Evaluation Table:

PEP ID:	
Manufacturer:	
Product Name:	

731 Structural Supports for Traffic Signals & Highway Lighting
ADOT Specifications: 731, Stored Specification 731STRSUP, T.S. 4-1 through 4-31, T.S. 5-0 through 5-2

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Aluminum Poles and Mast Arms: General	731-2.01(A)	Standard aluminum poles assemblies for highway lighting shall include pole shafts, pole bases, and mast arms.		
Aluminum Poles and Mast Arms: General	731-2.01(A)	Each aluminum pole and mast arm shall be designed and manufactured as a complete assembly. The assembly shall be furnished and installed as a complete unit that is configured to the necessary dimensions with all the required components including mounting brackets and assembly, ground lugs, rain caps, hand hole covers, anchor bolts, nuts, washers and related hardware and accessories.		
Aluminum Poles and Mast Arms: General	731-2.01(A)	The design of the pole assembly (pole, mast arm, and luminaire attachment portion) shall be per the requirements of the 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th edition with 2015 interim revisions.		
Aluminum Poles and Mast Arms: General	731-2.01(A)	The design of the poles, mast arms and luminaire mounting brackets shall be based on a wind speed of 90 miles per hour with a luminaire having an effective projected area of 1.5 square feet and a weight of 55 pounds.		
Aluminum Poles and Mast Arms: General	731-2.01(A)	The design shall also be based upon the worst-case loading, derived by combining the loads caused by a 20-foot truss mast arm, except for S and T poles, design luminaire, design wind speed and other dead loads, as appropriate. Secondary deflections shall be accounted for in all designs.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Aluminum Poles and Mast Arms: General	731-2.01(A)	Aluminum poles shall have a minimum design life of 50 years.		
Aluminum Poles and Mast Arms: General	731-2.01(A)	The pole and mast arm shall be supplied from the same manufacturer and of similar metal properties providing a uniform appearance.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1) ASTM B221	The tapered pole shaft shall be fabricated from a one-piece, seamless, round tapered tube of Aluminum Alloy 6063-T6, conforming to the requirements of ASTM B221, and shall be full-length heat treated after tapering and welding on the base and hand hole reinforcing to produce a T6 temper.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1)	The pole shafts shall either maintain a uniform taper rate from the base of the pole to the pole top or shall be non-tapered.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1)	The base plate shall be constructed to match the foundation bolt pattern for standard poles shown in the Standard Drawings for Aluminum Light Poles.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1)	No field splices of pole shafts shall be allowed.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1)	The pole shaft shall have an internal vibration damper.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1)	All aluminum poles shall have a hand hole in the base of the poles and shall conform to the details shown on the Standard Drawings, with the exception that the hand hole shall use aluminum components and stainless-steel screws.		
Aluminum Poles and Mast Arms: Pole Shafts	731-2.01(B)(1)	An aluminum tag shall be permanently attached to the pole above the hand hole. The tag shall state the manufacturer's name, pole type, ADOT standard drawing number, pole length, and gage number.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Aluminum Poles and Mast Arms: Truss Mast Arms	731-2.01(B)(2) ASTM B221	The aluminum truss mast arms shall be fabricated by the same manufacturer as the aluminum pole manufacturer and from Aluminum Alloy 6063-T6 conforming to the requirements of ASTM B221.		
