

MicroStation v8.11.7.180 E-SHEET NAME: DATE PLOTTED: January 11, 2011 USER: Ted.Swansegger FILE NAME: G:\PWORK\TED.SWANSEGGER\DM528756.V04-GENERAL NOTES (GN).DGN

GENERAL NOTES

THIS WORK SHALL CONSIST OF FURNISHING (WHEN SPECIFIED) AND INSTALLING ALL MATERIALS NECESSARY FOR TRAFFIC SIGNAL INSTALLATION(S).

THE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT EDITIONS OF:

1. PLANS AND STANDARD DETAIL SHEETS
2. KENTUCKY DEPARTMENT OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
3. KENTUCKY DEPARTMENT OF HIGHWAYS, STANDARD DRAWINGS
4. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70: NATIONAL ELECTRICAL CODE.
5. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE), NATIONAL ELECTRICAL SAFETY CODE
6. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
7. STANDARDS OF THE UTILITY COMPANY SERVING THE INSTALLATION

THE TRAFFIC SIGNAL PLANS INDICATE THE EXTENT AND GENERAL ARRANGEMENT OF THE PROPOSED SIGNAL INSTALLATION AND ARE FOR GENERAL GUIDANCE. ANY COMMISSION OR OMISSION SHOWN OR IMPLIED SHALL NOT BE CAUSE FOR DEVIATION FROM THE INTENT OF THE PLANS AND SPECIFICATIONS. IF ANY MODIFICATIONS OF THE PLANS OR SPECIFICATIONS ARE CONSIDERED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH MODIFICATIONS AND THE REASONS, THEREFORE, SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR WRITTEN APPROVAL PRIOR TO BEGINNING SUCH MODIFIED WORK.

THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND THE DISTRICT UTILITY AGENT PRIOR TO BEGINNING CONSTRUCTION TO INSURE PROPER CLEARANCE AND SHIELDING FROM EXISTING AND PROPOSED UTILITIES. THE CONTRACTOR SHALL USE ALL POSSIBLE CARE IN EXCAVATING ON THIS PROJECT SO AS NOT TO DISTURB ANY EXISTING UTILITIES WHETHER SHOWN ON THE PLANS OR NOT SHOWN ON THE PLANS. ELEVATIONS AND LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE ONLY. ANY UTILITIES DISTURBED OR DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE REPLACED OR REPAIRED TO ORIGINAL CONDITION BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT. IF NECESSARY TO AVOID EXISTING UTILITIES, THE CONTRACTOR SHALL HAND DIG AREAS WHERE POLES OR CONDUIT CROSS UTILITIES.

CONTRACTOR SHALL MAKE AN INSPECTION OF THE PROJECT SITE PRIOR TO SUBMITTING A BID AND SHALL BE THOROUGHLY FAMILIARIZED WITH EXISTING CONDITIONS. SUBMISSION OF A BID WILL BE CONSIDERED AN AFFIRMATION OF THIS INSPECTION HAVING BEEN COMPLETED.

MATERIALS - GENERAL

ALL MATERIALS SHALL BE APPROVED PRIOR TO BEING UTILIZED. THE CONTRACTOR SHALL SUBMIT FOR MATERIAL APPROVAL AN ELECTRONIC FILE OF DESCRIPTIVE LITERATURE, DRAWINGS AND ANY REQUESTED DESIGN DATA FOR THE PROPOSED MATERIALS. AFTER APPROVAL, NO SUBSTITUTIONS OF ANY APPROVED MATERIALS MAY BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.

MATERIALS - WIRE AND CABLE

ALL WIRE AND CABLE SHALL BE PLAINLY MARKED IN ACCORDANCE WITH THE PROVISIONS OF THE NATIONAL ELECTRICAL CODE.

GROUNDING CONDUCTORS SHALL BE 4 AWG, SOLID, BARE, COPPER UNLESS OTHERWISE SPECIFIED.

SERVICE ENTRANCE CONDUCTORS SHALL BE 6 AWG, STRANDED, COPPER, TYPE USE-2.

SIGNAL CABLES SHALL BE 14 AWG, STRANDED, COPPER WITH THE NUMBER OF CONDUCTORS INDICATED, AND SHALL CONFORM TO IMSA 19-1.

