TECHNICAL SPECIAL PROVISION

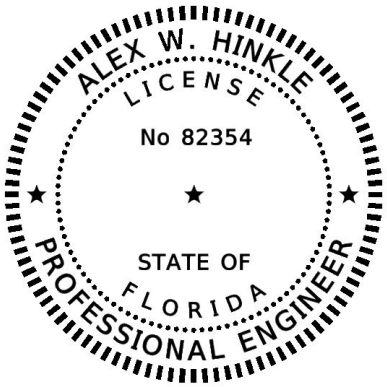
FOR

T633 – MULTI-CONDUCTOR COMMUNICATION CABLE

FINANCIAL PROJECT NO.: 441016-1-52-01

BREVARD COUNTY

The official record of this Technical Special Provision has been electronically signed and sealed by on the date adjacent to the seal.



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Page(s): 1 - 3

SECTION T633
MULTI-CONDUCTOR COMMUNICATION CABLE

T633-1 Description.

Furnish and install multi-conductor communication cable for ITS field devices as shown in the Plans. Multi-conductor communication cable is used to carry communication signals between ITS equipment, via communication protocols such as Ethernet and RS-485 serial, or is used to energize signaling equipment as part of signaling circuits.

T633-2 Materials.

T633-2.1 General: Use only new materials meeting the requirements of this Technical Special Provision.

T633-2.2 CAT-6 Cable: Use polyethylene jacketed CAT-6 cable conforming to the requirements of TIA 568 C.2 with ETL verification. Cable which is ran outside of equipment enclosures must be shielded twisted pair Ethernet cable (FTP) using an aluminum foil shield with drain wire, include solid copper conductors, and be terminated with shielded RJ-45 connectors. Cable which remains within the equipment enclosure where it originates may be un-shielded twisted pair (UTP), include stranded copper conductors, and be terminated with un-shielded RJ-45 connectors. Use straight-through cables when connecting data terminating equipment (DTE) to data communications equipment (DCE), and cross-over cables when connecting DTE to DTE or DCE to DCE. For RJ-45 connector color coding: use TIA T-568B connectors as the standard configuration for straight-through cables, and use TIA T-568B on one end and TIA T-568A on the other end for cross-over cables.

T633-2.3 Wrong Way Detection System (WWDS) Composite Communication Cable: Use cable consisting of multiple cables housed within a single overall UV resistant polyethylene or polyvinyl jacket to carry serial communication and low voltage power to the Remote WWDS Sign from the Primary or Secondary WWDS Signs. The composite cable shall include: two (2) insulated stranded copper conductors, minimum 12 AWG, for low voltage power and serial communication; and one (1) insulated stranded ground copper, minimum 12 AWG. The cable must include an overall metallic shield with drain wire, or individual shields with drain wires for each conductor. Terminate the conductors and ground in the transformer base of the Remote WWDS Signpost, following the manufacturer's recommendation for wrong way sign power connectivity. At the Primary and Secondary WWDS Signs, securely terminate two (2) conductors in pole mounted small equipment enclosures to power the relay switch and wireless radio component per the manufacturer's recommendations, and the ground wire in the transformer base of the Primary and Secondary WWDS signposts, following the manufacturer's recommendation for wrong way sign power connectivity. Terminate the power conductors with screw type terminals to surge suppression, power supply, and communication equipment as depicted in the Plans and as described in the WWDS manufacturer installation instructions.

T633-3 Installation Requirements.

Install multi-conductor communication cable in continuous lengths between ITS cabinets and from ITS cabinets to the appropriate ITS device. Separate multi-conductor communication cables from high voltage conductors. Do not install multi-conductor communication cabling in the same conduit or pull boxes, as cable carrying current in excess of 1.5 amps or energized to a voltage in excess of 24 VDC/VAC to ground or between conductors. Keep cable on the unprotected side

of surge suppression devices separate from cable on the protected side to prevent induction of lightning and other high voltage transient currents.

T633-3.1 Protection of Cable: Ensure cable drawn through conduit, ducts, drilled holes protected by a rubber grommet, or support structures is installed in such a manner as to prevent damage to conductors or insulation.

T633-3.2 Surge Protective Devices: Install surge protective devices, meeting the requirements of Section 620, on cable when entering traffic signal cabinets, ITS cabinets, or other equipment enclosures, and as indicated in the Plans, prior to connection to Ethernet switches, PoE injectors, device servers, and other terminal devices.

T633-3.3 Outdoor Connections: Cable connections to equipment located outdoors must be provided with a means to prevent water intrusion at the equipment connection or cable entrance to the equipment housing.

T633-3.4 Break-away Connections: When installing cabling that enters a post or pole that is attached to a break-away base, install an in-line break-away connector for the cable in the pull box at the base of pole or post or within the post's or pole's break-away base. The break-away connection shall be installed to disengage if the break-away post or pole in knocked down and thereby prevent damage to underground cabling leading to the pole or post.

Install a strain relief mechanism that attaches to the cabling or break-away connector and prevents the section of cabling that does not enter the break-away pole or post from moving if pulled. The mechanism must be strong enough to allow disengagement of the break-away connector and must not cause damage to the cable's jacket. The strain relief mechanism must be manufactured or corrosion resistant materials and be suitable for installation in wet conditions.

T633-4 Warranty.

Ensure that the CAT-6 and WWDS composite communication cable have 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. Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or maintaining agency.

T633-5 Method of Measurement.

The Contract unit price for multi-conductor communication cable, furnished and installed, will include furnishing all material, terminal connectors, break-away connections, strain relief mechanisms, surge suppression devices, cable shield grounding, and labor necessary for a complete and accepted installation. Payment will be based on the linear feet of multi-conductor cable installed.

T633-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Technical Special Provision.

Payment will be made under:

Item No. 633-8-1 Multi-Conductor Communication Cable, Furnish & Install – per foot.