STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0275-01	2001	10	18

CONSTRUCTION AND MATERIAL REQUIREMENTS

FOR TRAFFIC SIGNAL INSTALLATIONS

NOTE

WHENEVER THE PLAN SPECIFICATIONS CONFLICT WITH THE LATEST EDITION OF THE KANSAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, THE PLAN SPECIFICATIONS SHALL GOVERN, AND WHEN THE PLAN NOTES CONFLICT WITH PLAN SPECIFICATIONS, THE PLAN NOTES SHALL GOVERN.

CONSTRUCTION

THE CONTRACTOR SHALL HAVE A LICENSED JOURNEYMAN ELECTRICIAN ON SITE WHILE TRAFFIC SIGNAL INSTALLATION WORK IS PERFORMED.

THE LOCAL POWER COMPANY SHALL BE NOTIFIED BY THE CONTRACTOR PRIOR TO BEGINNING WORK TO DETERMINE THE PROPER TYPE AND METHOD OF HOOK UP FOR THE PARTICULAR LOCATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF ANY COSTS ASSOCIATED WITH THE POWER HOOK UP, INCLUDING CONDUIT, LEAD-IN WIRE, SERVICE POLE, METER LANDING, ETC., REGARDLESS OF WHETHER THESE COSTS HAVE BEEN LISTED ON THE BILL OF MATERIALS.

LOCATIONS FOR SIGNAL POLES, PEDESTALS, SERVICE BOXES, JUNCTION BOXES AND LOOP DETECTORS SHALL BE STAKED BY THE CITY. STAKED LOCATIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION OF EACH ITEM.

THE PLAN LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE BEGINNING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ALL DAMAGES WHICH MAY BE OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES. COMPANIES OR AGENCIES THAT HAVE IDENTIFIED UTILITIES IN THIS VICINITY ARE SHOWN IN THE PLANS.

MATERIALS

ALL MATERIALS USED IN THE FABRICATION OR ASSEMBLY OF THE ITEMS LISTED BELOW SHALL BE NEW AND SHALL COMPLY WITH THE APPLICABLE PARTS OF SUBSECTION 1703 "ELECTRIC LIGHTING AND TRAFFIC SIGNAL EQUIPMENT" OF THE STANDARD SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION STANDARD NO. TS-1.

ALL SIGNS, SIGNALS, AND MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

SEE SUBSECTION 1605 "STRUCTURAL STEEL" AND SUBSECTION 1606 "STRUCTURAL STEEL TUBING" OF THE STANDARD SPECIFICATIONS FOR THE BASIS OF ACCEPTANCE FOR MATERIAL FURNISHED UNDER THESE SUBSECTIONS.

SEE SUBSECTION 1613 "ANCHOR BOLTS FOR STRUCTURAL USES" OF THE STANDARD SPECIFICATIONS FOR THE BASIS OF ACCEPTANCE OF ANCHOR BOLTS FOR TRAFFIC SIGNAL POLES. IF TYPE "B" CERTIFICATION IS NOT PROVIDED ACCORDING TO SECTION 2600 "MATERIALS CERTIFICATIONS" OF THE STANDARD SPECIFICATIONS, THE ENGINEER MAY REQUIRE TESTING OF AN ANCHOR BOLT. ANCHOR BOLTS FOR CONTROLLER CABINETS AND TRAFFIC SIGNAL PEDESTALS SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS SPECIFICATION A36 "SPECIFICATION FOR STRUCTURAL STEEL" AND WILL BE VISUALLY ACCEPTED BY THE ENGINEER.

