

NOTE:			COUNTY OF	ITEM NO.	SHEET NO.
WHENEVER THE PLAN SPECIFICATIONS CONFLICT WITH THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, THE PLAN SPECIFICATIONS SHALL GOVERN.					
HIGH MAST POLES					
HIGH MAST POLE DESIGN SHALL BE IN ACCORDANCE WITH LOADING AND ALLOWABLE STRESS REQUIREMENTS OF 2009 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS." FIFTH EDITION WITH CURRENT INTERIMS. LOADING SHALL BE BASED ON BASIC WIND SPEED OF 90 MPH, WITH A DESIGN LIFE/RECURRENCE INTERVAL OF 50 YEARS AND DESIGNED TO FATIGUE CATEGORY I. ALL DRAWINGS SHALL BE SUBMITTED IN DETAIL DEMONSTRATING THE COMPLIANCE WITH THE AASHTO SPECIFICATION.					
THE STEEL POLE MEMBERS SHALLBE DESIGNED FOR VORTEX SHEDDING. THERE SHALL BE NO GALLOPING DESIGN FOR THIS STRUCTURE. ALL STRUCTURES SHALL BE DESIGNED FOR A GUST FACTOR OF 1.14. THERE SHALL BE NO TRUCK INDUCED GUST FATIGUE.					
THE FABRICATOR SHALL BE CERTIFIED UNDER CATEGORY I "CONVENTIONAL STEEL STRUCTURES" AS SET FORTH BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION QUALITY CERTIFICATION PROGRAM.					
ALL WELDING SHALL BE IN ACCORDANCE WITH SECTIONS 1 THROUGH 8 OF THE AMERICAN WELDING SOCIETY (AWS) D1.1 STRUCTURAL WELDING CODE. TACKERS AND WELDERS SHALL BE QUALIFIED IN ACCORDANCE WITH THE CODE. TUBE LONGITUDINAL SEAM WELDS SHALL BE FREE OF CRACKS AND EXCESSIVE UNDERCUT, PERFORMED WITH AUTOMATIC PROCESSES, AND BE VISUALLY INSPECTED. LONGITUDINAL WELDS SUSPECTED TO CONTAIN DEFECTS SHALL BE MAGNETIC PARTICLE INSPECTED. ALL CIRCUMFERENTIAL BUTT WELDED POLE AND ARM SPLICES SHALL BE ULTRASONICALLY AND RADIOGRAPHICALLY INSPECTED.					
ALL MATERIALS AND PRODUCTS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA AND COMPLY WITH ASTM OR AASHTO SPECIFICATIONS.					
ALL POLES SHALL BE OF THE SAME DESIGN. POLES SHALL BE DESIGNED FOR 12 FIXTURES PER POLE. THE COMBINED EFFECTIVE PROJECTED AREA (EPA) AND WEIGHT OF THE FIXTURES AND LOWERING DEVICE SHALL BE DETERMINED BY THE FIXTURE MANUFACTURER.					
THE CALCULATIONS SHALL INCLUDE A POLE, BASE PLATE, AND ANCHOR BOLT ANALYSIS. THE POLE CALCULATIONS SHALL BE ANALYZED AT THE POLE BASE, 5 FT INTERVALS, AND AT EACH SLIP JOINT SPLICE. AT EACH OF THESE LOCATIONS, THE FOLLOWING INFORMATION SHALL BE GIVEN:					
1. THE POLE'S DIAMETER, THICKNESS, SECTION MODULUS, MOMENT OF INERTIA, AND CROSS SECTIONAL AREA. 2. THE CENTROID, WEIGHT, PROJECTED AREA, DRAG COEFFICIENT, VELOCITY PRESSURE, AND WIND FORCE OF EACH TRAPEZOIDAL POLE SEGMENT. 3. THE AXIAL FORCE, SHEAR FORCE, PRIMARY MOMENT, TOTAL MOMENT, AXIAL STRESS, BENDING STRESS, ALLOWABLE AXIAL STRESS, ALLOWABLE BENDING STRESS, AND COMBINED STRESS RATIO (CSR) AT EACH ELEVATION. 4. THE POLE'S ANGULAR AND LINEAR DEFLECTION AT EACH ELEVATION.					
