TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2014	19180-3212-04	2C

HIGH MAST CONSTRUCTION SPECIFICATION

HIGH MAST POLES

(1) THE POLES SHALL BE ROUND TAPERED STEEL POLES DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2013 EDITION OF THE STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, EXCEPT AS FURTHER PROVIDED HEREIN.

(2) POLES SHALL BE DESIGNED FOR 90 MPH WIND PRESSURE. THE DESIGN SHALL SUPPORT THE NUMBER AND TYPE OF LUMINAIRES AND MOUNTING HEAD SPECIFIED IN THE PLANS.

(3) MATERIAL USED IN THE MANUFACTURE OF STEEL HIGH MAST POLES SHALL BE:

(A) ASTM A-572 GRADE 60 HIGH STRENGTH STEEL.

(B) POLES SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A-123.

(C) ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 55 AND ANCHOR BOLT NUTS SHALL CONFORM TO ASTM A-563.

(D) ANCHOR BOLTS SHALL BE THREADED ON END (LOWER THREADING IS FOR A PLATE NUT ATTACHMENT).

(E) ANCHOR BOLTS SHALL BE GALVANIZED ON THE THREADED ENDS A MINIMUM OF 10".

(F) ANCHOR BOLTS AND ANCHOR BOLT NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.

(G) AN ANCHOR BOLT CAGING METHOD TO MECHANICALLY ALIGN ANCHOR BOLTS SHALL BE PROVIDED. NO WELDING OF ANCHOR BOLTS SHALL BE PERMITTED.

(4) FABRICATION AND WELDING OF THESE POLES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AWS 01.1 SPECIFICATION.

(A) ALL WELDS SHALL BE INSPECTED ACCORDING TO THE AWS STANDARDS, SECTION 6, USING DYE PENETRANT OR MAGNETIC PARTICLE INSPECTIONS.

(B) THE FIRST WELDED JOINT OF EACH FULL PENETRATION TRANSVERSE WELD FOR EACH ORDER SHALL BE NONDESTRUCTIVELY EXAMINED TO VERIFY THE PREPARATION, PROCEDURES, MAINTENANCE OF UNIFORMITY, AND THAT THE WELD IS OF REQURIED QUALITY.

(C) LONGITUDINAL SEAM WELDS SHALL HAVE A MINIMUM OF 60% PENETRATION AND SHALL BE VERIFIED BY POLISHING, ETCHING AND EXAMINING A TRIMMING CUT-OFF FROM SELECTED MALE TUBE ENDS.

(D) THE FEMALE TUBE ENDS IN THE AREA OF TELESCOPING JOINTS SHALL BE WELDED BOTH INSIDE AND OUTSIDE TO INSURE THE INTEGRITY OF THE WELD.

(E) NO TRANSVERSE WELDING SHALL BE PERMITTED TO SECURE OVERLAPPING TELESCOPING JOINTS.

(5) EACH POLE SHALL BE FURNISHED WITH A TOP MOUNTING TENON TO ACCEPT THE LUMINAIRE MOUNTING DEVICE.

(6) THE POLE, NEAR THE BASE, SHALL HAVE A HANDHOLE OPENING 10" WIDE BY 20" HIGH TO RECEIVE THE MOUNTING HEAD LOWERING MECHANISM. HANDHOLE MUST BE OVAL IN SHAPE.

(A) THE OPENING SHALL BE REINFORCED ON THE INSIDE WITH A STELL SLEEVE. THE SLEEVE SHALL HAVE SUFFICIENT THICKNESS AND LENGTH TO REPLACE THE EQUIVALENT STRENGTH OF THE TUBE SECTION LOST BY THE 10" BY 20" OPENING.

(B) A MOUNTING PLATE FOR ATTACHING THE LOWERING MECHANISM SHALL BE ATTACHED TO THE REINFORCING SLEEVE AND BE ACCESSIBLE THROUGH THE HANDHOLE.

(C) EACH POLE SHALL HAVE A HANDHOLE COVER, ATTACHED BY FOUR STAINLESS HEX BOLTS.

(7) EACH POLE SHALL BE PROVIDED WITH A MEANS FOR GROUNDING CONSISTING OF A 1/2" UNC-2 NUT WELDED TO THE INSIDE OF THE POLE.

(8) ONLY QUALIFIED MANUFACTURERS WILL MANUFACTURE THE SPECIFIED POLES. RESPONSIBILITY FOR COMPLIANCE WITH THE SPECIFICATIONS REMAINS WITH THE CONTRACTOR. MANUFACTURER WILL SUPPLY A CERTIFICATE OF COMPLIANCE TO SPECIFICATION BY AN INDEPENDENT TESTING LABORATORY HIRED BY THE MANUFACTURER AND APPROVED BY THE STATE.

HIGH MAST LUMINAIRES

(9) LUMINAIRES SHALL BE A COMPLETE ASSEMBLY CONSISTING OF A BALLAST HOUSING REFRACTOR, BALLAST, LAMP SOCKET, AND ALL MISCELLANEOUS HARDWARE. THE BALLAST HOUSING SHALL BE CAST ALUMINUM WITH A 2" SIDE ENTRY SLIP-FITTER MOUNT. THE REFLECTOR SHALL BE SHEET ALUMINUM SPUN, OR PRESSED. REFRACTORS SHALL BE BOROSILICATE GLASS. ALL SCREWS, CLAMP BANDS, AND OTHER HARDWARE ON THE LUMINAIRE SHALL BE STAINLESS STEEL. THE LUMINAIRE SHALL BE FOR OPERATION WITH AN A.N.S.I. S52 1000 WATT HIGH PRESSURE SODIUM LAMP. THE BALLAST SHALL BE REGULATOR TYPE 240 VOLT SUPPLY VOLTAGE. EACH LUMINAIRE SHALL BE INDIVIDUALLY FUSED WITH A 5.0 AMP, 600 VOLT FUSE WITH WEATHERPROOF FUSE HOLDER. THE LUMINAIRES SHALL HAVE A TYPE V DISTRIBUTION.