TRAFFIC SIGNAL SPECIFICATIONS

I. GENERAL

A. TRAFFIC SIGNAL IMPROVEMENT POLICIES: THE WORK INCLUDED IN THIS PROJECT MAY INVOLVE REPLACEMENT AND/OR MODIFICATION OF EXISTING TRAFFIC SIGNAL EQUIPMENT AT A LOCATION WHICH IS PRESENTLY CONTROLLED BY OPERATING TRAFFIC SIGNALS. THE FOLLOWING POLICIES ARE TO BE OBSERVED DURING THE PROPOSED MODIFICATIONS AND IMPROVEMENTS:

1. EXISTING OPERATION: THE CONTRACTOR SHALL PROVIDE CONTINUOUS OPERATION OF THE TRAFFIC SIGNALS DURING THE SIGNAL MODIFICATIONS AND IMPROVEMENTS EXCEPT FOR SHUTDOWNS TO ALLOW FOR ALTERATIONS AS REQUIRED FOR INSTALLATION OF THE PROPOSED IMPROVEMENTS.

2. PERIODS OF DISRUPTION: SOME PERIODS OF DISRUPTION OF EXISTING SIGNAL OPERATION CAN BE TOLERATED DURING INSTALLATION OF THE PROPOSED IMPROVEMENTS; HOWEVER, THE CONTRACTOR SHALL COORDINATE ANY PLANNED DISRUPTION OF SIGNAL OPERATIONS WITH THE ENGINEER A REASONABLE TIME IN ADVANCE OF SUCH DISRUPTION OF OPERATIONS.

3. DISRUPTION TIMES: PLANNED DISRUPTION OF SIGNAL OPERATIONS SHALL BE LIMITED TO THE HOURS BETWEEN 9:00 AM AND 4:00 PM. THE SIGNAL CONTROLS SHALL BE OPERABLE DURING ALL OTHER PERIODS.

4. EXISTING WIRING: ALL EXISTING WIRING WITHIN EXISTING CONTROLLER CABINETS SHALL BE IDENTIFIED BY THE CONTRACTOR AND EACH CONDUCTOR PROPERLY LABELED PRIOR TO DE-ENERGIZING THE EXISTING CONTROLLER TO INSTALL THE PROPOSED MODIFICATIONS AND IMPROVEMENTS.

B. SALVAGED EQUIPMENT

1. REINSTALLED: WHEN SALVAGED EQUIPMENT IS TO BE REINSTALLED, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY MATERIALS AND EQUIPMENT INCLUDING ANCHOR BOLTS, NUTS, WASHERS, CONCRETE, ETC. REQUIRED TO COMPLEMENT THE SALVAGED EQUIPMENT IN THE NEW INSTALLATION.

2. NOT REINSTALLED: WHEN SALVAGED EQUIPMENT IS NOT TO BE REINSTALLED, IT SHALL BE DELIVERED TO CITY'S CMF, 1801 SOUTH McLEAN. NOTIFY SIGNAL SUPERVISOR (913) 268-4033 PRIOR TO DELIVERY [MIN. 24-HOURS].

3. REMOVAL OF EXISTING BASES: EXISTING BASES FOR TRAFFIC SIGNAL POLES, PEDESTALS AND CONTROLLERS SHALL BE REMOVED A MINIMUM OF 600 mm BELOW FINISHED GRADE OR AS SHOWN ON THE PLANS.

C. GUARANTEE: ALL EQUIPMENT FURNISHED ON A PROJECT BY THE CONTRACTOR SHALL BE GUARANTEED AGAINST ANY IMPERFECTIONS IN WORKMANSHIP AND MATERIALS. SHOULD ANY DEFECT DEVELOP UNDER NORMAL AND PROPER OPERATING CONDITIONS DURING A 30 DAY TESTING PERIOD FOLLOWING COMPLETION OF ALL ELECTRICAL APPARATUS HOOK-UPS AND PRIOR TO ACCEPTANCE BY THE STATE, THIS MALFUNCTION SHALL BE CORRECTED BY AND AT THE EXPENSE OF THE CONTRACTOR, INCLUDING ALL LABOR, MATERIALS AND ASSOCIATED COSTS. THE CUSTOMARY MANUFACTURERS' WARRANTIES SHALL BE ASSIGNED TO THE MAINTAINING AGENCY.

II CIRCUIT BREAKER, WIRE, AND CABLE

A. SERVICE CIRCUIT BREAKERS: THE CONTRACTOR SHALL PROVIDE CIRCUIT BREAKERS AS SHOWN ON THE PLAN FOR SECONDARY POWER DROP. THE CIRCUIT BREAKERS SHALL BE SINGLE POLE, MOLDED CASE, OF THE SIZE AND TRIP RATING AS SHOWN ON THE PLAN. THE CIRCUIT BREAKERS SHALL BE PROVIDED IN A SUITABLE WATERTIGHT ENCLOSURE PROVIDED WITH A HASP FOR A PADLOCK. PADLOCKS WILL BE PROVIDED BY OTHERS.

B. GROUNDING: ALL TRAFFIC SIGNAL POLES, PEDESTALS, CONTROLLER CABINETS, AND SERVICE CIRCUIT BREAKERS SHALL BE GROUNDED BY MEANS OF A NO. 6 AMERICAN WIRE GAUGE SOLID BARE COPPER WIRE BOLTED TO THE INSIDE OF THESE DEVICES WITH A 12 mm INTERNAL GROUND LUG. ALL GROUND WIRES SHALL BE ATTACHED BY MEANS OF A GROUND CLAMP TO A COPPER-CLAD STEEL ROD. THE GROUND ROD SHALL BE OF THE SIZE SPECIFIED ON THE PLANS .

C COLOR CODING: ALL DETECTOR WIRE AND CABLE SHALL BE COLOR CODED ACCORDING TO ONE OF THE FOLLOWING METHODS: THE METHOD APPROVED BY THE INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION, INC. OR METHOD ONE FOR 2010 AS APPROVED BY THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION.

D POLE WIRING: EACH SIGNAL HEAD SHALL HAVE A SEPARATE RUN OF SIGNAL CABLE FROM THE TERMINAL BLOCK IN THE POLE TO THE SIGNAL HEAD. WIRING SHALL CONFORM TO THE APPROPRIATE ARTICLES OF THE NATIONAL ELECTRIC CODE OR SUBSEQUENT REVISIONS. THE CONDUCTORS FROM THE TERMINAL BLOCK IN THE CONTROLLER TO THE SIGNAL BASE SHALL BE A CONTINUOUS RUN. NO SPLICES OF CABLE WILL BE PERMITTED IN CONDUIT OR OUTSIDE OF JUNCTION BOXES, SERVICE BOXES OR POLE BASES UNLESS OTHERWISE SPECIFIED IN THE SUPPLEMENTAL SPECIFICATIONS, SPECIAL PROVISIONS, OR ON THE PLANS FOR AN OVERHEAD WIRING SYSTEM.

ALL SIGNAL CABLE SPLICES SHALL BE MADE ABOVE GROUND IN POLE OR PEDESTAL BASES.

WHEN CONDUCTORS AND CABLES ARE PULLED INTO THE CONDUIT, ALL ENDS SHALL BE TAPED TO EXCLUDE MOISTURE, AND SHALL BE SO KEPT UNTIL THE SPLICES ARE MADE OR TERMINAL APPLIANCES ATTACHED. ENDS OF SPARE CONDUCTORS SHALL REMAIN TAPED.

WHEN PULLING CONDUCTORS THROUGH CONDUITS, A POWDERED SOAPSTONE, TALC OR OTHER APPROVED LUBRICANT SHALL BE USED. CABLE SHALL NOT BE TAPED OR BUNDLED TOGETHER TO BE PULLED OR LEFT IN CONDUIT.

2 m OF SLACK OR EXCESS CABLE, AS APPLICABLE, SHALL BE LEFT IN EACH SERVICE BOX FOR TRAFFIC SIGNAL CABLE, AND DETECTOR LEAD-IN WIRE.