LOOP WIRE SHALL BE 14 AWG, STRANDED, COPPER AND CONFORM TO IMSA SPEC 51-7.

LOOP LEAD-IN CABLE SHALL BE 14 AWG, STRANDED, COPPER, PAIRED CONDUCTORS, ELECTRICALLY SHIELDED AND CONFORM TO IMSA 19-2.

MATERIALS - CONDUIT

CONDUIT SHALL BE RIGID STEEL, BE GALVANIZED INSIDE AND OUT, AND SHALL CONFORM TO THE UNDERWRITER'S LABORATORIES REQUIREMENTS FOR RIGID METALLIC CONDUIT.

MATERIALS - CONCRETE

UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE CLASS A.

MATERIALS - GROUNDING

GROUND RODS SHALL BE COMPOSITE SHAFTS CONSISTING OF A COPPER EXTERIOR INSEPARABLY MOLTEN WELDED TO STEEL CORE. GROUND RODS SHALL HAVE A MINIMUM DIAMETER OF 5/8 INCH, A MINIMUM LENGTH OF 8 FEET AND SHALL BE MANUFACTURED FOR THE SOLE PURPOSE OF PROVIDING ELECTRICAL GROUNDING. GROUND RODS SHALL BE EQUIPPED WITH COPPER OR BRONZE CLAMPS.

MATERIALS - WOOD POLES

WOOD POLES SHALL BE CLASS 4 CONFORMING TO THE REQUIREMENTS OF ANSI O5.1 AND THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION. THE POLES SHALL BE PENTACHLOROPHENOL TREATED IN ACCORDANCE WITH AWPA P-9, TYPE A.

MATERIALS - MESSENGER/GUY/TETHER CABLE

MESSENGER/GUY/TETHER CABLE SHALL CONSIST OF "CLASS A", ZINC-COATED, HIGH-STRENGTH STEEL OF THE SPECIFIED STRENGTH AND EXTRA GALVANIZED PER ASTM A475-03.

MATERIALS - ANCHOR AND ANCHOR ROD

ROCK ANCHORS SHALL BE 53" LONG WITH EYE TYPE TRIPLEYLE (REG TM) AND EXPANDABLE. ALL OTHER ANCHORS SHALL BE OF THE EXPANDABLE TYPE, WITH A MINIMUM AREA OF 135 SQUARE INCHES.

ALL ANCHOR RODS, UNLESS OTHERWISE SPECIFIED SHALL BE 7 FEET MINIMUM LENGTH, 5/8 INCHES MINIMUM DIAMETER, AND SHALL BE OF DOUBLE-EYE DESIGN.

MATERIALS - STEEL STRAIN POLES, MAST ARM POLES, AND BASES

ALL MATERIALS AND PRODUCTS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.

MILL CERTIFICATIONS SHALL BE SUPPLIED AS PROOF OF COMPLIANCE WITH THE SPECIFICATIONS. POLE SHALL BE ANCHOR-BASED, HOT-DIPPED GALVANIZED INSIDE AND OUT, THE POLE SHALL BE DESIGNED TO SUPPORT THE SPECIFIED WEIGHTS WHEN THE ARE APPLIED ACROSS THE DIAGONAL OF THE BOLT CIRCLE. POLES SHALL BE FURNISHED COMPLETE WITH FULLY GALVANIZED ANCHOR BOLTS AND HARDWARE.

MAST ARM POLES SHALL BE OF MONOTUBE DESIGN SIMILAR TO THE ONE DEPICTED ON THE STANDARD DETAIL SHEET. POLES AND ARMS SHALL BE ASTM A 595, GRADE A OR B MINIMUM YIELD STRENGTH 55 KSI, ASTM A 572, GRADE 65, OR ASTM A 53.

MAST ARM POLES SHALL NOT HAVE MORE THAN A 3 DEGREES RISE OF THE ARM. THE DIAMETER OF THE MAST ARM SHALL NOT BE GREATER THAN 21 INCHES AT THE ATTACHMENT TO THE POLE.

