BIDDER'S EXCEPTION STATEMENT TO TECHNICAL SPECIFICATIONS

All Bidder representations will be relied on by GRDA in its evaluation of the bid to this RFQ. One of GRDA's evaluation criteria will be the number and extent of the exceptions to GRDA's specifications. Bidders shall be presumed to agreement with GRDA's specifications unless the Bidder takes specific exception to one or more of the specifications as stated in the table below. Whether or not exceptions are taken, Bidders must submit this statement as part of their bid.

Bidders must clearly identify all exceptions to specifications. Bidders must also state with specificity the reasons for taking exceptions and the proposed alternatives/specification. Bidders are cautioned against an exception that may be materially deviating from the specifications included in this RFQ. A material deviation is an exception which results in the Bidder providing goods and/or services that are substantially different than the goods and/or services GRDA requested in the RFQ. If exceptions are not identified in this statement, any exception raised following the notification of the award could result in the revocation of bid award and being rejected from further consideration.

PRINT THE WORDS "NO EXCEPTIONS" HERE _____ IF THERE ARE NO EXCEPTIONS TAKEN TO ANY OF THE SPECIFICATIONS OF THIS RFQ.

IF THERE ARE EXCEPTIONS TAKEN TO ANY OF THE SPECIFICATIONS, THEY MUST BE CLEARLY STATED IN THE TEXT BOX BELOW AND SUBMITTED AS PART OF YOUR PROPOSAL.

ANY EXCEPTION THAT MATERIALLY DEVIATES FROM A SPECIFICATION IN THIS RFQ MAY RESULT IN THE REJECTION OF THE BID FROM FUTHER CONSIDERATION.

EXCEPTIONS TO TECHNICAL SPECIFICATIONS:

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TRANSMISSION LINE STEEL POLE SPECIFICATIONS

MONOPOLE AND H-FRAME

6/9/2026

SPECIFICATIONS FOR TRANSMISSION LINE STEEL POLES
MONOPOLE AND H-FRAME

1. SCOPE:

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

2. DEFINITIONS:

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

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

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

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

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

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

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

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

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

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

3. CODES AND STANDARDS:

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

A. American Concrete Institute (ACI):
   1. 318 – Building Code Requirements for Reinforced Concrete.

B. American Institute of Steel Construction (AISC):
   1. Manual of Steel Construction.

2. Quality Criteria and Inspection Standards.

C. American National Standards Institute (ANSI):
   1. B18.2.1 – Square and Hex Bolts and Screws including Hex Cap Screws, and Lag Screws.
   2. B18.2.2 – Square and Hex Nuts.
   3. C2 – National Electric Safety Code (NESC).

D. American Society for Testing and Materials (ASTM):
   1. A6 – General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use.
   2. A153 – Zinc Coating (Hot Dip) on Iron and Steel Hardware.
   3. A325 – High Strength Bolts for Structural Steel Joints, including suitable Nuts and Plain Hardened Washers.
   4. A354 – Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
   5. A370 – Mechanical Testing of Steel Products.
   6. A385 – High Quality Zinc Coating (Hot Dip).
   7. A449 – Quenched and Tempered Steel Bolts and Studs.
   8. A563 – Carbon and Alloy Steel Nuts.
   9. A577 – Ultrasonic Angle-Beam Examination of Steel Plates.
   10. A578 – Straight Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications.
   11. A615 – Deformed Billet Steel Bars for Concrete Reinforcement.
   12. A673 – Sampling Procedures for Impact Testing of Structural Steel.
   13. A871 – High Strength Low-Alloy Structural Steel Plate with Atmospheric Corrosion Resistance.
   14. B6 – Zinc (Slab Zinc).
   15. E165 – Liquid Penetrant Inspection Method.
   16. E709 – Magnetic Particle Examination.

E. American Society of Civil Engineers (ASCE):
   1. Manual 72 – Design of Steel Transmission Poles.

F. American Welding Society (AWS):
   1. C2.1 – Recommended Safe Practice for Thermal Spraying.
   2. D1.1 – Structural Welding Code – Steel.

G. National Electrical Manufacturers Association (NEMA) Standards Publication TT1, Tapered Tubular-Steel Structures.

H. American Society for Nondestructive Testing, Recommended Practice No. SNT-TC-1A, Supplement A through E.

I. Zinc Institute:
   1. Z170 15M – Inspection Manual for Hot-Dip Galvanized Products.

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

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

5. GENERAL REQUIREMENTS:

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

5.1 GENERAL STRUCTURE DESIGN:

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

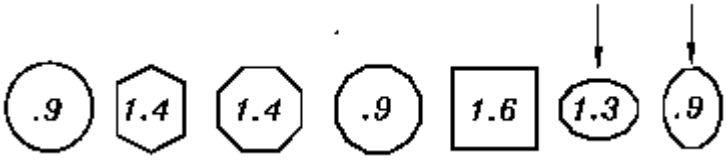
5.1.2 The structure shall be capable of withstanding all specified loading cases including secondary stresses from foundation movements when specified, but not considering the possible restraining effect of conductors or shield wires. The indicated loads shall include all overload capacity factors, therefore,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

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

Pressures in psf shall be computed as follows:

$$p = W \times Cd$$

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



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

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

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

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

5.1.8 Structures which are to be direct embedded shall have bearing plates and ground sleeves. Bearing plates shall have a diameter not more than 2 inches greater than the maximum pole diameter. All steel poles shall have a minimum 2 inch X 2 inch drain hole at the bottom. When a painted finish is specified, poles shall be hermetically sealed. Ground sleeves shall have a minimum length of 3 feet. The ground sleeve shall have a minimum thickness of 3/16 inch and shall be centered at the groundline. A seal weld shall be provided around the ground sleeve. The ground sleeve shall not be considered in strength calculations.

