STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0720-01	2023	338	517

CONSTRUCTION AND MATERIAL REQUIREMENTS FOR INTELLIGENT TRANSPORTATION SYSTEM (ITS) INSTALLATIONS

TABLE OF CONTENTS

1.0	DESCRIPTION	SHEET S01
2.0	BID PREPARATION	SHEET S01
3.0	MATERIALS	SHEET S01
4.0	SUBMITTALS	SHEET S01
5.0	CONDUITS	SHEET S02
6.0	PULL BOXES, SPLICE VAULTS, AND JUNCTION BOXES	SHEET S03
7.0	WIRING	SHEET S03
8.0	GROUNDING, POWER SUPPLY ASSEMBLY, AND POWER	SHEET S04
9.0	CONCRETE FOUNDATIONS	SHEET S05
10.0	ITS FIELD ELEMENTS	SHEET S05
11.0	DYNAMIC MESSAGE SIGN SYSTEM (DMS)	SHEET S06
12.0	CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)	SHEET S06
13.0	VEHICLE DETECTION SYSTEM (VDS)	SHEET S08
14.0	ITS CABINET ASSEMBLY	SHEET S09
15.0	FIBER OPTIC CABLE, INSTALLATION, AND HARDWARE	SHEET S09
16.0	CELLULAR MODEMS	SHEET S11
17.0	POINT-TO-POINT (P2P) ETHERNET RADIO (LICENSED BAND)	SHEET S11
18.0	POINT-TO-MULTIPOINT (P2M) ETHERNET RADIO	SHEET S11
19.0	ITS COMMUNICATIONS INTEGRATION	SHEET S12
20.0	ITS COMPONENT TESTING	SHEET S12
21.0	TRAINING	SHEET S14
22.0	BASIS OF ACCEPTANCE FOR ITS SYSTEM	SHEET S14
23.0	MAINTENANCE AND WARRANTY	SHEET S14
24.0	TRM CHECKLIST	SHEET S15

1.0 DESCRIPTION

These specifications describe the equipment, material, and construction requirements to complete the lump sum Intelligent Transportation System (ITS) bid item. Compliance by the Contractor with the Specifications and Plans does not relieve the Contractor of the responsibilities of furnishing equipment and materials of proper design and installation to meet operating warranties for all ITS related components.

2.0 BID PREPARATION

Confirm the existing conditions before preparing the bid. Topography as shown on the plans is derived from existing roadway plans. Visit the site of the work and make a determination of the amount of rock, unclassified, or other materials that might be encountered. No additional pay will be made for differences in material encountered. Review the locations of devices and conduits throughout the project area prior to submittal of bid to determine the types and extent of incidental installation, removal, relocation, and replacement items to include in the price.

3.0 MATERIALS

All materials shall conform to the requirements for individual components of the ITS identified in these Specifications. All materials shall be as specified in the Summary of Quantities on the Plans and shall meet the Buy America Act requirements outlined in Section 106 of KDOT's Standard Specifications.

3.1 BASIS OF ACCPTANCE

Acceptance of material furnished under these specifications will be based on satisfactory submittals that meet the requirements of section 4.0 and on the Engineer's approval of submittals where "no exceptions taken" or "exceptions as noted" is indicated.

3.2 KDOT SUPPLIED MATERIALS

KDOT may provide equipment such as Cisco equipment, VDS, DMS, DMS cabinet, DMS multimode communication cable, and analog CCTV cameras for installation by the Contractor, as noted in the plans. Refer to the Summary of Quantities in the plans for specific KDOT supplied items. When using KDOT furnished equipment, the KDOT furnished equipment shall become the Contractor's responsibility upon delivery of this equipment to the Contractor.

4.0 SUBMITTALS

Submit one electronic copy of each submittal group to the Engineer for review and approval. At the same time, submit an electronic version to the KDOT ITS unit and others as directed by the KDOT ITS unit. Include in each submittal sufficient information and details to permit full evaluation of each item. Submittals, which in the judgment of the Engineer are insufficient to permit proper evaluation, will not be reviewed. Take care to address all the requirements of the Contract Documents in the submittal data. Leave nothing to assumption. Address the functional and technical interrelationships among the various items in detail.

In each submittal group, state all relevant information regarding materials and equipment in order to procure exact replacements of any or all items on the project. To be acceptable, provide a material list for each submittal group containing all items supplied by the Contractor for the group. The Engineer reserves the right to reject an incomplete or unclear submittal. Identify the materials on the list by the contract project number, item description, catalog part numbers, catalog cuts, shop drawings, trade names, and schedules or other pertinent information. Clearly indicate the materials from any catalog cuts. Note any material designation used in the Contract Documents on the materials list. Submit all manufacturer product sheets for review and approval.

For each item, include in the documents all information necessary to determine product specification compliance. Clearly indicate, on the documentation, the exact model number, accessories, and options that are being proposed for use. If standard manufacturer documentation does not specifically address all the product requirements, then obtain a letter from the manufacturer certifying compliance with each referenced requirement that is not indicated on the standard documentation. If reprinted literature, such as catalog cut sheets, is used to satisfy some or all of the submittal data requirements, do not include any statements on the literature which conflict with the requirements of the Contract Documents. Cross off and initial any such statements. Give an explanation of how specifications shall be met pertaining to items changed from the literature.

4.1 SUBMITTAL SCHEDULE AND REVIEW PERIODS

Submit product data submittals and shop drawings in a timely manner to allow for job completion within the contract working days. All submittals and shop drawings to be approved prior to installion on site.

For each submittal, plan for any given package of submittal information to be in the hands of the Engineer for up to 15 business days. Obtain final approval, in writing from the Engineer, on all items within the submitted documentation. No time extensions will be granted as a result of having to resubmit items for review or having to make any modifications necessary to any submitted documentation. Review of the submittal data by the Engineer will not relieve the Contractor from obligation to furnish and install the work in accordance with Contract Documents.