EACH POLE SECTION SHALL CONFORM TO ASTM A 595 GRADE A WITH A MINIMUM YIELD STRENGTH OF 55 KSI OR ASTM A 572 WITH A MINIMUM YIELD STRENGTH OF 65 KSI. TUBES SHALL BE ROUND OR 16 SIDED WITH A FOUR INCH CORNER RADIUS, HAVE A CONSTANT LINEAR TAPER OF .144 IN/FT AND CONTAIN ONLY ONE LONGITUDINAL SEAM WELD. CIRCUMFERENTIAL WELDED TUBE BUTT SPLICES AND LAMINATED TUBES ARE NOT PERMITTED. POLE SECTIONS SHALL BE TELESCOPICALLY SLIP FIT ASSEMBLED IN THE FIELD TO FACILITATE INSPECTION OF INTERIOR SURFACE WELDS AND THE PROTECTIVE COATING. THE MINIMUM LENGTH OF THE TELESCOPIC SLIP SPLICES SHALL BE 1.5 TIMES THE INSIDE DIAMETER OF THE EXPOSED END OF THE FEMALE SECTION. LONGITUDINAL SEAM WELDS ON BOTH SECTIONS OF THE SLIP SPLICE SHALL BE COMPLETE PENETRATION WELDS FOR A LENGTH EQUAL TO THE MINIMUM SPLICE LENGTH PLUS 1/2 FT. LONGITUDINAL SEAM WELDS WITHIN 1/2 FT OF COMPLETE PENETRATION POLE TO BASE PLATE WELDS SHALL BE COMPLETE PENETRATION WELDS. TUBES SHALL BE HOT DIP GALVANIZED PER ASTM A 123.					
BASE PLATES SHALL CONFORM TO ASTM GRADE 36 OR GRADE 50. THE THICKNESS OF THE BASE PLATES SHALL BE EQUAL TO OR GREATER THAN THE NOMINAL DIAMETER OF THE CONNECTION BOLT. PLATES SHALL BE INTEGRALLY WELDED TO THE TUBES WITH A TELESCOPIC WELDED JOINT OR A FULL PENETRATION BUTT WELD WITH BACKUP BAR. PLATES SHALL BE HOT DIP GALVANIZED PER ASTM A 123.					
ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENT OF ASTM F 1554 GRADE 55 FOR HOOKED SMOOTH BARS OR GRADE 105 FOR HEADED. THE UPPER 12" OF THE BOLTS SHALL BE HOT DIP GALVANIZED PER ASTM A 153. EACH ANCHOR BOLT SHALL BE SUPPLIED WITH TWO HEX NUTS AND TWO FLAT WASHERS. THE STRENGTH OF THE NUTS SHALL EQUAL OR EXCEED THE PROOF LOAD OF THE BOLTS. BOTH NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.					
1/3/2011					
GALVANIZING: PRIOR TO BEING INCORPORATED INTO AN ASSEMBLED PRODUCT, STEEL PLATES 3/4 INCH OR MORE IN THICKNESS SHALL BE BLAST CLEANED WHEN REQUIRED TO REMOVE ROLLED-IN MILL SCALE, IMPURITIES AND NON-METALLIC FOREIGN MATERIALS. AFTER ASSEMBLY, ALL WELD FLUX SHALL BE MECHANICALLY REMOVED. THE IRON OR STEEL PRODUCT SHALL BE DEGREASED BY IMMERSION IN AN AGITATED 4.5%-6% CONCENTRATED CAUSTIC SOLUTION ELEVATED TO A TEMPERATURE RANGING FROM 150-190 °F. IT SHALL THEN BE PICKLED BY IMMERSION IN A HEATED SULFURIC ACID SOLUTION OF 6%-13% CONCENTRATION, WITH A CONTROLLED TEMPERATURE BETWEEN 150-190 °F. IT SHALL NEXT BE RINSED CLEAN FROM ANY RESIDUAL EFFECTS OF THE CAUSTIC OR ACID SOLUTION BY IMMERSION IN A CIRCULATING FRESH WATER BATH. FINAL PREPARATION SHALL BE ACCOMPLISHED BY IMMERSION IN A CONCENTRATED ZINC AMMONIUM CHLORIDE FLUX SOLUTION HEATED TO 130° F. THE SOLUTION'S ACIDITY CONTENT SHALL BE MAINTAINED BETWEEN 4.5-5.0 PH. THE ASSEMBLY SHALL BE AIR DRIED TO REMOVE ANY MOISTURE REMAINING IN THE FLUX COAT AND/OR TRAPPED WITHIN THE PRODUCT.					
