

**TSP 301**  
**TECHNICAL SPECIFICATIONS**  
**FOR**  
**TRAFFIC SIGNAL INSTALLATIONS IN THE**  
**CITIES OF MARYVILLE & ALCOA, TN**

**EQUIPMENT**

In addition to any requirements put forth by the State of Tennessee (TDOT) for signalized intersections, the following are required for traffic signal equipment installations in the Cities of Maryville & Alcoa, TN.

**3.01 Signal Control Equipment**

The standard signal controller for use in the Cities of Maryville & Alcoa is the **PEEK ATC-1000**, configured for use as a **TS2-Type 2** controller in a TS1 cabinet (standard TDOT spec cabinet). The PEEK ATC-1000 shall include a multi-mode fiber module for communications.

In a NEMA TS2-Type1 cabinet (see section 3.02), the standard controller will be a **PEEK ATC-1000**, configured for **TS2-Type 1** operation.

It shall be the contractor's responsibility to ensure that the most current firmware is installed on the controller.

The standard conflict monitor unit shall be a **PEEK SG1000** configured for either TS1 or TS2-Type1 operation as necessary.

**3.02 Controller Cabinet**

**NEMA TS2- Type 1** cabinet, with the following specifications, shall be required for all new installations and modifications of an intersection:

A **P44 enclosure type** with 2 shelves, LED lighting, 1 fan, 1 thermostat, and 12"x16" Air filter.

**IF** a video detection system is to be installed, the cabinet shall not have loop detector racks, or harnesses.

The metering device for the cabinet electricity shall be installed on the pole which the power service is dropped to if power is an overhead service. If power is fed from underground service, meter shall be mounted to "unistrut" style rigid brackets which shall be cast into the cabinet foundation, unless other arrangement is specified.

The cabinet base foundation will include a poured pad/ work platform in front of the door at ground level. Refer to “MACTO CD 1.0 Cabinet Detail” for more detail.

Any work associated with installation of the controller, conflict monitor, loop detectors, wiring, etc. or power up/set-up shall be included in the unit price bid for this item.

All controller cabinets shall be installed with the door opposite the intersection so that the signal technician will have a view of the intersection while facing the equipment.

### **3.02.01 NEMA TS2-Type 1 cabinets**

NEMA TS2-Type 1 cabinets shall have **16 phase load bays, TS2 Type 1 Controller Interface, NO A, B and C controller connectors, controller power supply connector, SDLC BUS of a minimum of six (6) ports and NEMA TS2 MMU.**

## **MATERIALS**

In addition to the requirements of TDOT and the Manual on Uniform Traffic Control Devices, the following are requirements for traffic signal materials in the Cities of Maryville and Alcoa.

### **3.03 Signal Displays**

All signal displays shall be incandescent look signal lamps. LED modules are to be included in the price for items “MACTO 730-02.xx Signal Head Assembly L.E.D.”

All signal heads shall be of cast aluminum, color yellow.

Signal head assemblies shall include vacuum formed ABS finished backplates or approved equivalent dull black backplates with a retro-reflective border.

Pedestrian displays shall be a single section, LED, cast aluminum, yellow, hand/man displays with a countdown timer.

Pedestrian pushbuttons shall be accessible type, meeting all current MUTCD, PROWAG requirements. The following APS pushbuttons are approved for use in the cities of Alcoa and Maryville:

- 1) Polara iNavigator APS 3-wire System (iN3 Push Button Station)

Alternatives will be considered on a case by case basis. The brand or type of APS pushbutton will be determined in the project plans. APS pushbutton device shall be ADA compliant, provide confirmation of button push, audible message and vibrating button during walk, and standard locating tone during Don't Walk.

The following are approved mounting methods for signal heads:

Span Wire Installations: Pelco or compatible quick disconnect hanger.

(Wiring schematic available on request.)

Mast Arm Installations: Astro Brac or compatible rigid mount.

### **3.04 Signal Wiring**

Signal cable shall have a minimum of one spare conductor after installation.

For phases using 3 section heads a five-conductor cable shall be used per phase.

For phases using 5 section heads a seven conductor cable shall be used.

### **3.05 Fiber Optic Cable**

Multi-mode type fiber optic cable shall be 50  $\mu\text{m}$  core diameter, with at least 12 fibers per cable unless otherwise specified in the plans. Single-mode type cable shall be between 8-9  $\mu\text{m}$  core diameter, with at least 12 fibers per cable unless otherwise specified. A fiber optic drop cable shall be a minimum of 6 fibers (each type) and be spliced into the trunkline in a splice enclosure either aurally or in a pull box. Contractor shall provide 50ft of slack either lashed to a span aurally, or coiled in a pull box for underground installations. Termination panels shall be provided with sufficient size to provide for a neat installation, and enough panel space to accommodate the specified number of fibers for termination. ST connectors shall be used on the termination panel unless otherwise specified. Contractor shall provide any necessary jumpers for installed equipment.

### **3.06 Video Detection**

The following video detection units are approved for use in the cities of Alcoa and Maryville:

- 1) Gridsmart

Substitutions will be considered on a case by case basis. The brand or type of video detection will be determined in the project plans. Video detection units shall be capable of providing color video monitoring and be IP addressable with an Ethernet port provided for remote configuration and streaming video.

### **3.07 Removal of Signal Equipment**

Signal controller equipment, signal displays/wiring, loop detectors, cabinet and wiring, span wires, mast arm poles, etc to be removed from the site shall be returned to MACTO. Care should be taken to avoid damaging equipment. Removal of Signal Equipment includes removal of strain poles, controller cabinets and foundations, and any concrete foundations supporting mast arms or strain poles to a depth of 2 ft below finished grade.

### **3.08 Ethernet Switch**

All ethernet switches shall be hardened and unmanaged with two (2) small form-factor pluggable (SFP) ports as well as a minimum of six (6) gigabyte ethernet ports.

SFP transceiver modules shall be compatible with single-mode fiber and have LC connectors.

All ethernet switches shall function on 1310 nm wavelength and contain any necessary hardware to bring into full operation.

## **INSTALLATION OF TRAFFIC SIGNAL EQUIPMENT**

### **3.09 Requirements for New Signal Installations**

All new signal displays shall be covered with a durable black bag when not operational. It shall be the contractor's responsibility to ensure that signal displays remain covered and that covers do not become worn & tattered before final removal.

## **QUALIFIED PERSONNEL**

### **3.10 Requirements for Certification of Personnel**

For installation of any traffic control device or equipment, an IMSA Level II (or higher) certified technician shall supervise all activities. The certified technician shall be present on the site while work is being performed.

### **3.11 Proof of Certification**

Proof of IMSA certification shall be required in the form of a certification card accompanied by photo ID.