Aluminum Poles and Mast Arms: Welding	731-2.01(B)(3) AWS D1.2	Welding of all components of aluminum light poles shall conform to the American Welding Society (AWS) D1.2 Specifications for Class I Structures.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4)	Break-away bases for light poles and flasher poles shall be a frangible pole mounting pedestal (base).		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4)	Break-away bases shall be fabricated from 356 T6 aluminum alloys and shall have a stainless-steel wheel abraded finish.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4)	The break-away bases shall have all the necessary hardware to make a complete and functional unit.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4) ASTM F3125	Bolts, nuts, and washers connecting the pole to the break-away base shall be fabricated from steel conforming to the requirements of ASTM F3125 Grade A325.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4) ASTM F2329	Bolts shall be galvanized in accordance with the requirements of ASTM F2329.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4) ASTM B695-85 ASTM F2329	The 2-3/4 inch x 1/2-inch thick washers shall be zinc mechanically coated per ASTM B695-85 Class 50 or shall be galvanized per the requirements of ASTM F2329.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4) AWS D1.2	Welding of all components of aluminum break-away bases shall conform to the AWS D1.2 Specifications.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4)	Break-away bases shall be certified by the manufacturer to meet or exceed the change in momentum requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and to be acceptable for use on Federal Aid projects.		
Aluminum Poles and Mast Arms: Break-away Transformer Bases	731-2.02(B)(4)	The manufacturer shall also certify that the break-away base has been tested and approved by the Federal Highway Administration (FHWA) and that the casting has the same chemistry, mechanical properties, and geometry as the casting used in the tests.		
Aluminum Poles and Mast Arms: Anchor Bolts, Nuts, and Washers	731-2.02(B)(5) ASTM F1554 ASTM F2329	All anchor bolts shall be fabricated from steel conforming to the requirements of ASTM F1554 Grade 55, shall be fully galvanized in accordance with the requirements of ASTM F2329, and shall conform to the requirements shown on the Standard Drawings.		
Steel Poles and Mast Arms: General	731-2.02(A)	Standard steel poles assemblies for traffic signals and highway lighting shall include pole shafts, mast arms, and pole bases.		
Steel Poles and Mast Arms: General	731-2.02(A)	Each steel pole and mast arm shall be designed and manufactured as a complete assembly. The assembly shall be furnished and installed as a complete unit that is configured to the necessary dimensions with all the required components including mounting brackets and assembly, ground lugs, rain caps, hand hole covers, anchor bolts, nuts, washers and related hardware and accessories.		
Steel Poles and Mast Arms: General	731-2.02(A)	The design of the traffic signal and lighting supports shall be per the requirements of the 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th edition, with the 2015 interim revisions.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Steel Poles and Mast Arms: General	731-2.02(A)	All pole lighting supports and mast arms shall be designed to withstand 90 miles per hour wind, and a 3-second Gust. Fatigue analysis is to be per Fatigue Category 2, without galloping. Truck Induced velocity shall be 55 mph wind speed.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	Tapered pole shafts shall be fabricated from sheet steel of weldable grade which shall meet a minimum yield stress, after fabrication, of 50,000 pounds per square inch.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	A taper rate of approximately 0.14 inches in diameter per linear foot shall be required unless otherwise specified.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1) ASTM A53 ASTM A500	Standard pipe pole shafts shall be fabricated from standard weight structural steel which conforms to the minimum strength requirements of ASTM A53, or A500 Grade B.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	Each section shall be fabricated from not more than two pieces of sheet steel.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	When two pieces are used, the longitudinal welded seams shall be directly opposite one another.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	When the sections are buttwelded, seams shall be directly opposite one another. When the sections are buttwelded together, the longitudinal welded seams on adjacent sections shall be placed to form continuous straight seams from base to top of pole.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	Pole shafts shall be straight, with a permissive variation not to exceed one inch measured at the midpoint.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1) ASTM A123	Pole shafts shall be galvanized in accordance with the requirements of ASTM A123.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	All steel poles shall have a hand hole in the base of the poles and shall conform to the details shown on the Standard Drawings.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	All welds shall be continuous and any exposed welds, except fillet welds, shall be ground flush with the base metal.		
Steel Poles and Mast Arms: Pole Shafts	731-2.02(B)(1)	A metal tag shall be permanently attached to the pole above the hand hole stating the manufacturer's name, pole type per the Department's plans, pole drawing number, shaft length and gage number.		
