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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.

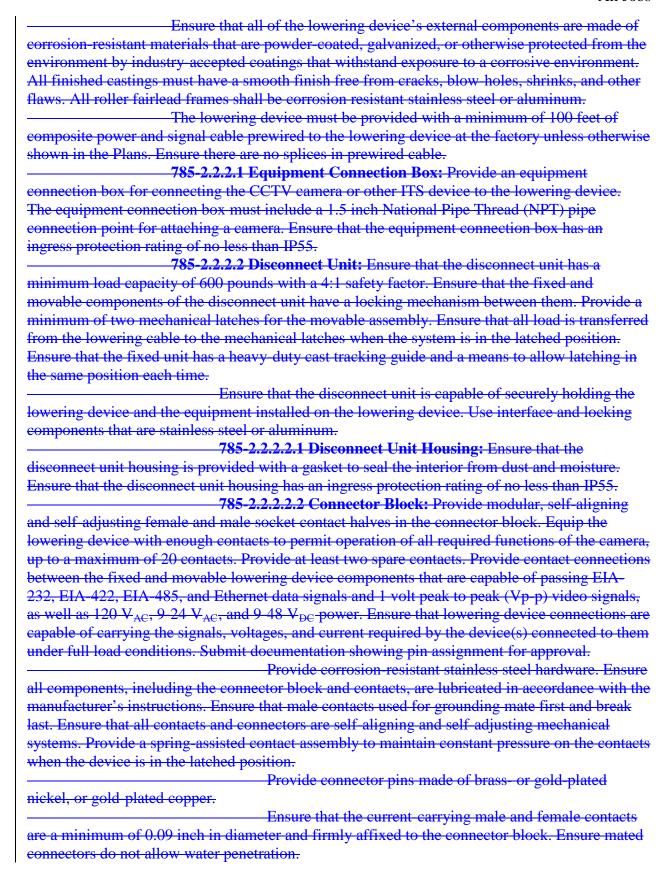
Use concrete poles constructed in accordance with Section 450. Obtain concrete poles from a manufacturing plant that is currently on the Department's list of Precast Prestressed Concrete Producers with an Accepted Quality Control Program. Producers seeking inclusion on the list shall meet the requirements 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.

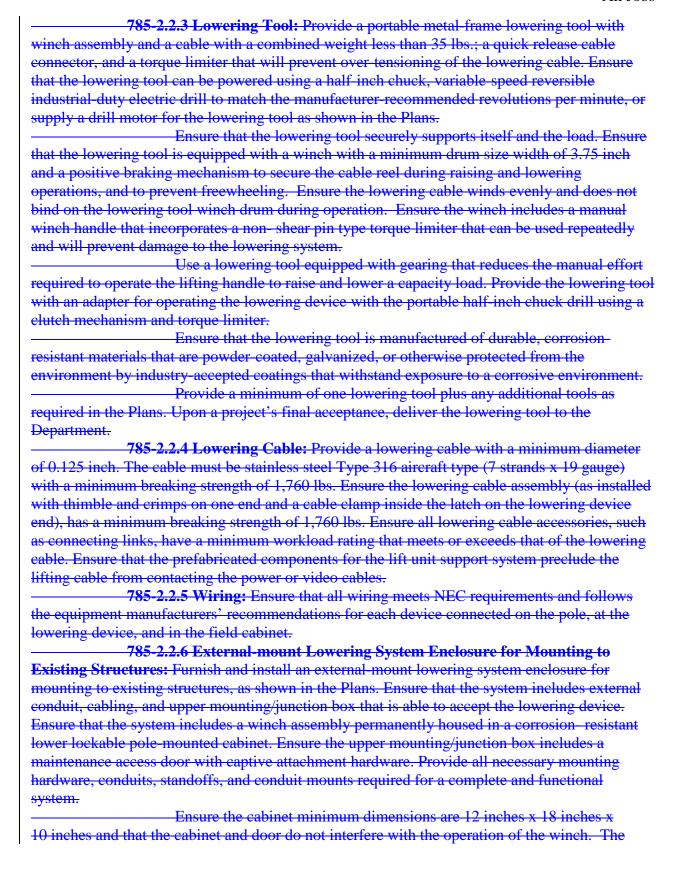
Ensure that the pole-top tenon is rotatable.

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.





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.

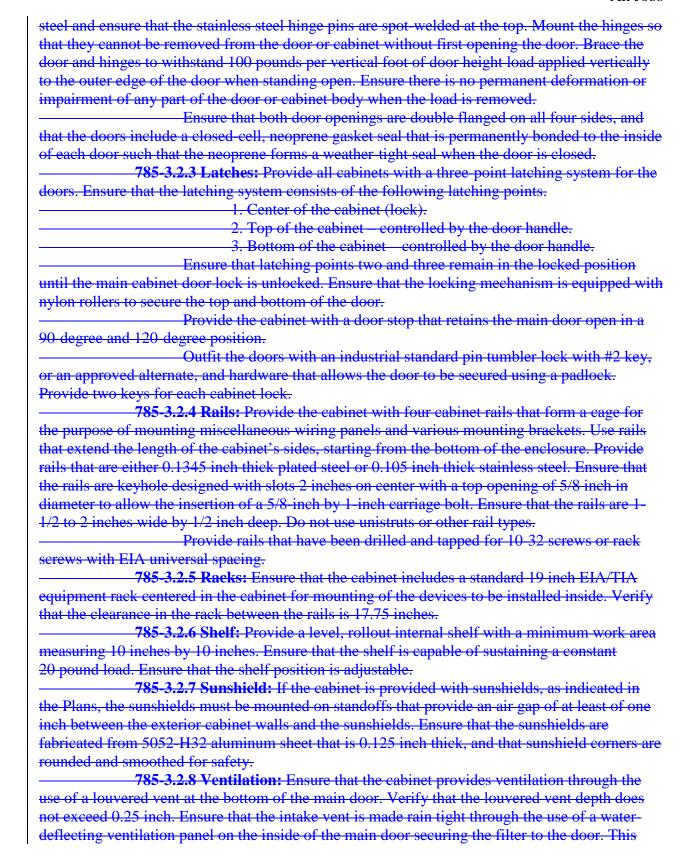
The minimum dimensions for cabinets are listed below.

