  
 \*\*Structure deflections shall be limited to 1.0% of the pole height under the deflection load case and 30% under all other load cases.

Wire Symbol	Wire Type	MISC HV Tension (lbs)	Rating Spans (ft)	Wind Spans (ft)	Weight Spans (lb)
OA	DMC-13425	5000	516	400	300
OB	DMC-13425	4800	414	400	400
C	T2 373.7 2308E 185 ACR	31400	485	600	500

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TITLE: ROCHELLE MUNICIPAL UTILITIES  
 RICHIE TO CENTERPOINT 34.5KV LINE  
 1-STRINGS 1-MISC-230C-185  
 ON DRILLED PIER W/ GROUND

DATE: 10/17/2008

PROJECT: 08

DRAWN BY: RMA  
 CHECKED BY: RMA  
 2008 TR-01-1400-010

SHEET: 2 OF 2



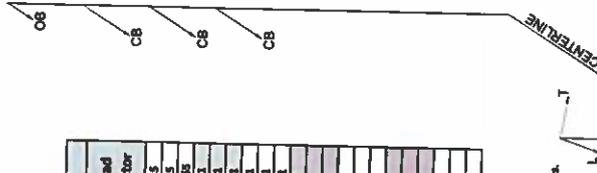
**LOADING DIAGRAMS**



Load Case	Description	Wind / Ice / Temp	Loads (kips)		Load Factor
			OA	CA	
1	MESC 2500	40mph / 0.5" / 0°F	0.6	1.4	1.5
2	MESC 250C	34mph / 0" / 60°F	0.3	0.7	1.05
3	MESC 2500	40mph / 0.75" / 15°F	0.7	1.3	1.1
4	Extreme Ice	0mph / 1" / 30°F	0.9	1.5	1.1
5	UPSR	0mph / 0" / -15°F	0.2	0.2	1
6	Deflection (Dead-end & Switch)	0mph / 0" / 60°F	0.3	0.6	1
7	Maintenance	0mph / 0" / 60°F	0.3	0.3	1

\*The maintenance vertical load shall be applied to one wire position using a vertical load factor of 3.0 while all other wire positions use a vertical load factor of 1.0. Each wire position shall be checked with the 3.0 vertical load factor.  
 The applied vertical load on all attachments and accessories on dead ends shall be not less than 5000 lbs, as required by OSHA.  
 \*\*Structure deflection shall be limited to 2% of the peak height under the deflection load case and 10% under all other load cases.

Wire Symbol	Wire Type	MESC HV Tension (lbs)	Building Span (ft)	Wind Span (ft)	Weight Span (ft)
OA	DNO-12425	5100	512	400	400
CA	T2 397.5 KCMIL "BIS" ACSR	11400	511	400	400



Load Case	Description	Wind / Ice / Temp	Loads (kips)		Load Factor
			OB	CB	
1	MESC 250B	40mph / 0.5" / 0°F	0.6	1.3	1.5
2	MESC 250C	34mph / 0" / 60°F	0.3	0.6	1.1
3	MESC 2500	40mph / 0.75" / 15°F	0.4	0.8	1.1
4	Extreme Ice	0mph / 1" / 30°F	0.5	1.4	1.1
5	UPSR	0mph / 0" / -15°F	0.2	0.3	1
6	Deflection (Dead-end & Switch)	0mph / 0" / 60°F	0.3	0.6	1
7	Maintenance	0mph / 0" / 60°F	0.3	0.3	1

\*The maintenance vertical load shall be applied to one wire position using a vertical load factor of 3.0 while all other wire positions use a vertical load factor of 1.0. Each wire position shall be checked with the 3.0 vertical load factor.  
 The applied vertical load on all attachments and accessories on dead ends shall be not less than 5000 lbs, as required by OSHA.  
 \*\*Structure deflection shall be limited to 2% of the peak height under the deflection load case and 10% under all other load cases.

Wire Symbol	Wire Type	MESC HV Tension (lbs)	Building Span (ft)	Wind Span (ft)	Weight Span (ft)
OA	DNO-12425	5100	512	400	400
CA	T2 397.5 KCMIL "BIS" ACSR	11400	511	400	400

**STRS 1, 8, 19**

**STR 7, 18, 35**

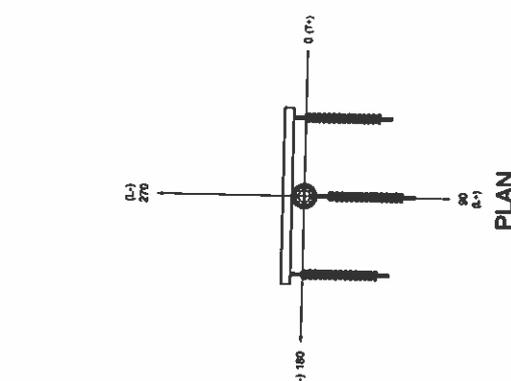
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REV #	DESCRIPTION	DATE	BY	CHK	APP
1	ISSUED FOR PROCUREMENT	10/17/2008	MM	AT	NMA

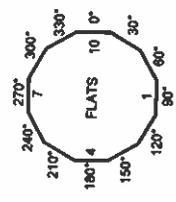


ROCHELLE MUNICIPAL UTILITIES  
 RITCHE TO CENTERPOINT 34.8KV LINE  
 TS-482-40-ENG  
 RISER DEADEND ON DRILLED PIER  
 2008-10-18-482-40-040  
 SHEET 1 OF 1





PLAN



LOOKING AT 180° FLAT

- GENERAL NOTES:**
- STRUCTURE POLE CLASS, LENGTH, AND EMBEDMENT ARE SPECIFIED IN STRUCTURE SCHEDULE WITH RFD.
  - FIBERGLASS POLES SHALL BE SUPPLIED BY PUPPS OR 1468597. FABRICATOR SHALL ENSURE SLEAVED HOLES ARE SIZED AND SPACED TO ACCOMMODATE CROSSARM AND BRACE.
  - FIBERGLASS CROSSARM IS PUPPS 1468597. FABRICATOR SHALL ENSURE SLEAVED HOLES ARE SIZED AND SPACED TO ACCOMMODATE CROSSARM.
  - FIBERGLASS CROSSARM IS PUPPS 1468597. FABRICATOR SHALL ENSURE SLEAVED HOLES ARE SIZED AND SPACED TO ACCOMMODATE CROSSARM.
  - EQUIPMENT SHALL BE MOUNTED TO THE POLE USING THE FOLLOWING EQUIPMENT: NUTS, WASHERS, AND OTHER MOUNTING EQUIPMENT.
  - STRUCTURE DETAILS LOCATED ON DRAWING 22002445.
  - THE POLE TOP SHALL BE COVERED WITH A PERMANENTLY ATTACHED 3/16" STEEL PLATE WITH A 1/2" RADIUS. THE PLATE SHALL BE DELIVERED WITH THE POLE CAP ATTACHED IN PLACE.
  - ALL WIRING SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING: ALL WIRING SHALL HAVE THE CROSSARM OR BRACKET TO ACCOMMODATE THE LOADS SPECIFIED IN THE POLE DATA SUMMARY TABLE.
  - FOR ALL MULTIPHASE SECTIONS, A FLAT SHOULD BE ON THE D-180° AXIS.
  - WELDING PERMITTED FOR ERECTION AND ASSEMBLY SHALL BE BOLTED TYPE, I.E. NO FIELD WELDING.
  - STEP CLIPS SHALL BE INSTALLED AT 1'-0" STAGGERED BRACING AND SHALL BE ORIENTED TO PROVIDE THE CLAMBER WITH THE GREATEST DISTANCE FROM CLAMBER TO STEP BRACE. STEP CLIPS SHALL NOT INTERFERE WITH ANY APPURTENANCES, INSULATOR MOUNTING BRACKETS, AND STOP 2' BELOW THE TOP OF THE POLE.
  - GROUNDING CONNECTIONS SHALL BE INSTALLED AT POLE JOINTS. REFER TO DETAIL 1-1 FOR BRACKET BRACKET BRACKETS (CROSS) SHALL BE INSTALLED AT 10' SPACING AFTER THE FIRST BRACKET. BRACKETS SHALL STOP 3' ABOVE GROUND LINE.

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REV#	DESCRIPTION	DATE	BY	CHK	APP
1	ISSUED FOR PROCUREMENT	10/17/2025	DMW	AT	DMW

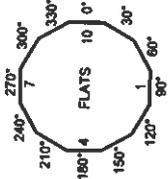
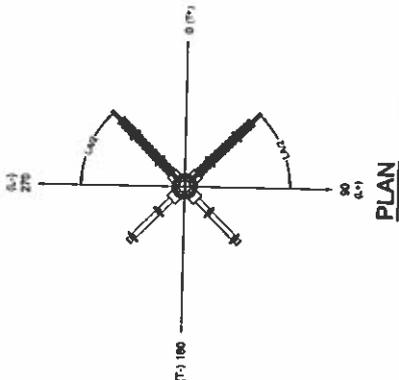
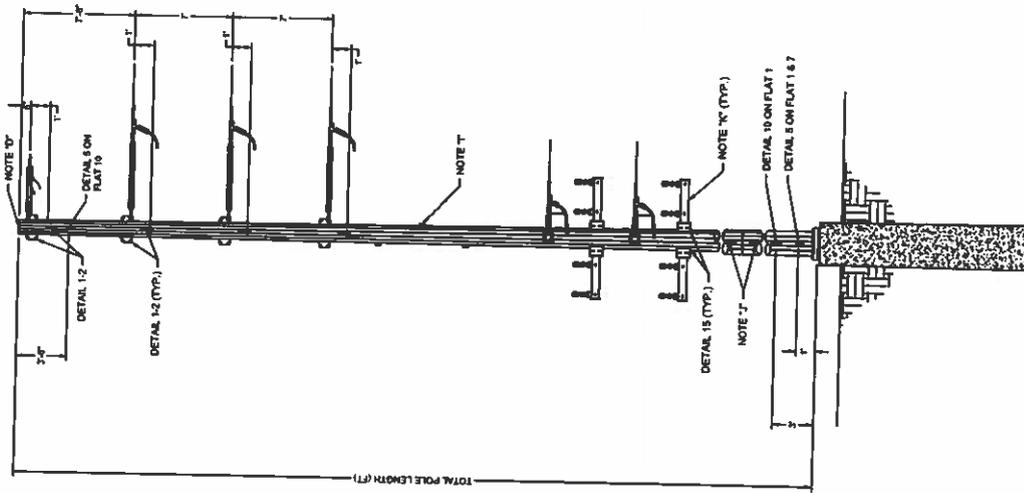


PROJECT: ROCHELLE MUNICIPAL UTILITIES  
 RITCHE TO CENTERPOINT 24.8KV LINE  
 TERMINAL DEVIATOR RISER

DATE: 10/17/2025  
 SCALE: 1" = 10'-0"

DESIGNED BY: DMW  
 DRAWN BY: DMW  
 CHECKED BY: DMW  
 APPROVED BY: DMW

PROJECT NO: 2200-1468597-AT  
 SHEET: 1 OF 1



- GENERAL NOTES:**
- STRUCTURE POLE CLASS, LENGTH, AND EMBEDED ARE SPECIFIED IN STRUCTURE TABLE WITH 1800.
  - POLE FABRICATOR TO PROVIDE ALL BOLTS, NUTS, WISHERS, AND OTHER MOUNTING EQUIPMENT.
  - STRUCTURE DETAILS LOCATED ON DRAWING 2200-DETAILS.
  - POLE TOP SHALL BE COVERED WITH A PERMANENTLY ATTACHED 3/16" STEEL PLATE BE SECURED WITH THE POLE CAP ATTACHED IN PLACE.
  - ALL WINGS AND ATTACHMENTS SUPPORTED BY THE POLE SHALL BE WELDED TO CONNECTIONS SHALL HAVE THICKNESS DETERMINED TO ACCOMMODATE THE LOADS SPECIFIED IN THE STRUCTURE LOAD TABLE.
  - ALL CONNECTIONS FOR SECTION AND ASSEMBLY SHALL BE BOLTED TYPE, I.E. NO FIELD WELDING PERMITTED.
  - ORIENTATION SHOWN IS FOR POSITIVE LINE ANGLES FOR STRUCTURES WITH NEGATIVE STEPS. FLIP ORIENTATION ALONG VERTICAL AXIS.
  - POLE CLIPS SHALL BE PROVIDED AT 1'-0" STAGGERED SPACING AND SHALL BE ORIENTED TO PROVIDE THE CLAMPS WITH 1/2" STAGGERED SPACING FROM CIRCUIT WIRES. STEP CLIPS SHALL NOT INTERFERE WITH ANY APPURTENANCES. STEP CLIPS SHALL START ABOVE BRACETS, SLIP JOINTS, OR OTHER POLE FEATURES. STEP CLIPS SHALL START ABOVE GROUNDING CONDUIT STOP BELOW TOP OF POLE.
  - UNDERBUILD SHALL BE PROVIDED AT POLE JOINTS. REFERENCE DETAIL 11 UNDERBUILD ATTACHMENT REQUIREMENTS.
  - DRAWING 2200-SPUR RACKS ARE TO BE PROVIDED AT STR 14, 20, AND 48. SEE DETAIL 7 ON DRAWING 2200-SPUR RACKS FOR MORE INFORMATION AND SHALL BE ORIENTED ON A FLAT THAT DOES NOT INTERFERE WITH THE INFORMATION AND SHALL BE PROVIDED ON A DOWNLEAD TABS. PER DETAIL 9 ON DRAWING 2200-DETAILS.
  - FOR STRUCTURES WITH OPTIC FIBER SPUR RACKS AND SHALL BE ORIENTED ON A FLAT THAT DOES NOT INTERFERE WITH OTHER ATTACHMENTS.

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REV #	DESCRIPTION	DATE	BY	CHK	APP
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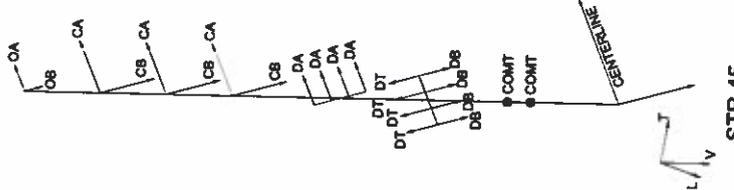


PROJECT	NO. 10170000	SCALE	AS SHOWN
APPROVED	DATE	DATE	DATE
DRAWING NO.	2200-18-0-DWG		

FILE: ROCHELLE MUNICIPAL UTILITIES  
 RITCHE TO CENTERPOINT 34 BAY LINE  
 T8-50-ENG  
 CORNER OGDUNO ON DRILLED PIER



**LOADING DIAGRAMS**



**Technical Specification 45**

Level	Description	Wind / Ice / Temp		Load Case					Load Factor
		Wind	Temp	OA	OB	CA	CB	DT	
1	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
2	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
3	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
4	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
5	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
6	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
7	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
8	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
9	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
10	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
11	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
12	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
13	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
14	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0
15	Normal	100%	100%	1.0	1.0	1.0	1.0	1.0	1.0

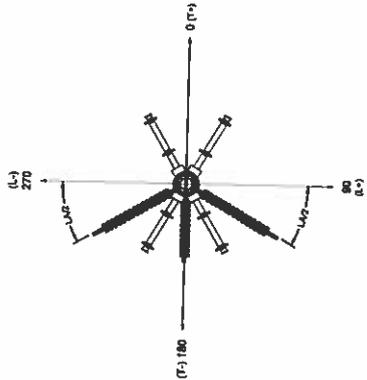
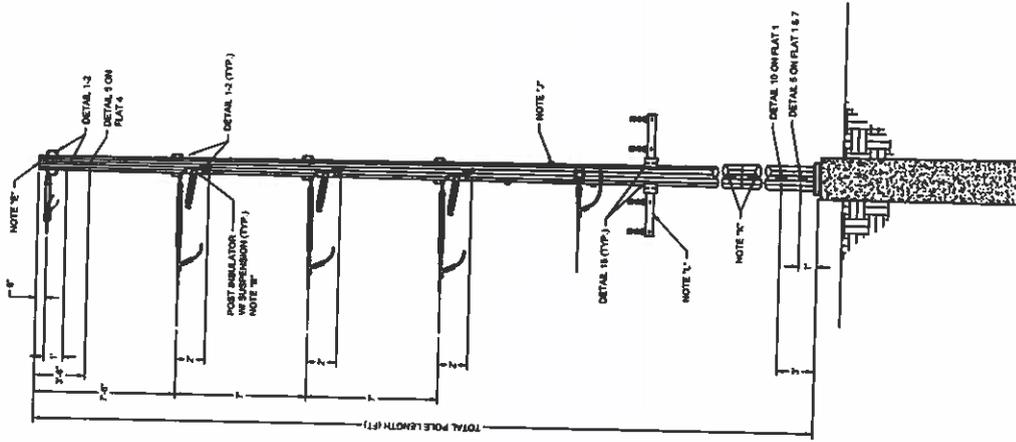
The information provided shall be applied to all other similar utility structures. The information provided shall be applied to all other similar utility structures. The information provided shall be applied to all other similar utility structures.

