Florida Department of Transportation

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ANANTH PRASAD, P.E.
SECRETARY

August 6, 2014

Khoa Nguyen
Director, Office of Technical Services
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: State Specifications and Estimates Office
Section **785**
Proposed Specification: **7850000 Intelligent Transportation Systems Infrastructure.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

This change is proposed by Alan El-Urfali of the State Traffic Engineering and Operations Office to consolidate material requirements from the Minimum Specifications for Traffic Control Signals and Devices (MSTCSD) and the Standard Specifications for Road and Bridge Construction (SSRBC). This activity is a planned part of an ongoing specification consolidation effort. Language in Section 785 will be incorporated in Sections 641, 649, and 676 as applicable.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to SP965DS or daniel.scheer@dot.state.fl.us.

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Daniel Scheer, P.E.
State Specifications Engineer

DS/dt
Attachment
cc: Florida Transportation Builders' Assoc.
State Construction Engineer

INTELLIGENT TRANSPORTATION SYSTEMS – INFRASTRUCTURE.
(REV 6-3-14)

SECTION 785 is deleted:

~~SECTION 785~~
~~INTELLIGENT TRANSPORTATION SYSTEMS~~
~~INFRASTRUCTURE~~

~~785-1 Description.~~

~~Furnish and install ITS infrastructure components as shown in the Plans. Ensure that all materials furnished, assembled, fabricated, or installed are new products.~~

~~785-2 Pole and Lowering Device.~~

~~**785-2.1 Description:** Furnish and install a steel or concrete pole, with or without a lowering device, as shown in the Plans. Consider the lowering device and pole as two interdependent components of a single unit, and provide them together to ensure compatibility of the pole and lowering device.~~

~~**785-2.2 Materials:**~~

~~**785-2.2.1 Pole:** Use a concrete or steel pole in accordance with Design Standards, Index No. 18111 or 18113.~~

~~Obtain steel poles from a fabrication facility that is currently on the Department's list of Metal Producers with an Accepted Quality Control Program. Producers seeking inclusion on the list shall meet the requirements of 105-3.~~

~~Use concrete poles constructed in accordance with Section 450. Obtain concrete poles from a manufacturing plant that is currently on the Department's list of Precast Prestressed Concrete Producers with an Accepted Quality Control Program. Producers seeking inclusion on the list shall meet the requirements of 105-3. Assume responsibility for performance of all quality control testing and inspection required by Sections 346 and 450; however the PCI personnel and plant certifications are not required.~~

~~Ensure that the pole-top tenon is rotatable.~~

~~**785-2.2.2 Lowering Device:** Use a lowering device as shown in the Plans. Use only lowering device equipment and components that meet the requirements of these minimum specifications, and are listed on the Department's Approved Product List (APL). The lowering device must be permanently marked with manufacturer name or trademark, part number, and date of manufacture.~~

~~Ensure that the lowering device provides the electrical connections between the control cabinet and the equipment installed on the lowering device without reducing the function or effectiveness of the equipment installed on the lowering device or degrading the overall system in any way. The lowering device system support arm must be capable of withstanding service tension and shear up to 1 kip (kilopound) minimum.~~

~~Ensure that the lowering device includes a disconnect unit for electrically connecting the equipment installed on the lowering device's equipment connection box to the power, data, and video composite cables (as applicable); a divided support arm, a pole adapter for the assembly's attachment to the rotatable pole-top tenon, and a pole-top junction box, as shown in the Plans.~~

Ensure that all of the lowering device's external components are made of corrosion-resistant materials that are powder-coated, galvanized, or otherwise protected from the environment by industry-accepted coatings that withstand exposure to a corrosive environment. All finished castings must have a smooth finish free from cracks, blow-holes, shrinks, and other flaws. All roller fairlead frames shall be corrosion resistant stainless steel or aluminum.

The lowering device must be provided with a minimum of 100 feet of composite power and signal cable prewired to the lowering device at the factory unless otherwise shown in the Plans. Ensure there are no splices in prewired cable.

785-2.2.2.1 Equipment Connection Box: Provide an equipment connection box for connecting the CCTV camera or other ITS device to the lowering device. The equipment connection box must include a 1.5 inch National Pipe Thread (NPT) pipe connection point for attaching a camera. Ensure that the equipment connection box has an ingress protection rating of no less than IP55.

