

## **MATERIAL SPECIFICATIONS FOR CONTROLLER, VSLS**

### A. General

1. Ensure that the controller camera consists of a ground mountable cabinet enclosure with all necessary equipment as designed and hardware as a fully assembled unit:
  - a. Controller Cabinet
  - b. VSLS Controller
  - c. Ethernet switch / Communications modem
  - d. Fiber optic patch panel
  - e. Communications and power cables connectors
  - f. Fiber optic jumper cables
  - g. Power Distribution Unit (PDU)
  - h. Uninterruptible Power Supply (UPS), UPS batteries, and Automatic Transfer Switch (ATS)
  - i. Disconnect Switch

### B. Controller Cabinet

1. General Requirements
  - a. Ensure that:
    - (A) The Controller Cabinet conforms to NJDOT ITS details for Controller, VSLS. Ensure the Controller Cabinet is equipped with pullout shelves for installing equipment.
    - (B) A fluorescent fixture is supplied with a lens or shield and a 15 watt type T-8 lamp with rapid start, high power factor ballast and installed in the top front and rear of the cabinet. A switch shall be installed on the inside of the cabinet doors to manually disable the lamps.
    - (C) All Controller Cabinet terminals, outlets, circuit boards, and other components are labeled using silk screening or a similar permanent process.
    - (D) The Controller Cabinet has space for installing low voltage power supplies.
2. Power Distribution Equipment
  - a. Provide power distribution equipment that is NEMA and UL compliant and includes the following as a minimum:
    - (A) Distribution Panel board. Single Phase, 3-wire (#14 to 4 AWG), 120/240 VAC, Neutral Installed, (14)-circuit breaker min., fixed main bus rated at 100 ampere and enclosure; main circuit breaker is to be 1-pole, 240 volt, 60 amperes; each circuit breaker is to be 1-pole, 120 volt with a minimum short circuit rating of 10k AIR. Include (8)-15 ampere circuit breakers and (2)-20 ampere circuit breaker. Also include (1)-30 ampere 2-pole, 240 volt circuit breaker with a minimum short circuit rating of 10k AIR.
    - (B) (1)-Duplex NEMA 5-20R outlet for PDU Connection and (1)-Duplex NEMA 5-15R GFCI convenience receptacle.
    - (C) Terminal blocks as required or specified.
    - (D) Surge Suppressors. 10 kA Surge Current rating min. for protection of VSLS and networking equipment. Ensure surge protectors protect all communication signals connecting the control equipment from off-site sources.
    - (E) PDU. Ensure that the PDU conforms to NJDOT material specification ITS- Power Distribution Unit (PDU).
    - (F) Disconnect. Ensure that the disconnect conforms to NJDOT material specification ITS- Disconnect Switch.
    - (G) UPS and ATS. Ensure that the UPS and ATS conforms to NJDOT material specification ITS- Uninterruptible Power Supply (UPS).
3. Environmental Systems
  - a. Furnish and mount one (1) thermostatically controlled fan with a minimum 100 CFM air flow for ventilation, screened against the entrance to remove dust and foreign matter in the top of the cabinet completely wired and interconnected. Provide and install a contact closure with wiring to indicate that cabinet ventilation has failed. A failure of the ventilation is to be reported when the temperature in the cabinet exceeds a preset temperature selected from an adjustable range from 70°F to 130°F.

- b. Filtered air intake ports are to be located on the bottom third of the access door.
  - c. Ensure that the fan and air filters are removable and replaceable from inside the cabinet.
  - d. Mount a 400 watt blower heater inside the cabinet on one side. Ensure that the heater is controlled by a thermostat which is designed to operate the heating system only when required. Set the low temperature to activate heating at 35°F. Ensure that the unit turn-off is at 60°F. Provide a contact closure capable of indicating a low temperature alarm. Ensure that the sensor is adjustable in the range of 41°F to 5°F and set to 20°F.
- C. Ethernet Switch
- 1. Ensure that the Ethernet Switch conforms to NJDOT material specification ITS- Ethernet Switch.
- D. Fiber Optic Patch Panel
- 1. Ensure that the controller assembly contains a 12-port fiber optic patch panel assembly suitable for terminating 12 single mode fibers using SC connectors. Ensure that the patch panel is suitable for mounting inside the outdoor enclosures and is mounted on the side of the cabinet. Ensure that the Patch Panel conforms to NJDOT material specification ITS- Fiber Optic Patch Panel.
- E. Fiber Optic Jumper Cables
- 1. Provide and install 12-6' long standard full duplex single mode loose tube fiber optic jumper cables with factory installed connectors on both ends. Provide the connector at one end of Type SC and the other end as specified or required to connect to communications equipment. The jumper cable is to be suitable for installation inside the outdoor cabinets. Ensure that the fiber material characteristics conforms to NJDOT material specification ITS- Fiber Optic Cable.