HIGH MAST LUMINAIRE LOWERING SYSTEM

(10) THE LOWERING SYSTEM SHALL CONSISTS OF A HEAD FRAME, A LUMIAIRE RING, AND A WINCH AND HOISTING ASSEMBLY. THE HEAD FRAME SHALL BE GALVANIZED STEEL CONSTRUCTION, AND SHALL ATTACH TO THE POLE BY MEANS OF A SLILP-FITTER AND SET SCREWS. THE HEAD FRAME SHALL BE EQUIPPED WITH SIX CABLE SHEAVES GROOVED TO THE EXACT DIAMTER OF THE HOIST CABLES. THE HOIST CABLES SHALL BE STAINLESS STEEL, 7 X 19 STRANDED AIRCRAFT CABLES, 3/16" DIAMETER.

(11) A POWER CABLE SHEAVE SHALL BE PROVIDED AND SHALL BE EQUIPPED WITH "KEEPER" DEVICES TO PREVENT THE CABLE FROM JUMPING THE GROOVE DURING OPERATION.

(12) THREE LATCHING DEVICES SHALL BE PROVIDED IN THE HEAD FRAME TO SUPPORT THE LUMINAIRE RING ASSEMBLY WHEN THE LOWERING DEVICE IS NOT IN OPERATION. THE LATCHES SHALL ALTERNATELY LATCH AND UNLATCH UPON SUCCESSIVE ACTUATIONS OF RAISING THE LUMINAIRE RING. EACH LATCH SHALL BE EQUIPPED WITH A FLAG TO INDICATE THE LATCHED-UNLATCHED POSITIONS. ALL COMPONENTS OF THE LATCH MECHANISM MUST BE SERVICEABLE FROM THE GROUND WHEN THE RING IS LOWERED. A BOTTOM LATCHING DEVICE IS NOT ACCEPTABLE.

(13) THE LUMINAIRE RING SHALL BE GALVANIZED STEEL CHANNEL CONSTRUCITON WITH 2" NPS GALVANIZED PIPE MOUNTING ARMS FOR THE LUMINAIRES. THE RING SHALL BE PREWIRED WITH TYPE ST. 105 DEGREE C, 600V CABLE TO A MAIN TERMINAL BLOCK MOUNTED WITHIN A WHEATHERPROOF HOUSING. A WEATHERTIGHT TWISTLOCK POWER PLUG AND RECEPTACLE, NEMA L8-20R CONFIGURATION, SHALL BE PROVIDED ON THE RING FOR TESTING THE LUMINAIRES WHILE IN THE LOWERED POSITION.

(14) WHERE LUMINAIRES ARE PLACED ON ONE SIDE OF THE RING ONLY, A COUNTER-BALANCING DEVICE OR DEVICES SHALL BE FURNISHED AND INSTALLED TO INSURE EVEN WEIGHT DISTRIBUTION AROUND THE RING AND PROPER OPERATION OF THE RING DURING RAISING AND LOWERING.

(15) THE WINCH SHALL BE A WORM GEAR, SELF-LOCKING TYPE, DESIGNED FOR HAND OPERATION OR FOR OPERATION BY A 1/2" HEAVY DUTY REVERSING DRILL MOTOR. TWO (2) PORTABLE HAND CRANKS SHALL BE FURNISHED TO THE ENGINEER.

(16) ONE COMPLETE ASSEMBLY OF A PORTABLE POWER UNIT CONSISTING OF A 1/2" HEAVY DUTY REVERSING DRILL MOTOR, A TORQUE-LIMITING SLIP CLUTCH, REMOTE CONTROL UNIT WITH A MINIMUM 25' CORD (AS REQUIRED BY THE UTILITY) AND 480V-240V STEP-DOWN TRANSFORMER SHALL BE MOUNTED ON A SUITABLE BED PLATE AND HAVE A QUICK-CONNECT SHAFT CONNECTOR TO THE WINCH DRIVE.

(17) A 1/4" STAINLESS STEEL 7 X 19 AIRCRAFT CABLE SHALL BE PROVIDED ON THE WINCH. A NON-AUTOMATIC CIRCUIT BREAKER DISCONNECT AND A MATCHING NEMA L8-20P PLUG AND RECEPTACLE SHALL BE FURNISHED IN THE BASE OF THE POLE.

(18) THE NEMA L8-20P PLUG SHALL BE A FOUR PRONG PLUG (2 - 240V HOT LEGS, 1-NEUTRAL AND 1-GROUND) RATED AT 60A. THE PLUG SHALL HANDLE THE MAXIMUM POSSIBLE LOAD (12 - 1130W LUMINAIRE SYSTEM, 6 ON ONE HOT LEG & 6 ON THE OTHER).

(19) ACCEPTABLE LOWERING DEVICES ARE MANUFACTURED BY GENERAL ELECTRIC, HOLOPHANE, MILLERBERND, EAGLE AND QUALITY LIGHTING.

(20) ALL HIGH MAST COMPONENTS INCLUDED IN THIS SPECIFICATION SHALL BE INCLUDED FOR PAYMENT UNDER THE BID ITEM COST FOR THE HIGH MAST POLE.

(21) THE DRILL MOTOR CORD SHALL BE A MINIMUM OF 25 TO 30 FT LONG. CONTRACTOR TO ENSURE THE CORD IS LONG ENOUGH FOR OPERATOR SAFETY.

SEALED BY

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HIGH MAST LIGHTING NOTES

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