

AMENDMENT TO OPSS 622, APRIL 2017

Special Provision No. 106S19

March 2018

622.07 CONSTRUCTION

622.07.06 Quality Control

Section 622.07.06 is deleted in its entirety and replaced with the following:

622.07.06 Quality Control

622.07.06.01 Pre-installation Testing and Inspection

622.07.06.01.01 General

All tests shall be completed prior to transporting the controller to the Working Area.

Traffic signal controllers, UPS systems, and other components shall be tested and inspected prior to installation to ensure that they are according to the Contract Documents.

A Request to Proceed shall be submitted to the Contract Administrator after completion of all pre-installation testing and inspection.

The next operation after the completion of all pre-installation testing and inspection shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

622.07.06.01.02 Cabinet Assembly and Components

A visual check shall be made to ensure that all components necessary to the complete controller are present and that all pre-assembled equipment is securely mounted and connected.

622.07.06.01.03 Circuit Output

The output terminal board voltage shall be tested for 108 V minimum output from load switches and for proper terminal assignment according to the manufacturer's wiring diagram.

622.07.06.01.04 Interval Sequence

With the proper programming for the intersection in operation but with modified timing values suitable to test conditions, the controller unit shall be cycled through all phases for a minimum of six hours. Controller output shall be tested to ensure that the proper phases and phase intervals appear in the correct sequence by use of a 120 V test board with lamps or by use of a 24 V test board with LED or other appropriate indicators wired to the input side of the load switches. Test results shall be confirmed a minimum of six times.

622.07.06.01.05 Actuation

With an appropriate test board, the effect of detection devices and pedestrian push-buttons in entering a call to the controller unit shall be tested. All modes of detector sensor unit program and vehicle extension calls shall

be tested. Tests shall confirm that all calls are registered, activated and are associated with the correct traffic phase.

622.07.06.01.06 Conflict Monitor

The conflict monitor shall be tested by removal of the monitor programming card or by methods recommended by the manufacturer. Diode breakouts in the monitor card shall be according to the signal operation required. All flash and reset functions shall be tested.

622.07.06.01.07 Flasher

The output of flasher units and flash transfer relays shall be tested for proper functioning over a two hour period.

622.07.06.01.08 Recall

Recall switch functions for each phase shall be tested to ensure that the controller recalls to the phase selected and remains on 'hold' in the absence of a call on an opposing phase.

622.07.06.01.09 Programming

With actual phase timing for the intersection operational, the controller programming or cam breakouts shall be tested to ensure that the intended operation is accomplished. This test shall include all possible combinations of actuation and recall settings together with any special features such as advance green, phase skip, pre-emption or co-ordination.

622.07.06.01.10 Manual Control

The manual over-ride controls shall be tested for proper operation under all possible switching combinations.

622.07.06.01.11 Environmental Protection

The heater element and circuitry shall be tested for continuity and proper resistance. The ventilation fan shall be checked for proper operation in conjunction with the thermostat control system. If the average temperature during the installation period is below 5°C and falling, the cover plate shall be installed over the louvres and the heater circuit shall be prepared for operation.

622.07.06.01.12 UPS System

Prior to the installation of the UPS system, the UPS system shall be tested and inspected to verify that it performs according the manufacturer's specifications and the Contract Documents. In particular, and without limiting the foregoing, the UPS system shall be operated and tested to verify the following:

- a) Transfer time in case of power failure is less than 60 milliseconds.
- b) Voltage regulation at 120 VAC is +/- 3 percent.
- c) Frequency regulation at 60 Hz is +/- 3 Hz.
- d) Thermostat controlled battery heating mats operate according to the manufacturer's specifications.

- e) When powered by the batteries alone, the UPS system provides full signal operation at full load for a minimum of 4 hours, and then switches over to flashing operation and provides flashing operation for a further 6 hours.

Prior to installation, certification from the manufacturer stating that the product is according to the Contract Documents shall be submitted to the Contract Administrator. This certification shall include an explicit certification that, when powered by the batteries alone, the UPS system provides full signal operation at full load for a minimum of 4 hours, and then switches over to flashing operation and provides flashing operation for a further 6 hours.

622.07.06.02 Proof of Performance Testing and Inspection

622.07.06.02.01 General

All tests shall be completed prior to traffic signal activation.

The traffic signal control system, including traffic signal controllers, UPS systems, and other components, shall be tested and inspected prior to traffic signal activation to ensure that the traffic signal control system and all components are according to the Contract Documents.

The testing and inspection results shall be documented in a report and submitted to the Contract Administrator within 3 Days of completion of the testing and inspection.

A Request to Proceed shall be submitted to the Contract Administrator after completion of all proof of performance testing and inspection and submission of the test and inspection report.

The next operation after the completion of all proof of performance testing and inspection and submission of the test and inspection report shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

622.07.06.02.02 Controller

These tests shall be performed upon installation of the controller. The controller shall be allowed to operate functionally only after all testing has been completed and all components are operational.

The Contract Administrator and ministry electrical staff shall be notified of the time and location of all testing 3 Business Days prior to the start of each test.

The work shall be inspected and tested 3 Business Days prior to the actual switch on of the signals to ensure that it according to the requirements of the Contract Documents and without limiting the foregoing, the Contractor shall ensure the following:

- a) All components are installed, tested and proven as indicated in the Contract Documents.
- b) All systems are energized and in working order
- c) The signal timing is consistent and complete, without activating the traffic signals for public display.

622.07.06.02.03 Signal Cable

All traffic signal cable circuits shall be tested disconnected for continuity and the absence of short circuits as determined by an ohmmeter test.

622.07.06.02.04 120 V Test

The operation of all signal head lamps and the absence of short circuits shall be tested by progressively connecting each active signal cable conductor to the AC+ bus through a temporary 10A fuse bypassing the load switches.

622.07.06.02.05 Interval Sequence

With the proper programming and timing functions in operation, the controller shall be cycled through all phases for a minimum of 1 hour with all signal circuits connected but with signal heads covered.

622.07.06.02.06 Actuation

All calls shall be observed to be registered and activated. Actuation equipment shall be tested according to OPSS 623.

622.07.06.02.07 UPS System

The UPS system shall be activated according to the manufacturer's recommendations.

The UPS system and all components shall be tested and inspected to verify that it performs according to the manufacturer's specifications and the Contract Documents.

The proof of performance testing and inspection shall include all testing and inspection identified under the Pre-installation Testing and Inspection clause and verification that all UPS equipment has been grounded according to the manufacturer's specifications and OPSS 609.

622.07.06.03 New UPS System "Switch On"

A new UPS system installed at a location not previously equipped with a UPS system or to replace an existing UPS system shall be initially switched on for operation according to the following requirements:

- a) The Contract Administrator shall be given a minimum of 3 Business Days notice of when the UPS system is to be installed or switched over, and 24 hours notice prior to the start of the work.
- b) All repairs or replacement of defective components shall be completed prior to activation.
- c) Switch on for operation of UPS shall not be permitted on Fridays, Saturdays, Sundays, Mondays, and statutory holidays.
- d) Switch on for operation of UPS shall be under police supervision.