4.2 SUBMITTAL REQUIREMENTS

Certify, by stamp or letter, that the material has been reviewed and approved and that it conforms to the requirements of the Contract Documents. If this certification is not included, the submittal will be returned without action.

Submit electronic shop drawing submittals for structural items in Group 5 such as CCTV poles and DMS structures as full size created documents or larger. The intent of this requirement is to provide a legible set of shop drawing submittals to allow for a thorough shop drawing review.

At the time of each submittal, define and delineate in writing, separate from the certification, any deviations from the Contract Documents. If the Engineer accepts this deviation, the deviation will be authorized by issuing a change order or if the deviation is minor, by endorsement to the letter.

To aid in control of the submittal data process, transmit each group of submittal data to the Engineer using a transmittal sheet. The Engineer will date-stamp these transmittal sheets with the date received and will return a copy of the stamped transmittal sheet when returning the submittal data. List on the transmittal sheet specifically each item or element included in the transmittal. An element is one part of several parts of information related to the same item. Each drawing shall be listed separately. Furthermore, each drawing shall have a unique drawing number that can be referenced. The same drawing number shall not be used on more than one sheet.

The Engineer review will be only for conformance with the design concept of the work and for compliance with the information contained in the Contract Documents. The review of a specified item, as such, will not indicate review of the assembly in which the item functions. Review by the Engineer will not relieve the Contractor from responsibility for any errors or omissions in the submittals nor from his responsibility for complying with the Contract Documents.

4.3 SUBMITTAL GROUPS

Submit the data for the items in each group together. In general, no items in any group will be accepted until all items in the group are accepted; however, the Engineer may accept some items in a group, at his or her discretion, prior to all items being approved. Submit all additional devices that are not specifically listed below with the appropriate group. Clearly label on each submittal the intended location and purpose for each submitted product. KDOT may provide a list of required submittals to include. For submittal purposes, submit the data for the following items in groups defined as follows:

Group 1 - Conduit, Pull Boxes, Wiring, and Electrical
- HDPE conduit
- Rigid metallic conduit
- Conduit couplings and/or reducers
- Pull boxes
- Splice vaults
- Electrical conductors
- Power service equipment
- Grounding equipment
- Air terminal equipment
- Warning tape
- Tracer wire
- Pull rope
- Duct plugs
- Surge Protection Device

Group 2 - Cabinet Assembly
- Cabinet
- Field traffic controller
- Fluorescent or LED cabinet lights and fixture
- Fan and thermostat assembly
- Power supply
- Power strip
- Detector card
- Load center
- Locking system
- Filter
- Door plate label
- Alarm
- Cabinet wiring diagram
- Surge Protection Device

Cabinet rack elevation drawings (See ITS-D04)
All other cabinet equipment except CCTV and communications equipment

Group 3 - ITS Device Equipment
- Encoder
- Cat 6 cable
- Communication Switch
- Ethernet/Data transceiver
- PoE Injector
- Pavement sensor
- Vehicle detector
- Sensor mount
- Co-Ax cable
- Cellular equipment
- Communication Surge Protection Device
- Media converter
- CCTV camera and power supply
- CCTV cables
- CCTV mounting equipment
- Detector cable

Bluetooth detection system
Automated Gate System
Dynamic Curve Warning System
Shop drawings for CCTV camera lowering device, including composite cable for CCTV
Shop drawings and specification for IP CCTV cameras including EPA and weight
Wireless point to multi-point IDU radio, ODU antenna, power supply, mounting equipment, and radio cabling
Wireless point to point IDU radio, ODU antenna, power supply, mounting equipment, and radio cabling
Other communications equipment or accessories

Group 4 - Fiber Optics
Fiber optic cable
Fiber optic patch cable
Fiber optic splice enclosure and trays
Fiber distribution assembly
Fiber optic patch panels
Fiber connectors
Cable labels
Closet connector housing assembly
Any other fiber optic equipment

Group 5 - CCTV, Detector, and DMS Support Structures (send electronic submittal). Structural shop drawings to be reviewed by design Engineer (or consultant of record) with final approval by KDOT.
Shop drawings for DMS structures, foundations, and DMS mounting details
Shop drawings for CCTV pole (including handhole locations) and foundation
Shop drawings for detector pole and foundation

Group 6 - Testing
Ground resistance testing procedure and equipment
Example fiber optic test results sheet
Test procedures not provided by KDOT
KDOT may provide DMS and CCTV test procedures
Fiber optic testing equipment and testing procedures
Fiber optic test equipment calibration certifications (recalibrated within the last year)

Group 7 - Other
Cisco network and fiber optic splicing certifications
Fiber optic cable installation procedure and splicing resume
Miscellaneous items that did not fall in any of the previous groups

4.4 STRUCTURAL AND FOUNDATION SHOP DRAWINGS

For all non-catalog or custom made items including the support structures and foundations for VDS, CCTV and DMS, submit shop drawings for approval along with other data necessary to permit full evaluation of the proposed product and/or material. Obtain approved submittals prior to purchase or fabrication of any support structures for use on this project.

Structural and foundation shop drawings and calculations shall be sealed and signed by a Professional Engineer licensed in the State of Kansas.

No additional payment will be made for Contractor geotechnical work. Historical boring log data may be provided by the Engineer.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S01 VERSION DATE: 02-12-21

APP'D			
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN OK.	DETAIL OK.	QUAN. OK.	TRACE OK.

KDOT Graphics Certified 05-02-2022

KDOT Graphics Certified

Plotted : 25-SEP-2023 18:44

Drawn By : lcvohs
File : ITS-S01.dgn