Steel Poles and Mast Arms: Mast Arms	731-2.02(B)(2)	Tapered mast arms for all pole types shall be fabricated from sheet steel with a minimum yield stress of 50,000 pounds per square inch after fabrication.		
Steel Poles and Mast Arms: Mast Arms	731-2.02(B)(2)	A taper rate of approximately 0.14 inches change in diameter per linear foot shall be required unless otherwise specified.		
Steel Poles and Mast Arms: Mast Arms	731-2.02(B)(2) ASTM F3125 ASTM F2329	All bolts, washers, and nuts for mast arms shall be high strength, shall be fabricated from steel which meets the requirements of ASTM F3125 GR A325, and shall be electrogalvanized in accordance with the requirements of ASTM F2329.		
Steel Poles and Mast Arms: Mast Arms	731-2.02(B)(2) ASTM A123	Mast arms shall be galvanized in accordance with the requirements of ASTM A123.		
Steel Poles and Mast Arms: Mast Arms	731-2.02(B)(2)	A metal tag shall be permanently attached on the side of the mast arm near the base stating the manufacturer's name, pole type and name as shown on the plans, mast arm or pole drawing number, length, and gage number.		
Steel Poles and Mast Arms: Steel Pole Extensions and Twin Luminaire Brackets	731-2.02(B)(3) ASTM A53 ASTM A500	Pole extensions and twin luminaire brackets shall be fabricated from new pipe conforming to the requirements of ASTM A53 or A500 Grade B.		
Steel Poles and Mast Arms: Steel Pole Extensions and Twin Luminaire Brackets	731-2.02(B)(3)	All welding shall conform to the requirements of the American Welding Society, Structural Welding Code - Steel, D1.1, latest edition.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Steel Poles and Mast Arms: Steel Pole Extensions and Twin Luminaire Brackets	731-2.02(B)(3) ASTM A123	Pole extensions and twin luminaire brackets shall be fully galvanized in accordance with the requirements of ASTM A123.		
Steel Poles and Mast Arms: Standard Bases	731-2.02(B)(4) ASTM A36	Poles shall have standard bases fabricated from structural steel plates conforming to the minimum strength requirements of ASTM A36.		
Steel Poles and Mast Arms: Standard Bases	731-2.02(B)(4)	Exposed surfaces shall be finished smooth and all exposed edges shall be neatly rounded to a 1/8inch radius.		
Steel Poles and Mast Arms: Standard Bases	731-2.02(B)(4) ASTM A123	Standard bases shall be galvanized in accordance with the requirements of ASTM A123.		
Steel Poles and Mast Arms: Anchor Bolts, Nuts and Washers	731-2.02(B)(5) ASTM F1554	Standard anchor bolts, washers, and nuts shall be fabricated from steel conforming to the requirements of ASTM F1554 Grade 55.		
Steel Poles and Mast Arms: Anchor Bolts, Nuts and Washers	731-2.02(B)(5) ASTM F2329	Anchor bolts, washers, and nuts shall be fully galvanized in accordance with the requirements of ASTM F2329.		
Steel Poles and Mast Arms: Anchor Bolts, Nuts and Washers	731-2.02(B)(5)	Anchor bolts shall conform to the requirements shown on Standard Drawings.		
Steel Poles and Mast Arms: Anchor Bolts, Nuts and Washers	731-2.02(B)(5)	Welding shall not be performed on any portion of the body of these bolts.		
Wood Poles: General	731-2.03(A)	Wood poles shall consist of full length, pressure treated material. Material, treatment, and preservatives shall be in accordance with the latest revisions of the AWPA Book of Standards.		
Wood Poles: General	731-2.03(A)	The lengths of the poles shall be 25 feet for service poles and 35 feet for other poles and shall be Class 3, unless otherwise specified.		