BASE PLATES SHALL BE ASTM GRADE 36 OR 50 AND THE THICKNESS SHALL BE EQUAL TO OR GREATER THAN THE NOMINAL DIAMETER OF THE CONNECTION BOLT. THE BASE PLATE OF VERTICAL POLE SHALL FIT INSIDE A 36 INCH DIAMETER. POLE, BASE PLATE, AND ALL ASSOCIATED HARDWARE SHALL BE GALVANIZED PER ASTM A 123 OR A 153.

FOR MAST ARM POLES, CONTRACTOR SHALL NOTIFY POLE MANUFACTURER OF ALL EXTRA HOLES NECESSARY FOR ATTACHMENT OF SIGNAL EQUIPMENT (PEDESTRIAN SIGNALS, PEDESTRIAN DETECTORS, SUPPLEMENTAL SIGNAL HEADS, SIGNS, CAMERAS, ETC.).

POLE DIAMETER AND WALL THICKNESS SHALL BE CALCULATED IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, CURRENT EDITION. FOR MAST ARM POLES, FATIGUE CLASSIFICATION SHALL BE CATEGORY II (WITH GALLOPING AND NATURAL WIND GUSTS, TABLE 11-1) WITH 25 YEAR DESIGN LIFE (FROM TABLE 3-3).

ANCHOR BOLTS SHALL CONFORM TO ASTM F 1554. ANCHOR BOLTS AND ALL ASSOCIATED HARDWARE SHALL BE FULLY GALVANIZED PER ASTM A 153. POLES SHALL BE FURNISHED WITH A MINIMUM OF FOUR (4) FULLY GALVANIZED ANCHOR BOLTS FOR STEEL STRAIN POLES AND A MINIMUM OF SIX (6) FULLY GALVANIZED ANCHOR BOLTS FOR MAST ARM POLES. EACH ANCHOR BOLT SHALL BE FURNISHED WITH ONE (1) NUT, TWO (2) WASHERS, ONE (1) LOCK WASHER, AND ONE (1) LEVELING NUT.

THE MAXIMUM ANCHOR BOLT CIRCLE SHALL NOT BE MORE THAN 24.5 INCHES. THE MAXIMUM ANCHOR BOLT DIAMETER SHALL NOT BE MORE THAN 2.25 INCHES.

NO VIBRATION MITIGATION DEVICE SHOULD BE CONSIDERED.

POLES SHALL INCLUDE TWO, 2 INCH BLIND HALF COUPLINGS INSTALLED 3 FEET FROM TOP OF POLE/MAST ARM POLES ONLY IF SPECIFIED).

STEEL STRAIN POLES SHALL BE FURNISHED WITH TWO (2) POLE CLAMP ASSEMBLIES SUITABLE FOR ATTACHING MESSENGER CABLE. EACH CLAMP ASSEMBLY SHALL INCLUDE A MINIMUM OF ONE (1) 1/2 INCH BOLT (SHALL BE ASTM STANDARD WITH A MINIMUM TENSILE LOAD OF 17,050 LBS). ALL POLE HARDWARE SHALL BE HOT-DIPPED GALVANIZED.

POLES SHALL BE FURNISHED WITH ONE (1) 1/2 INCH X 5 INCH HANDHOLE AND COVER TO ALLOW ACCESS AT THE BOTTOM OF THE POLE. THERE SHALL BE A GALVANIZED STEEL HANDHOLE COVER THAT IS SECURED WITH STAINLESS STEEL SCREWS OR SOME TYPE OF DEVICE TO KEEP THE RESTRAINING STRAP FROM SPINNING.

A COPPER, STAINLESS STEEL OR BRASS GROUNDING LUG SHALL BE INSTALLED 180 DEGREES FROM THE HANDHOLE OPENING AND SHALL BE ACCESSIBLE FROM THE HANDHOLE.

STEEL STRAIN POLES SHALL BE PERMANENTLY LABELED AFFIXED 6 FEET FROM THE BOTTOM OF THE BASE PLATE ON THE OUTSIDE WITH MANUFACTURER, THE HEIGHT, MINIMUM STRINGING TENSION AT YIELD, ORDER NUMBER, AND MAXIMUM DEFLECTION RATE.