Wire Symbol	Wire Type	MESC HV Tension (lbs)	Rating Span (ft)	Wind Span (ft)	Weight Span (ft)
OA	DND-13429	5000	445	400	400
OB	DND-13429	5100	489	400	400
CA	T2 397.5 KOMIL "IBIS" ACSR	11400	445	400	400
CB	T2 397.5 KOMIL "IBIS" ACSR	11400	489	400	400
DA	336.4 KOMIL 18/1 "MERLIN" ACSR	3400	233	200	200
DB	336.4 KOMIL 18/1 "MERLIN" ACSR	3400	275	200	200
DT	336.4 KOMIL 18/1 "MERLIN" ACSR	3400	179	200	200
COMT	ADSS ALCOA	1890	220	300	600

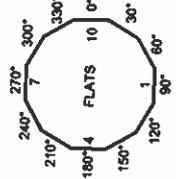
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PROJECT: ROCKWELL MUNICIPAL UTILITIES  
 RITCHIE TO CENTERPOINT 36 KV LINE  
 TR-62-EMO  
 CORNER DRAWING ON DRILLED PIER  
 DATE: 10/17/2008  
 DRAWING NO: 2008-12-00-00  
 SHEET: 3



PLAN



**GENERAL NOTES:**

- A. STRUCTURE POLE CLASS, LENGTH, AND EMBEDMENT ARE SPECIFIED IN STRUCTURE TABLE PROVIDED WITH RFP.
- B. INSULATOR LINE POST (ILP) INSULATOR IS MACLEAN'S H02C1003100281818. FABRICATOR SHALL ENSURE SLEAVED HOLES ARE SIZED AND SPACED TO ACCOMMODATE ILP.
- C. POLE INSULATOR TO PROVIDE ALL BOLTS, NUTS, WASHERS, AND OTHER MOUNTING EQUIPMENT.
- D. STRUCTURE DETAILS LOCATED ON DRAWING 2000-DETAILS.
- E. THE POLE TOP SHALL BE COVERED WITH A PERMANENTLY ATTACHED 3/16\"/>

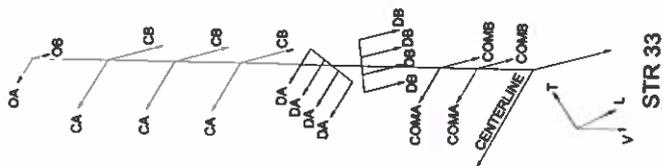
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REV #	DESCRIPTION	DATE	BY	CHK	APP
0	ISSUED FOR PROCUREMENT	10/17/2008	JMM	AT	JMM



FILE NO. ROCHELLE MUNICIPAL UTILITIES  
 RITCHE TO CENTERPOINT 24.8V LINE  
 LARGE 3-004-DWG  
 ON ORLEANS  
 DATE: 10/17/2008  
 DRAWN BY: JMM  
 CHECKED BY: AT  
 2008-10-04-DWG  
 SHEET 1 OF 2

# LOADING DIAGRAMS



Terminal Description: 22

Lead Code	Description	Wind / Ice / Temp	Leads (ft)										Lead Factor	
			OA	OB	CA	CB	DA	DB	COMA	COMB				
1	MSC 100A	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
2	MSC 200C	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
3	MSC 200B	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
4	MSC 200A	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
5	MSC 100B	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
6	MSC 100C	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
7	MSC 100D	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
8	MSC 100E	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
9	MSC 100F	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
10	MSC 100G	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
11	MSC 100H	Temp / 10 / 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1

\*The maximum vertical load shall be applied to any position using a vertical load factor of 1.4 unless otherwise specified.  
 \*The maximum horizontal load shall be applied to any position using a horizontal load factor of 1.4 unless otherwise specified.  
 \*The applied vertical load on all leads is assumed to be obtained with the 2.0 standard load factor.  
 \*The applied horizontal load on all leads is assumed to be obtained with the 2.0 standard load factor.  
 \*The maximum deflection shall be limited to 2% of the pole height under the distribution load and 1% under all other load cases.

Wire Symbol	Wire Type	MSC HV Tension (lbs)	Routing Span (ft)	Wind Span (ft)	Weight (lb)
OA	DMO-13429	4800	417	400	300
OB	DMO-13429	5000	516	400	400
CA	T2 397.5 EGMIL "865" ACSR	11000	417	400	400
CB	T2 397.5 EGMIL "865" ACSR	11400	485	400	400
DA	336.4 EGMIL "867" MERLIN ACSR	3400	194	300	300
DB	336.4 EGMIL "867" MERLIN ACSR	3400	263	300	300
COMA	A055 ALCOA	18000	193	300	300
COMB	A055 ALCOA	20000	256	300	300

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REV	DESCRIPTION	DATE	BY	CHK	APP
1	ISSUED FOR PROCUREMENT	01/17/2024	MM	AT	MM



DATE	01/17/2024	BY	MM
APPROVED	MM	DATE	01/17/2024
PROJECT	200178-00A-00	ISSUE	1
CLIENT	ROCHELLE MUNICIPAL UTILITIES	PROJECT	2
LOCATION	RITCHE TO CENTERSPOINT 24.8KV LINE	PROJECT	3
PROJECT	LARGE ANGLE DEADEND	PROJECT	4
PROJECT	REVISION	PROJECT	5
PROJECT	REVISION	PROJECT	6
PROJECT	REVISION	PROJECT	7
PROJECT	REVISION	PROJECT	8



# LOADING DIAGRAMS

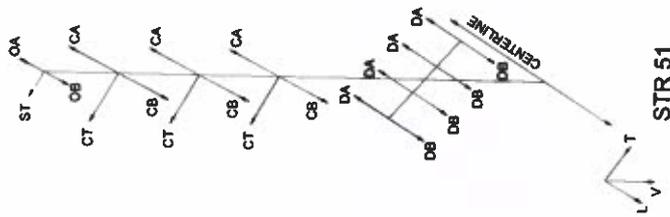


Table 1: Loading Diagram 1 (CP-T)

Load Case	Description	Wind / Ice / Temp	OA	OB	OC	OD	OE	OF	OG	OH	OI	Load Number
1	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1
2	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2
3	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3
4	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	4
5	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	5
6	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	6
7	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	7
8	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	8
9	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	9
10	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10
11	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	11

Table 2: Loading Diagram 2 (CP-T)

Load Case	Description	Wind / Ice / Temp	OA	OB	OC	OD	OE	OF	OG	OH	OI	Load Number
1	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1
2	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2
3	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3
4	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	4
5	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	5
6	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	6
7	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	7
8	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	8
9	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	9
10	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10
11	WIND	15/0/0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	11

Table 3: Wire Data

Wire Symbol	Wire Type	RESC HV Tension (lbs)	Span (ft)	Weight / Span (lb)
OA	DNO-13A29	500	50	200
OB	DNO-13A29	5000	445	300
OC	7 # 9 ALLUMWELD	500	40	200
OD	7 # 9 ALLUMWELD	500	40	200
OE	7 # 9 ALLUMWELD	500	40	200
OF	7 # 9 ALLUMWELD	500	40	200
OG	7 # 9 ALLUMWELD	500	40	200
OH	7 # 9 ALLUMWELD	500	40	200
OI	7 # 9 ALLUMWELD	500	40	200

Table 4: Wire Data

Wire Symbol	Wire Type	RESC HV Tension (lbs)	Span (ft)	Weight / Span (lb)
OA	DNO-13A29	500	50	200
OB	DNO-13A29	5000	445	300
OC	7 # 9 ALLUMWELD	500	40	200
OD	7 # 9 ALLUMWELD	500	40	200
OE	7 # 9 ALLUMWELD	500	40	200
OF	7 # 9 ALLUMWELD	500	40	200
OG	7 # 9 ALLUMWELD	500	40	200
OH	7 # 9 ALLUMWELD	500	40	200
OI	7 # 9 ALLUMWELD	500	40	200

STR 51

STR 1 (CP-T)

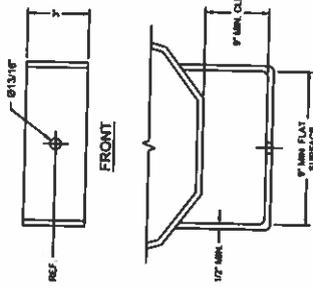
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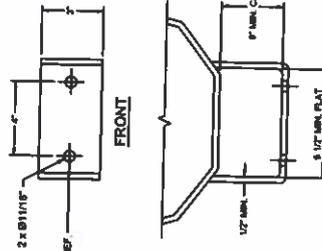
DATE	10/17/2025	ISSUE	1
DATE	10/17/2025	ISSUE	2
DATE	10/17/2025	ISSUE	3
DATE	10/17/2025	ISSUE	4

ROCHELLE MUNICIPAL UTILITIES  
 RITCHE TO CENTERPOINT 24 SV LINE  
 TS-500-MO-ENG  
 3-WAY DEAD-END TAP W/ MODIFIED  
 DATE: 10/17/2025

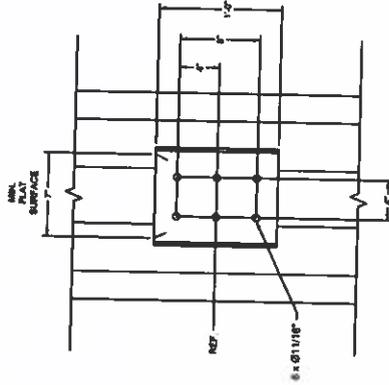
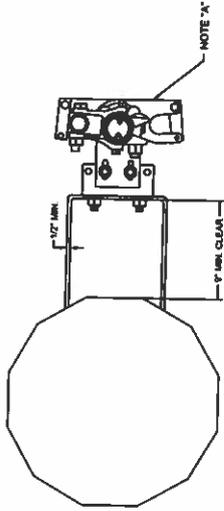




PLAN  
DETAIL "A"  
SWITCH MOUNTING BRACKET



PLAN  
DETAIL "B"  
PIPE GUIDE MOUNTING BRACKET



DETAIL "C"  
OPERATOR MOUNTING BRACKET

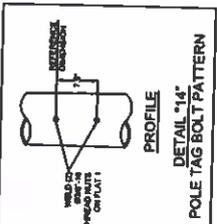
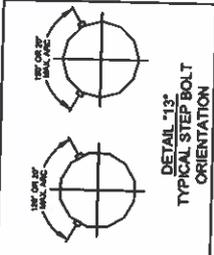
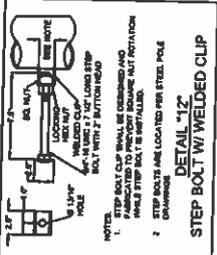
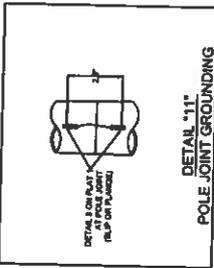
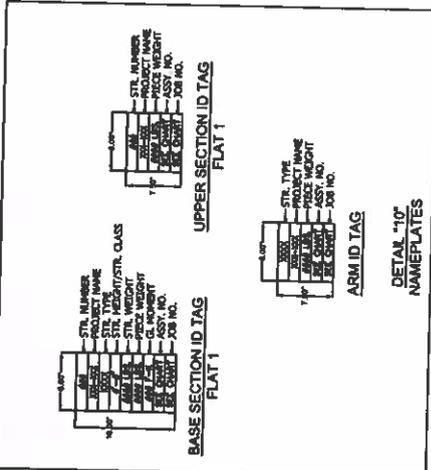
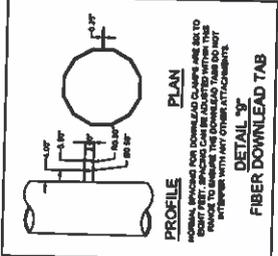
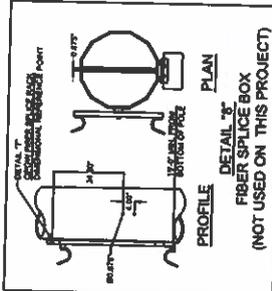
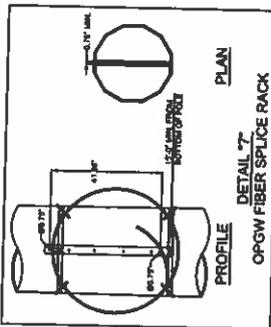
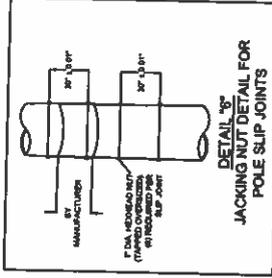
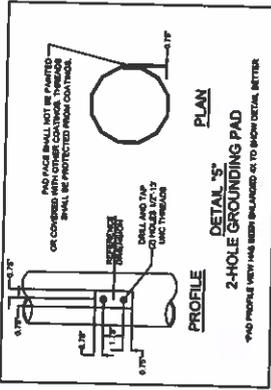
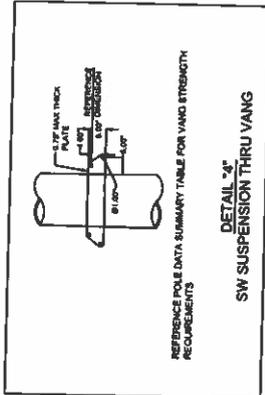
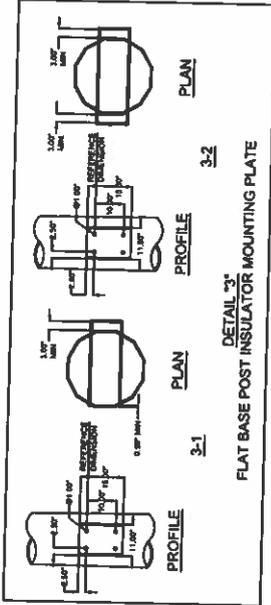
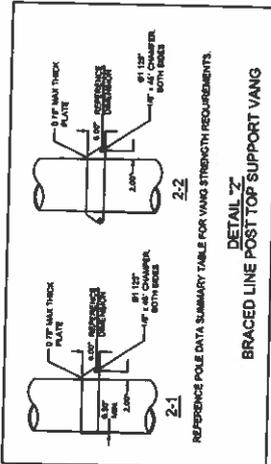
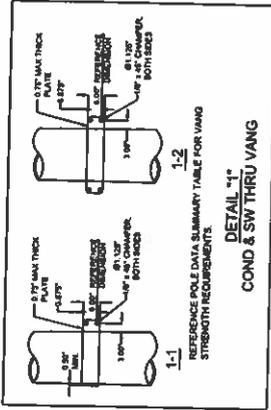
GENERAL NOTES:  
A. DEVICE SHOWN IS A SWING HANDLE. THE SWITCH ASSEMBLY ON ORDER WILL BE OPERATED BY A R.I.O. DEVICE.