Product Property	Specification/ Test Method	Requirement			Results	Pass/ Fail
Wood Poles: Acceptance Species	731-2.03(C)	1) Douglas Fir (Pseudotsuga menzieii, MIRB Franco) 2) Southern Pines 3) Western Pine 3a. Loblolly (Pinus taeda) 3b. Longleaf (Pinus palustris) 3c. Pong (Pinus rigida serotina) 3d. Shortleaf (Pinus echinata) 3e. Slash (Pinus caribaea) 3f. Ponderosa (Pinus ponderosa laws)				
Wood Poles: Defects: Prohibited Defects	731-2.03(D)(1)	Pole exhibiting any of the following defects will not be accepted: Bird holes; Breaks; Catface (Scars); Compound through checks; Decay; Double Sweep (poles having sweep in two planes); Hollow butts or tops; Improper Framing; Nails or other metal not authorized by the Engineer; Plugged holes (other than increment borer); Small Butt; Small Top; Spike knots of any knot with bark inclusion; Split top; Worm or insect holes.				
Wood Poles: Limited Defects: Blue Stain	731-2.03(D)(2)(a)	Any core with 50 percent or more blue stain in sapwood will be rejected.				
Wood Poles: Limited Defects: Check	731-2.03(D)(2)(b)	Any check more than 1/8-inch wide and extending down from the top of the pole more than 12 inches and within 30 angular degrees from the axis of the face of the pole directly above the brand will be unacceptable.				
Wood Poles: Limited Defects: Check	731-2.03(D)(2)(b)	Through checks or splits in the butt surface are permitted, provided their height from the butt along the side surface does not exceed 2 feet.				
Wood Poles: Limited Defects: Check	731-2.03(D)(2)(b)	A check is considered to be continuous if it is not separated by at least ½-inch of wood. Maximum acceptable dimensions of checks are as follows:			See below	
Wood Poles: Limited Defects: Check	731-2.03(D)(2)(b)	**Length of Pole**	**Maximum Width**	**Maximum Length**	**Result**	
		≤30 feet	1/4 inch	5 feet		
		35-40 feet	5/16 inch	5 feet		

Product Property	Specification/ Test Method	Requirement			Results	Pass/ Fail
		≥45 feet	3/8 inch	8 feet		
Wood Poles: Limited Defects: Compression Wood	731-2.03(D)(2)(c)	The following defect is acceptable subject to the limitation stated: Compression wood in the outer 1-1/2 inch of the pole.				
Wood Poles: Limited Defects: Insect Damage	731-2.03(D)(2)(d)	Insect damage consisting of surface scoring or channeling are permitted; all other forms of insect damaged are prohibited.				
Wood Poles: Limited Defects: Insufficient Sapwood	731-2.03(D)(2)(e)	The following defect is acceptable subject to the limitation stated: Sapwood thickness less than the following: Douglas Fir – 1 inch Pine – 3 inches				
Wood Poles: Limited Defects: Knot	731-2.03(D)(2)(f)	The diameter of any single knot or the sum of the diameters of all knots in any 1-foot section shall not exceed the limits set up in the following table, excluding knots ½-inch or less in diameter for the sum of diameters:				
Wood Poles: Limited Defects: Knot	731-2.03(D)(2)(f)	**Length/Class of Pole**	**Diameter of Any Single Knot**	**Sum of Diameters of Knots in Any 1-Foot Section**	**Result**	
		≤45 feet	2.5 inches	8 inches		
		≥50 feet	3.0 inches	10 inches		
Wood Poles: Limited Defects: Knot	731-2.03(D)(2)(f)	Maximum single knot in any sworl shall be 2 inches in diameter.				
Wood Poles: Limited Defects: Knot	731-2.03(D)(2)(f)	Maximum sum of knots in any sworl shall not exceed 20 percent of the pole circumference at the point of the sworl or more than the amount shown in the table above under the column heading “Sum of Diameters of Knots in Any 1-Foot Section.”				