THE PRODUCT SHALL BE HOT-DIP GALVANIZED TO THE REQUIREMENTS OF EITHER ASTM A 123 (FABRICATED PRODUCTS) OR ASTM A 153 (HARDWARE ITEMS) BY IMMERSION IN A MOLTEN BATH OF PRIME WESTERN GRADE ZINC MAINTAINED BETWEEN 810-850 °F.					
LOWERING DEVICE					
HEAD FRAME ASSEMBLY: THE HEAD FRAME ASSEMBLY SHALL BE FABRICATED FROM GALVANIZED STRUCTURE STEEL OR STAINLESS STEEL. THE HEAD FRAME ASSEMBLY SHALL MOUNT TO THE HIGH MAST POLE TENON AND SHALL BE SECURED WITH STAINLESS STEEL SET SCREWS. THE MANUFACTURER OF THE LOWERING DEVICE SHALL COORDINATE WITH THE POLE MANUFACTURER TO ENSURE COMPATIBILITY BETWEEN THE LOWERING DEVICE AND THE POLE. THE HEAD FRAME ASSEMBLY SHALL BE A TOP LATCHING DESIGN WITH THREE LIFTING CABLES USED TO RAISE AND LOWER THE LUMINAIRE RING. THE LIFTING CABLES SHALL BE STAINLESS STEEL, .18 INCH, 19 X 7 OR 7 X 19, AIRCRAFT CABLES MANUFACTURED PER MIL W-83140. EACH LIFTING CABLE SHALL BE SUPPORTED BY TWO SHEAVES (PULLEYS). SHEAVES SHALL BE CAST OR FORGED STEEL WITH A MACHINED GROOVE FOR THE CABLE .007 INCH LARGER THAN THE NOMINAL DIAMETER OF THE CABLE. SHEAVES MAY ALSO BE MANUFACTURED OF A MOLYBDENUM DISULFIDE REINFORCED NYLON. SHEAVES SHALL INCORPORATE OIL IMPREGNATED SINTERED BRONZE BUSHINGS. SHEAVES SHALL BE SUPPORTED BY SMOOTH STAINLESS STEEL SHAFTS. HEAD FRAME ASSEMBLY COVER SHALL BE CONSTRUCTED OF COPPER FREE SPUN ALUMINUM OR CLEAR UV STABILIZED ACRYLIC. COVER SHALL BE SHAPED TO SHED WATER.					
ELECTRICAL POWER CORD: ELECTRICAL POWER CORD SHALL BE TYPE SO, EXTRA FLEXIBLE, RATED FOR 600 VOLTS. POWER CORD SHALL BE 4 CONDUCTOR *8 AWG OR 3 CONDUCTOR *10 AWG. POWER CORD SHALL BE SUPPORTED BY A MINIMUM OF SEVEN TEFLON OR DELRIN ROLLERS. CORD SHALL BE TERMINATED WITH A 4 CONDUCTOR TWISTLOCK CONNECTOR ON THE FREE END AND 600 VOLT TERMINAL BLOCK IN THE RING ENCLOSURE. LUMINAIRE RING: THE LUMINAIRE RING SHALL BE CONSTRUCTED OF 6 FT X 2 FT GALVANIZED STRUCTURE STEEL. THE LUMINAIRE RING SHALL BE PREWIRED AND INCLUDE A WEATHERPROOF JUNCTION BOX AND TEST RECEPTACLE FOR GROUND LEVEL TESTING OF THE LUMINAIRES. IF A SPECIAL CABLE IS REQUIRED FOR GROUND LEVEL TESTING, ONE CABLE SHALL BE SUPPLIED WITH EACH PORTABLE POWER UNIT SPECIFIED ON THE PROJECT. THE RING SHALL INCLUDE THE APPROPRIATE NUMBER OF 2" STEEL LUMINAIRE MOUNTING TENONS INSTALLED. THE LUMINAIRE RING SHALL HAVE SPRING LOADED IRIS ARMS OR SPRING LOADED ROLLERS TO KEEP THE RING CONCENTRIC AROUND THE POLE DURING RAISING AND LOWERING. DESIGN OF THE IRIS ARMS SHALL BE AS SHOWN ON THE SPECIFICATION SHEETS. SPRINGS AND SPRING MOUNTING HARDWARE SHALL BE STAINLESS STEEL.					