MAST ARM POLES SHALL BE PERMANENTLY LABELED AFFIXED 6 FEET FROM THE BOTTOM OF THE BASE PLATE ON THE OUTSIDE WITH MANUFACTURER, MOMENT, AND ORDER NUMBER.

STEEL REINFORCEMENT SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI.

ALL WELDING SHALL BE IN ACCORDANCE WITH SECTIONS 1 THROUGH 8 OF THE AWS D1.1 STRUCTURAL WELDING CODE. TACKERS AND WELDERS SHALL BE QUALIFIED IN ACCORDANCE WITH THE CODE. TUBE SHALL CONTAIN ONLY ONE LONGITUDINAL SEAM WELD. TUBE LONGITUDINAL SEAM WELDS SHALL BE FREE OF CRACKS AND EXCESSIVE UNDERCUT, PERFORMED WITH AUTOMATIC PROCESSES, AND SHALL BE VISUALLY INSPECTED. LONGITUDINAL WELDS SUSPECTED TO CONTAIN DEFECTS SHALL BE MAGNETIC-PARTICLE INSPECTED BY THE MANUFACTURER.

ANALYSIS - STEEL STRAIN & MAST ARM POLES AND BASES

ALL CALCULATIONS AND DRAWINGS SHALL BE STAMPED BY A LICENSED PROFESSIONAL ENGINEER.

A DETAILED ANALYSIS OF THE POLE SHALL BE SUBMITTED. THE DETAILED ANALYSIS SHALL BE CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE DETAILED ANALYSIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING CALCULATIONS:

1. PROVIDE GROUP I, II, III, IV LOAD COMBINATIONS AS LISTED IN TABLE 3-1 GROUP LOAD COMBINATIONS IN AASHTO.
2. PROVIDE DIMENSIONS AND WEIGHTS FOR ALL ATTACHMENTS. THIS INCLUDES AREAS USED FOR WIND, ICE AND FATIGUE LOADS, DRAG COEFFICIENTS, PROJECTED AREAS, VELOCITY PRESSURES AND WIND FORCE FOR EACH SEGMENT.
3. FOR GROUP LOADS II, III, AND IV, WHICH HAVE WIND LOADS, PROVIDE CALCULATIONS FOR EACH CONTROLLING "WORST CASE" WIND DIRECTION THAT CONTROLS ANY ASPECT OF THE DESIGN (ANCHOR BOLTS, POLE SIZING, ETC.)
4. ANCHOR BOLTS SHALL BE DESIGNED FOR THE ORIENTATION THAT WOULD PROVIDE THE MAXIMUM STRESS ON ANY INDIVIDUAL BOLT.
5. PROVIDE ALL STRUCTURAL PROPERTIES FOR POLES, ANCHOR BOLTS AND BASE PLATES. THIS INCLUDES THE POLES DIAMETER, THICKNESS, SECTION MODULUS, MOMENT OF INERTIA, AND CROSS SECTIONAL AREA.
6. CALCULATIONS FOR EACH MEMBER SHALL INCLUDE LOADS, SECTION PROPERTIES, MEMBER FORCES (AXIAL, SHEAR, BENDING, AND TORSION), MEMBER DEFLECTIONS (ANGULAR AND LINEAR), MEMBER STRESSES (ACTUAL AND ALLOWABLE), AND THE COMBINED STRESS RATIO (CSR).
7. FATIGUE CALCULATIONS SHOULD BE SHOWN FOR ALL FATIGUE RELATED CONNECTIONS. PROVIDE THE CORRESPONDING DETAIL, STRESS CATEGORY AND EXAMPLE FROM TABLE 11-2 IN AASHTO.
8. IN FATIGUE CALCULATIONS, THE EFFECTIVE THROAT THICKNESS OF A COMPLETE JOINT PENETRATION GROOVE WELD SHALL BE THE THICKNESS OF THE THINNER PART JOINED PER AISC J2.1A.
9. LIMIT VERTICAL DEFLECTION TO 8 INCHES FOR GALLOPING. (MAST ARM ONLY)
10. THE HORIZONTAL DEFLECTION LIMITS FOR VERTICAL SUPPORTS IN SECTION 10.4.2.1 OF THE AASHTO SPECIFICATION SHOULD BE SHOWN AND VERIFIED. (MAST ARM ONLY)

ALL BIDS SHALL INCLUDE A SHOP DRAWING SPECIFYING THE POLE HEIGHT, ARM LENGTH(S), BOLT CIRCLE DIAMETER, BOLT DIAMETER, AND DETAILED DRAWINGS SHOWING THE HANDHOLE COVER ASSEMBLIES.