Wood Poles: Limited Defects: Mechanical Damage	731-2.03(D)(2)(g)	Poles are not acceptable if they have abrasions or damage cause by forklifts, dragging along the ground, indentation of chains, cables, cant hooks, peaveys, pole tongs, or other mechanical damage penetrating the pole more than ¾ inch.				

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Wood Poles: Limited Defects: Pilodyn	731-2.03(D)(2)(h)	The pilodyn can be used to check hardness of poles. The test will normall be taken at the ground line and any measurement 22mm and over on ponderosa pine will result in that pole being rejected.		
Wood Poles: Limited Defects: Ring Count	731-2.03(D)(2)(i)	The average annual ring count shall be not less than six rings per inch average measured in the outer 3 inches on the butt face.		
Wood Poles: Limited Defects: Sapstain	731-2.03(D)(2)(j)	Stain that is not accompanied by softening or other disintegration (decay) of the wood is permitted.		
Wood Poles: Limited Defects: Shake	731-2.03(D)(2)(k)	Shakes in the butt surface extending through an arc of not more than 90 degrees are permitted, provided they are at least 2 inches from the outside diameter of butt.		
Wood Poles: Limited Defects: Short Crook	731-2.03(D)(2)(l)	Any localized deviation from straightness in a 5-foot section or less shall be classified as a short crook, and the deviation from straightness shall not exceed 1-1/2 inches.		
Wood Poles: Limited Defects: Spiral Grain	731-2.03(D)(2)(m)	Spiral grain is permitted provided it does not exceed ½ turn in 15 feet or one complete turn in any 30 feet of the pole.		
Wood Poles: Limited Defects: Sweep	731-2.03(D)(2)(n)	Where sweep is in one plane and one direction only, a straight line connecting the surface of the pole at a point located 6 feet from the butt, and the edge of the pole at the top shall not be separated from the surface of the pole at any point by more than 1 inch for each 10 feet of length between these points.		
Wood Poles: Limited Defects: Sweep	731-2.03(D)(2)(n)	Where sweep is in one plane and two directions (reverse sweep), a straight line connecting the midpoint at a point located 6 feet from the butt with the midpoint of the top shall not deviate from the center line of the pole more than ¼ the diameter of the pole at the point of widest deviation.		
Wood Poles: Dimensions: Length	731-2.03(E)(1)	Poles less than 50 feet in length shall be not more than 3 inches shorter or 6 inches longer than nominal length.		

Product Property	Specification/ Test Method	Requirement				Results	Pass/ Fail
Wood Poles: Dimensions: Length	731-2.03(E)(1)	Poles 50 feet or more in length shall be not more than 6 inches shorter or 12 inches longer than nominal length.					
Wood Poles: Dimensions: Length	731-2.03(E)(1)	The minimum lengths for the wood species shown are as follows:				See below	
Wood Poles: Dimensions: Length	731-2.03(E)(1)	**Wood Species**		**Minimum Length of Pole**		**Result**	
		Douglas Fir		50 feet			
		Western Pine		45 feet			
		Southern Pine		30 feet			
Wood Poles: Dimensions: Classification	731-2.03(E)(2)	The pole circumference at the top and at a point 6 feet from the butt shall not be less than the dimensions shown below:				See below	
Wood Poles: Dimensions: Classification	731-2.03(E)(2)	**Pole Dimensions, Class 3**				**Result**	
		Minimum Circumference at Top is 23 inches		**Minimum Circumference at 6 Feet from Butt (Inches)**			
		Length of Pole (Feet)	**Groundline Distance from Butt (Feet)**	**Western Pine**	**Douglas Fir and Southern Pine (all types)**		
		20	4	29.5	27.0		
		25	5	32.5	29.5		
		30	5.5	35.0	32.0		
		35	6	37.5	34.0		
		40	6	39.5	36.0		
		45	6.5	41.5	37.5		
		50	7	43.5	39.0		
		55	7.5	45.0	40.5		
		60	8	46.5	42.0		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Wood Poles: Manufacturing Requirements: Bark Removal	731-2.03(F)(1)	Poles shall be smoothly trimmed by machine; the depth of the cut shall be kept to a minimum consistent with proper removal of the bark. Beveling the top or butt, excessive trimming around knots which results in separation in wood structure (knot pop-up), prominent spiral ridges on pole surfaces, rough or feathery surfaces, exposed heartwood (except at knot areas), patches of inner bark more than ½-inch wide and 6 inches long, and abrupt changes in contour due to shaving are evidences of improper removal of bark. Individual poles with such defects shall be rejected.		