785-2.2.2.2 Disconnect Unit: Ensure that the disconnect unit has a minimum load capacity of 600 pounds with a 4:1 safety factor. Ensure that the fixed and movable components of the disconnect unit have a locking mechanism between them. Provide a minimum of two mechanical latches for the movable assembly. Ensure that all load is transferred from the lowering cable to the mechanical latches when the system is in the latched position. Ensure that the fixed unit has a heavy-duty cast tracking guide and a means to allow latching in the same position each time.

Ensure that the disconnect unit is capable of securely holding the lowering device and the equipment installed on the lowering device. Use interface and locking components that are stainless steel or aluminum.

785-2.2.2.2.1 Disconnect Unit Housing: Ensure that the disconnect unit housing is provided with a gasket to seal the interior from dust and moisture. Ensure that the disconnect unit housing has an ingress protection rating of no less than IP55.

785-2.2.2.2.2 Connector Block: Provide modular, self-aligning and self-adjusting female and male socket contact halves in the connector block. Equip the lowering device with enough contacts to permit operation of all required functions of the camera, up to a maximum of 20 contacts. Provide at least two spare contacts. Provide contact connections between the fixed and movable lowering device components that are capable of passing EIA-232, EIA-422, EIA-485, and Ethernet data signals and 1 volt peak to peak (Vp-p) video signals, as well as 120 V_{AC}, 9-24 V_{AC}, and 9-48 V_{DC} power. Ensure that lowering device connections are capable of carrying the signals, voltages, and current required by the device(s) connected to them under full load conditions. Submit documentation showing pin assignment for approval.

Provide corrosion-resistant stainless steel hardware. Ensure all components, including the connector block and contacts, are lubricated in accordance with the manufacturer's instructions. Ensure that male contacts used for grounding mate first and break last. Ensure that all contacts and connectors are self-aligning and self-adjusting mechanical systems. Provide a spring-assisted contact assembly to maintain constant pressure on the contacts when the device is in the latched position.

Provide connector pins made of brass- or gold-plated nickel, or gold-plated copper.

Ensure that the current-carrying male and female contacts are a minimum of 0.09 inch in diameter and firmly affixed to the connector block. Ensure mated connectors do not allow water penetration.

~~**785-2.2.3 Lowering Tool:** Provide a portable metal-frame lowering tool with winch assembly and a cable with a combined weight less than 35 lbs.; a quick release cable connector, and a torque limiter that will prevent over-tensioning of the lowering cable. Ensure that the lowering tool can be powered using a half-inch chuck, variable-speed reversible industrial-duty electric drill to match the manufacturer-recommended revolutions per minute, or supply a drill motor for the lowering tool as shown in the Plans.~~

~~Ensure that the lowering tool securely supports itself and the load. Ensure that the lowering tool is equipped with a winch with a minimum drum size width of 3.75 inch and a positive braking mechanism to secure the cable reel during raising and lowering operations, and to prevent freewheeling. Ensure the lowering cable winds evenly and does not bind on the lowering tool winch drum during operation. Ensure the winch includes a manual winch handle that incorporates a non-shear pin type torque limiter that can be used repeatedly and will prevent damage to the lowering system.~~

~~Use a lowering tool equipped with gearing that reduces the manual effort required to operate the lifting handle to raise and lower a capacity load. Provide the lowering tool with an adapter for operating the lowering device with the portable half-inch chuck drill using a clutch mechanism and torque limiter.~~

~~Ensure that the lowering tool is manufactured of durable, corrosion-resistant materials that are powder-coated, galvanized, or otherwise protected from the environment by industry-accepted coatings that withstand exposure to a corrosive environment.~~

~~Provide a minimum of one lowering tool plus any additional tools as required in the Plans. Upon a project's final acceptance, deliver the lowering tool to the Department.~~