CONSTRUCTION METHODS - WIRING

ALL WIRING SHALL CONFORM TO THE PROVISIONS OF THE NATIONAL ELECTRICAL CODE. EACH WIRE/CABLE IN THE CONTROLLER CABINET SHALL BE AFFIXED WITH A PERMANENT IDENTIFICATION LABEL. EACH SPlicing LOOP WIRE AND LOOP LEAD-IN SHALL BE AFFIXED WITH A PERMENT IDENTIFICATION LABEL. PAYMENT FOR THIS SHALL BE INCIDENTAL TO THE COST OF THE WIRE/CABLE.

CONSTRUCTION METHODS - WIRING COLOR CODES

| 5-CONDUCTOR THREE SECTION HEADS | | 7-CONDUCTOR FIVE SECTION HEADS | | 5-CONDUCTOR PED SIGNAL AND BUTTON | |
|------------------------------------|--------|-----------------------------------|--------------|--------------------------------------|--------|
| CONNECTION | COLOR | CONNECTION | COLOR | CONNECTION | COLOR |
| RED SIGNAL | RED | RED BALL | RED | WALK | GREEN |
| YELLOW SIGNAL | ORANGE | YELLOW BALL | ORANGE | DONT WALK | RED |
| GREEN SIGNAL | GREEN | YELLOW ARROW | WHITE/TRACER | BUTTON | BLACK |
| NEUTRAL | WHITE | GREEN BALL | GREEN | BUTTON | ORANGE |
| NOT USED | BLACK | GREEN ARROW | BLUE | NOT USED | WHITE |
| | | NEUTRAL | WHITE | | |
| | | NOT USED | BLACK | | |

CONSTRUCTION METHODS - CONDUIT INSTALLATION

RIGID STEEL CONDUIT ENCASEMENT SHALL BE PROVIDED FOR ALL CONDUCTORS EXCEPT FOR OVERHEAD INSTALLATIONS, WHERE CONDUCTORS ARE RUN INSIDE POLES OR CABINETS AND INDUCTION LOOP CONDUCTORS LAID WITHIN PAVEMENTS. ALL CONDUIT INSTALLATIONS SHALL CONFORM TO THE PROVISIONS OF THE NATIONAL ELECTRICAL CODE.

ALL CONDUIT ENDS SHALL BE REAMED TO REMOVE BURRS AND SHARP EDGES. DAMAGED PORTIONS OF THE GALVANIZED SURFACES AND UNTREATED THREADS RESULTING FROM FIELD CUTS SHALL BE PAINTED WITH A RUST INHIBITIVE PAINT.

CONDUIT BENDS SHALL HAVE A RADIUS OF NOT LESS THAN 12 TIMES THE NOMINAL DIAMETER OF THE CONDUIT.

CONDUIT WHICH WILL NOT BE SUBJECTED TO REGULAR PRESSURE FROM TRAFFIC SHALL BE LAID TO A DEPTH OF NOT LESS THAN 18 INCHES BELOW FINISHED GRADE. ON CROSSINGS UNDER ROADWAY SURFACES AND SHOULDERS, THE CONDUIT SHALL BE PLACED AT A DEPTH OF NOT LESS THAN 24 INCHES BELOW GRADE.

AFTER THE CONDUIT HAS BEEN INSTALLED AND PRIOR TO BACKFILLING, THE CONDUIT INSTALLATION SHALL BE INSPECTED AND APPROVED BY THE ENGINEER.

WHEN BACKFILLING TRENCHES, THE BACKFILL MATERIAL SHALL BE PLACED AND COMPACTED IN LIFTS OF 9 INCHES OR LESS, ANY AREA DISTURBED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THE SATISFACTION OF THE ENGINEER.