Wood Poles: Manufacturing Requirements: Marking	731-2.03(F)(2)	The following marks shall be burn-branded legibly on the butt and on the face of the pole per AWPA Standard M6 at a point 12 feet ± 2 inches tolerance: (a) The suppliers code or trademark (b) The Plan location and the year of treatment (c) Code letters denoting pole species and preservative used (d) The circumference class numeral and numerals showing the length of the pole		
Wood Poles: Manufacturing Requirements: Treating Charge Number	731-2.03(F)(3)	Code numerals indicating the treating charge number must be placed on the butt either by stamping or on metal tags.		
Wood Poles: Preservatives: Preservative Requirements	731-2.03(G)(1)	The type of preservative to be used shall be Penta-Volatile Petroleum Solvent (Cellon or Dow process).		
Wood Poles: Preservatives: Penta-Volatile Petroleum Solvent	731-2.03(G)(2)	The pentachlorophenol shall conform to AWPA Standard P8. The carries shall be hydrocarbon solvents Type B or D conforming to AWPA Standard P9.		
Wood Poles: Treatment: Poles	731-2.03(H)(1)	Poles shall be treated in accordance to AWPA Standards C1 and C4.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Wood Poles: Treatment: Moisture Content	731-2.03(H)(2)	Prior to treatment, poles shall be sufficiently air-seasoned, boultonized or kiln-dried to minimize checking after treatment and to permit maximum penetration and retention of preservative.		
Wood Poles: Treatment: Moisture Content	731-2.03(H)(2)	Moisture content of the sapwood shall be below 25 percent. The moisture content may be determined by electrical resistance type moisture meters and shall have insulated needles driven 2 inches in fir or 2-1/2 inches in pine.		
Wood Poles: Treatment: Retention	731-2.03(H)(3)	Douglas Fir – The treating process must produce not less than 1 inch penetration at any point on the pole. If the sapwood thickness exceeds 1 inch between the butt and standard ground line, 85 percent of the sapwood shall be treated. The assay zone shall be 1/4 to 1 inch. Cellon or Dow Process – Retention shall be not less than 0.90 pounds per cubic foot in the assay zone.		
Wood Poles: Treatment: Retention	731-2.03(H)(3)	Western and Southern Pines – The treating process must produce complete sapwood penetration. The assay zone shall be 0.5 to 2.0 inches. Cellon or Dow Process – Retention shall be not less than 0.60 pounds per cubic foot in the assay zone.		
Wood Poles: Treatment: Penetration	731-2.03(H)(4)	Not less than one increment core shall be taken in the ground line area. All increment borer holes shall be plugged with tight fitting cylindrical wood plugs treated with the same preservative used to treat the pole. Penetration shall be determined by Cellon or Dow Process – Penta Check or Wetzel Stain methods.		
Wood Poles: Treatment: Cleanliness – After Treatment	731-2.03(H)(5)	Cellon or Dow Process – Poles shall be washed or brushed so they are clean and free of surface crystals.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Wood Poles: Treatment: Retreatment	731-2.03(H)(6)	All poles which fail to meet the treating requirements of this specifications may be treated one time after initial inspection. Temperature and pressure must conform to AWPA Standard C1 for retreatment. Stored Poles – All poles showing brands or marks indicating treatment within any calendar year three years or more previous to the year of shipment shall be retreated one time conforming to AWPA Standard C1. Cut Back Poles – All poles that are shortened or trimmed shall be retreated within seven days conforming to AWPA Standard C1.		
