Section 670 General Requirements for Intelligent Transportation Systems (ITS)

670.1 Description

(1) This section describes additional personnel qualifications, construction methods, and testing requirements used to perform ITS work.

670.2 Materials

(1) Furnish ITS materials conforming to the general requirements for electrical work as specified in 651.2.

670.3 Construction

670.3.1 General

(1) Perform ITS work conforming to the general requirements for electrical work as specified in 651.3.

670.3.2 Personnel Qualifications

670.3.2.1 Field System Integrator

(1) Perform ITS work with onsite assistance and under the supervision of a qualified field system integrator selected from the department's approved field system integrator list. The field system integrator provides assistance and expertise to the contractor in the areas of equipment installation, operation, integration with existing equipment, testing, and network management.

(2) The field system integrator is responsible for ensuring that equipment is installed as the plans show and functions properly. The field system integrator also helps submit material lists, shop drawings, documentation, as-builts, test results, training and operation manuals as well as associated presentations, wiring schematics, and equipment test procedures.

(3) Ensure that the field system integrator schedules, manages, and documents periodic ITS focused progress meetings beginning within one month after ITS work under the contract begins. Hold additional meetings at least monthly while ITS work under the contract is scheduled. The department defines ITS work as operations required under the contract related to electrical work.

670.3.2.2 Certified Fiber Optic Technician

(1) Have a certified fiber optic technician perform work for fiber optic terminations, splicing, and testing. Have a certified fiber optic technician supervise all fiber optic cable installation.

(2) Submit material to certify technicians meet the following requirements:

- Education: attend and successfully complete at least one 4-day class on installation of fiber optic products conducted by major manufacturer and have FOA certification.
- Work history: demonstrate a minimum of 2 years work experience in the last 5 years with splicing, termination, and testing of fiber optic cable.

(3) Remove, replace, and reinstall work performed by non-certified technicians for fiber optic communications equipment and material.

670.3.3 Testing

670.3.3.1 Contractor-Furnished Equipment and Materials

(1) Furnish equipment necessary to test the completed installation. Test and demonstrate to the engineer's satisfaction that equipment is calibrated and in working order.

(2) Submit documentation required that demonstrates component performance and operation as specified in contract.

(3) The field system integrator will approve final set up and testing of all equipment and materials.

(4) Perform tests on weekdays during normal working hours. Obtain the engineer's approval for test times and dates.

(5) Resubmittal of rejected equipment or material is allowed for consideration with proof of correction and testing. The department may approve rejected material but is not considered acceptance for equipment or material until final post-installation testing.

670.3.3.2 Department-Furnished Equipment and Materials

(1) Have the field system integrator inspect department-furnished equipment and materials to ensure that they conform to contract requirements and function properly. Notify the department within 3 days if the inspection identifies defective equipment or materials. The department will replace whatever is defective.

(2) Do not take possession of defective equipment or materials. Once possession is taken, the contractor is responsible for replacing defective equipment and materials.

670.3.3.3 Post-Installation Testing

(1) Furnish test procedures for each component in the contract. A component is defined as a subsystem confined to the end functionality of the device. Components include field devices, processor, assemblies, cabling, connections, communications, and any additional elements associated with proper operation and full functionality of the field device.

(2) Submit 5 copies of component test procedures to the department. The field system integrator and contractor shall develop test procedures 30 days before initial installation. The department will approve test procedure within 30 days of the date received and provide a written approval.

(3) Resubmit rejected test procedures within 15 days of notification. The department will provide written approval of resubmitted test procedures within 30 days of the date received.

670.3.4 ITS Documentation

670.3.4.1 Preconstruction Work

(1) Provide 5 copies of equipment list, catalog cut-sheets, and drawings within 28 days after notice of award to the engineer. The engineer will review the equipment list and drawings within 30 days of submittal. Obtain the engineer's written approval before procuring equipment and beginning the work.

(2) Equipment list will include bid items in the work and contain names and addresses of manufacturers, catalog tear sheets showing catalog numbers, and specifications. Resubmit a new alternative for partial or totally rejected equipment within 15 days of written notice. The engineer will review within 30 days of submittal.

(3) Do not make substitutions or changes to engineer-approved materials without the engineer’s written approval. Check the availability, price, and delivery date before making submittal of equipment or material.

670.3.4.2 Post-Construction Work

(1) Submit 5 copies of ITS documentation including but not limited to the following:

- Operator's manual: for contractor furnished equipment, submit a manual containing detailed operating instructions for each different type or model of equipment and or operation performed.
- Maintenance procedures manuals: for contractor furnished equipment, submit a manual containing detailed preventive and corrective maintenance procedures for each type or model of equipment furnished.
- Cabinet fiber optic wiring diagram: submit a cabinet wiring diagram, identified by location for each cabinet. Include both electrical wiring and fiber optic conductor and cable connections. Place one copy of the fiber optic wiring diagram in a weatherproof holder in the cabinet. Deliver the other copies to the engineer.
- As-built drawings: submit final as-built drawings that detail the final placement of conduit, cabling, equipment, and geometric modifications within the contract. Provide documentation in an electronic format adhering to the region’s ITS computer aided drafting standards and according to the department’s as-built requirements. The department will review the as-built drawings for content and electronic format. Modify both the content and format of as-built drawings until meeting all requirements.
- Equipment inventory list: submit an inventory list including serial number, make, model, date installed, and location installed of equipment installed under the contract.

670.4 Measurement

(1) The department will measure Field System Integrator and ITS Documentation as a single lump sum unit for all services acceptably completed under the contract.

670.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
670.0100	Field System Integrator	LS
670.0200	ITS Documentation	LS

(2) Payment for Field System Integrator and ITS Documentation is full compensation for providing specified expertise, assistance, and documents. The department will pay separately for other ITS work under the various ITS bid items of 671 through 678.

(3) The department will not pay for removing, replacing, and reinstalling work performed by non-certified technicians as required under 670.3.2.2.