

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0673-01	2017	88	99

20.8.3 TEST RESULTS

Include in this section a copy of the results for all the tests that have been conducted for the contract including but not limited to ITS component test results. Include in this section as applicable to the Plans:

1. Ground resistance testing and certifications (signed by the project inspector)
2. CCTV test results
3. DMS test results
4. Vehicle detector test results
5. Wireless data communications test results
6. Fiber optic cable installation test results
7. Integration test results

20.8.4 CONFIGURATION FILES

Save all configuration files for Contractor and KDOT-supplied electronic equipment and maintain an up-to-date detailed component inventory. Maintain both hard copy and electronic files (Word or Excel) and deliver up-to-date copies of these files to the Engineer periodically as work progresses, or as directed by the Engineer.

20.8.5 WARRANTIES

Include in this section a complete copy of all warranty information for Contractor supplied equipment as specified in these specifications. Provide effective dates for all warranties. Warranty information will be verified by KDOT prior to final project acceptance. Provide a spreadsheet of all ITS equipment on a project including: purchase date, serial and model numbers, and effective warranty period. Include any warranty submittals within this section.

20.8.6 CABLE AND CONDUCTOR CERTIFICATIONS

Include in this section all cable and conductor certifications from the supplier indicating that the materials meet the requirements of these specifications; and that the cable furnished was from a lot manufactured by (manufacturer's name) whose test results indicate compliance with the specifications. Include packaging and shipping labels showing the manufacturer's name, the cable type, and actual length of cable on reel, contractor's name, contract number, and reel number. Also include the date of manufacture, cable characteristics (size, attenuation, bandwidth), factory test results, cable identification number and other pertinent information.

20.8.7 LOWERING DEVICE INSTALLATION CERTIFICATIONS FROM MANUFACTURER

Include in this section all lowering device installation certifications from the manufacturer indicating that the lowering device was installed correctly and that a factory representative was on site to assist with the assembly and testing of the installation. Include the installation instructions and the operational specifications of the lowering device.

20.8.8 CABINET RACK ELEVATIONS

Include in this section all cabinet rack elevation drawings for each field cabinet assembly and all racks modified in a KDOT facility. Provide elevations that are drawn to scale, including both the front and back elevations. Label each drawing with a title stating field cabinet name, location, and mile post along with a summary stating type of cabinet, cabinet outside dimensions, and rack dimensions (19" rack with XXU slots). Indicate on the drawings the placement of each piece of equipment, blank panels, and blank spaces. Show vertical dimensions in both inches and rack units (multiples of 1.75 inches). Indicate in the drawings blank space reserved for KDOT provided equipment.

20.8.9 AS-BUILT PLAN SET AND SHOP DRAWING

Keep and maintain at the job site half-size contract Plans with shop drawings and submittals. Legibly mark these Plans in a contrasting, reproducible color to depict any changes or other deviations that have been made to the Plans or approved shop drawings including buried or concealed construction and utility features that are revealed during the course of construction. Record the locations of all buried utilities that differ from the location indicated or that were not indicated on the contract Plans. Record the tie-point measurements for each buried electrical pull box. Supplement the as-built documents by any detailed sketches, as necessary or directed, to indicate fully existing conditions and the work as actually constructed. Prior to final acceptance of the project, provide the Engineer with the original as-built plan set with shop drawings, two half-size copies of the complete as-built plan set and record drawings, and one electronic PDF copy.

Include in this section an electronic PDF of as-built plan set and shop drawings.

20.8.10 SPLICE VAULT / PULL BOX DOCUMENTATION

Clearly record on the communications layout/plan sheets of the as-built plan set, the sequential fiber cable markings at all splice vaults, for each cable run entering into the splice vault.

Include photographic documentation of each fiber optic splice vault and pull box installed throughout the project. This documentation should include: a photo of the inside of each vault or box, a location description, the vault or box identifier as labeled in the plans, a description of each cable in the vault, and any other pertinent information that would be useful for future maintenance.

20.8.11 GPS DOCUMENTATION AND TIE-POINT MEASUREMENTS

Include in this section an electronic list of GPS readings in excel format for all installed devices including but not limited to: DMS foundations, CCTV foundations, detection, cabinets, pullboxes, splices vaults, wireless towers, and power supplies. Coordinate with KDOT on the current GPS format for coordinates. The accuracy of the GPS reading shall be within 3 feet. Also include in this section a sketch including the 3 tie-point measurements for each buried electrical pull box.

20.8.12 IN-CABINET DOCUMENTATION

Provide to the Engineer final in-cabinet documentations for review and acceptance. Provide documentation that is computer generated and use 8 1/2" by 11" paper size. Place approved documentation in each cabinet folder. Include, at a minimum, the following documentation in the cabinet: the maintenance log, cabinet elevation drawings, communication schematic drawings, and test results. If changes occur during construction, provide the revised documentation to the cabinets.

Include in this section an electronic PDF of in-cabinet documentation.

21.0 TRAINING

21.1 DESCRIPTION

Conduct training courses for KDOT operations and maintenance staff on operating components of the ITS system if requested by KDOT. Design training courses to ensure that KDOT staff achieves a full knowledge and appreciation of the design, operation and maintenance of equipment. Training may consist of field device operations and maintenance training, field communications operations and maintenance training, and system (outside plant) operations and maintenance training.

21.2 MATERIALS

Provide all training documentation, and coordination with vendors to provide teaching staff. Provide the training to consist of lectures and demonstrations that shall provide practical (hands-on) training and experience.

Provide 5 hard copies of the training manuals and 1 electronic copy of the training manuals.

Provide a detailed training plan and a syllabus for each course for the approval of the Engineer. Include in the information: tentative dates for courses, locations, and an outline of topics and names of instructors. Provide this information to the Engineer at least 30 days in advance of the training course.

21.3 CONSTRUCTION REQUIREMENTS

Provide up to a 2-day training class to train operations and field maintenance personnel at KDOT's request. Include in-field demonstrations.

22.0 BASIS OF ACCEPTANCE FOR ITS SYSTEM

The ITS system will be accepted when all test results, documentation including but not limited to the TRM and as-built plans are received and approved by the Engineer, all test periods are successfully completed, and all training is completed.

23.0 MAINTENANCE AND WARRANTY

23.1 MAINTENANCE

Maintain all equipment and cables installed in this project until the ITS system has passed all testing requirements specified herein and has been accepted by KDOT. Once the operational test period has successfully been completed, turn over the maintenance of the ITS system to KDOT.

23.2 WARRANTY

Equipment Warranty: Obtain, assign, and furnish to the Engineer written manufacturer's warranties for all Contractor-provided products and electronic equipment consistent with those provided as customary trade practice.

Contractor Warranty: Provide a Contractor's warranty providing for satisfactory in-service operation of the ITS during the 60 day test period for each ITS component. Comply with the following for Contractor provided equipment: If defects develop during this period, replace or repair the provided equipment, at the expense of the Contractor, including all labor, material and associated costs, as necessary to restore required performance. Comply with the following for KDOT provided equipment: If defects develop in KDOT provided equipment, KDOT will provide a replacement and Contractor shall replace equipment, at the expense of the Contractor, including all labor, material and associated costs, as necessary to restore required performance. KDOT labor costs resulting from equipment replacement will not be charged to the manufacturer or the Contractor.

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KANSAS DEPARTMENT OF TRANSPORTATION			
ITS EQUIPMENT SPECIFICATIONS			
ITS-S14		VERSION DATE: 05-29-17	
APP'D	DESIGNED	QUANTITIES	TRACED
	DETAIL	QUAN. CK.	TRACE CK.