CONSTRUCTION METHODS - SPLICING

THIS NOTE DESCRIBES THE SPLICING PROCESS (IF REQUIRED) AND IS NOT INTENDED TO GRANT PERMISSION TO SPLICE. PERMISSION TO SPLICE SHALL BE DETERMINED BY THE DIVISION OF TRAFFIC OPERATIONS AND THE LOCATIONS SHALL BE SHOWN ON THE LAYOUT SHEET. IF SPLICING IS NEEDED BUT NOT SHOWN ON THE LAYOUT SHEET, THE CONTRACTOR SHALL RECEIVE PRIOR WRITTEN APPROVAL FROM THE DIVISION OF TRAFFIC OPERATIONS.

ALL UNDERGROUND SPLICES SHALL BE MADE WITH BUTT SPLICES. BUTT SPLICES SHALL BE COPPER AND OF THE CORRECT WIRE RANGE. BUTT SPLICES SHALL BE COVERED WITH A 3M MASTIC PAD OR APPROVED EQUAL AND TAPED WITH A 3M BRAND #33 ELECTRICAL TAPE OR APPROVED EQUAL. MASTIC PAD MUST COVER AT LEAST 3 INCHES PAST EACH END OF BUTT SPLICE AND SHALL EXTEND AT LEAST ONE INCH ONTO THE OUTER INSULATION OF THE LEAD-IN WIRE (IMSA 19-2). UNDERGROUND SPLICES INCLUDE SPLICES IN JUNCTION BOXES, TRANSFORMER BASES, POLE BASES AND PEDESTAL BASES. EACH CONDUCTOR, INCLUDING THE GROUND, SHALL BE ENCASED IN A SEPARATE SPLICE KIT. COST FOR SPLICING SHALL BE INCIDENTAL TO THE COST OF THE WIRE/CABLE.

CONSTRUCTION METHODS - PAINTING

UNTREATED OR DAMAGED PORTIONS OF THE GALVANIZED SURFACE OF POLES AND CONDUIT SHALL BE PAINTED WITH A RUST INHIBITIVE PAINT.

CONSTRUCTION METHODS - LOOP INSTALLATION

UNSHIELDED LOOP WIRE (FROM 14 AWG/1 PAIR CABLE OR FIELD TERMINAL CONNECTION IN CABINET TO LOOP) SHALL BE TWISTED WITH THREE TO FIVE TURNS PER FOOT BEFORE PLACEMENT IN SAW SLOT, CONDUIT, JUNCTION BOX, OR CABINET.

LOOPS SHALL BE EXTENDED SPLICE-FREE TO THE CONTROLLER, POLE, PEDESTAL OR JUNCTION BOX. LOOP WIRES SHOWN AS EXTENDED TO POLES, PEDESTALS, OR JUNCTION BOXES SHALL BE SPLICED INTO LOOP LEAD-IN CABLE AT THE BOXES, POLES, OR PEDESTALS. LOOP LEAD-IN CABLE SHALL BE EXTENDED SPLICE-FREE FROM POLE OR JUNCTION BOX TO CONTROLLER. SPLICES, WHEN PERMITTED, SHALL CONFORM TO SPLICING NOTE AND BE PLACED TO MINIMIZE POSSIBILITY OF WATER INTRUSION. LOOP WIRE AND LOOP LEAD-IN SHALL HAVE AT LEAST 1 FOOT EXTRA WIRE PAST THE INSTALLED CONDUIT IN THE JUNCTION BOXES AND PEDESTALS. LOOP SPLICES SHALL BE ACCESSIBLE FROM THE HANDHOLE OF THE STEEL STRAIN/MAST ARM POLES (IF SPLICES ARE NOTED ON PLAN SHEET).

FOR ALL PROJECTS INVOLVING NEW ASPHALT PAVEMENT, TRAFFIC LOOPS SHALL BE INSTALLED IN THE BASE COURSE OF ASPHALT PAVEMENT BEFORE THE FINAL SURFACE IS CONSTRUCTED. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE INSTALLATION OF TRAFFIC LOOPS WITH THE PAVING CONTRACTOR AND THE RESIDENT ENGINEER.