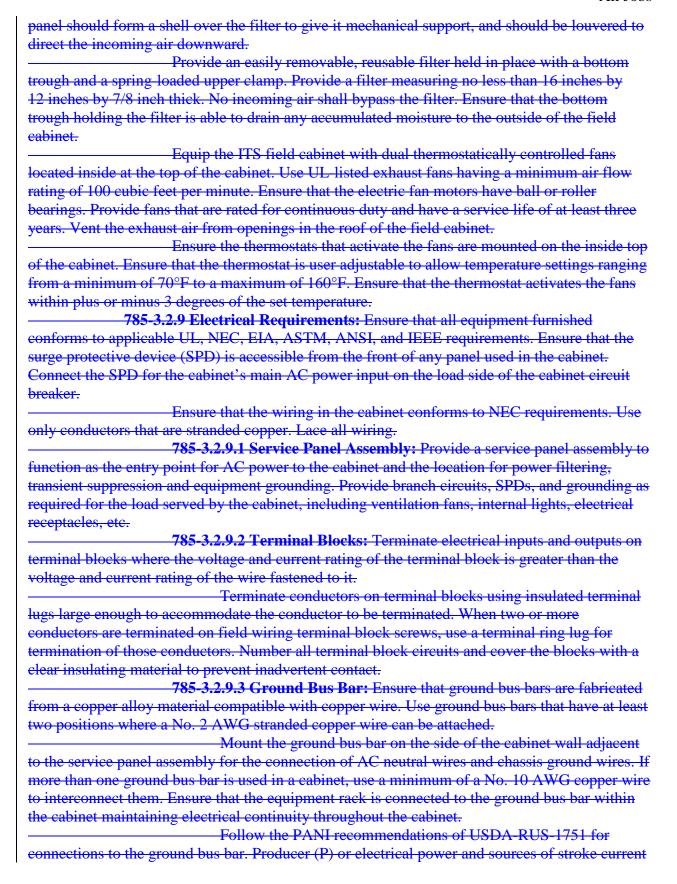
Table 785-2			
Required Cabinet Dimensions in Inches			
Cabinet Type	Height	Width	Depth
336	36" - 39'	24" - 26"	20' - 22"
336S	46"-48"	24" - 26"	22" - 24"
334	66" - 68"	24" - 26"	30" - 32"

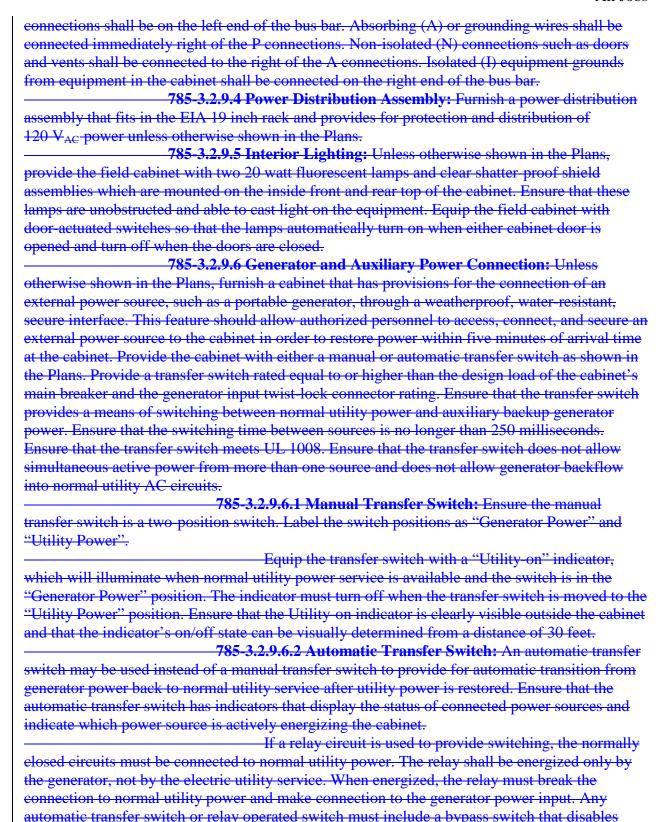
Ensure that the cabinet enclosure top is crowned to prevent standing water. Construct the field cabinet so that it is weather resistant under all conditions. Ensure all exterior cabinet and door seams are continuously welded and smooth. All welds shall be neatly formed and free of cracks, blow holes and other irregularities. Verify that all exterior cabinet welds are gas tungsten are (TIG) welds. Ensure that all internal cabinet welds are gas metal are (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







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.

${\bf INTELLIGENT\ TRANSPORTATION\ SYSTEMS-INFRASTRUCTURE.} \\ (REV\ 6-3-14)$

SECTION 785 is deleted: