FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS	87N-0094-01	1998	149	202

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

SEE STANDARD SPECIFICATIONS, LATEST EDITION, SECTION 801, 'ELECTRIC LIGHTING AND TRAFFIC SIGNALS'.

THE CONTRACTOR SHALL PROVIDE, ON THE JOB SITE AT ALL TIMES, AN EMPLOYEE WITH LEVEL II CERTIFICATION IN TRAFFIC SIGNAL INSTALLATION BY THE INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION (IMSA). THIS REQUIREMENT APPLIES TO ALL TRAFFIC SIGNAL WORK IN PROJECTS LET BY THE KANSAS DEPARTMENT OF TRANSPORTATION AFTER JANUARY 1, 1996.

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 CONTRACTOR. 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.

MAJOR ITEMS OF ELECTRONIC EQUIPMENT INSTALLED UNDER THIS CONTRACT SHALL BE OF THE SAME TYPE AND CONSIST OF PRODUCTS PROVIDED BY THE SAME SUPPLIER IN ORDER TO SECURE UNIFORMITY, SINGLE RESPONSIBILITY, AND MOST SATISFACTORY SERVICE.

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 STORED ON SITE FOR REMOVAL BY THE OWNER OF THE EQUIPMENT. THE STORED EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNTIL THE OWNER REMOVES IT FROM THE WORK SITE.

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.

C. TURN-ON

1. FLASHING OPERATION: AT LOCATIONS WITHOUT PREVIOUS TRAFFIC SIGNAL CONTROL, THE NEW TRAFFIC SIGNALS SHALL BE FLASHED TWO TO THREE BUSINESS DAYS PRIOR TO FULL SIGNAL SYSTEM TURN-ON.

2. SYSTEM TURN-ON: THE SIGNAL SYSTEM TURN-ON SHALL NOT OCCUR ON FRIDAYS, WEEKENDS, OR HOLIDAYS AND SHALL BE COMPLETED PRIOR TO 3:00 PM ON THE DAY OF THE TURN-ON.

3. SUPPLIER REPRESENTATIVE: THE SUPPLIER OF CONTROL EQUIPMENT SHALL HAVE A REPRESENTATIVE PRESENT AT THE SIGNAL SYSTEM TURN-ON.

4. TRAFFIC ENGINEERING NOTIFICATION: THE BUREAU OF TRAFFIC ENGINEERING SHALL BE NOTIFIED AT LEAST ONE WEEK IN ADVANCE OF THE DATE OF SIGNAL TURN-ON.

D. 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. NEMA TRAFFIC SIGNAL CONTROL SYSTEMS

A. GENERAL

1. MANUALS: A MINIMUM OF TWO MANUALS SHALL BE PROVIDED FOR EACH CONTROLLER AND SHALL INCLUDE COMPLETE NOMENCLATURE, WIRING DIAGRAMS, SCHEMATICS SHOWING TEST VOLTAGES, FUNCTIONAL DESCRIPTION OF CIRCUITS, PARTS LIST AND CROSS REFERENCE TO STANDARD PART NUMBERS, APPROPRIATE TESTING PROCEDURES, AND OTHER PERTINENT DATA.

2. CONFLICT MONITOR: THE CONFLICT MONITOR SHALL, AS A MINIMUM, MEET THE REQUIREMENTS OF THE LATEST EDITION OF SECTION 6 OF THE NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION STANDARD TS-1. THE CONTROLLER SHALL NOT OPERATE WITH THE CONFLICT MONITOR DISCONNECTED. THE CONFLICT MONITOR SHALL BE MICROPROCESSOR-BASED WITH A LIQUID CRYSTAL DISPLAY. IN ADDITION, THE UNIT SHALL PERFORM THE FOLLOWING:

a. MINIMUM CLEARANCE MONITOR: ABSENCE OF A MINIMUM 2.8 SECOND PERIOD OF AN ACTIVE YELLOW INPUT ON A CHANNEL AFTER A GREEN SHALL CAUSE A FAILURE.

b. WATCH DOG MONITOR: DURING FLASHING OPERATION, ABSENCE OF A CHANGE OF STATE FOR GREATER THAN 1.5 SECONDS SHALL CAUSE A FAILURE.

c. YELLOW MONITORING: THE CONFLICT MONITOR SHALL MONITOR FOR GREEN OR WALK VERSUS AN ACTIVE YELLOW INDICATION ON ONE CHANNEL. THIS CONDITION SHALL CAUSE A FAILURE.

d. RED MONITORING: THE CONFLICT MONITOR SHALL MONITOR FOR GREEN OR WALK OR YELLOW VERSUS AN ACTIVE RED INDICATION ON ONE CHANNEL. THIS CONDITION SHALL CAUSE A FAILURE.

e. RESET: IF A RESET COMMAND IS RECEIVED FROM EITHER THE FRONT PANEL CONTROL OR THE EXTERNAL RESET INPUT FOR A CONTINUOUS DURATION OF MORE THAN 120 SECONDS, THE UNIT SHALL IGNORE THE RESET COMMAND AND BEGIN NORMAL MONITORING FUNCTIONS.

f. CLOCK: AN INTERNAL CLOCK SHALL BE PROVIDED TO MARK THE DATE AND TIME WHEN THE UNIT IS TRIGGERED BY A FAILURE. BACKUP POWER SHALL ALLOW THE CLOCK TO MAINTAIN TIMING DURING POWER INTERRUPTIONS. AUTOMATIC ADJUSTMENTS SHALL BE MADE TO THE TIME OF DAY AND DATE TO ACCOMMODATE LEAP YEARS AND DAYLIGHT SAVINGS TIME.

g. DISPLAY AND LOG: A MINIMUM OF THE LAST NINE FAILURES WHICH CAUSED THE CONFLICT MONITOR TO TRIGGER SHALL BE LOGGED. THIS LOG SHALL NOT BE LOST DUE TO POWER INTERRUPTIONS. THE CONFLICT MONITOR SHALL DISPLAY THE MOST RECENT FAILURE UNTIL RESET AND LOG BY TIME AND DATE THE FOLLOWING EVENTS: POWER ON/OFF OCCURRENCES, FAILURES AND TYPE, AND DISPLAY INDICATIONS AT THE TIME OF FAILURE.

3. CONTROLLER CABINET

a. HOUSING: THE CONTROLLER AND ALL ASSOCIATED EQUIPMENT SHALL BE FURNISHED COMPLETELY HOUSED IN A STURDY NATURAL ALUMINUM CABINET. THE CABINET SHALL BE OF CLEAN CUT DESIGN AND APPEARANCE, HAVING NO SHARP EDGES, CORNERS OR PROJECTIONS. THE SIZE OF THE CABINET SHALL BE SUFFICIENT TO PROVIDE AMPLE SPACE FOR HOUSING THE CONTROLLER AND ALL ASSOCIATED ELECTRICAL AND AUXILIARY DEVICES.

b. DOOR: A HINGED DOOR SHALL BE PROVIDED, PERMITTING COMPLETE ACCESS TO THE INTERIOR OF THE CABINET. THE CABINET IS TO BE WEATHERPROOF AND DUST-TIGHT. THE DOOR SHALL BE PROVIDED WITH A STRONG LOCK AND TWO SETS OF KEYS. THE DOOR HINGES AND PINS SHALL BE OF A NONCORRODING MATERIAL.

c. POLICE DOOR: IN ADDITION TO THE MAIN DOOR OF THE CONTROLLER CABINET, THERE SHALL BE AN AUXILIARY DOOR PROVIDED IN THE MAIN DOOR WITH A LOCK AND STANDARDIZED POLICE KEY. THE PANEL BEHIND THE AUXILIARY POLICE DOOR SHALL CONTAIN TWO SWITCHES TO ACCOMPLISH THE FOLLOWING FUNCTIONS: (1) CHANGE FROM NORMAL OPERATION TO FLASHING, AND VICE VERSA AND (2) INTERRUPT POWER TO THE SIGNAL HEADS.

d. EQUIPMENT SUPPORTS: THE CABINET SHALL CONTAIN STRONG MOUNTING TABLES, SLIDING TRAYS, OR OTHER SUITABLE SUPPORTS FOR THE CONTROLLER AND ASSOCIATED EQUIPMENT.

e. FAN AND FILTERS: THE CABINET SHALL CONTAIN A VENTILATING FAN CONTROLLED BY A THERMOSTAT AND SUITABLE DUST FILTERS FOR THE CAPACITY OF THE VENTILATING SYSTEM. THE FILTERS SHALL BE OF THE DRY TYPE AND EASILY REPLACED.

f. OUTLETS: TWO OUTLETS (A CONVENIENCE OUTLET AND TROUBLE LAMP RECEPTACLE) SHALL BE FURNISHED WITH EACH CABINET.

g. WIRING DIAGRAMS: A MINIMUM OF TWO FIELD WIRING DIAGRAMS OF EACH CABINET SHALL BE PREPARED AT THE COMPLETION OF THE INSTALLATION. COPIES SHALL BE KEPT WITH OTHER FIELD SERVICE INFORMATION ON FILE WITH THE PERMANENT RECORDS OF THE INTERSECTION AND IN THE CABINET.

4. WIRING

a. GENERAL: THE CONTROLLER SHALL BE EQUIPPED WITH AN ACCESSIBLE FIELD TERMINAL AND CONNECTING TERMINAL ASSEMBLY. ALL CABINET WIRING SHALL BE NEAT, TRAINED, SECURE, FIRM, AND CLEARLY IDENTIFIED AT TERMINAL POINTS BY LETTERS OR NUMBERS.

b. TERMINALS: AS A MINIMUM, THE FOLLOWING ITEMS SHALL BE A PART OF THE CABINET WIRING AND ALL TERMINALS PROPERLY IDENTIFIED BY FUNCTION OR NUMBER WITH A FUNCTION CODE:

i. POWER INPUT FUSE: A TERMINAL WITH MAIN CIRCUIT BREAKER FOR POWER SUPPLY LINE INPUT.

ii. POWER INPUT NEUTRAL: A TERMINAL UNFUSED FOR THE NEUTRAL SIDE OF POWER SUPPLY LINE INPUT.

iii. SIGNAL CABLE: TERMINALS FOR CONDUCTORS OF SIGNAL LIGHT CABLE; ONE FOR EACH SIGNAL OUTPUT CIRCUIT SPECIFIED.

iv. GROUNDING: A GROUNDING BUS WITH NO FEWER THAN EIGHT CONNECTING POINTS OR TERMINALS.

v. DETECTOR CABLE: TERMINALS FOR ALL DETECTOR CABLES AS REQUIRED FOR PROPER OPERATION FOR THE NUMBER AND SIZE OF DETECTOR LOOPS SHOWN ON THE PLAN.

vi. PEDESTRIAN PUSH BUTTON CABLE: TERMINALS FOR ALL PEDESTRIAN PUSH BUTTON CABLES AS REQUIRED FOR THE TYPE AND NUMBER OF PUSH BUTTONS SPECIFIED ON THE PLAN.

c. ARRANGEMENT: THE CONTROLLER ASSEMBLY SHALL BE FUNCTIONALLY ARRANGED WITHIN THE CABINET IN A MANNER THAT WILL NOT HINDER THE ENTRANCE, TRAINING, AND CONNECTION OF THE INCOMING CABLES AND CONDUCTORS, NOR UNNECESSARILY OVERLAP THE CONDUCTORS.

d. POLARITY: THE OUTGOING TRAFFIC CONTROL SIGNAL CIRCUITS SHALL BE OF THE SAME POLARITY AS THE LINE SIDE OF THE POWER SUPPLY. THE COMMON RETURN OF THE SIGNAL CIRCUITS SHALL BE OF THE SAME POLARITY AS THE GROUND OR NEUTRAL SIDE OF THE LINE POWER SUPPLY.

e. GROUNDING: THE GROUNDED SIDE OF THE LINE POWER SUPPLY SHALL BE GROUNDED TO THE CONTROLLER CABINET IN AN APPROVED MANNER.

f. ACCESSORIES: WHEN OTHER ACCESSORIES ARE A PART OF THESE SPECIFICATIONS, THERE SHALL BE A SUFFICIENT NUMBER OF TERMINALS ON THE PANEL TO TERMINATE AND INTERCONNECT ALL EQUIPMENT.

g. RADIO INTERFERENCE: A COMBINATION OF CHOKE COILS AND/OR CAPACITORS SHALL BE APPLIED TO THE INCOMING POWER LINE CIRCUIT IN ORDER TO SUPPRESS OR MINIMIZE INTERFERENCE WITH RADIO RECEPTION.

5. LOAD SWITCHES: LOAD SWITCHES SHALL HAVE A MINIMUM RATING OF 10 AMPERES INCANDESCENT LOAD, CONTINUOUS DUTY AT 120 VOLT ALTERNATING CURRENT. LOAD SWITCHING SHALL BE PERFORMED WITH SOLID-STATE DEVICES DESIGNED TO PROVIDE FULL LINE VOLTAGE AND LOAD CURRENT TO THE SIGNAL LAMPS. ALL LOAD SWITCHES SHALL BE JACK-MOUNTED FOR EASE IN REPLACEMENT AND CHECKING.

6. SURGE PROTECTION

a. DETECTORS: INTERNAL SURGE PROTECTION FOR EACH LOOP DETECTOR IS REQUIRED.

b. ALTERNATING CURRENT SERVICE INPUT: THE CONTROLLER CABINET ALTERNATING CURRENT SERVICE SHALL BE PROVIDED WITH THE FOLLOWING SURGE PROTECTION:

i. SURGES: THE UNIT SHALL BE ABLE TO WITHSTAND A MINIMUM OF TWENTY 20,000-AMPERE SURGES.

ii. TERMINALS: THE PROTECTOR SHALL BE PROVIDED WITH TERMINALS AS DEFINED BELOW:

MAIN LINE: ALTERNATING CURRENT LINE FIRST STAGE TERMINAL.

MAIN NEUTRAL: ALTERNATING CURRENT NEUTRAL INPUT TERMINAL.

EQUIPMENT LINE IN: ALTERNATING CURRENT LINE SECOND STAGE INPUT TERMINAL, 10 AMPERES.

EQUIPMENT LINE OUT: ALTERNATING CURRENT LINE SECOND STAGE OUTPUT TERMINAL, 10 AMPERES.

EQUIPMENT NEUTRAL OUT: NEUTRAL TERMINAL TO PROTECTED EQUIPMENT.

GROUND: EARTH CONNECTION.

iii. INDUCTOR: THE EQUIPMENT LINE IN AND EQUIPMENT LINE OUT TERMINALS SHALL BE SEPARATED BY A 200 MICROHENRY INDUCTOR RATED TO HANDLE 10 AMPERES ALTERNATING CURRENT SERVICE.

iv. FIRST STAGE CLAMP: THE FIRST STAGE CLAMP SHALL BE BETWEEN MAIN LINE AND GROUND TERMINALS.

v. SECOND STAGE CLAMP: THE SECOND STAGE CLAMP SHALL BE BETWEEN EQUIPMENT LINE OUT AND EQUIPMENT NEUTRAL.

vi. NEUTRALS: MAIN NEUTRAL AND EQUIPMENT NEUTRAL OUT SHALL BE CONNECTED TOGETHER INTERNALLY AND SHALL HAVE CLAMPING DEVICES RATED AT 20 KILOAMPERES BETWEEN MAIN NEUTRAL AND GROUND TERMINALS.

vii. LINE TERMINALS: MAIN LINE AND EQUIPMENT LINE TERMINALS SHALL BE ISOLATED INTERNALLY.

viii. SOLID-STATE: NO GAS DISCHARGE TUBES WILL BE ALLOWED. THE PROTECTOR SHALL BE OF SOLID-STATE DESIGN.

ix. PEAK CLAMP VOLTAGE: PEAK CLAMP VOLTAGE SHALL BE 350 VOLTS AT 20 KILOAMPERES, WITH THE VOLTAGE MEASURED BETWEEN EQUIPMENT LINE OUT AND EQUIPMENT NEUTRAL OUT TERMINALS AND THE CURRENT APPLIED BETWEEN MAIN LINE AND GROUND TERMINALS, WITH GROUND AND MAIN NEUTRAL TERMINALS EXTERNALLY TIED TOGETHER. THIS VOLTAGE SHALL NEVER EXCEED 350 VOLTS.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
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KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL SPECIFICATIONS

149/202

TE120ASI 04/05/95

FHWA APPROVAL		06/08/95	APP'D	James E. Toboben	
DESIGNED	C.J.M.	DETAILED	C.J.M.	QUANTITIES	TRACED
DESIGN CK.	L.G.V.	DETAIL CK.	L.G.V.	QUAN. CK.	TRACE CK.

Plotted By : FISCHER
Plot File : e:\Vrafstdn\tei20asi.dgn
Plot Date : 99999STIME99999