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

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

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

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

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

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

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

5.1.16 Weathering steel structures shall be designed to eliminate water and refuse traps. 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, the Fabricator 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.

5.2 Materials

5.2.1 All steel materials shall conform to ASTM specifications, as required by design, and shall be suitable for use in weathered and galvanized structures. **The steel should be manufactured in North America**. The vendor shall supply certification of the steel origin and location of manufacturing.

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

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

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

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

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

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

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

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

5.3 FABRICATION

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

5.3.2 One hundred percent (100%) penetration welds shall be required in, but not limited to, the following areas:
- circumferential welds (C-welds) joining structural members;
- longitudinal welds in the female portion of the joint within the slip joint area;
- welds at the butt joints of back-up strips; and
- base plate-to-shaft weld.
- longitudinal welds for a minimum length of 3 inches where there are adjacent C-welds, flange welds, base welds and ends of tubes.

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

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

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

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

5.3.7 All undercutting shall conform to the following:

a. Base plate to pole shaft welds, circumferential groove welds, longitudinal welds in a female telescoping joint, and arm shaft to pole connection plate welds, shall have no undercutting in excess of 0.008 inch with the exception that a 0.02 inch undercut is allowed for two (2) inches in any twelve inches of weld length.

b. Longitudinal welds in vang, pull-offs, seam welds of arms, step welds, ladder lugs and other areas shall have no undercutting in excess of 0.02 inch.

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

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

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

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

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

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

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

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

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

5.4 FINISHES

5.4.1 The following finishes are acceptable: galvanizing or weathering steel, and below grade coating. Drawings shall govern what finishes are acceptable if more restrictive than specification.

a. Galvanizing - All structures and structural components which are hot-dip galvanized shall meet all the requirements of ASTM A123 or ASTM A153. Measures shall be taken to prevent warping and distortion according to ASTM A384 and to prevent embrittlement according to ASTM A143. Pre-clean the poles and attachments utilizing a caustic bath, acid pickle and flux or mechanical method to remove mill scale, rust, grease or other

deleterious substances. Galvanize the threaded portion of anchor bolts and 6 inches below the threads, conforming to ASTM A123. The “Finish” shall be a galvanized coating that is continuous, adherent and free of uncoated spots, blisters, chemical flux and projections which will interfere with the intended use of the structure and assemblies. Holes shall be clean and free of superfluous spelter. Poles made of ASTM A588 steel shall not be galvanized due to the high silicon content of the steel.

b. Weathering Steel - Steel shall conform to ASTM A588 or A871. After fabrication, poles made of weathering steel shall be cleaned of oil, scale, etc., in accordance with the Steel Structure Painting Council's Surface Preparation Specification, SSPC-SP6, to ensure uniform and rapid formation of the protective oxide layer.

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

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

5.5 INSPECTION AND TESTING

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

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

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

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

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

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

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

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

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

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

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

5.6 STRUCTURE TESTING

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

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

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

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

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

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

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

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

5.7 SHIPPING

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

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

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

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

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

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

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

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

6. INFORMATION TO BE SUPPLIED BY THE MANUFACTURER

6.1 Information to be supplied with the proposal.

a. Calculated shipping weight of each structure excluding anchor bolts. Separate weights shall be given for arms and poles.

b. Ultimate groundline reactions (including overload factors) in poles and guy wires.

c. Anchor bolt size, length and locations (bolt circle diameters).

d. Type of material of major components (ASTM number).

e. Description of pole shaft, including thickness, length, diameter, cross-sectional geometry, and method of fastening each shaft component.

f. Data showing the design of the arm, arm connections, arm attachment plates and brackets.

g. Draft drawings of structure and structure attachments.

6.2 Documentation to be supplied for the owner's approval prior to fabrication. Documentation includes final design calculations for pole shaft, base plate, anchor bolts, arms, and other appurtenances, including their connections for all structures. The following information shall be supplied:

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

b. For the critical loading case, shear and axial forces, moments, stresses, section moduli, cross-sectional areas at the arm connections, bolt stresses in the arm connection, and deflection at the end of the arm.

c. Anticipated deflections at the top of the pole and at the ends of the arms shall be indicated for each pole for the "normal" loading condition of 60°F, no wind.

d. For all specified loading cases, reactions and groundline moments shall be supplied.

e. Detail drawings for each structure type giving weights of structure components, dimensions, and bill of materials.

f. Assembly instructions and erection drawings. Slip joint lengths and allowable tolerances.

6.4 Test Reports (as requested).

a. Certified mill test reports for all structural material.

b. Certified welding reports for each structure.

c. Impact property test reports showing that the material used in the structures meets the impact properties.

d. Test reports on coating thickness.

e. Report of structure testing, when required, including photographs, diagrams, load trees, etc.

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

a. The Fabricator shall provide data files in PLS-Pole (latest version) format of the model of each structure type and height for inclusion into the Owner's PLS-Cadd design model. All PLS-Pole model files shall be submitted in "backup" file format and included on compact disc (CD), DVD or USB medial storage device. Individual component/library files used for each structure shall not be accepted.

b. All final drawings shall become the property of the owner, who shall have full rights to reproduce drawings and use them as the owner sees fit, including submitting them to other vendors for the purpose of obtaining bids on future steel pole purchases.