~~**785-2.2.4 Lowering Cable:** Provide a lowering cable with a minimum diameter of 0.125 inch. The cable must be stainless steel Type 316 aircraft type (7 strands x 19 gauge) with a minimum breaking strength of 1,760 lbs. Ensure the lowering cable assembly (as installed with thimble and crimps on one end and a cable clamp inside the latch on the lowering device end), has a minimum breaking strength of 1,760 lbs. Ensure all lowering cable accessories, such as connecting links, have a minimum workload rating that meets or exceeds that of the lowering cable. Ensure that the prefabricated components for the lift unit support system preclude the lifting cable from contacting the power or video cables.~~

~~**785-2.2.5 Wiring:** Ensure that all wiring meets NEC requirements and follows the equipment manufacturers' recommendations for each device connected on the pole, at the lowering device, and in the field cabinet.~~

~~**785-2.2.6 External-mount Lowering System Enclosure for Mounting to Existing Structures:** Furnish and install an external-mount lowering system enclosure for mounting to existing structures, as shown in the Plans. Ensure that the system includes external conduit, cabling, and upper mounting/junction box that is able to accept the lowering device. Ensure that the system includes a winch assembly permanently housed in a corrosion-resistant lower lockable pole-mounted cabinet. Ensure the upper mounting/junction box includes a maintenance access door with captive attachment hardware. Provide all necessary mounting hardware, conduits, standoffs, and conduit mounts required for a complete and functional system.~~

~~Ensure the cabinet minimum dimensions are 12 inches x 18 inches x 10 inches and that the cabinet and door do not interfere with the operation of the winch. The~~

~~cabinet must provide adequate clear area for operation of the winch manually and with an electric drill.~~

~~The cabinet must be constructed of 5052 sheet aluminum with a minimum thickness of 1/8 inch. All inside and outside edges of the cabinet must be free of burrs. The outside surface of the cabinet must have a smooth, uniform natural aluminum finish. All welds must be neatly formed, free of cracks, blow holes, and other irregularities. Cabinet hinges must be vandal resistant and made of 14 gauge diameter stainless steel or 1/8 inch diameter aluminum and include stainless steel hinge pins. Cabinet door must not sag. Door opening must be double flanged. Door must include neoprene closed-cell gaskets permanently secured on the interior door surfaces that contact the door opening. The cabinet must be NEMA 4 rated.~~

~~Door must include a pin tumbler lock. Provide locks keyed for use with a #2 key unless otherwise directed. Provide two keys with each cabinet. The cabinet door handle must include a lock hasp that will accommodate a padlock with a 7/16 inch diameter shackle.~~

~~Ensure external conduit used to connect the winch cabinet to the upper mounting/junction box is galvanized schedule 40 with NPT threads. The conduit must have a minimum ID of 3 inches at the lower winch cabinet entrance and allow the lowering cable to wind evenly on the winch drum without binding. All conduit couplings and connections between the pole-mounted cabinet and upper mounting/junction box must be watertight.~~

~~**785-2.3 Installation Requirements:**~~

~~**785-2.3.1 General:** Ensure that the divided support arm and receiver brackets self-align the contact unit with the pole centerline during installation and that the contact unit cannot twist when subjected to the design wind speeds defined in the FDOT Structures Manual, Volume 9.~~

~~Ensure all pulleys installed for the lowering device and portable lowering tool have sealed, self-lubricated bearings, oil-tight bronze bearings, or sintered bronze bushings.~~

~~Provide 1.25 inch-diameter PVC conduit in the pole for the lowering cable. Verify that a conduit mount adapter is furnished for the interface between the conduit and the internal back side of the lowering device.~~

~~**785-2.3.2 Concrete Poles:** Install foundation and pole in accordance with 641-4.2, except footing dimensions shall be in accordance with Design Standard 18113.~~

~~**785-2.3.3 Steel Poles:** Install foundation and pole in accordance with 649-5 and 649-6.~~

~~**785-2.3.4 Lowering Device:** Ensure that the lowering device can be safely operated and is installed in a manner that does not place the operator directly under the device when it is being raised or lowered.~~