1 m OF SLACK OR EXCESS CABLE SHALL BE LEFT IN EACH JUNCTION BOX AND AT EACH TERMINATION POINT.

EXCESS CABLE TO BE UNIFORMLY BUNDLED AND SECURED WITH 1/4-20 THREADED STUD, AS CLOSE AS POSSIBLE TO TOP OF SERVICE BOXES AND JUNCTION BOXES.

E SPLICES

1 SIGNAL CONDUCTOR CABLE - CONDUCTORS SHALL BE JOINED BY TWISTING THE CONDUCTORS. CONDUCTOR INSULATION SHALL BE FEATHERED, TRIMMED TO CONICAL SHAPE, BEFORE APPLYING SPLICE INSULATION. SPLICE INSULATION SHALL CONSIST OF LAYERS OF THERMOPLASTIC OR NEOPRENE INSULATION ELECTRICAL TAPE BEARING THE LABEL OF THE UNDERWRITERS LABORATORIES, INC., APPLIED TO A THICKNESS EQUAL TO AND WELL LAPPED OVER THE ORIGINAL INSULATION, EXCEPT THAT ON HIGH VOLTAGE SPLICES TWO LAYERS OF RUBBER TAPE CONFORMING TO THE REQUIREMENTS AT A.S.T.M. DESIGNATION: D 119 SHALL BE APPLIED OVER THE CONDUCTOR BEFORE PLACING THE THERMOPLASTIC TAPE. THE SPLICE SHALL THEN BE WELL COVERED WITH TWO LAYERS OF FRICTION OR OTHER APPROVED TAPE. AT LEAST 1 m OF SLACK SHALL BE LEFT FOR EACH CABLE SPLICE IN PEDESTAL AND POLE BASES.

2. WHEN TERMINATING ENDS OF CABLE AT ALL TERMINAL BLOCKS AN APPROVED #14 INSULATED SPADE TERMINAL SHALL BE PROPERLY CRIMPED ON END OF EACH CONDUCTOR TO PROVIDE A SECURE CONNECTION.

3. LOCKING SPADE TERMINALS SHALL NOT BE USED.

F. WIRING NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL LOOP WIRE, SHIELDED LOOP LEAD-IN WIRE, POWER SUPPLY CABLE AND TRAFFIC SIGNAL CABLE FOR THE COMPLETE OPERATION OF THE TRAFFIC SIGNAL.

2. ONE SEVEN CONDUCTOR CABLE SHALL BE RUN FROM THE CONTROLLER TO EACH SIGNAL POLE FOR PEDESTRIAN MOVEMENT. THE FOLLOWING COLOR CODES SHALL BE USED:

RED	DON'T WALK (PHASE 2 OR 6)
GREEN	WALK (PHASE 2 OR 6)
ORANGE	PUSH BUTTON (PHASE 2 OR 6)
WHITE W/BLACK	DON'T WALK (PHASE 4 OR 8)
BLUE	WALK (PHASE 4 OR 8)
BLACK	PUSH BUTTON (PHASE 4 OR 8)
WHITE	COMMON

3. ONE FIVE CONDUCTOR CABLE SHALL BE RUN FROM THE POLE BASE TO EACH 3-SECTION SIGNAL HEAD. THE FOLLOWING COLOR CODES SHALL BE USED:

BLACK	NOT USED
WHITE	COMMON
RED	RED BALL
GREEN	GREEN BALL
ORANGE	YELLOW BALL

TRAFFIC SIGNAL SPECIFICATIONS

PROJECT NUMBER

DRAWN BY: TM	APPROVED BY	REVISED:
DATE: FEB. 96		DATE:

CITY OF WICHITA

DEPARTMENT OF PUBLIC WORKS

TRAFFIC ENGINEERING DIVISION — SCALE

WM. G. McKINLEY, TRAFFIC ENGINEER