

GENERAL NOTES - continued -

MICROFILMED
APR 20 1984

843 Controller, Full Actuated, 4 Phase, Solid State Digital, Microprocessor Type with Cabinet, as per plan

In addition to 843, the controller shall be in accordance with NEMA Standards TS-1-1976 Parts 1, 2, 13 and 14. The overlap programming shall be by use of an interchangeable plug-in printed circuit board assembly as described in Part 14 of TS-1-1976. Overlap capabilities shall be provided and brought to accessible terminal points. Manual control timing switches and cords are not required. Load switches and flasher shall conform to Parts 5 and 8 of NEMA TS-1-1976. The load switches shall contain indicator lights for each circuit visible from the front. In addition to NEMA requirements, the conflict monitor shall also have the capabilities to cause the signal to flash: if all of the red lamps on a solid state load switch are burned-out; when the conflict monitor is disconnected; and within one second when green with yellow or green with red colors are lighted on the same phase. Also, the monitor shall have the capability to display on the front panel indicators the exact channel in which a switch output failure occurs. Cabinets shall be aluminum, either cast, formed of sheet or drawn with welded bracing and stiffeners as needed to assure a strong, rigid and weatherproof cabinet. Controller cabinet size shall comply to the requirements of 843 assuming the controller frame size to be a minimum of 22" wide x 21" high x 14" deep. The controller harness length shall be sufficient to reach any point within the cabinet. The controller housing shall be keyed to the State master. Controller cabinet shall be painted yellow Federal Standard 595 color 13655. The controller cabinet shall be equipped with a convenient 3 wire outlet and a standard lamp socket with lamp, both to be wired in advance of police panel power switch. Lightning protection shall be provided as shown on Lightning Protection System detail sheet and will be paid for under this item. Payment for Item 843 Controller, Full Actuated, 4 Phase, Solid State Digital, Microprocessor Type with Cabinet will be at the contract bid price per each complete and in place including all connections tested and accepted.

632.04 General and 843.05 As-Built Controller Cabinet Wiring Diagrams

In lieu of the 7th paragraph of 632.04 and the 3rd and 4th paragraphs of 843.05, the following shall apply.

Before starting installation of the controller and/or controller cabinet, the Contractor shall furnish to the Engineer, two copies each of cabinet wiring diagram, service manuals and installation and maintenance instructions for each installation, including all components and interconnections.

Before starting installation of other signal components, the Contractor shall furnish to the Engineer, two copies each of wiring diagrams, service manuals, and installation and maintenance instructions for each component.

Prior to commencement of the 10-day functional test, the Contractor shall modify these documents as necessary to reflect current conditions. On completion of the signal work and prior to its acceptance, the Contractor shall again replace or modify the documents as necessary. The Engineer will retain the documents at the project until the signal work has been accepted, at which time they will be transferred to the Department's or local agency's traffic control maintenance unit.

Manufacturer's guarantees or warranties on all installed traffic signal and signal-control equipment shall be transferred to the Department or other maintaining agency on completion and acceptance of the signal work.

632.27 Testing

In addition to the requirements of 632.27 the following shall apply:

Short Circuit Test. Prior to the performance of any cable insulation tests or performance test, a short circuit test shall be performed with a volt-ohmmeter or other approved instrument. Short circuit tests of external controller cabinet cabling shall be conducted with electrical loads, power sources or grounds, including disconnected. Signal cable routed to signal heads may be tested with connections made to lamp sockets without lamps installed. Each conductor shall be measured against every other conductor and ground to assure that no short circuits, cross circuits or other improper connections exist. Continuity shall not exist between any conductor and another conductor including ground.

Circuit Continuity Test. Each circuit branch shall be temporarily jumpered at its termination and the temporarily looped circuit checked for continuity to assure that no open circuits exist, the circuit branch is according to plan, no high resistance connections exist and each circuit is properly identified. Lead-in cable for loop detector wire shall be tested before and after the cable is spliced to the loop wire. Circuit continuity testing of signal head may be done by applying 120 volts to each outgoing circuit and observing that only the specified lamps are lighted.

Functional Test. Before the 10 day performance test begins, the Contractor shall make the following checks and demonstrate to the Engineer that the system is ready for the performance test. The incoming voltage shall be a nominal 120 volts. The cabinet ventilating fan, fan thermostat, and convenience outlet with lamp shall be operational. Timing settings on the controller shall be correct according to the plans. All cabinet switches including the power on/off switch and flash switch shall be checked. All controller functions shall be checked to verify correct operation. The detector amplifiers shall be checked to determine which pavement loop is associated with which amplifier. The visual indication of amplifiers shall be checked to determine that each vehicle class (truck, car and motorcycle) entering sensor areas is detected on the associated amplifier and that no extraneous calls occur when the sensor area is vacant. The flash switch shall be checked to verify transfer of signal operation to flash and return to stop-and-go operation. The conflict monitor shall be checked to verify that it is not activated by normal signal operations or by the manipulation of cabinet switches. If the monitor is activated, the Contractor shall determine the cause of the problem and make appropriate changes and adjustments before beginning the performance test. The Contractor shall test the conflict monitor by artificially causing a number of different conflicting indications and verify that at each test the monitor causes the signals to begin flashing and places the controller in a "stop timing" mode. Artificial causation may be achieved by touching a jumper wire between two conflicting load switch outputs or by other methods approved by the Engineer. The signal shall flash when the monitor is disconnected.

632 POWER SERVICE, as per plan

The disconnect switch with enclosure provided as a part of this item, shall conform to 732.21 and additionally shall be designed or modified such that it can be padlocked in both the "on" and "off" positions.

632 Weatherheads and Blind Half Couplings

In addition to the requirements of 632.28 poles, supports and pedestals shall include weatherheads and blind half couplings.

632 Loop Detector Amplifiers, By Type As Per Plan
In addition to the requirements of 632 and 732.07 or 732.08, loop detector amplifiers shall have the following requirements or features:
The output device shall be a relay, and all contacts shall be included in the wiring harness.
The unit shall be self tuning.
The unit's electrical connection plugs or wiring harness shall allow ready replacement with single channel amplifier as described in the final paragraph of 732.07.

FED RD DIVISION	STATE	PROJECT
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PLAN NO
LAK-84-14.48

CAB.
ELECTRICAL WELDING USED