ALL NON-SHRINK GROUT SHALL CONFORM TO THE REQUIREMENTS OF THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

CONSTRUCTION METHODS - SYSTEM GROUNDING AND BONDING

ALL CONDUITS, POLES, PEDESTALS, AND CONTROLLER CABINETS SHALL BE BONDED TO GROUND RODS AND THE ELECTRICAL SYSTEM GROUND TO FORM A COMPLETE GROUNDING SYSTEM.

ALL GROUND RODS SHALL BE SEPARATED BY A MINIMUM OF 6 FEET. TOP OF GROUND ROD SHALL BE A MINIMUM OF 3 INCHES BELOW FINISHED GRADE.

CONSTRUCTION METHODS - STEEL STRAIN & MAST ARM POLES AND BASES

CONTRACTOR SHALL USE HEAT SHRINK TAPE OR VINYL TO WRAP ALL WIRES WHERE THEY PASS THROUGH HOLES. CONTRACTOR SHALL DEBURR HOLES AND PROVIDE A GROMMET AT EACH OPENING.

STEEL REINFORCEMENT AND ANCHOR BOLTS SHALL BE ADEQUATELY SUPPORTED IN THE PROPER POSITIONS SO NO MOVEMENT OCCURS DURING CONCRETE PLACEMENT. WELDING OF ANCHOR BOLTS TO THE REINFORCING CAGE IS UNACCEPTABLE. TEMPLATES SHALL BE USED.

TOP NUTS SHALL BE TIGHTENED TO ONE-SIXTH TURN BEYOND SNUG-TIGHT. SNUG-TIGHT IS DEFINED AS THE CONDITION WHERE THE NUT IS IN FULL CONTACT WITH THE BASE PLATE. IT IS ASSUMED THAT THE FULL EFFORT OR A WORKMAN ON A 12-INCH WRENCH RESULTS IN A SNUG-TIGHT CONDITION.

DRILLED SHAFT DEPTH SHALL BE BASED ON THE SOIL CONDITIONS ENCOUNTERED DURING DRILLING. THE FINISHED GRADE SLOPE AT THE SITE, AND THE SPECIFIED SERVICE MOMENT AT THE BASE OF THE POLE. FINAL SERVICE MOMENT SHALL BE PROVIDED BY THE POLE MANUFACTURER AND SHALL NOT BE LESS THAN THE MOMENT SPECIFIED IN THE PLANS.

IF ROCK IS ENCOUNTERED DURING DRILLING OPERATIONS AND CONFIRMED BY THE RESIDENT ENGINEER TO BE OF SOUND QUALITY, THE SHAFT IS ONLY REQUIRED TO BE FURTHER ADVANCED INTO THE ROCK BY THE LENGTH OF ROCK SOCKET SHOWN IN THE POLE BASE CHART ON THE POLE BASE/SIGNAL HEAD STANDARD DETAIL SHEET. THE TOTAL LENGTH OF THE SHAFT NEED NOT BE LONGER THAN THAT OF SOIL ALONE. BOTH LONGITUDINAL REBAR LENGTH AND NUMBER OF TIES OR SPIRAL LENGTH SHALL BE ADJUSTED ACCORDINGLY.

THE CONTRACTOR MAY PROPOSE A SHORTER DEPTH FOR THE DRILLED SHAFT. IF SO, THE CONTRACTOR SHALL PROVIDE, FOR KYTC'S REVIEW AND APPROVAL, A DETAILED COLUMN DESIGN WITH INDIVIDUAL SITE SPECIFIC SOIL AND ROCK ANALYSIS PERFORMED AND APPROVED BY A REGISTERED PROFESSIONAL ENGINEER.

SPIRAL REINFORCEMENT MAY BE SUBSTITUTED FOR TIES. IF SPIRAL REINFORCEMENT IS USED, ONE AND ONE-HALF CLOSED COILS SHALL BE PROVIDED AT EACH END OF EACH SPIRAL UNIT. SPLICES FOR SPIRALS SHALL BE MADE WITH A MINIMUM OF ONE AND ONE-HALF TURNS OF THE SPIRAL.