LUMINAIRES: HIGH MAST LUMINAIRES SHALL BE 1000W, HPS, 480V SINGLE PHASE STARTERS SHALL BE A PAYNE SPARKMAN OR APPROVED EQUAL.					
CRITERIA FOR APPROVAL OF LUMINAIRES: AVERAGE MAINTAINED: .8 FOOTCANDLES• MINIMUM MAINTAINED : .2 FOOTCANDLES• UNIFORMITY RATIO : <= 4:1• • ON ROADWAY SURFACE					
A 0.2 ISO-FOOTCANDLE TRACE MUST COVER ALL ROADWAY SURFACES. THIS TRACE MUST BE FROM TAPER TO TAPER ON EACH MAINLINE AND CROSSROAD.					
ALL CRITERIA MUST BE MET WITH ORIGINAL LOCATIONS OF POLES ON THE PLAN SHEET.					
ALL HIGH MAST LUMINAIRES SHALL BE OF THE SAME MANUFACTURER.					
LATCHING MECHANISM: THE LATCHING MECHANISM SHALL CONSIST OF THREE HIGH STRENGTH, MARINE GRADE ALUMINUM LATCHING HOUSINGS AND THREE STAINLESS STEEL LATCH PINS. LATCHING AND UNLATCHING SHALL BE ACCOMPLISHED BY ALTERNATELY RAISING AND LOWERING THE LUMINAIRE RING. LATCHING MAY BE ACCOMPLISHED BY ROTATION OF THE LATCH PIN OR TRAVEL OF THE PIN THROUGH A MECHANICAL CIRCUIT. THE LATCHING HOUSINGS SHALL BE AN ENCLOSED DESIGN WITH THE ONLY OPENING AT THE BOTTOM. LATCH HOUSINGS SHALL HAVE A FLARED ENTRANCE BELL TO ALIGN THE LATCH PIN. EACH LATCH SHALL INCLUDE A REFLECTIVE INDICATOR FLAG THAT INDICATES WHEN THE LATCHING IS COMPLETE. EACH LATCH SHALL INCLUDE A SPRING TO COMPENSATE FOR POLE DEFLECTION.					
WINCH ASSEMBLY: THE WINCH ASSEMBLY SHALL CONSIST OF A WINCH DRUM AND GEARBOX MOUNTED IN THE POLE AND AN EXTERNAL POWER UNIT. THE RAISING AND LOWERING SHALL BE SUPPORTED BY A SINGLE 1/4 INCH DIAMETER ZINC ELECTROPLATED STEEL AIRCRAFT CABLE. THE WINCH SHALL HAVE A LOAD RATING OF AT LEAST 1200 LB WITH A GEAR RATIO NOT LESS THAN 30:1. THE WINCH ASSEMBLY SHALL INCLUDE A FAIL SAFE BRAKE SYSTEM TO PREVENT FREEWHEELING OF THE WINCH DRUM. THE PORTABLE EXTERNAL POWER UNIT SHALL CONSIST OF A DRILL MOTOR, TORQUE LIMITER, STEP DOWN TRANSFORMER FOR 480 VOLT OPERATION, AND REMOTE SWITCH. TO PROVIDE COMPATIBILITY WITH EXISTING HIGH MAST SYSTEMS IN KENTUCKY, THE PORTABLE POWER UNIT AND WINCH UNIT SHALL BE FULLY COMPATIBLE WITH THE HOLOPHANE LD-5 PORTABLE LOWERING DEVICE.					