~~Ensure the lowering device support arm self-aligns the disconnect unit and attached device with the pole centerline and remains centered after installation without moving or twisting. Ensure the connection between the lowering device and tenon is weather resistant to prevent the entrance of water. For externally-mounted lowering systems, use conduit straps to secure lowering cable conduit to the pole. Do not use stainless steel bands to secure conduit to the pole. Place the stainless steel lowering cable inside conduit. Ensure that only the lowering cable is in motion inside the pole when the lowering device is operated. Ensure that all other cables remain stable and secure during lowering and raising operations. Label all wire leads with their function, label spares as spares.~~

~~Ensure that crimps and other cable connection hardware associated with the lowering cable cannot come in direct contact with the winch tool or guides when operating~~

the system. Ensure the correct length of lowering cable is installed and that the installed length prevents cable slack and prevents cable from jumping off the winch spool. Ensure the lowering cable strands do not twist or unwind when the lowering device is operated.

Provide manufacturer recommended field installation instructions, inspection instructions (including recommended schedules and procedures), and operating instructions.

785-3 ITS Field Cabinet.

785-3.1 Description: Furnish and install a cabinet for housing ITS equipment and network devices including, but not limited to, managed field Ethernet switches, hub switches, device servers, digital video encoders, fiber optic cable patch panels, and equipment racks for non-intrusive vehicle detection systems. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on the Department's APL.

785-3.2 Materials:

785-3.2.1 Cabinet Shell: Ensure the cabinet shell conforms to NEMA 3R requirements. Ensure that the cabinet shell is constructed using unpainted sheet aluminum alloy 5052-H32 with a minimum thickness of 0.125 inch. Ensure that the cabinet has a smooth, uniform natural aluminum finish without rivet holes, visible scratches or gouges on the outer surface. Other finishes are acceptable if approved.

The minimum dimensions for cabinets are listed below.

Table 785-2
Required Cabinet Dimensions in Inches

Cabinet Type	Height	Width	Depth
336	36" - 39'	24" - 26"	20' - 22"
336S	46" - 48"	24" - 26"	22" - 24"
334	66" - 68"	24" - 26"	30" - 32"

Ensure that the cabinet enclosure top is crowned to prevent standing water. Construct the field cabinet so that it is weather resistant under all conditions. Ensure all exterior cabinet and door seams are continuously welded and smooth. All welds shall be neatly formed and free of cracks, blow holes and other irregularities. Verify that all exterior cabinet welds are gas tungsten arc (TIG) welds. Ensure that all internal cabinet welds are gas metal arc (MIG) or TIG welds. Ensure that all inside and outside edges of the cabinet are free of burrs. Ensure that all edges are filled to a radius of 0.03125 inch minimum. Use ER5356 aluminum alloy bare welding electrodes conforming to AWS A5.10 requirements for welding on aluminum. Procedures, welders and welding operators shall conform to AWS requirements as contained in AWS B3.0 and C5.6 for aluminum.

Ensure that the cabinet is furnished with two lifting eye plates on either side of the top for lifting the cabinet and positioning it. Ensure that each lifting eye opening has a minimum diameter of 0.75 inch and that each eye is able to support the weight load of 1,000 lbs. Ensure that all external bolt heads are tamperproof.

785-3.2.2 Doors: Provide a cabinet with front and rear doors, each equipped with a lock and handle. Ensure that each cabinet door is full size, matching the height and width dimensions of the cabinet enclosure, and has no fewer than three stainless steel hinges or alternately, one full-length "piano" hinge. Provide hinges that are made of 14-gauge stainless

steel and ensure that the stainless steel hinge pins are spot-welded at the top. Mount the hinges so that they cannot be removed from the door or cabinet without first opening the door. Brace the door and hinges to withstand 100 pounds per vertical foot of door height load applied vertically to the outer edge of the door when standing open. Ensure there is no permanent deformation or impairment of any part of the door or cabinet body when the load is removed.

Ensure that both door openings are double flanged on all four sides, and that the doors include a closed-cell, neoprene gasket seal that is permanently bonded to the inside of each door such that the neoprene forms a weather-tight seal when the door is closed.

785-3.2.3 Latches: Provide all cabinets with a three-point latching system for the doors. Ensure that the latching system consists of the following latching points.

1. Center of the cabinet (lock).
2. Top of the cabinet – controlled by the door handle.
3. Bottom of the cabinet – controlled by the door handle.