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REV #	DESCRIPTION	DATE	BY	CHKD	APPV
0	ISSUED FOR PROCUREMENT	10/7/2006	MM	AT	MM



TITLE	ROCHELLE MUNICIPAL UTILITIES	DATE	10/7/2006	SCALE	N/A	SHEET	1
PROJECT	ROCHELLE MUNICIPAL UTILITIES	APPROVED	MM				
DESIGNED BY	ROCHELLE MUNICIPAL UTILITIES	DRAWING NO.	2006-TM-U-VERT-07L				
DATE	10/7/2006	SCALE	N/A				

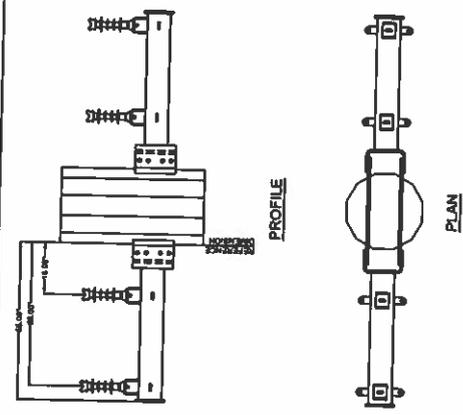


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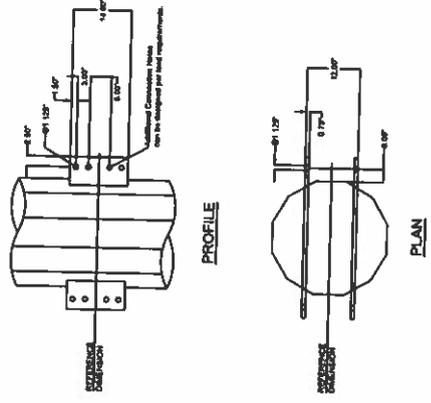
DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD
REV #	DESCRIPTION	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY
0	ISSUED FOR PROCUREMENT	10/27/2023	NEW	AT	NEW	AT	NEW	AT	NEW



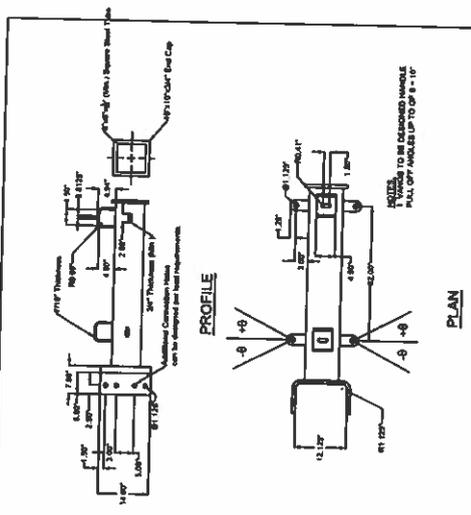
TITLE	ROCHELLE MUNICIPAL UTILITIES	DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD
PROJECT	RITCHIE TO CENTERPOINT 4.5KV LINE	DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD
DRAWING #	STEEL DETAILS	DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD
PROJECT #	2023-02/VALS	DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD
SCALE	1" = 1"	DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD
SHEET	1	DATE	10/27/2023	BY	AT	CHKD	DATE	10/27/2023	BY	AT	CHKD



15-1  
FABRICATED STEEL ARM  
ASSEMBLY



15-2  
STEEL ARM THRU VANG



15-3  
FABRICATED STEEL ARMS

FABRICATED STEEL ARM DETAIL FOR UNDERBUILD DEADENDS

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REV #	DESCRIPTION	DATE	BY	CHKD	APPV
0	ISSUED FOR PROCUREMENT	07/2023	DMW	AT	MA



TITLE	ROCHELLE MUNICIPAL UTILITIES ATTACHE TO CENTERPOINT 34.5KV LINE STEEL DETAILS	DATE	07/2023	SCALE	NA
DRAWN	DMW	DATE	07/2023	SHEET	1 OF 3
APPROVED	MA				
CHECKED	DMW				

## Braced Post Insulator Assembly B2901054B11074AX

Item #	CAT #	Qty.
1)	H2 90 10 044 AX SS 017	[1]
2)	S1 90 90 062 VX SS 016	[1]
3)	Shackle (ASH-55-BC)	[2]

### ASSEMBLY DIMENSIONAL VALUES

Post Section Length (PSL)	54.3 in	1,379 mm
Suspension Section Length (SSL)	75.3 in	1,913 mm
Height of Assembly (H1)	74.0 in	1,880 mm
Connection Height (H2)	67.9 in	1,723 mm
Length of Brace (B)	80.2 in	2,037 mm
Upper Pole Connection Offset (A)*	2.0 in	51 mm
Angle Between Insulators (C)	62 Degrees	
Dry Arc Distance	45.0 in	1,143 mm
Leakage Distance	120.5 in	3,061 mm

\*Connection bracket to be supplied by customer (if applicable)

### ASSEMBLY ELECTRICAL VALUES\*

60 Hz Dry F.O. (Min. Withstand)	429 kV	(402) kV
60 Hz Wet F.O. (Min. Withstand)	397 kV	(313) kV
CIFO+ (Min. Withstand)	741 kV	(661) kV
CIFO- (Min. Withstand)	808 kV	(700) kV

\*Values shown are based on minimum electricals for the assembly

### ASSEMBLY MECHANICAL VALUES

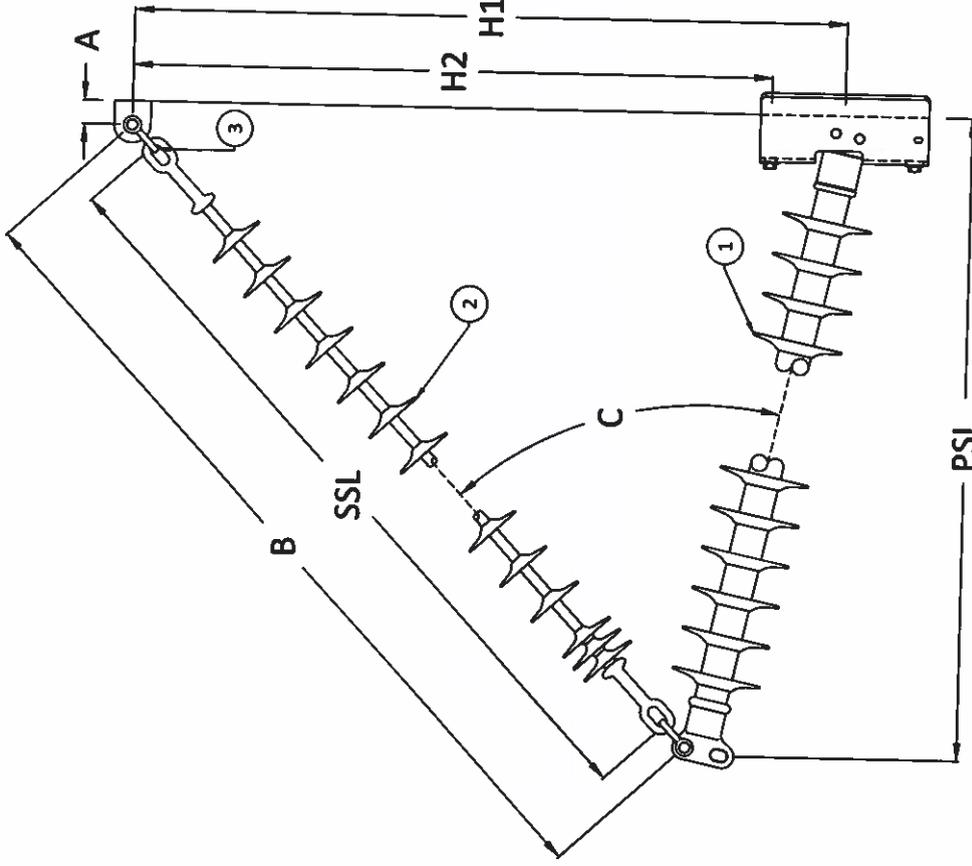
Maximum Working Vertical Load	11,283 lbs	50.2 kN
Longitudinal Stiffness	2,176 lbs/ft	2,950 N•m

Created On: 6/4/2024

Created By: ESH

Revision: B

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Note: Braced post image not to scale

MPS Catalog Number:

**H2 90 10 044 AX SS 017**

Date:

03/31/2021

**End Fittings**

Tower End Fitting:

Gain / 12 deg / Steel

Line End Fitting:

Anchor / Ductile Iron  
2 HL Drop Tongue / Galv. Ductile Iron

**Material**

Corona Ring (Tower):

None

Corona Ring (Line):

None

Corona Rings are recommended for applications of 230 kV and above

Mounting Angle:

12 deg

Number of Sheds:

17

Rod Diameter:

2.5 in

Weight Estimate:

69.1 lbs

**Dimensional Values**

Section Length (L):

54.3 in  
1,379 mm

Rubber Length (X):

44 in  
1,118 mm

Shed spacing (S):

2.5 in  
64 mm

Shed Projection (P):

2.4 in  
61 mm

Dry Arc Distance:

46.9 in  
1,191 mm

Leakage Distance:

120.5 in  
3,061 mm

**Electricals Values**

60 Hz dry Flashover (Min. Withstand):

446 kV

60 Hz Wet Flashover (Min. Withstand):

413 kV

CIFO Positive (Min. Withstand):

771 kV

CIFO Negative (Min. Withstand):

832 kV

**Mechanical Values**

Max. Design Cant. Load (MDCL):

1,624 lbs

Specified Cant. Load (SCL):

3,248 lbs

Specified Tensile Load (STL):

15,000 lbs

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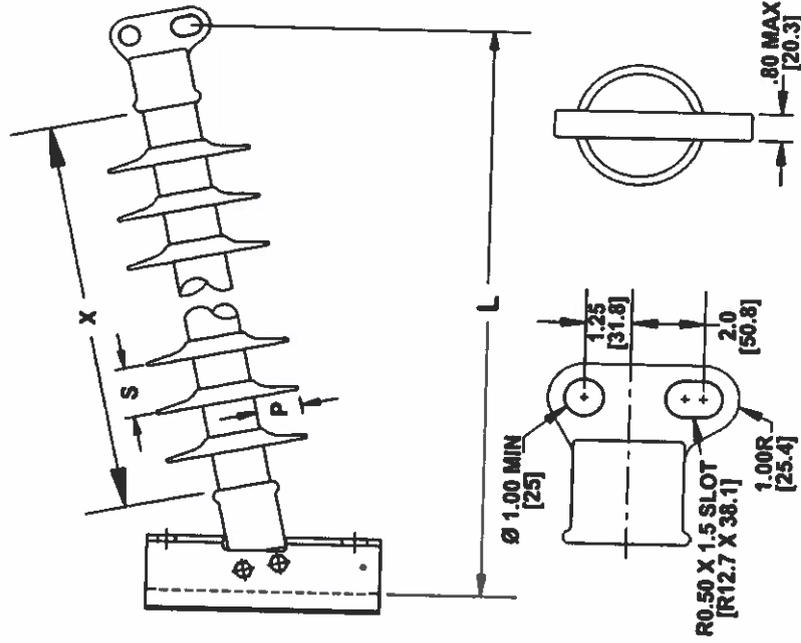
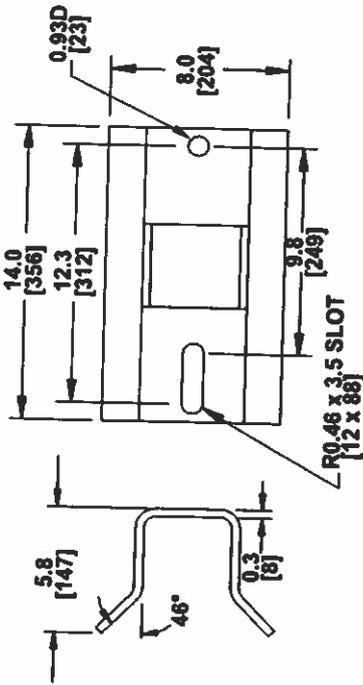
Notes:

Dimension: inches [millimeters]

NOTE: Drawing not actual depiction of insulator appearance.

Silicone rubber sheath and sheds complies with applicable ANSI and IEC standards.

Prepared By: Dylan Huegel



MPS Catalog Number:

**S1 90 90 062 VX SS 016**

Date:

04/14/2021

**End Fittings**

Tower End Fitting:

Eye

Line End Fitting:

Eye

**Material**

Corona Ring (Tower):

None

Corona Ring (Line):

None

Corona Rings are recommended for applications of 230 kV and above

Number of Sheds:

16 Standard

Rod Diameter:

16 mm

Weight Estimate:

10.9 lbs  
5 kg

**Dimensional Values**

Section Length (L):

1,915 mm

Rubber Length (X):

1,575 mm

Standard Shed Height (P):

54 mm

Shed Spacing (S):

117 mm

Dry Arc Distance:

1,661 mm

Leakage Distance:

3,119 mm

**Electricals Values**

60 Hz dry Flashover (Min. Withstand):

637 kV

60 Hz Wet Flashover (Min. Withstand):

558 kV

CIFO Positive (Min. Withstand):

1074 kV

CIFO Negative (Min. Withstand):

1129 kV

**Mechanical Values**

Specified Mech. Load (SML):

25,000 lbs  
111.2 kN

Routine Test Load (RTL):

12,500 lbs  
55.6 kN

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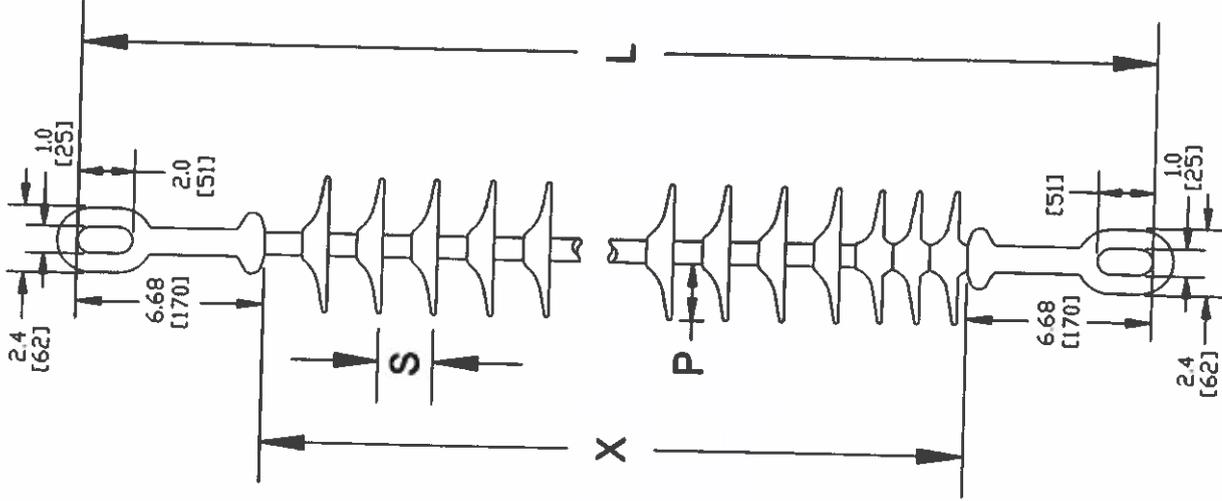
Notes:

Dimension: inches [millimeters]

NOTE: Drawing not actual depiction of insulator appearance.

Silicone rubber sheath and sheds complies with applicable ANSI and IEC standards.