DRILLED SHAFT LENGTHS SHOWN IN THE POLE BASE CHART ON THE POLE BASE/SIGNAL HEAD STANDARD DETAIL SHEET ARE BASED ON TWO SUBSURFACE CONDITIONS, SOIL OR ROCK. SOIL SHALL BE, AT A MINIMUM, A COHESIVE, MEDIUM-STIFF CLAY. ROCK SHALL BE SOUND AND REMAIN INTACT DURING DRILLING. SUBSURFACE CONDITIONS CONSISTING OF VERY SOFT CLAY OR VERY LOOSE SATURATED SAND WILL RESULT IN SOIL PARAMETERS WEAKER THAN THOSE ASSUMED FOR THE DRILLED SHAFT LENGTHS SHOWN IN THE POLE BASE CHART ON THE POLE BASE/SIGNAL HEAD STANDARD DETAIL SHEET. IF THESE WEAKER THAN ASSUMED SOIL CONDITIONS ARE ENCOUNTERED AT THE SITE, THE ENGINEER SHALL CONSULT WITH THE KYTC GEOTECHNICAL BRANCH, WHICH MAY RECOMMEND AN ALTERNATE FOUNDATION DEPTH OR DIAMETER. PAYMENT FOR ADDITIONAL MATERIALS WILL BE BASED ON THE CONTRACTORS BID PRICE FOR TRAFFIC SIGNAL POLE BASE AND MEASURED BY CUBIC YARD.

THE BOTTOM OF THE DRILLED HOLE SHALL BE FIRM AND THOROUGHLY CLEANED SO NO LOOSE OR COMPRESSIBLE MATERIALS ARE PRESENT AT THE TIME OF CONCRETE PLACEMENT. IF THE DRILLED HOLE CONTAINS STANDING WATER, THE CONCRETE SHALL BE PLACED USING A TREMIE TO DISPLACE WATER. CONTINUOUS CONCRETE FLOW WILL BE REQUIRED TO INSURE FULL DISPLACEMENT OF ANY WATER.

EXPOSED PORTIONS OF CONCRETE SHALL BE FORMED TO CREATE A SMOOTH FINISHED SURFACE. ALL FORMING SHALL BE REMOVED UPON COMPLETION OF CONSTRUCTION.

ACCEPTANCE REQUIREMENTS

PRIOR TO FINAL INSPECTION OF THE SIGNAL INSTALLATION, THE CONTRACTOR SHALL PROVIDE, AT NO EXTRA COST, AN ACCEPTABLE AND COMPLETE SET OF REPRODUCIBLE AS-BUILT DRAWINGS WHICH SHOW THE ARRANGEMENT AND LOCATION OF ALL EQUIPMENT (I.E., JUNCTION BOXES, CONDUITS, SPARE CONDUITS, ETC.) AND CIRCUITS.

AFTER THE INSTALLATION IS COMPLETED THE CONTRACTOR SHALL, IN THE PRESENCE OF THE ENGINEER, CONDUCT AN OPERATIONAL TEST DEMONSTRATING THAT THE SYSTEM OPERATES IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

INDUCTION LOOP CONDUCTORS SHALL TEST FREE OF SHORTS AND UNAUTHORIZED GROUNDS AND SHALL HAVE AN INSULATING RESISTANCE OF AT LEAST ONE HUNDRED MEGOHMS WHEN TESTED WITH A 500 VOLT DIRECT CURRENT POTENTIAL IN A REASONABLY DRY ATMOSPHERE BETWEEN CONDUCTORS AND GROUND.

GROUND RODS SHALL HAVE A RESISTANCE TO GROUND NOT TO EXCEED 25 OHMS. IF THE RESISTANCE TO GROUND IS GREATER THAN 25 OHMS, TWO OR MORE GROUND RODS CONNECTED IN PARALLEL SHALL BE INSTALLED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY AND ALL ELECTRICAL INSPECTIONS, MEMBERSHIPS, METER BASES AND ANY OTHER REQUIREMENTS BY THE UTILITIES SERVING THE INSTALLATION AND PAYING ALL FEES REQUIRED.

TRAFFIC SIGNAL GENERAL NOTES,
MATERIALS, CONSTRUCTION METHODS,
AND ACCEPTANCE REQUIREMENTS