Ensure that latching points two and three remain in the locked position until the main cabinet door lock is unlocked. Ensure that the locking mechanism is equipped with nylon rollers to secure the top and bottom of the door.

Provide the cabinet with a door stop that retains the main door open in a 90-degree and 120-degree position.

Outfit the doors with an industrial standard pin tumbler lock with #2 key, or an approved alternate, and hardware that allows the door to be secured using a padlock. Provide two keys for each cabinet lock.

785-3.2.4 Rails: Provide the cabinet with four cabinet rails that form a cage for the purpose of mounting miscellaneous wiring panels and various mounting brackets. Use rails that extend the length of the cabinet's sides, starting from the bottom of the enclosure. Provide rails that are either 0.1345 inch thick plated steel or 0.105 inch thick stainless steel. Ensure that the rails are keyhole designed with slots 2 inches on center with a top opening of 5/8 inch in diameter to allow the insertion of a 5/8-inch by 1-inch carriage bolt. Ensure that the rails are 1-1/2 to 2 inches wide by 1/2 inch deep. Do not use unistruts or other rail types.

Provide rails that have been drilled and tapped for 10-32 screws or rack screws with EIA universal spacing.

785-3.2.5 Racks: Ensure that the cabinet includes a standard 19 inch EIA/TIA equipment rack centered in the cabinet for mounting of the devices to be installed inside. Verify that the clearance in the rack between the rails is 17.75 inches.

785-3.2.6 Shelf: Provide a level, rollout internal shelf with a minimum work area measuring 10 inches by 10 inches. Ensure that the shelf is capable of sustaining a constant 20 pound load. Ensure that the shelf position is adjustable.

785-3.2.7 Sunshield: If the cabinet is provided with sunshields, as indicated in the Plans, the sunshields must be mounted on standoffs that provide an air gap of at least of one inch between the exterior cabinet walls and the sunshields. Ensure that the sunshields are fabricated from 5052-H32 aluminum sheet that is 0.125 inch thick, and that sunshield corners are rounded and smoothed for safety.

785-3.2.8 Ventilation: Ensure that the cabinet provides ventilation through the use of a louvered vent at the bottom of the main door. Verify that the louvered vent depth does not exceed 0.25 inch. Ensure that the intake vent is made rain tight through the use of a water-deflecting ventilation panel on the inside of the main door securing the filter to the door. This

panel should form a shell over the filter to give it mechanical support, and should be louvered to direct the incoming air downward.

Provide an easily removable, reusable filter held in place with a bottom trough and a spring-loaded upper clamp. Provide a filter measuring no less than 16 inches by 12 inches by 7/8 inch thick. No incoming air shall bypass the filter. Ensure that the bottom trough holding the filter is able to drain any accumulated moisture to the outside of the field cabinet.

Equip the ITS field cabinet with dual thermostatically controlled fans located inside at the top of the cabinet. Use UL-listed exhaust fans having a minimum air flow rating of 100 cubic feet per minute. Ensure that the electric fan motors have ball or roller bearings. Provide fans that are rated for continuous duty and have a service life of at least three years. Vent the exhaust air from openings in the roof of the field cabinet.

Ensure the thermostats that activate the fans are mounted on the inside top of the cabinet. Ensure that the thermostat is user-adjustable to allow temperature settings ranging from a minimum of 70°F to a maximum of 160°F. Ensure that the thermostat activates the fans within plus or minus 3 degrees of the set temperature.

785.3.2.9 Electrical Requirements: Ensure that all equipment furnished conforms to applicable UL, NEC, EIA, ASTM, ANSI, and IEEE requirements. Ensure that the surge protective device (SPD) is accessible from the front of any panel used in the cabinet. Connect the SPD for the cabinet's main AC power input on the load side of the cabinet circuit breaker.

Ensure that the wiring in the cabinet conforms to NEC requirements. Use only conductors that are stranded copper. Lace all wiring.

785.3.2.9.1 Service Panel Assembly: Provide a service panel assembly to function as the entry point for AC power to the cabinet and the location for power filtering, transient suppression and equipment grounding. Provide branch circuits, SPDs, and grounding as required for the load served by the cabinet, including ventilation fans, internal lights, electrical receptacles, etc.