Prepared By: Hunter Seabolt



MPS Catalog Number:

**S1 40 80 038 MX SS 019**

Date:

11/07/2023

### End Fittings

Tower End Fitting:

Y-Clevis

Line End Fitting:

Ball (ANSI 52-5)

### Material

Corona Ring (Tower):

None

Corona Ring (Line):

None

Corona Rings are recommended for applications of 230 kV and above

Number of Sheds:

19 Standard

Rod Diameter:

16 mm

### Dimensional Values

Section Length (L):

49.9 in

Rubber Length (X):

38.3 in

Standard Shed Height (P):

2.32 in

Shed Spacing (S):

2 in

Dry Arc Distance:

40.7 in

Leakage Distance:

119 in

### Electricals Values

60 Hz dry Flashover (Min. Withstand):

402 kV (373) kV

60 Hz Wet Flashover (Min. Withstand):

362 kV (315) kV

CFO Positive (Min. Withstand):

693 kV (599) kV

CFO Negative (Min. Withstand):

737 kV (645) kV

### Mechanical Values

Specified Mech. Load (SML):

25,000 lbs 111.2 kN

Routine Test Load (RTL):

12,500 lbs 55.6 kN

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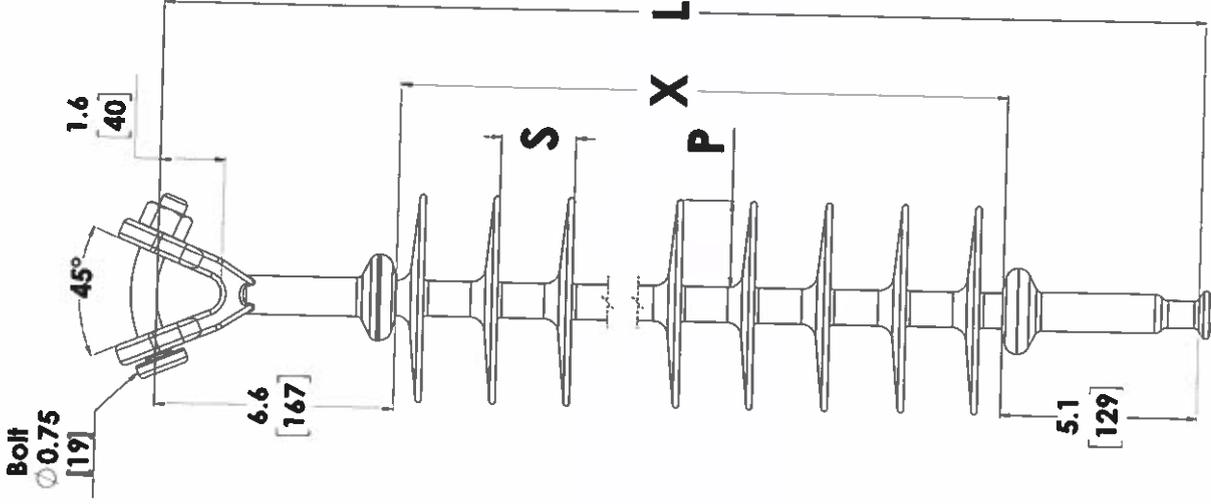
Dimension: inches [millimeters]

Silicone rubber sheath and sheds complies with applicable ANSI and IEC standards.

NOTE: Drawing not actual depiction of insulator appearance.

Notes:

Prepared By: Evan Huber





7801 Park Place Rd.  
York, SC 29745 USA  
(803) 628-2100

MPS Catalog Number

**H2 9C 10 031 MX SS 016**

Date 7/14/2014

**End Fittings**

- Tower End Fitting: Galv / 12 deg / Ductile Iron
- Line End Fitting: 5" Bolt Circle / Galv. Ductile Iron  
2 HL Drop Tongue / Galv. Ductile Iron

**Material**

Corona Ring (Line) None  
Corona Rings are recommended for applications of 230 kV and above

- Mounting Angle: 12
- Number of Sheds: 16
- Rod Diameter: 2.5 in
- Weight Estimate: 50.4 lbs / 23 kg

**Dimensional Values**

- Section Length (L): 41.9 in / 1065 mm
- Rubber Length (X): 31 in
- Shed spacing (S): 2.0 in / 50 mm
- Shed Projection (P): 1.6 in / 41 mm
- Dry Arc Distance: 33.4 in / 848 mm
- Leakage Distance: 85.0 in / 2158 mm

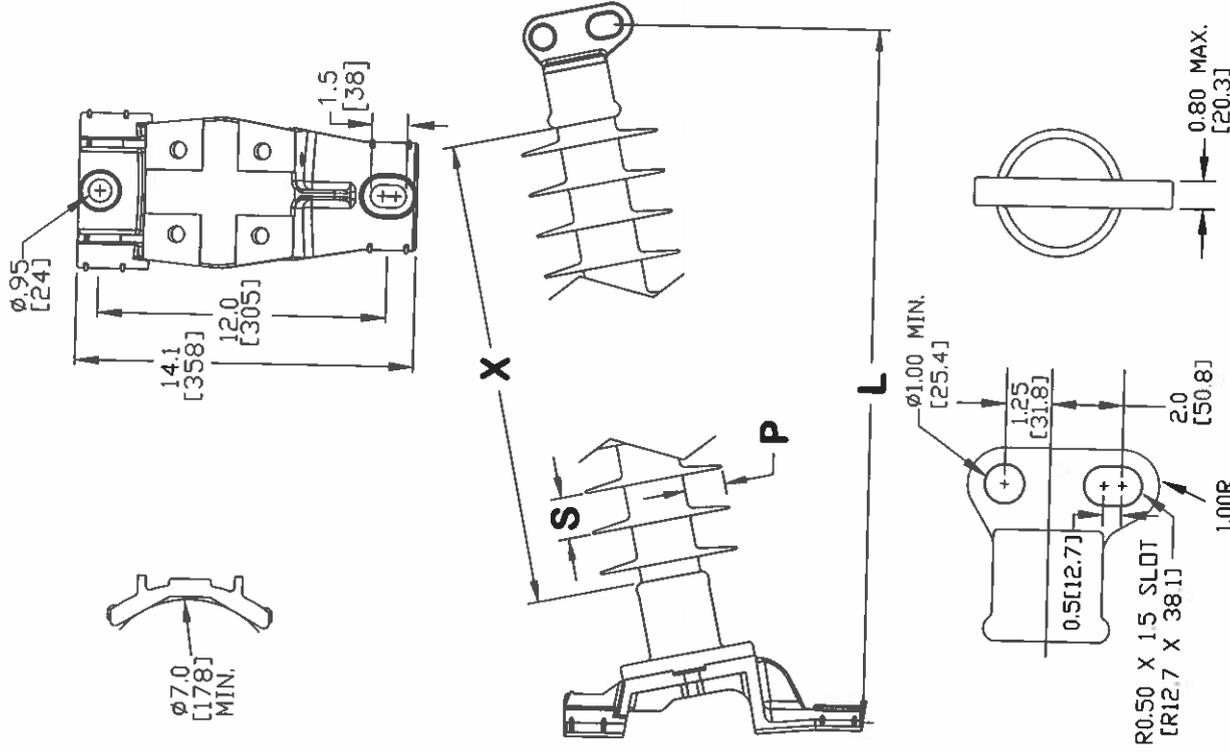
**Electricals Values**

- 60 Hz dry Flashover: 325 kV / Min. Withstand 305 kV
- 60 Hz Wet Flashover: 300 kV / Min. Withstand 233 kV
- Pos. Critical Impulse Flashover: 557 kV / Min. Withstand 498 kV
- Neg. Critical Impulse Flashover: 649 kV / Min. Withstand 534 kV

**Mechanical Values**

- Max. Design Cant. Load (MDCL): 2,328 lbs / 10.4 kN
- Specified Cant. Load (SCL): 4,656 lbs / 20.7 kN
- Specified Tensile Load (STL): 15,000 lbs / 66.7 kN

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Dimension: inches [millimeters]  
NOTE: Drawing not actual depiction of insulator appearance

Silicone Rubber Sheath & Sheds. Complies with applicable ANSI and IEC standards.

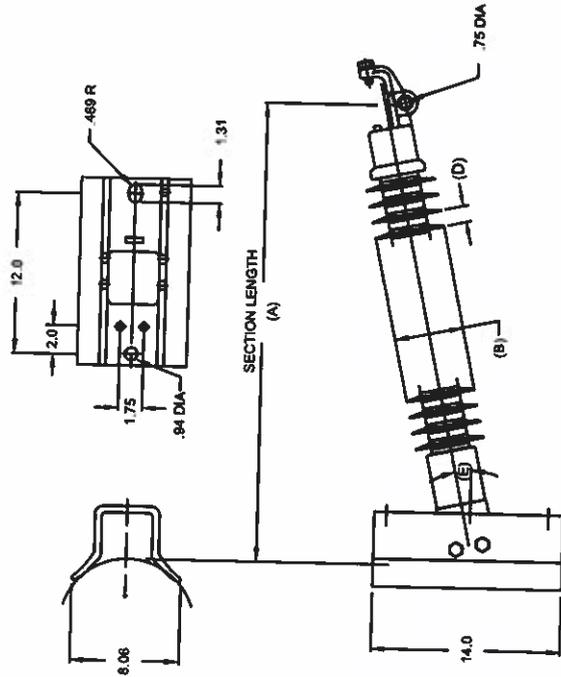
OHIO BRASS QUADRI-SIL LINE POST INSULATOR

CAT NO.: P250043S1020

REV: 01 June 6, 2023



HUBBELL POWER SYSTEMS INC.  
 CUSTOMER SERVICE: (573) 682-5521  
[www.hubbellpowersystems.com](http://www.hubbellpowersystems.com)



END FITTINGS AND MATERIALS

TOWER END Gain - AJ - 12in CL - 7/8 Bolts  
 LINE END HORIZONTAL CLAMPTOP CAP / GALV STEEL

NOTES:

1. SILICONE RUBBER SHEATH AND SHEDS. WASHABLE PER IEEE P957
2. ELECTRICAL VALUES PER ANSI C29.11 (IEC 61952 IEC 62217)

MECHANICAL VALUES	LBS	KN
MAX DESIGN CANTILEVER LOAD (RCL)	1600	7.1
SPECIFIED CANTILEVER LOAD (SCL)	3200	14.2

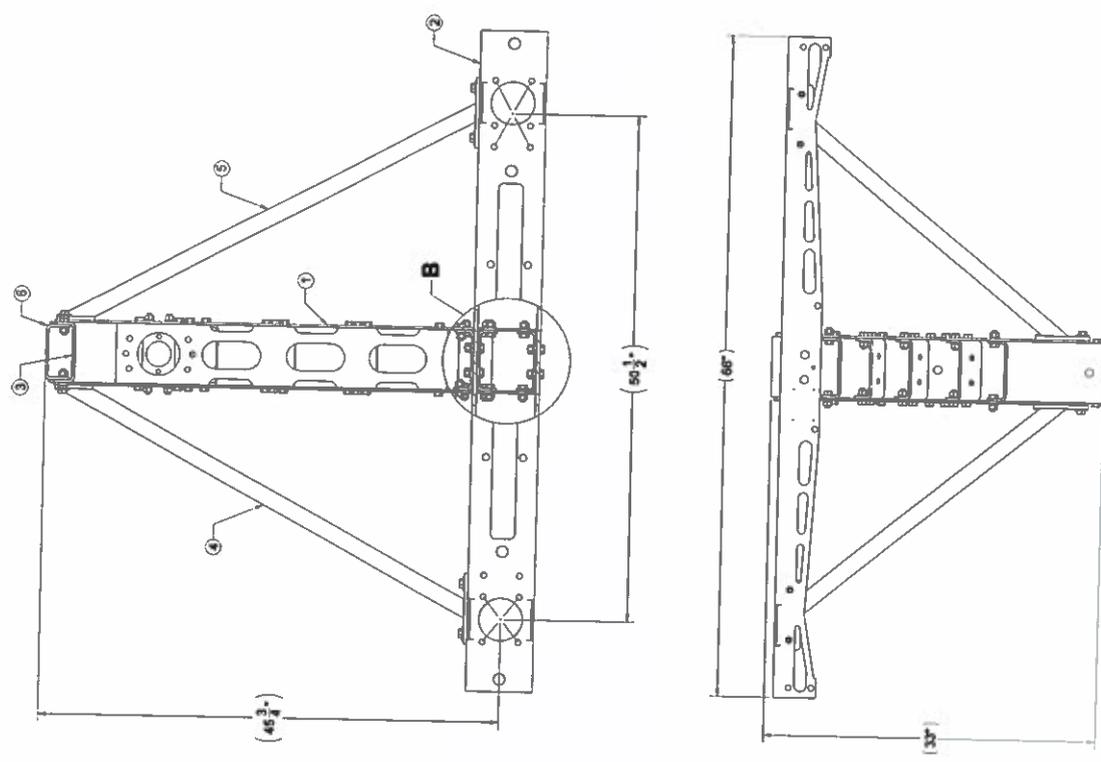
ELECTRICAL VALUES	KV
60 HZ DRY FLASHOVER (DRY WITHSTAND)	455
60 HZ WET FLASHOVER (WET WITHSTAND)	405 (300)
CRITICAL IMPULSE FLASHOVER + (WITHSTAND)	700 (630)
CRITICAL IMPULSE FLASHOVER - (WITHSTAND)	800 (720)
RIV AT 115% SYSTEM VOLTAGE	<100 $\mu$ V

DIMENSIONAL VALUES	IN.	MM
SECTION LENGTH (A)	56.6	1438
MAJOR SHED DIAMETER (B)	5.06	128.5
MINOR SHED DIAMETER (C)	-	-
SHED SPACING (D)	1.21	30.7
DRY ARC DISTANCE	44	1118
AVG. SHEATH THICKNESS	>0.118	>3
LEAKAGE DISTANCE	113	2870
CORE ROD DIAMETER	2.50	63.5

OTHER DETAILS	WEIGHT
CORONA RING (TOWER)	NONE
CORONA RING (LINE)	N/A
TORQUE REQUIREMENTS	12 DEG
MOUNTING ANGLE (E)	36
NUMBER OF SHEDS	54 lbs.
WEIGHT	24 kg.

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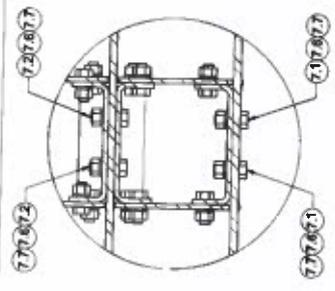
(Switch Frame Only - Part of 1GL069203SN drawing)



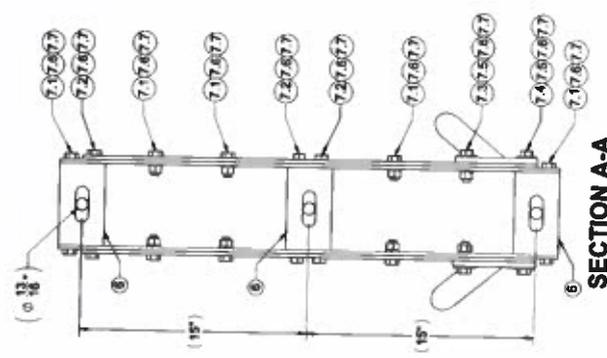
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	V819-6223	1	CENTER SECTION, GRV & BELOW, 1-WAY, BOLT-TOGETHER
2	V819-6224	1	PHASE MOUNTING PLATFORM, 6-WAY, 1-WAY
3	V819-6225	1	BACK CHANNEL, GRV & BELOW, STEEL
4	V819-6226	1	SPACE WELDMENT, GRV & BELOW, 1-WAY, LH
5	V819-6227	1	SPACE WELDMENT, GRV & BELOW, 1-WAY, RH
6	V819-5229	3	MOUNTING BRACKET, STEEL, FLAT BACK
7	V819-6230	1	FRAME ASSTY., HARDWARE, GRV & BELOW, 1-WAY, BOLT-TOGETHER

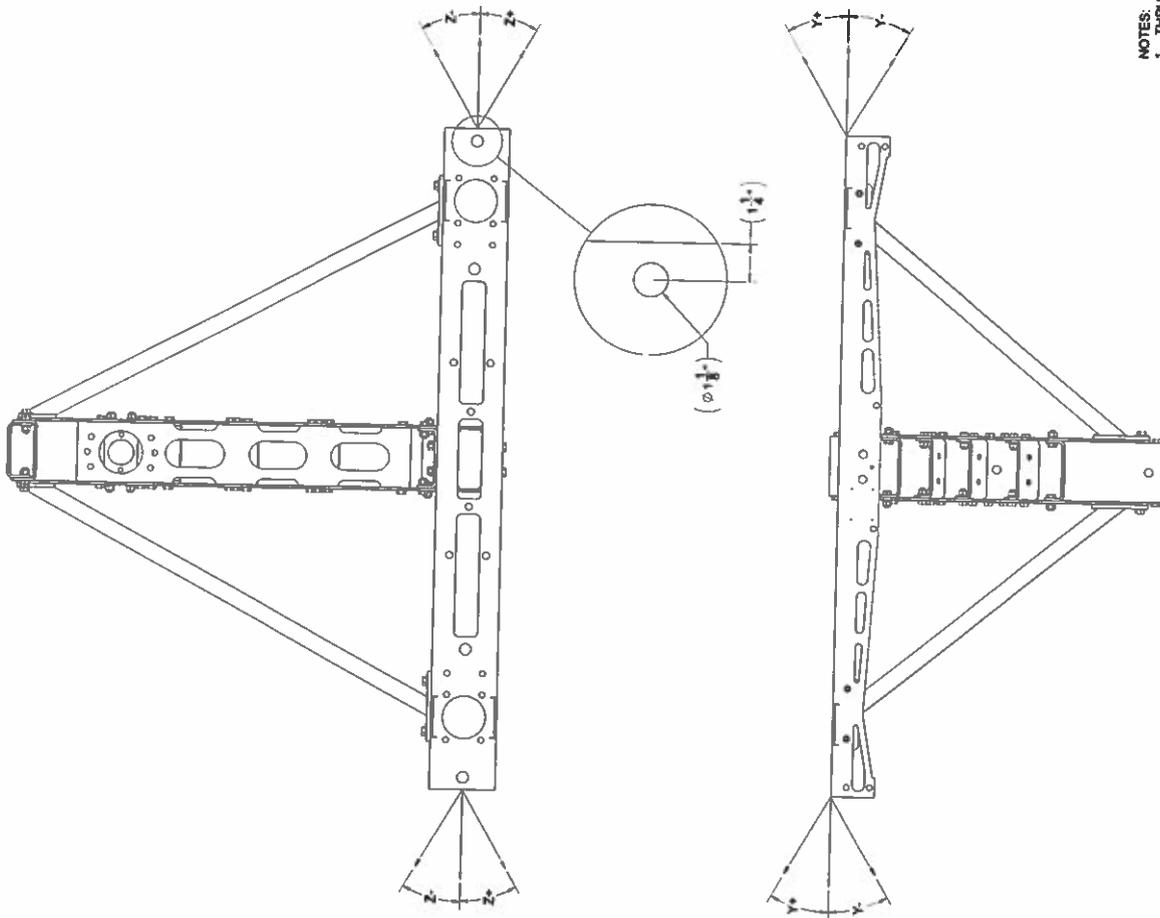
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
7	1079-6209	7	FRAME ASSTY., HARDWARE, GRV & BELOW, 1-WAY, BOLT-TOGETHER
7.1	54488	12	HMMB, 1/2" x 13 x 1 1/4" L.O., OS
7.2	54889	12	HMMB, 1/2" x 13 x 1 1/4" L.O., OS
7.3	56481	2	HMMB, 1/2" x 13 x 1 1/4" L.O., OS
7.4	56485	2	HMMB, 1/2" x 13 x 1 1/4" L.O., OS
7.5	56485	6	HMMB, 1/2" x 13 x 1 1/4" L.O., OS
7.6	52371	26	FLAT WASHER, 1/2", ASM, OS
7.7	56305	26	HEX NUT, 1/2"-13, OS



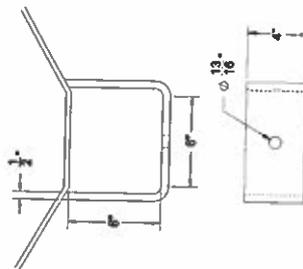
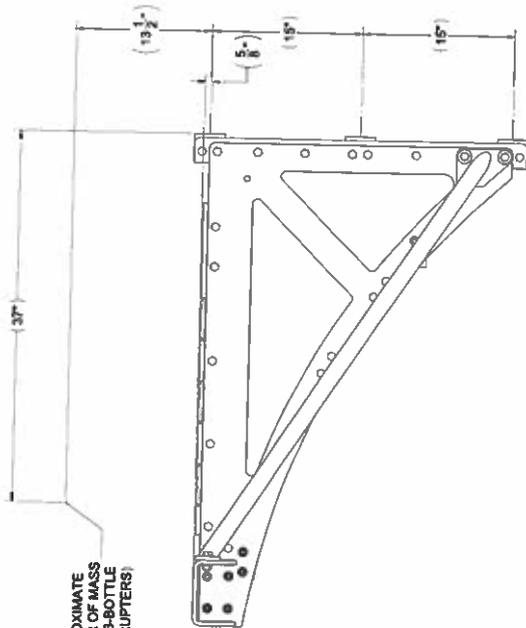
DETAIL B  
JOINING OF CENTER SECTION ① & PHASE PLATFORM ②



REVISIONS  
 NO. DESCRIPTION DATE APPROVED BY  
 1 SEE CO  
 TITLE  
 FRAME ASSTY., GRV,  
 TYPE OF BOLT,  
 TOGETHER, FLAT BACK  
 D V819-5821 A  
 REV  
 SCALE: 1:6 WEDBY 208 SHEET 1 OF 2



APPROXIMATE  
CENTER OF MASS  
(W/ 1M 3-BOTTLE  
INTERRUPTERS)



**FOR WELDED BRACKET MOUNTING**  
WELD BRACKETS PARALLEL TO THE SLOPE OF THE POLE.  
THREE BRACKETS ARE REQUIRED PER FRAME.  
SEE MOUNTING LOCATIONS ON SIDE VIEW.  
MOUNTING HARDWARE SUPPLIED BY SEECO.

**FOR THRU-BOLT MOUNTING**  
(3)  $\varnothing$  13/16" HOLES ARE REQUIRED PER FRAME FOR  $\varnothing$  3/4" THRU-BOLTS.  
SEE MOUNTING LOCATIONS ON SIDE VIEW.  
THRU-BOLTS SUPPLIED BY CUSTOMER.

APPROXIMATE AREA (ft <sup>2</sup> )	
LONGITUDINAL	TRANSVERSE
WITH ARCHING HORNS	965
WITH 1M MONORUPTRs <sup>®</sup> (3-BOTTLE)	1,550
WITH 5M MONORUPTRs <sup>®</sup> (3-BOTTLE)	1,340

Y	ALLOWABLE TENSION*	% OF FULL TENSION*
0 - 5'	10,000 #	100%
10'	5,000 #	50%
15'	3,750 #	37.5%

\*SEE NOTE 1.

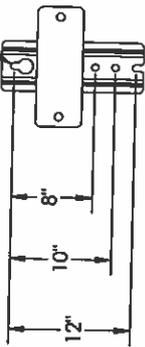
- NOTES:**
- THRU / MAIN LINE TENSION MAY BE PULLED AT AN ANGLE FOLLOWING THE Y-DIRECTION TABLE IN EITHER THE Y- OR Y+ DIRECTION PROVIDED BOTH SIDES ARE EITHER Y- & Y- OR Y+ & Y+.
  - THRU / MAIN LINE TENSION MAY BE PULLED UP TO 15' IN EITHER THE Z- OR Z+ DIRECTION PROVIDED BOTH SIDES ARE EITHER Z- & Z- OR Z+ & Z+.

REV	DESCRIPTION	DATE	APPROVED
1	SEECO		
TITLE: FRAME ASSTY, 684V, 1000V, 1500V, 2000V, 2500V, 3000V, 3500V, 4000V, 4500V, 5000V, 5500V, 6000V, 6500V, 7000V, 7500V, 8000V, 8500V, 9000V, 9500V, 10000V TOGETHER WITH BACK SEE DWG. NO. <b>D V819-5821</b> SCALE: 1:1 (NODRAWN SHEET)			

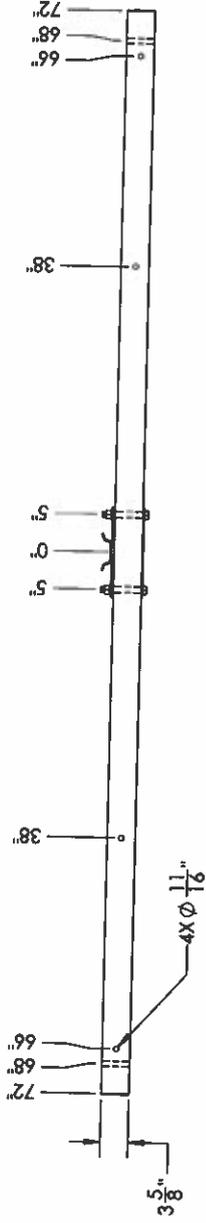
**PUPI®**  
www.pupicrossarms.com

# REPRESENTATIVE OF SERIES 2000, SERIES 2500, AND SERIES 3000 ASSEMBLIES

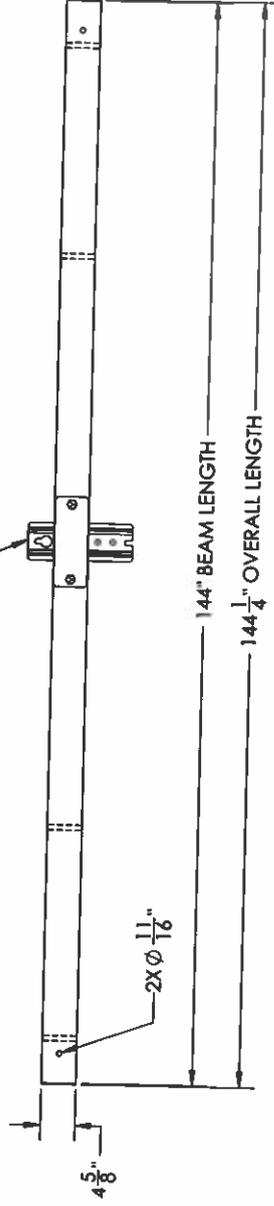
$\phi \frac{11}{16}$ "  
MOUNT HOLES



DETAIL -A-



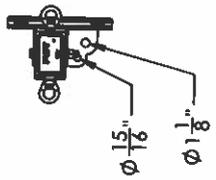
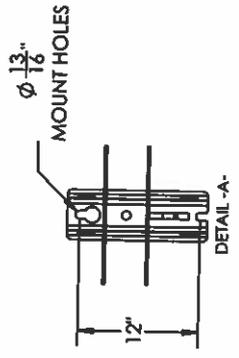
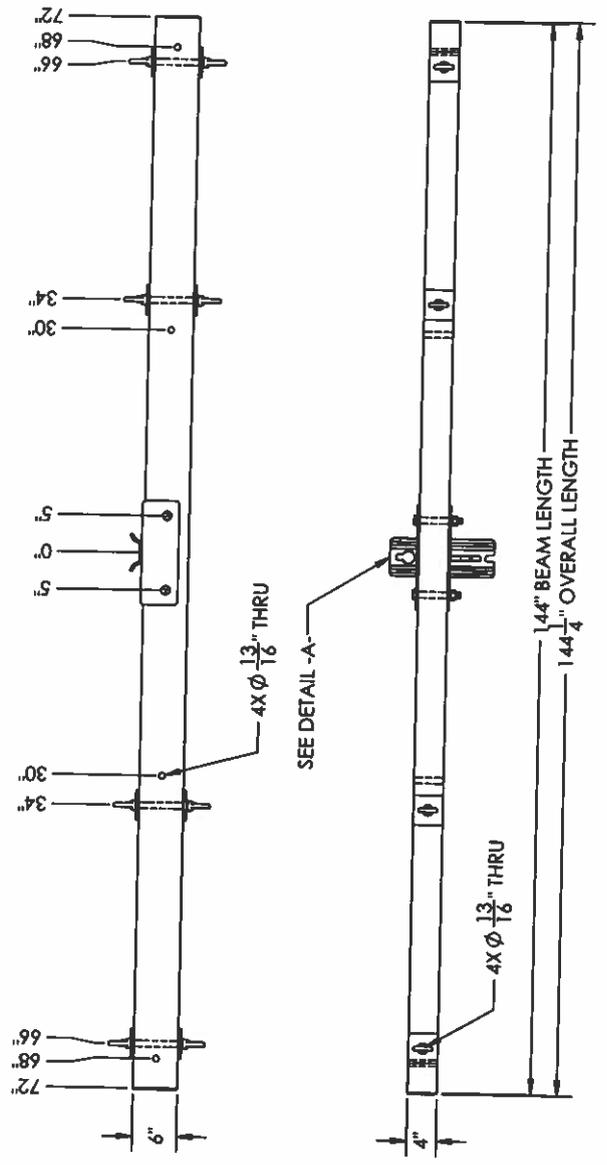
SEE DETAIL A



<p>---UNLESS OTHERWISE SPECIFIED--- DIMENSIONS ARE IN INCHES. INTERPRET DIM AND TOL PER ASME Y14.5-2009</p>	STATE:	2019-01-22
	DRAWN:	2019-01-22
<p>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF GEOTEK. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF GEOTEK IS PROHIBITED.</p>	CHECKED:	
	APPROVED:	
<p>THIRD ANGLE PROJECTION</p>	REPLACES:	
	DATE:	
<p>DESCRIPTION: <b>TANGENT ASSEMBLY</b> <b>144 in. PUPI SPX</b></p>		
<p>SIZE/DWG. NO. <b>B/TB----144SPX-</b></p>		
<p>1421 SECOND AVE NW STEWARTVILLE, MN 55976 (800) 533-1680 www.geotekinc.com</p>		
<p>BEAM COLOR: REV:</p>		<p>SHEET 1 OF 1</p>



# REPRESENTATIVE OF SERIES 4000 ASSEMBLY



<b>---UNLESS OTHERWISE SPECIFIED---</b> DIMENSIONS ARE IN INCHES INTERPRET DIM AND TOL PER ASME Y14.5-2009	STATE: _____ DRAWN: 2020-02-07 CHECKED: 2017-05-18 APPROVED: _____ REPLICAS: _____	<b>GEOTEK</b> A Whole New World of Composites 1421 SECOND AVE NW STEWARTVILLE, MN 55976 (800) 533-1680 www.geotekinc.com
	THRO ANGLE PROJECTION  DATE: _____	DESCRIPTION: <b>DEADEND ASSEMBLY</b> <b>144 in, PUPPI SPX</b> SIZE/DWG. NO.: <b>B DA4000144E4SPX-</b>



QUALITY STEEL POLES. DELIVERED.

2427 Kelly Ln, Houston, TX 77066

[sales@tappinc.com](mailto:sales@tappinc.com)

[www.tappinc.com](http://www.tappinc.com)

281-444-8277

## Customer References

**Dominion**

**Sheela Dean**

Sr Sourcing Specialist/Power Delivery Material

[Sheela.M.Dean@dominionenergy.com](mailto:Sheela.M.Dean@dominionenergy.com)

804-690-8221

**Basin Electric**

**Shane Vasbinder**

Senior Transmission Engineer

[Svasbinder@bepc.com](mailto:Svasbinder@bepc.com)

701-557-5779

**Pacificorp**

**Cameron Nielsen**

Associate Director, Supply Chain

[Cameron.Nielsen@pacificorp.com](mailto:Cameron.Nielsen@pacificorp.com)

801-220-4607

**Exelon**

**Rozeta Ali**

Senior Category Manager - T&S Category

[Rozeta.Ali@ComEd.com](mailto:Rozeta.Ali@ComEd.com)

630-290-1397



## Tablas de Tolerancias de Fabricación

Manufacturing Tolerance Tables

A.IP.02-10

ASTM A6. Tolerancias Internas de Grupo Poleas. Poleas Group Internal Tolerances. C.F.E. 16100-54.		CORTE DE TRAPEZOIDES. CUTTING OF TRAPEZOIDES.		Norma/Esp. Regulations/Spe.
Característica. Feature		Tolerancia. Tolerance.		
Longitud de trapezoid poste grande. Length Trapezoid of the large pole.		± 1"		Interna. Internal.
Longitud del trapezoid poste chico. Length Trapezoid of the small pole.		+3/4" - 1/4"		Interna. Internal.
Longitud de trapezoid brazos. Length Trapezoid of the arm.		± 1"		Interna. Internal.
Camber trapezoid poste grande. Camber in large pole trapezoid.		1/8" X Longitud del trapezoid (FT) / 5. 1/8" X Trapezoid Length (FT) / 5.		ASTM A6
Camber trapezoid poste chico. Camber in small pole trapezoid.		1/8" en cada 10 pies 1/8" in every 10 ft.		Interna. Internal.
Camber trapezoid brazos. Camber in arm trapezoid.		1/8" X Longitud del trapezoid (FT) / 5. 1/8" X Trapezoid Length (FT) / 5.		ASTM A6
Desarrollo de trapezoid poste grande. Development of large pole trapezoid.		± 2 mm		Interna. Internal.
Desarrollo de trapezoid poste chico. Development of small pole trapezoid.		± 3 mm		Interna. Internal.
Desarrollo de trapezoid brazos. Development of arm trapezoid.		± 2 mm		Interna. Internal.
Planicidad en trapezoides. Flatness on trapezoids.				
Localización de barrenos en trapezoides. Distance of holes in trapezoids.			PARA POSTES SE TOMA LA MITAD DE LO INDICADO EN ASTM A6 ± 3/8" de la corona del trapezoid. ± 3/8" of the trapezoid's top.	ASTM A6
Longitud de la sección. Section length.			POSTE GRANDE. LARGE POLE. Tolerancia. Tolerance.	Interna. Internal.
Redondeo diámetros menores de 36" en secciones. Rounding of diameters smaller than 36" on sections.		± 1"		Norma/Esp. Regulations/Spe.
Redondeo diámetros mayores de 36" en secciones. Rounding of diameters larger than 36" on sections.		± 1/4"		Interna. Internal.
Diámetro lado base y lado corona. Diameter bottom and top sides.		± 1/2"		Interna. Internal.
		± 1/8"		Interna. Internal.
Tordimiento total en poste. Total twisting.		a) 4° por sección a) 4° degrees per section. b) Para postes con placa estabilizadora se nivela en zona de empotramiento y se verifica el torcimiento con referencia en el nivel de tierra. b) For poles with stabilizer plate, level in the embedment area and check the twist with reference to the ground level. c) En ambos casos, la alineación de los accesorios deberá ser nivelada ± 1° con respecto al eje del poste. c) In both cases, the alignment in accessories shall be level ± 1° with respect to the pole axis.		Interna. Internal.
Diferencia de caras en los extremos. Difference of faces at the ends.		± 1/8"		Interna. Internal.
Diferencia de caras en el centro de la sección. Difference of faces at the center shaft.		±10% del tamaño nominal de la cara ±10% of nominal size face		Interna. Internal.
Empotramientos postes C.F.E. C.F.E. pole splice joint		+10% - 2% del empotramiento de diseño + 10% - 2% From splice joint design		C.F.E. 16100-54.

Empotramientos postes exportación. <i>Splice joint for exportation poles.</i>	+6" - 3" o lo que indique el plano de fabricación <i>+6" - 3" as according to the fabrication drawing.</i>	Interna. <i>Internal.</i>
Tolerancia entre tuercas para empotramientos. <i>Tolerance between jacking nuts.</i>	±1/16"	Interna. <i>Internal.</i>
Tolerancia en camber cuando por diseño sea requerido Camber. <i>Tolerance when required by design</i>	±10%	Interna. <i>Internal.</i>
Holgura entre secciones empotradas. <i>Gap between in slip joint for embedded sections.</i>	1/8", Máximo 2 caras seguidas con 1/4" y que el GAP mayor a 1/4" no exceda el 30% del perímetro. <i>1/8", Maximum 2 faces in a row with 1/4" and that the GAP greater than 1/4" does not exceed 30% of the perimeter.</i>	Interna. <i>Internal.</i>
Ángulos de doblez ( Proceso de doblado). <i>Bending angles (Bending process)</i>	± 0.5"	Interna. <i>Internal.</i>
Ángulos de doblez ( Después de conformado). <i>Bending edge (After forming).</i>	± 4"	Interna. <i>Internal.</i>
Caras sumidas. <i>Sunken faces.</i>	±1/8"	Interna. <i>Internal.</i>
Centrado de la sección con la placa base o brida. <i>Centering of the section with the base plate or flange.</i>	± 1/4"	Interna. <i>Internal.</i>
Perpendicularidad o escuadrado placa base, brida a caña. <i>Perpendicularity or square base plate, flange to shaft.</i>	1/8" en 60FT. <i>1/8" in 60FT.</i>	Interna. <i>Internal.</i>
Enderizado o fuera de línea recta. <i>Straightened or out of straight line.</i>	3" en cada 100FT. <i>3" in each 100FT.</i>	Interna. <i>Internal.</i>
Concavidad o convexidad en bridas. <i>Concavity or convexity in flanges.</i>	3/16" por brida, si excede esta tolerancia se presenta y debra quedar 3/16" entre bridas ensambladas. <i>3/16" per flange, if this tolerance is exceeded, 3/16" must remain between assembled flanges.</i>	Interna. <i>Internal.</i>
Abertura de barras con conexión a percha. <i>Opening of bars with connection to the bracket.</i>	-1/8" + 0"	Interna. <i>Internal.</i>
Tolerancia en paso de escalones N01. <i>Tolerance for distance between N01 step bolts.</i>	± 1"	Interna. <i>Internal.</i>
Tolerancia en paso de escalones McGregor. <i>Tolerance for distance between McGregor step clips.</i>	± 1"	Interna. <i>Internal.</i>
Tolerancia entre accesorios de ensamble. <i>Tolerance between fit up accessories.</i>	± 1/16"	Interna. <i>Internal.</i>
Tolerancia entre accesorios que no son de ensamble. <i>Tolerance between accessories not for fit up.</i>	± 1"	Interna. <i>Internal.</i>
Barrenos o galuceos de dren. <i>Drain holes.</i>	± 1/4" + 1/2" siempre y cuando queden por dentro de la caña. <i>± 1/4", +1/2" as long as they remain inside the shaft.</i>	Interna. <i>Internal.</i>
Tolerancia para placas base ancho, largo, diagonal, diametro. <i>Tolerances on gauge to base plate, length, diagonal, diameter.</i>	+1/2" - 1/8"	Interna. <i>Internal.</i>
Planicidad en placa base. <i>Flatness on base plates.</i>	ASTM A6	Interna. <i>Internal.</i>
Longitud y ancho de placas. (Excepto placas base /bridas). <i>Length and width of plates (except base plates/flanges)</i>	± 1/2" - 1/8"	Interna. <i>Internal.</i>
Diferencia entre ancho de caras generado por camber. <i>Difference between face width generated by camber.</i>	± 10% del ancho de la cara requerido. <i>± 10% of the required face width.</i>	Interna. <i>Internal.</i>
Excentricidad de barrenos. <i>Hole eccentricity.</i>	± 1/16"	Interna. <i>Internal.</i>
Distancia entre barrenos de una misma conexión. <i>Distance between holes of the same connection.</i>	± 1/16"	Interna. <i>Internal.</i>
Alineación de barrenos de perlas y barras <i>Alignment of bracket and bar holes</i>	±1/16" en un solo sentido todos <i>± 1/16" in one direction all.</i>	Interna. <i>Internal.</i>
Diametro de barrenos. <i>Hole diameter.</i>	+ 1/16" - 0"	Interna. <i>Internal.</i>
Vang que no son conexión a estructura H fuera de eje. <i>Vang that are not connection to off-axis H-structures.</i>	2° en un solo sentido todos. <i>2° in one direction all</i>	Interna. <i>Internal.</i>
Nivelado de conexiones de aisladores <i>Leveling of insulator connections</i>	1° en un solo sentido todos. <i>1° in one direction all.</i>	Interna. <i>Internal.</i>
Longitud de flocado en pernos de anclaje. <i>Thread length on anchor bolts.</i>	+ 2" - 0"	Interna. <i>Internal.</i>

Longitud en pernos de anclaje. <i>Length in anchor bolts</i>	± 1"	Interna. <i>Internal</i>
Longitud de la porción galvanizada en los pernos de anclaje. <i>Length of galvanized portion on anchor bolts.</i>	+ 12" - 0"	Interna. <i>Internal</i>
<b>POSTE CHICO. SMALL POLE.</b>		
Característica. <i>Feature.</i>	Tolerancia. <i>Tolerance.</i>	Norma/Esp. <i>Regulation/Spec.</i>
Longitud de los postes y cañas. <i>Length of poles and shafts.</i>	+ 3/4 - 1/4"	Interna. <i>Internal</i>
Díámetro. <i>Diameter.</i>	± 1/16"	Interna. <i>Internal</i>
Redondeo postes y cañas. <i>Rounding poles and shafts.</i>	± 1/16"	Interna. <i>Internal</i>
Redondeo postes ráfagas o similares. <i>Rounding of "rafaga" poles or similar.</i>	± 1/4"	Interna. <i>Internal</i>
Torcimiento postes barrenados. <i>Twisting of drilled poles.</i>	4°	Interna. <i>Internal</i>
Torcimiento postes nacionales. <i>Twisting of national poles.</i>	6°	Interna. <i>Internal</i>
Tolerancia entre accesorios de ensamble. <i>Tolerance between assembly accessories.</i>	± 1/16"	Interna. <i>Internal</i>
Tolerancia entre accesorios que no son de ensamble. <i>Tolerance between non-assembly accessories.</i>	± 1"	Interna. <i>Internal</i>
Centrado del poste con la placa base. <i>Centering of the pole with the base plate.</i>	± 1/8"	Interna. <i>Internal</i>
Enderezado o fuera de línea recta. <i>Straightened or out of straight line.</i>	3" en cada 100FT. <i>3" in each 100FT.</i>	Interna. <i>Internal</i>
Tolerancia para dimensión placa base. <i>Tolerance for the base plate dimension.</i>	± 1/4"	Interna. <i>Internal</i>
Perpendicularidad o escuadrado placa base, brida a caña. <i>Perpendicularity or square by base plate, flange to shaft.</i>	1/8" en 60FT. <i>1/8" each 60FT.</i>	Interna. <i>Internal</i>
Distancia entre barrenos placa base. <i>Distance between holes on the base plate.</i>	± 1/16"	Interna. <i>Internal</i>
Caras sumidas. <i>Sunken faces.</i>	1/8"	Interna. <i>Internal</i>
<b>BRAZOS. ARMS.</b>		
Característica. <i>Feature.</i>	Tolerancia. <i>Tolerance.</i>	Norma/Esp. <i>Regulation/Spec.</i>
Longitud de los brazos. <i>Length of the arms.</i>	± 1"	Interna. <i>Internal</i>
Díámetro. <i>Diameter.</i>	± 1/4"	Interna. <i>Internal</i>
Redondeo. <i>Rounding.</i>	± 1/4"	Interna. <i>Internal</i>
Torcimiento en brazo. <i>Arm twisting.</i>	4°	Interna. <i>Internal</i>
Tolerancia entre accesorios de ensamble. <i>Tolerance between assembly accessories.</i>	± 1/16"	Interna. <i>Internal</i>
Tolerancia entre accesorios que no son de ensamble. <i>Tolerance between non-assembly accessories.</i>	± 1"	Interna. <i>Internal</i>
Centrado de la caña a la percha. <i>Centering of the shaft to the bracket.</i>	± 1/8"	Interna. <i>Internal</i>
Desviación de la caña con respecto a la percha. <i>Shaft deviation according to the bracket.</i>	± 1" y no mayor a 1.5" fuera del eje en cualquier longitud. <i>± 1" and no more than 1.5" off axis.</i>	Interna. <i>Internal</i>
Elevación del brazo. <i>Rise.</i>	+ 1" - 0"	Interna. <i>Internal</i>
Enderezado o fuera de línea recta. <i>Straightened or out of straight line.</i>	3" en cada 100FT. <i>3" each 100FT.</i>	Interna. <i>Internal</i>

Diferencia entre ancho de caras. <i>Difference between face widths.</i>	$\pm 10\%$ del ancho de la cara requerido $\pm 10\%$ of the required face width	Interna. <i>Internal.</i>
Abertura de percha con conexión a barras. <i>Opening of the bracket with connection to bars.</i>	$+ 1/8"$ . 0"	Interna. <i>Internal.</i>
Abertura de percha con conexión a trabes. <i>Opening of the bracket with connection to beams.</i>	$+ 1/4"$ . 0"	Interna. <i>Internal.</i>
Localización líneas de dobles. <i>Location of bending lines.</i>	$\pm 1/8"$	Interna. <i>Internal.</i>
Ángulos de dobles ( Proceso de doblado). <i>Bending angles (Bending Process).</i>	$\pm 0.5^\circ$	Interna. <i>Internal.</i>
Ángulos de dobles ( Después de conformado). <i>Bending angles (After forming).</i>	$\pm 4^\circ$	Interna. <i>Internal.</i>
Barrenos o galucos de dren. <i>Drain holes.</i>	$- 1/4"$ . $+ 1/2"$ siempre y cuando queden por dentro de la caña $- 1/4"$ . $+ 1/2"$ as long as they are inside the shaft	Interna. <i>Internal.</i>
Barrenado en percha. <i>Drilling on the bracket.</i>	$\pm 1/16"$	Interna. <i>Internal.</i>
Díametro de barrenos. <i>Hole diameter.</i>	$+ 1/16"$ . 0"	Interna. <i>Internal.</i>
	Postes tipo prepa	
Característica. <i>Feature.</i>	Tolerancia. <i>Tolerance.</i>	Norma/Esp. <i>Regulation/Spec.</i>
Longitud. <i>Length.</i>	$\pm 1"$	Interna. <i>Internal.</i>
Redondeo. <i>Rounding.</i>	$\pm 1/4"$	Interna. <i>Internal.</i>
Díametro lado base y lado corona. <i>Diameter bottom and top sides.</i>	$\pm 1/8"$	Interna. <i>Internal.</i>
Enderezado o fuera de línea recta. <i>Straightened or out of straight line.</i>	$1/8"$ en cada 10FT. $1/8"$ in each 10FT.	Interna. <i>Internal.</i>
Ángulos de dobles ( Proceso de doblado). <i>Bending angles (Bending process).</i>	$\pm 0.5^\circ$	Interna. <i>Internal.</i>
Ángulos de dobles ( Después de conformado). <i>Bending edge (After forming).</i>	$\pm 4^\circ$	Interna. <i>Internal.</i>
Caras sumidas. <i>Sunken faces.</i>	$1/8"$	Interna. <i>Internal.</i>
Tordimiento de sección de extremo a extremo. <i>End-to-end section twist.</i>	6"	Interna. <i>Internal.</i>
Torcimiento de barrenos pasados de extremo a extremo . <i>Twisting of</i>	4"	Interna. <i>Internal.</i>
Desplazamiento de barrenos desde el lado corona (Espejo) <i>Displacement of holes from the top side (Mirror)</i>	3/8"	Interna. <i>Internal.</i>
Desplazamiento entre barrenos pasados <i>Displacement between past holes</i>	$1/16"$ (si excede $1/16"$ $\pm 1^\circ$ en eje de barrenos) $1/16"$ (if $1/16"$ is exceeded up to $1$ maximum)	Interna. <i>Internal.</i>
Desplazamiento entre de barrenos para rivnut <i>Displacement between rivnut holes</i>	$1/4"$	Interna. <i>Internal.</i>
Díametro de barrenos que no son para rivnut. <i>Diameter of non-rivnut holes/sole diameter.</i>	$+ 1/16"$ . 0"	Interna. <i>Internal.</i>
Diferencia entre ancho de caras. <i>Difference between face widths.</i>	$\pm 10\%$ del ancho de la cara requerido $\pm 10\%$ of the required face width	Interna. <i>Internal.</i>
Descentrado de barrenos sobre la cara de la caña <i>Offcentering of holes on the face of the section</i>	$1/4"$ hacia el mismo sentido sin morder arista $1/4"$ in the same direction without biting into the edge	Interna. <i>Internal.</i>

Estructuras		Norma/Esp. Regulation/Spe
Característica. Feature.	Tolerancia. Tolerance.	
Longitud. Length.	± 1" Por sección, pero ±1/8" entre secciones izquierda y derecha en estructuras bridadas ± 1" Per section, but ±1/8" between left and right sections on flanged structures	Interna. Internal.
Redondeo diámetros menores de 36" en secciones. Rounding of diameters smaller than 36" on sections.	± 1/4"	Interna. Internal.
Redondeo diámetros mayores de 36" en secciones. Rounding of diameters larger than 36" on sections.	± 1/2"	Interna. Internal.
Diámetro lado base y lado corona. Diameter bottom and top sides.	± 1/8"	Interna. Internal.
Torcimiento total en poste. Total twisting.	a) 4" por sección, compartiendo el torcimiento nivelando a 0° en la mitad de la sección en postes bridados a) 4" per section, sharing the twist, leveling at 0° in the middle of the section on flanged poles. b) Para postes con placa estabilizadora se nivela en zona de empotramiento y se verifica el torcimiento con referencia en el nivel de tierra. b) For poles with stabilizer plate, level in the embedment area and check the twist with reference to the ground level. c) Para postes con placa base, se respeta el nivel en los barrenos de la placa base, pudiendo compartir el torcimiento al centro de la caña. c) For poles with a base plate, the level in the holes of the base plate is respected, being able to share the twist at the center of the shaft. d) En ambos casos, la alineación de los accesorios deberá ser nivelada ± 1° con respecto al eje del poste. d) In both cases, the alignment in accessories shall be level ± 1° with respect to the pole axis.	Interna. Internal.
Accesorios para conexión entre piernas. Accessories for connection between legs.	a) ± 1/16" verticalmente entre accesorios para conexión de tirantes. a) ± 1/16" vertically between accessories for connecting braces. b) ± 1/16" del eje neutro del poste al barreno de conexión. b) ± 1/16" from the neutral axis of the pole to the connection holes.	Interna. Internal.
Longitud de traves, tirantes o brazos para conexión entre piernas marcado entre centros de conexión. Length of beams, braces or arms for connection between legs, marking between connection centers.	± 1/16"	Interna. Internal.
Torción de traves conectadas a perchas. Twisting of beams connected to brackets.	± 1° entre centros de conexión ± 1° between connection centers	Interna. Internal.
Torción de traves conectadas a poste con pernos roscados. Twisting of beams connected to poles with threaded bolts...	± 1° entre barrenos de conexión ± 1° between connection holes.	Interna. Internal.
Perpendicularidad o esquadro placa base, brida a caña. Perpendicularity or square by base plate, flange to shaft.	1/8" en 100FT. 1/8" each 100FT.	Interna. Internal.
Abertura de percha para conexión de traves, (poste y/o trabe) Bracket opening for girder connection (pole and/or beam)	+ 1/4" - 0"	Interna. Internal.
Distancia entre centros de piernas. Distance between leg centers.	± 1/16" en los extremos de la estructura ± 1/4" en la parte media de la estructura ± 1/16" at frame ends ± 1/4" in the middle part of the structure	Interna. Internal.
Distancia en diagonal desde la base hasta la corona (hipotenusa) Diagonal distance from pole base to pole top (hypotenuse)	± 1/4"	Interna. Internal.

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<b>1 COMPANY CERTIFICATIONS</b>								
1.1	Certified by International Standard Organization	ISO 9001 Certification Quality Management Systems - Requirements	ISO 9001 Certificate	Current ISO Certificate	Police Group	Quality Management	D	R
1.2	Certified by American Institute of Steel Construction	ASCE 207 Certification Standard for Steel Fabrication and Erection, and Manufacturing of Metal Components	ASCE Certificate	Current ASCE Certificate	Police Group	Quality Management	D	R
1.3	Certified by Canadian Welding Bureau	W47.1 Certification of Companies for Fusion Welding of Steel	CWB Certificate in Division 2	Current CWB Certificate	Police Group	Quality Management	D	R
<b>2 PREPARATION PRIOR TO MANUFACTURING</b>								
<b>2.1 DOCUMENTS</b>								
2.1.1	Customer specification review (latest version)	Customer Specifications	Customer Specifications & Drawings	Customer specifications (latest version).	N/A	Police Group	R	D
2.1.2	Shop Drawings	ASCE 48-19, Sect. 7.1 DETAILING	Shop Drawings approved by Customer	Shop Drawings approval by customer	100%	TAPP Engineering	R-H	D-H
2.1.3	Request for Information (RFI) information or clarification generated during the manufacturing phase.	TAPP Review Standard Practice	Customer Response to RFI	RFI answered and clarified.	As required	TAPP Project Management	D	R
2.1.4	Welding Procedures Specifications (WPS) and/or Procedure Qualification Record (PQR)	ASCE 48-19, Sect. 7.2.3 Welding, AWS D1.1; Section 5 & 6	WPS and/or PQR	Approved WPS & PQR	As required	Welding Engineering	D	R
2.1.5	Nondestructive Testing (NDT) Procedures Applicable (VT, PT, MT, UT)	AWS D1.1 Section 8 Applicable standards	NDT Procedures Applicable, I.C.A.21_Instructive Inspection with magnetic particle I.C.A.31_Instructive Inspection with penetrating liquids I.C.A.30_Instructions for visual inspection of welding I.C.A.20_Instruction Manual for inspection by ultrasound.	Approved nondestructive testing procedures by level III ASNT	As required	Quality Control - Inspection	D	R
<b>2.2 SKILLED LABOR</b>								
2.2.1	Welder, welding operator, and back welder qualifications.	ASCE 48-19, Sect. 7.2.3 Welding, AWS D1.1, Section 6, Part C	Qualifications Test Records according to process (s) and positions qualified	Objective evidence that the Effectiveness Period has not been exceeded by more than 6 months	100%	Welding Engineering	D	R
2.2.2	Nondestructive Testing (NDT) Inspectors Qualifications: VT (Visual Inspection) MT (Magnetic Particle Testing) PT (Penetrant Testing) UT (Ultrasonic Testing)	ASNT Recommended Practice SNT-TC-1A AWS D1.1 Section 6, Part A & D	NDT qualified procedures Inspectors certifications in VT, UT, MT &/or PT	Inspectors Certificates, Level I or II in NDT approved by ASNT Level III.	100%	Quality control	D	R
<b>2.3 MATERIAL RECEIPT INSPECTION</b>								
2.3.1	Charpy Impact Requirements (CWI): a) Structural plate or coil materials intended for: - Polygonal tubular and sub-welded flange / base plates for polygonal tubular poles, including flange plates - Polygonal tubular arm / beams and built-welded bracing b) Anchor bolts c) Welding Material	ASCE 48-19 Sections: 6.2.1.3 Energy Absorption 6.3.1 Material Properties (Welding) ASTM A370 Mechanical Testing of Steel Products ASTM A673 (Subsize test specimens) ASTM E23 Impact Testing of Metallic Materials	P, CA,00_Inspection and testing Procedure I.C.A.14_Material Receipt Inspection Instruction MTR Test Reports (MTRs) Note: If the MTR does not include the CVN Test, it must be performed by Polest's In-House Metallurgical Lab.	Absorbed energy requirements for subsize test specimens shall be in accordance with ASTM A370: a) 34 Size, 10 by 7.5 mm; 11 R-b (15J) b) 23 Size, 10 by 6.7 mm; 10 R-b (14J) c) 12 Size, 10 by 5 mm; 8 R-b (11J) d) 1/4 Size, 10 by 3.3 mm; 5 R-b (7J) e) 14 Size, 10 by 2.5 mm; 4 R-b (5J) Note: The temperature of -20 ° F (-29 ° C) shall be maintained in any case.	One test per Heat - Lot Number	Metallurgical Laboratory	D	R
2.3.2	Structural Shapes (Channels, Angles and others)	Applicable ASTM	MTR Test Reports (MTRs)	MTR	100% MTR	Metallurgical Laboratory	D	R
2.3.3	Anchor Bolts (if required)	ASCE 48-19, Sect. 9.3 Applicable ASTM	Quality Certificate	Quality Certificate	100% Quality Certificate	Metallurgical Laboratory	D	R
2.3.4	Structural Bolts	ASCE 48-19 Sect. 9.2 Applicable ASTM	Quality Certificate	Quality Certificate	100% Quality Certificate	Metallurgical Laboratory	D	R
2.3.5	Electrode (coated, wire, tubular) & Flux	AWS A5.1 & A5.5 for SMAW AWS A5.17 & A5.23 for SAW AWS A5.20, A5.29 & A5.36 for FCAW AWS A5.18 & A5.36 for GMAW	Certificate of welding electrodes & Flux	Quality Certificate	100% Quality Certificate	Metallurgical Laboratory	D	R
2.3.6	Coating	Coating specification that applies	Certificate of quality of applicable coating (paint or zinc)	Quality Certificate	100% Quality Certificate	Metallurgical Laboratory	D	R

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									Operator	Welder	Inspector	Controlled	Documentary	Dimensional	V	M	P	
3	<b>WELDING PROCESS</b>																	
3.1	<b>Complete Joint Penetrations For Pole Shafts (CJP Welds):</b>																	
3.1.1	a. Circumferential welded splices b. Circumferential welds in Base Plates or Flange Plates with reinforcing fillet weld c. Longitudinal seam welds within 6" of circumferential welds (Base plate, Flange plate intended for Pole and Cleason Sections) d. Longitudinal weld within 12" at the end of outer or leg sections with diameters equal to or greater than 12" e. Longitudinal weld within 6" at the end of outer or leg sections with diameters less than 12" f. Longitudinal weld within 6" on each side of any splices that pass through the longitudinal weld.	ASCE 48-19 Section 6.3 Welded & 6.4 Field connections of members AWS D1.1 Section 7 & 8	Shop Drawings Applicable WPS Applicable NDT reports A.CA.03 Weld Visual Inspection Acceptance Criteria	Every inch (100%) CJP WELDS	100% CJP Welds AWS D1.1 Table 8.1 Visual Inspection Acceptance Criteria (Statically loaded) 100% UT Table 8.2 (Statically loaded)	Engineering Production Welding	D	R	Operator	Inspector	Controlled	Documentary	Dimensional	V	M	P	U	a) All preheating and welding shall be in conformance with AWS D1.1. b) All weld repair shall be in accordance with AWS D1.1. c) Apply NDT as required.
3.1.1	b. Longitudinal seam welds within the total length to the max. splice length plus 6" at the bottom end of outer sections with diameters greater than 18" c. Longitudinal seam welds within the total length to the max. splice length at the bottom end of outer sections with diameter equal to or less than 18"	ASCE 48-19 Section 6.3 Welded & 6.4 Field connections of members AWS D1.1 Section 7 & 8	Shop Drawings Applicable WPS Applicable NDT reports A.CA.03 Weld Visual Inspection Acceptance Criteria	Every inch (100%) CJP WELDS	100% CJP Welds AWS D1.1 Table 8.1 Visual Inspection Acceptance Criteria (Statically loaded) 100% UT Table 8.2 (Statically loaded)	Engineering Production Welding	D	R	Operator	Inspector	Controlled	Documentary	Dimensional	V	M	P	U	a) All preheating and welding shall be in conformance with AWS D1.1. b) All weld repair shall be in accordance with AWS D1.1. c) Apply NDT as required.
3.1.2	<b>Complete Joint Penetrations Within Longitudinal Seam Welds for Arm and Base Shafts (CAJP Welds):</b> a. Seam weld adjacent to circumferential weld (Structural) shall be CJP with the next lengths: a. 3" for arm dia less than 7" (F/F) b. 4.5" for arm dia 7" (F/F) to 9" (F/F) c. 6" for arm dia greater than 9" (F/F)	ASCE 48-19 Section 6.3 Welded & 6.4 Field connections of members AWS D1.1 Section 7 & 8	Shop Drawings Applicable WPS Applicable NDT reports A.CA.03 Weld Visual Inspection Acceptance Criteria	Every inch (100%) CJP WELDS	100% CJP Welds AWS D1.1 Table 8.1 Visual Inspection Acceptance Criteria (Statically loaded) 100% UT Table 8.2 (Statically loaded)	Engineering Production Welding	D	R	Operator	Inspector	Controlled	Documentary	Dimensional	V	M	P	U	a) All preheating and welding shall be in conformance with AWS D1.1. b) All weld repair shall be in accordance with AWS D1.1. c) Apply NDT as required.
3.1.3	<b>Partial Joint Penetrations Within Longitudinal Seam Welds (PJP Welds):</b> These PJP's shall have a minimum 80% penetration	ASCE 48-19 Section 6.3 Welded Connections Section 7.2.3 Welding AWS D1.1 Section 7 & 8	Shop Drawings Applicable WPS Applicable NDT reports A.CA.03 Weld Visual Inspection Acceptance Criteria	a) 100% VT b) UT as required by "ACCEPTANCE CRITERIA and / or REJECTION"	100% PJP's according to AWS D1.1 Table 8.1 Visual Inspection Acceptance Criteria (Statically loaded)  Ultrasonic Test (UT) according to: Standard: Frequency of UT: 6" of one PJP Weld, one section every 10 sections Increased Confidence of UT: When 20% of project manufacturing is received and the results are 100% satisfactory, the inspection will be, one section every 20 sections.  Alert: Frequency of UT: If there is a "Rejection" to those 6" PJP Welds, the inspection will be increased to: one section of every 5 sections.	Engineering Production Welding	R	R	Operator	Inspector	Controlled	Documentary	Dimensional	V	M	P	U	a) All preheating and welding shall be in conformance with AWS D1.1. b) All weld repair shall be in accordance with AWS D1.1. c) Apply NDT as required.

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									Director	Welder	Supervisor	Inspector	Certified	Dimensional	Documentary	V	M	
3.1.4	Other Partial Joints Penetration (PJP Heads)- Other than Longitudinal Seam Welds: a. These PJP's are those welds for elements that through) from side to side in Arms, Beams and Poles b. For all inner sections, the seam welds into total splice area (Top End) shall be PJP welds at 80% and the weld reinforcement shall be grinding flush. For inner side on these welds, back weld shall be applied with a length equal to total splice area. c. Seam Weld adjacent to circumferential weld (bearing flange) a back weld (PJP) within 3" for inner shall be apply. d. Seam Weld adjacent to circumferential weld (bearing flange) at end of last Top Section a back weld (PJP) within 3" for inner shall be apply. e. Arm Seam weld adjacent to circumferential weld (Different to Bracket) a back weld (PJP) shall be apply with the next lengths: 1. 3" for arm dia less than 7" (FF) 2. 4.5" for arm dia 7" (FF) to 9" (FF) 3. 6" for arm dia greater than 9" (FF)	ASCE 48-19; Section 6.3 Welded Connections Section 7.2.3 Welding AWS D1.1 Section 7 & 8	Shop Drawings Applicable WPS Applicable NDT Reports A.CA.03 Weld Visual Inspection Acceptance Criteria	a) 100% VT	100% PJP Welds according to AWS D1.1 Table 6.3 Visual Inspection Acceptance Criteria (Statically loaded)	Engineering Production Welding	R	R	✓	✓	✓	✓	✓	✓	✓	✓	e) All preheating and welding shall be in accordance with AWS D1.1. f) All weld repair shall be in accordance with AWS D1.1. g) Apply NDT as required	
3.1.5	WELD- Fillet welds	ASCE 48-19; Section 6.3 Welded Connections Section 7.2.3 Welding AWS D1.1 Section 7 & 8	Shop Drawings Applicable NDT reports A.CA.03 Weld Visual Inspection Acceptance Criteria	100% VT	100% fusion throughout the entire cross section. AWS D1.1, Table 6.1 Visual Inspection Acceptance Criteria (Statically loaded)	Engineering Production Welding	R	R	✓	✓	✓	✓	✓	✓	✓	✓	e) All preheating and welding shall be in accordance with AWS D1.1. f) All weld repair shall be in accordance with AWS D1.1. g) Apply NDT as required	
3.2	<b>TOLERANCES AND TOLERANCES</b> Dimensional practices, including tolerances, shall ensure compliance with clearance, appearance, strength, and assembly requirements Note: These inspections are performed in Shop, runs material.	ASCE 48-19, Sect. 10.3.3 Dimensional Inspection. Shop Drawings	A.CA.01 Manufacturing tolerance Table R.CA.14 Final Inspection Points Record R.CA.30 Final Inspection Arms Record	100% products	A.CA.01 Manufacturing Tolerance Table	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓		
4	<b>INSPECTION AND TESTS</b>																	
4.1	Welds according to AWS D1.1, Table 6.1 (Statically Loaded) Note: If as required complete this inspection with MT or PT Method according to 4.2.1	AWS D1.1 Section 6.9 & Table 6.1 (Statically loaded) ASCE 48-19/Section 10.3.2 Visual Inspection	I.CA.30 Instruction manual for Visual Inspection on welding. R.CA.14 Final Inspection Points Record R.CA.30 Final Inspection Arms Record	100% Welding	AWS D1.1; Section 6.9 & Table 6.1 (Statically loaded) Visual Inspection Acceptance Criteria	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓		
4.1.2	Structures by Cold Bending Process intended to arms and beams, shall be inspected for cracking detection.	ASCE 48-19; Section 7.2.2.2 Forming	I.CA.24 Instruction Manual for Inspection of Fillet Processes R.CA.28 Inspection Record First Processes Accessories	a) 100% Visual Inspection in these bends. b) MT as required *ACCEPTANCE CRITERIA REJECTION *	All cracks are unacceptable. Standard Frequency of MT: 100% of the bends, one bracket for every 20 brackets, only in thicknesses greater than one inch. Increased Confidence of MT: When 20% of project manufacturing is reached and the results are 100% satisfactory, the inspection will be one bracket every 40 sections. Note: When the project represents a total of 20 brackets maximum, the inspection shall be one bracket every 5 brackets. Alert Frequency of MT: If there is rejection in the bends of a Bracket, the inspection of that Lot will be 100%.	Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓		
4.2	<b>COMPLEMENTARY NDT'S (PT and MT Methods)</b> Welding discontinuities shall be ground smooth and inspected using Penetrant Liquid or Magnetic Particle Methods. Note: This test will apply in case the visual inspection is insufficient to determine the acceptability or rejection of a weld.	AWS D1.1; Section 6.10 & Table 6.1 (Statically loaded) ASTM E709 Standard Guide for Magnetic Particle Testing ASTM E165 Standard Practice for Liquid Penetrant Examination	I.CA.22 Inspection instructions with magnetic particles D.SAP.25 Magnetic Particle Record I.CA.21 Inspection instructions with penetrating liquids D.SAP.26, Mill Penetrant Liquid Record	100% of those discontinuities.	AWS D1.1 Section 6.10 & Table 6.1 (Statically loaded)	Quality Control	D	R	✓	✓	✓	✓	✓	✓	✓	✓		