Type “A” Pole	T.S. 4-1	Type “A” poles shall conform to Standard Drawing T.S. 4-1.		
Type “S” Pole	T.S. 4-2	Type “S” poles shall conform to Standard Drawing T.S. 4-2.		
Type “T” Pole	T.S. 4-3	Type “T” poles shall conform to Standard Drawing T.S. 4-3.		
Type “S” and “T” Pole Twin Luminaires	T.S. 4-4	Type “S” and Type “T” steel twin luminaire mounting brackets and extensions shall conform to Standard Drawing T.S. 4-4.		
Aluminum Type “S” Pole	T.S. 4-5	Aluminum Type “S” poles shall conform to Standard Drawing T.S. 4-5.		
Aluminum Type “T” Pole	T.S. 4-6	Aluminum Type “T” poles shall conform to Standard Drawing T.S. 4-6.		
Type “G” Pole	T.S. 4-7	Type “G” poles shall conform to Standard Drawing T.S. 4-7.		
Aluminum Type “G” Pole	T.S. 4-8	Aluminum Type “G” poles shall conform to Standard Drawing T.S. 4-8.		
Type “H” Pole	T.S. 4-9	Aluminum Type “H” poles shall conform to Standard Drawing T.S. 4-9.		
Type “I” Pole	T.S. 4-10	Aluminum Type “I” poles shall conform to Standard Drawing T.S. 4-10.		
Type “J” Pole	T.S. 4-12	Type “J” poles shall conform to Standard Drawing T.S. 4-12.		
Type “Q” Pole	T.S. 4-13	Type “Q” poles shall conform to Standard Drawing T.S. 4-13.		

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Type “K” Pole	T.S. 4-14	Type “K” poles shall conform to Standard Drawing T.S. 4-14.		
Type “R” Pole	T.S. 4-15	Type “R” poles shall conform to Standard Drawing T.S. 4-15.		
Type “V” Pole	T.S. 4-16	Type “V” poles shall conform to Standard Drawing T.S. 4-16.		
Type “W” Pole	T.S. 4-17	Type “W” poles shall conform to Standard Drawing T.S. 4-17.		
Hand Hole	T.S. 4-18	Hand holes shall conform to Standard Drawing T.S. 4-18.		
Type “U” Pole	T.S. 4-19 to 4-26	Type “U” poles shall conform to Standard Drawings T.S. 4-19 to 4-26.		
Type PB Pole	T.S. 4-27	Pedestrian push button posts “Type PB Pole” shall conform to Standard Drawing T.S. 4-28.		
Pole Foundation Anchor Bolts	T.S. 4-28	Pole foundation anchor bolts shall conform to Standard Drawing T.S. 4-28.		
Steel Mast Arm Luminaire and Signal Arms to 20’	T.S. 4-29	Steel luminaire and signal arms to 20’ shall conform to Standard Drawing T.S. 4-29.		
Aluminum Truss Arm Type “G” “H” and “I” Poles	T.S. 4-30	Aluminum truss arms for Type “G” “H” and “I” poles shall conform to Standard Drawing T.S. 4-30.		
Signal Mast Arm Tenon	T.S. 4-31	Signal mast arm tenons shall conform to Standard Drawing 4-31.		
Type 2 Cast Aluminum Break-Away Base	T.S. 5-0 T.S. 5-1	Type 2 cast aluminum break-away bases shall conform to Standard Drawings T.S. 5-0 and T.S. 5-1.		
Type 3 Cast Aluminum Break-Away Base	T.S. 5-0 T.S. 5-2	Type 3 cast aluminum break-away bases shall conform to Standard Drawings T.S. 5-0 and T.S. 5-2.		