785.3.2.9.2 Terminal Blocks: Terminate electrical inputs and outputs on terminal blocks where the voltage and current rating of the terminal block is greater than the voltage and current rating of the wire fastened to it.

Terminate conductors on terminal blocks using insulated terminal lugs large enough to accommodate the conductor to be terminated. When two or more conductors are terminated on field wiring terminal block screws, use a terminal ring lug for termination of those conductors. Number all terminal block circuits and cover the blocks with a clear insulating material to prevent inadvertent contact.

785.3.2.9.3 Ground Bus Bar: Ensure that ground bus bars are fabricated from a copper alloy material compatible with copper wire. Use ground bus bars that have at least two positions where a No. 2 AWG stranded copper wire can be attached.

Mount the ground bus bar on the side of the cabinet wall adjacent to the service panel assembly for the connection of AC neutral wires and chassis ground wires. If more than one ground bus bar is used in a cabinet, use a minimum of a No. 10 AWG copper wire to interconnect them. Ensure that the equipment rack is connected to the ground bus bar within the cabinet maintaining electrical continuity throughout the cabinet.

Follow the PANI recommendations of USDA-RUS-1751 for connections to the ground bus bar. Producer (P) or electrical power and sources of stroke current

connections shall be on the left end of the bus bar. Absorbing (A) or grounding wires shall be connected immediately right of the P connections. Non-isolated (N) connections such as doors and vents shall be connected to the right of the A connections. Isolated (I) equipment grounds from equipment in the cabinet shall be connected on the right end of the bus bar.

785-3.2.9.4 Power Distribution Assembly: Furnish a power distribution assembly that fits in the EIA 19 inch rack and provides for protection and distribution of 120 V_{AC} power unless otherwise shown in the Plans.

785-3.2.9.5 Interior Lighting: Unless otherwise shown in the Plans, provide the field cabinet with two 20 watt fluorescent lamps and clear shatter-proof shield assemblies which are mounted on the inside front and rear top of the cabinet. Ensure that these lamps are unobstructed and able to cast light on the equipment. Equip the field cabinet with door-actuated switches so that the lamps automatically turn on when either cabinet door is opened and turn off when the doors are closed.

785-3.2.9.6 Generator and Auxiliary Power Connection: Unless otherwise shown in the Plans, furnish a cabinet that has provisions for the connection of an external power source, such as a portable generator, through a weatherproof, water-resistant, secure interface. This feature should allow authorized personnel to access, connect, and secure an external power source to the cabinet in order to restore power within five minutes of arrival time at the cabinet. Provide the cabinet with either a manual or automatic transfer switch as shown in the Plans. Provide a transfer switch rated equal to or higher than the design load of the cabinet's main breaker and the generator input twist-lock connector rating. Ensure that the transfer switch provides a means of switching between normal utility power and auxiliary backup generator power. Ensure that the switching time between sources is no longer than 250 milliseconds. Ensure that the transfer switch meets UL 1008. Ensure that the transfer switch does not allow simultaneous active power from more than one source and does not allow generator backflow into normal utility AC circuits.

785-3.2.9.6.1 Manual Transfer Switch: Ensure the manual transfer switch is a two-position switch. Label the switch positions as "Generator Power" and "Utility Power".

Equip the transfer switch with a "Utility-on" indicator, which will illuminate when normal utility power service is available and the switch is in the "Generator Power" position. The indicator must turn off when the transfer switch is moved to the "Utility Power" position. Ensure that the Utility-on indicator is clearly visible outside the cabinet and that the indicator's on/off state can be visually determined from a distance of 30 feet.

785-3.2.9.6.2 Automatic Transfer Switch: An automatic transfer switch may be used instead of a manual transfer switch to provide for automatic transition from generator power back to normal utility service after utility power is restored. Ensure that the automatic transfer switch has indicators that display the status of connected power sources and indicate which power source is actively energizing the cabinet.

If a relay circuit is used to provide switching, the normally closed circuits must be connected to normal utility power. The relay shall be energized only by the generator, not by the electric utility service. When energized, the relay must break the connection to normal utility power and make connection to the generator power input. Any automatic transfer switch or relay operated switch must include a bypass switch that disables automatic switching and permits manual selection of the power sources connected to the cabinet.