CIRCUIT BREAKER IN POLE: THE CIRCUIT BREAKER SHALL BE A SINGLE THROW, DOUBLE POLE DEVICE WITH 100 AMP FRAME FOR 480 VOLT OPERATION. AMPERAGE RATING SHALL BE 15A FOR TOWERS WITH 4 OR LESS LUMINAIRES, 20A FOR TOWERS WITH 6 LUMINAIRES, AND 30A FOR TOWERS WITH 8 OR 10 LUMINAIRES.					
GENERAL MATERIALS AND NOTES					
MISCELLANEOUS HARDWARE: MISCELLANEOUS HARDWARE THAT REQUIRES GALVANIZING OR ELECTROPLATING SHALL CONFORM ASTM A 123.					
METALLIC CONDUIT: METALLIC CONDUIT SHALL BE RIGID STEEL CONDUIT MEETING THE REQUIREMENTS OF AMERICAN STANDARD SPECIFICATION C-80.1.					
METALLIC CONDUIT FITTINGS: METALLIC CONDUIT FITTINGS SHALL BE ZINC COATED AND SHALL MEET THE REQUIREMENTS OF AMERICAN STANDARD SPECIFICATION C-80.1.					
NON-METALLIC CONDUIT: NON-METALLIC CONDUIT SHALL BE SCHEDULE 40 POLYVINYL CHLORIDE MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATIONS NO. LP 1036A, TYPE II, ELECTRICAL CLASS 2, GRADE C. EACH LENGTH SHALL BEAR THE UNDERWRITERS, INC. LABEL.					
NON-METALLIC CONDUIT FITTINGS: NON-METALLIC CONDUIT FITTINGS SHALL BE FABRICATED FROM POLYVINYL CHLORIDE HAVING THE SAME CHEMICAL AND PHYSICAL PROPERTIES AS THE CONDUIT WITH WHICH IT IS TO BE USED. EACH SHALL BEAR THE UNDERWRITERS, INC. LABEL. THE JOINTS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.					
CONCRETE CONDUIT MARKERS: MARKERS, IF REQUIRED, SHALL BE PLACED AT THE LOCATIONS SHOWN ON THE PLANS.					
DUCTED CABLE					
CABLE SHALL BE STRANDED ANNEALED COPPER MEETING THE REQUIREMENTS OF ASTM B-8 AND ASTM B-33 FOR OPERATION AT 600 VOLTS MAXIMUM MATERIAL SHALL MEET THE APPLICABLE REQUIREMENTS OF ICEA STANDARDS S-19-18. WITH THERMOPLASTIC INSULATION OF GRS-RUBBER BASE MEETING APPENDIX K(A) OF ICEA AND LISTED BY UL AS TYPE USE FOR DIRECT BURIAL; OR, MATERIAL SHALL MEET THE APPLICATION REQUIREMENTS OF ICEA STANDARD S-66-524. WITH THERMO-SETTING INSULATION OF CROSS LINK POLYETHYLENE MEETING REQUIREMENTS OF COLUMN "A" OF ICEA AND LISTED BY UL AS TYPE USE. CABLE SHALL BE PRE-INSTALLED IN DUCT. THE DUCT FOR SECONDARY CABLE UNDERGROUND SHALL BE POLYETHYLENE DUCT WITH MINIMUM TENSILE STRENGTH OF 3100 PSI DUCT TO PROVIDE FOR 40 % MAXIMUM FILL. THE DUCT SHALL MEET ASTM D 3485-80.					
TESTING					
CONTRARY TO SECTION 716.03.08 OF THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION THE TESTING SPECIFICATION FOR ROADWAY LIGHTING SYSTEMS SHALL ENSURE THAT CIRCUITS TEST FREE OF SHORTS AND UNAUTHORIZED GROUNDS AND HAVE AN INSULATING RESISTANCE OF NO LESS THAN 100 MEGOHMS WHEN TESTED WITH 500 VOLT DIRECT CURRENT POTENTIAL IN A REASONABLY DRY ATMOSPHERE BETWEEN CONDUCTORS AND GROUND.					
			HIGHMAST NOTES		