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									Operator	Supervisor	Inspector	Dimensional	Certified	Documentary	V	M	P	U	T	T		T	T	
4.2.2	Galvanized members with large T-joint connections. Note: In large plates, large plates, inspection only applies in case of indications detected by 4.3.1.	ASCE 48-18-Section 10.3.5 Weld Inspection	I.CA.22_ Inspection instructions with magnetic particles D.SAP.25_Magnetic Particle Record	100% of those discontinuities.	AWS D1.1 : Section 6.10 & Table 6.1 (Statistically loaded)	Quality Control	D	R																
4.3	<b>ULTRASONIC INSPECTION</b>																							
4.3.1	Steel plates over 1/4 inch thick shall be ultrasonically tested (Straight beam) to ensure equal defects free could lead to tearing. Note: The UT must be done before the first manufacturing process.	ASCE 48-18, Chapter 6, 6.3 WELDED CONNECTIONS, ASTM A435 Straight-Beam Ultrasonic Examination of Steel Plates	I.CA.20_ Inspection Manual for inspection by ultrasonic R.CA.17_ Ultrasonic Inspection Record (Ultrasonic Inspection Straight beam Report)	100% plates over 1/4 inch	a) Any indication that causes a total loss of the beam shall be rejected b) Any indication that causes the same amplitude of the reflection of the beam will be rejected and that is contained in a diameter equal to 3" or half the thickness of the plate, whichever is larger. c) If the discontinuity is larger than 75% of the area of the steel side it is rejected completely, if it is less than 75%, the piece remains under consideration of the use the sound part may be given, as long as the limitation is outside the product to be assembled.	Quality Control	D	R																
4.3.2	Welds Complete Joint Penetration Welds (CJP) shall be tested by Ultrasonic Test (UT) method	ASCE 48-18-Section 10.3.5 Weld Inspection -AWS D1.1 Sect. 6.13 Ultrasonic Testing -Sect 8 Part F Ultrasonic Testing of Groove Welds	I.CA.20_ Inspection Manual for inspection by ultrasonic I.CA.32_ Inspection manual for ultrasonic inspection for thin thickness D.SAP.24_MU Ultrasonic Record	Every inch (100%) CJP WELDS	AWS D1.1 : Clause 6, Section F or Annex O Section 6.13.1 Ultrasonic Testing Table 8.2 (Statistically loaded)	Quality Control	D	R																
4.3.3	T Complete Joint Penetration Welds (T-CJP Welds) In Galvanized members, such as large plates, large plates, shall be tested by Ultrasonic Method at 100% of all such joints, not only before, but also after galvanizing to ensure that no cracks have developed. Note: Apply Item 4.2.2 in case of indication by the Ultrasonic Method	ASCE 48-18- Section 10.3.5 Weld Inspection	I.CA.20_ Inspection Manual for inspection by ultrasonic R.CA.18_ Ultrasonic Inspection report D.SAP.24_MU Ultrasonic Record	Every inch (100%) of those T-CJP Welds	Any crack are unacceptable.	Quality Control	D	R																
4.3.4	Partial Joint Penetrations Within Longitudinal Seam Welds (PJP Welds). These PJP % shall be accordance with Item 3.1.3	Polesse Group	I.CA.60_ Instruction of Ultrasonic inspection for PJP D.SAP.24_MU Ultrasonic Record I.CA.20_ Inspection Manual for inspection by ultrasonic D.SAP.24_MU Ultrasonic Record (After a PJP repair)	As required by Item 3.1.2	PJP % required must be equal to or greater than that indicated.	Quality Control	D	R																
4.4	<b>FINAL INSPECTION</b>																							
4.4.1	All pole shall be inspected	Polesse Group	Document package contains All inspection reports A.CA.23_Visual aid for Dossier Creation	100% pole	Inspection Records reviewed and accepted	Dossier Department	D	R																
5	<b>SURFACE PREPARATION</b>																							
5.1	Surface Preparation (Steel structural) (if required)	SSPC-SP 10 Near-White Metal Blast Cleaning	I.PS.01_Sandblast instruction I.CA.25_ instruction manual for the sandblasting process R.CA.02_Sandblast product inspection	100% steel structural	SSPC-SP 10 Near-White Metal Blast Cleaning Surface finish and cleanliness shall be confirmed according to SSPC-VS 1	Production & Inspection	D	R																
	Surface Preparation (Steel structural with Atmospheric Corrosion Resistance) (if required)	SSPC-SP 8 Commercial Blast Cleaning		100% Steel structural with Atmospheric Corrosion Resistance)	SSPC-SP 8 Commercial Blast Cleaning Surface finish and cleanliness shall be confirmed according to SSPC-VS 1	Production & Inspection	D	R																
6	<b>COATING (if applicable)</b>																							
6.1	Visual inspection	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection. ASTM A123, A143 & A153	P.PI.01_Preparation and Application of Coating Inspection Reports	100% of products	Finish: Continuous, smooth, uniform. Appearance: Free from dirt, scale, blisters, flux deposits and gross zinc deposits as well as having no heavy zinc deposits that interfere with intended use. Adherence: The entire coating should have a strong adherence throughout the service life of galvanized steel.	Quality Control	D	R																

**INSPECTION AND TEST PLAN**  
**MANUFACTURING OF TRANSMISSION / DISTRIBUTION STEEL POLES AND OTHERS**

Code: ITP-Standard-8  
 Revision: 8  
 Date: JUL 06, 2023  
 Tab: 5 of 8

Log No:  
 D- Document  
 R- Review  
 H- Hold

CUSTOMER: PROJECT: ACTIVITIES: TP\_0

No	DESCRIPTION	STANDARD / SPECIFICATION	SUPPORT DOCUMENT (Procedure / Record)	INSPECTION FREQUENCY	ACCEPTANCE / REJECTION CRITERIA	OWNER	TAPP	CUSTOMER REP	INSPECTED BY				INSPECTION TYPE				OBSERVATIONS
									Operator	Welder	Supervisor	Inspector	Certified	Dimensional	Visual	Dimensional	
6.1.2	Measurement of Coating thickness.	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, ASTM A123, section 7.3	P.PI.01, Preparation and Application of Coating. Reports measurement of Dry coating Thickness	100%	Applicable Standard SSPC: To ensure that the minimum dry film thickness requirements of the coating specification are met.	Quality Control	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.2	<b>METALLURGY (Mechanical Injury Coatings)</b>																
6.2.1	Surface Preparation	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, SSPC SPS White Metal Blast Cleaning SSPC-CS 23.00 / NACE No. 12	Surface preparation inspection records P.PI.02, Preparation and Application of Metallizing (Grupo Poleas)	100% poles	SSPC SPS, White Metal Blast Cleaning Surface finish and cleanliness shall be confirmed according to SSPC- US 1	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.2.2	Visual Inspection	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, SSPC-CS 23.00 / NACE No. 12	Visual inspection record P.PI.02, Preparation and Application of Metallizing (Grupo Poleas)	100% poles	Smooth and uniform, no runs, sags, lifting, pinholes or overruns	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.2.3	Measurement of total Thickness	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, SSPC-PA 2 Measurement of Dry Coating Thickness with Magnetic Gages	Inspection thickness records P.PI.02, Preparation and Application of Metallizing (Grupo Poleas)	100%	Minimum 5 mils coating Thickness (-20%) Maximum 7 mils coating Thickness (+20%)	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.2.4	Adhesion testing (Tensile bond)	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, SSPC-CS 23.00 / NACE No. 12 ASTM D 4541 Test Method for Pull-Off Strength of Coatings	Adhesion testing records P.PI.02, Preparation and Application of Metallizing (Grupo Poleas)	1 Specimens every 10 poles.	≥ 500 Psi	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	A lot is a unit for the production of processed items with the same process parameters and climatic conditions.
6.3	<b>CONDUITE</b>																
6.3.1	Visual Inspection	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, Customer Specification Supplier technical Data sheet	E.CA.02, Composite and UV application specification	100% poles	Smooth and uniform, no runs, sags, lifting, pinholes or overruns	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.3.2	Measurement of Dry Coating Thickness	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, SSPC-PA 2 Measurement of Dry Coating Thickness with Magnetic Gages	E.CA.02, Composite and UV application specification	100%	20 mils coating Thickness (± 20%) Feathering: Only if required in the Shop Drawings	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.3.3	Adhesion testing	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, ASTM D 4541 Test Method for Pull-Off Strength of Coatings	Adhesion testing records	1 Specimens every 10 poles.	Only composite 2000 Psi metallizing and composite ≥ 500 Psi	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	A lot is a unit for the production of processed items with the same process parameters and climatic conditions.
6.4	<b>UV PROTECTION</b>																
6.4.1	Visual Inspection	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, Customer Specification Supplier technical Data sheet	E.CA.02, Composite and UV application specification	100% poles	Smooth and uniform, no runs, sags, lifting, pinholes or overruns	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
6.4.2	Measurement of Dry Coating Thickness	ASCE 48-18, Sect.10.3.4 Surface Coating Inspection, SSPC-PA 2 Measurement of Dry Coating Thickness with Magnetic Gages	E.CA.02, Composite and UV application specification	100%	±3 mils coating Thickness	Production & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	
7	<b>SHIPPING AND STORAGE REQUIREMENT</b>																
7.1	Shipping / Packing Good practice for shipment comply with carrier regulations and prevent damage or deterioration during handling, shipment and storage of products.	Poles Group	P.BM.01, Shipping procedure A complete packing list shall be enclosed with all shipments. ICA.19 Instruction manual for shipping R.CC.22 Shipping record for poles, shafts and concrete.	100%	Supplier shall mark containers or packages with necessary lifting, loading, and shipping information. Note: The R.CC.22 will be send to Customer if are required.	Shipping Department & Inspection	D	R	✓	✓	✓	✓	✓	✓	✓	✓	



2427 Kelly Lane. Houston, Texas 77066  
Phone: 281-444-8277 Fax: 281-444-7270  
[www.tappinc.com](http://www.tappinc.com)

## *Diversity Qualification Statement*

Areas served: National

Year Founded: 1989

Goods/Services: Professional Services, T&D Equipment, T&D Services

Diverse Classification: MBE

Founded in 1989, TAPP is a certified minority owned business located in Houston, TX. Our company is dedicated to manufacturing quality steel structures for the utility industry. TAPP's 1.5 million square foot, ISO 9001-2008 certified, state of the art manufacturing plant combined with our expert engineering and design staff gives the company the flexibility to manufacture or improve your most demanding projects. We can custom design any pole to meet your needs. Our modern inventory and production control systems provide real time scheduling capabilities with competitive lead times.

TAPP is certified as an MBE by the Houston Minority Supplier Development Council and the Supplier Clearing House for the California Public Utilities Commission. In addition, TAPP has successfully met the established requirements of the State of Texas Historically Underutilized Business (HUB) Program to be recognized as a HUB. TAPP provides diversity and equality to all in employment, regardless of their gender, race, ethnic origin, disability, age, nationality, national origin, sexuality, religion or belief, marital status and social class. We oppose all forms of unlawful and unfair discrimination. An atmosphere of civility and mutual respect towards difference is indispensable and enables the free interchange of ideas at TAPP. Selection for employment, promotion, training or any other benefit at TAPP are on the basis of aptitude and ability.

### **Copies of the following certificates are available on request**

TAPP HMSDC Minority Certificate

TAPP HUB Certificate

Supplier Clearinghouse Certificate-MBE

**BID BOND**

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

**BIDDER (Name and Address):** Transamerican Power Products, Inc.  
25700 I-45 N, Suite 315  
Spring, TX 77386

**SURETY (Name and Address of Principal Place of Business):** Travelers Casualty and Surety Company of America  
Claims Address: Travelers Bond, Attn: Claims  
1500 Market Street, W. Tower, Suite 2900  
Philadelphia, PA 19102  
One Tower Square  
Hartford, CT 06183

**OWNER (Name and Address):** **City of Rochelle**  
**420 N. 6<sup>th</sup> Street**  
**Rochelle, IL 61068**

**BID**  
Bid Due Date: November 13, 2025  
Project: Ritchie to Centerpoint 34.5kV Line - Steel Pole Procurement

**BOND**  
Bond Number: N/A - Bid Bond  
Date (Not later than Bid due date): November 13, 2025

Penal sum Five Percent of the Greatest Amount Bid \$5% G.A.B.  
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

**BIDDER**

**SURETY**

Transamerican Power Products, Inc. Seal  
Bidder's Name and Corporate Seal

Travelers Casualty and Surety Company of America Seal  
Surety's Name and Corporate Seal

By: [Signature]  
Signature and Title CFO H. V. [unclear]

By: [Signature]  
Signature and Title David T. Miclette, Attorney-in-Fact  
(Attach Power of Attorney)

Attest: \_\_\_\_\_  
Signature and Title

Attest: [Signature]  
Signature and Title Sandra Villegas, Witness

Note: Above addresses are to be used for giving required notice.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents,
  - 3.2. All Bids are rejected by Owner
  - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.



**Travelers Casualty and Surety Company of America  
Travelers Casualty and Surety Company  
St. Paul Fire and Marine Insurance Company**

**POWER OF ATTORNEY**

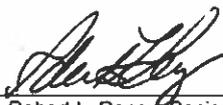
**KNOW ALL MEN BY THESE PRESENTS:** That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **DAVID T MICLETTE** of **HOUSTON** , Texas , their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

**IN WITNESS WHEREOF**, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st** day of **April**, 2021.



State of Connecticut

City of Hartford ss.

By:   
Robert L. Raney, Senior Vice President

On this the **21st** day of **April**, 2021, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

**IN WITNESS WHEREOF**, I hereunto set my hand and official seal.

My Commission expires the 30th day of June, 2026



  
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **13th** day of **November**, 2025



  
Kevin E. Hughes, Assistant Secretary

**To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.  
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.**

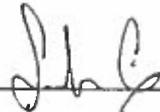
### Non-Collusion Affidavit

The Municipality reserves the right, before any award of contract is made, to require any bidder to whom it may make an award of the Principal Contract, to sign a non-collusion affidavit in the form designated below:

STATE OF Texas

COUNTY OF Spring

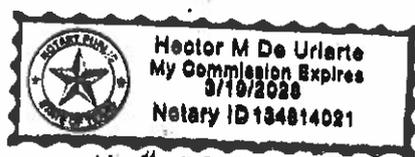
I Igor Lubisco, being first duly sworn, deposes and says that he is VP of Strategy and Execution \* (sole owner, partner, president, secretary, etc.) of the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any bidder to fix any overhead, profit or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further, that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, or any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

Signed: 

Title: Igor Lubisco | VP of Strategy and Execution

Subscribed and sworn to before me this 12 day of NOVEMBER 20 25

Seal of Notary:  
  
Notary Public



\* In making out this form, the title that is not applicable should be struck out. For example, if the Contractor is a corporation and this form is to be executed by its president, the words "Sole Owner, a partner, secretary", etc. should be struck out.