785-3.2.9.6.3 Generator Access Panel: Include a generator connection panel consisting of, at a minimum, the manual transfer switch and three-prong, 30-amp twist-lock connector with recessed male contacts for generator hookup. Locate and label the transfer switch and twist lock connector on a panel easily accessible behind a lockable exterior door. Ensure that this access door is labeled as "Generator Access Door", equipped with a tamper-resistant hinge, and that the door assembly is weatherproof and dustproof. The access door shall be provided with a No. 2 lock unless otherwise specified in the Plans. The access door must include a weatherproof opening for the generator cable. The generator hookup compartment must be recessed into the cabinet and be deep enough to allow closing and locking of the access door when the generator cable is connected. Limit the generator hookup compartment and access panel's intrusion into the cabinet interior to no more than 6 inches. Avoid blocking access to any other equipment in the cabinet. Locate this generator panel as close as possible to the main AC circuit breaker. Ensure that the bottom of the access panel is no less than 24 inches above the bottom of the cabinet. Never locate the generator access panel on the main cabinet door or back door.

Connect wiring from the Cabinet AC+ Input Terminal to the transfer switch. Connect the alternate power source's wiring on the transfer switch to a receptacle that can accept a 120 V_{AC} generator cord. Install a power service wire between the transfer switch and the existing power distribution panel in the cabinet.

785-3.3 Installation Requirements.

Mount the cabinet to a concrete base or attach it to a pole or support structure, as shown in the Plans, and provide the cabinet with the necessary base- or pole-mount hardware. Ensure that pole and structure-mounted field cabinets have mounting brackets on the side so that both cabinet doors are fully functional.

Supply ground-mounted field cabinets with a removable base plate. Ensure that the cabinet has welded inside two aluminum plates for anchoring the cabinet to a concrete or composite type base as shown in the Plans. Fabricate the plates from aluminum alloy 5052-H32. Ensure the plates are a minimum of 4 inches wide by 0.125 inch thick. Ensure the cabinet includes four 1 inch diameter holes for anchoring.

Make provisions for all telephone, data, control, and confirmation connections between the ITS device and field cabinet, and for any required wiring harnesses and connectors.

Ensure that the cabinet manufacturer's name and APL certification number appear only on the inside of the main cabinet door, along with the year and month of the cabinet's manufacture. Attach this information to the door by a method that is water resistant. Provide the field cabinet with a unique serial number that is engraved on a metallic plate epoxied to the inside of the cabinet on the upper right-hand side wall.

Mount a heavy-duty resealable plastic bag on the backside of the main cabinet door for containing cabinet prints, a list of terminal block connections, and other documentation that may be subject to damage when exposed to sunlight or moisture.

Place all equipment in the cabinet according to the recommendations of the manufacturers. A minimum clearance of 6 inches shall be provided between the top of the cabinet and the top of any equipment placed on the top shelf of the cabinet. A minimum clearance of 2 inches shall be provided between each side of the cabinet and the equipment placed on the cabinet shelves.

785-4 Warranty.

Ensure that the manufacturer will furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the Department or maintaining agency within 10 calendar days of notification.

Ensure that the lowering devices have a manufacturer's warranty covering defects for a minimum of three years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

Ensure that the ITS field cabinet has a manufacturer's warranty covering defects for a minimum of two years from the date of final acceptance in accordance with 5-11 and Section 608.

785-5 Method of Measurement.

The Contract unit price for each pole, furnished and installed, will include furnishing, placement, and testing of all equipment and materials, and for all tools, labor, cables, hardware, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

Except in the case of a retrofit, the work specified for furnishing and installing a lowering device will not be paid for directly, but will be considered incidental to the installation of a steel or concrete pole.

The Contract unit price for each ITS field cabinet, furnished and installed, will include furnishing, placement, and testing of all equipment and materials, and for all tools, labor, hardware, supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

785-6 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 785-1 ITS Pole, per each.

Item No. 785-2 ITS Field Cabinet, per each.

INTELLIGENT TRANSPORTATION SYSTEMS – INFRASTRUCTURE.
(REV 6-3-14)

SECTION 785 is deleted: