

# GENERAL NOTES

QUANTITY CALCULATIONS		FHWA REGION	STATE	PROJECT
BY <u>ELS</u>	DATE <u>3/73</u>	5	OHIO	
CHKD <u>D.C.</u>	DATE <u>3/73</u>			

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LAK-040-098  
LAK-283-383  
LAK-91-549

## TESTING OF TRAFFIC SIGNALS

The Contractor shall furnish all personnel, equipment and appliances required to successfully test the completed installations.

The Contractor shall test and demonstrate to the satisfaction of the engineer or his authorized representative, that the circuits are properly connected, continuous and free from short circuits, crosses and unspecified grounds, and that they are connected in accordance with the wiring instructions and that each circuit is operable correctly and independently of any other circuit.

The Contractor shall test each ungrounded circuit and spare wires (for signals, interconnection and detectors) terminating at the traffic controller cabinet for resistance to ground. This resistance to ground shall be not less than ten (10) megohms. The Contractor shall furnish a complete report of all megohm readings of each circuit and spare conductors in cables appearing at the controller base. The ground rod at the traffic controller shall have a resistance of not more than 15 OHMS to ground.

After all circuits and spare conductors have been tested the Contractor will install the traffic controller and connect the field wiring to the terminal contacts of the traffic controller. The completed installation shall operate continuously for a period of ten days without interruption or failure attributable to poor workmanship or defective material prior to acceptance and after any defective parts have been replaced and all faults corrected.

The Contractor shall have the responsibility of correcting malfunctions of the installation. Power for the test will be furnished from the service installed as a part of this contract. The cost of the power to conduct the test will be borne by the Contractor. Costs of conducting tests by the Contractor shall be included in the bid price for the item tested.

## 625 TRAFFIC SIGNAL HEADS, BY TYPE

This work shall consist of furnishing and installing vehicular traffic signal heads of the type and size shown on the plans, as shown on sheet 21 and as herein specified.

All traffic signals shall meet the latest ITE (Institute of Traffic Engineers) standards for "Adjustable Face Traffic Control Signal Head Standards". The traffic signals shall also meet the following requirements:

- Eight (8) or twelve (12) inch traffic signal sections shall normally be installed with standard cut-away type hoods unless the plans call for combination tunnel type hoods having open slots at the bottom of the hoods. Either type of hood shall be approximately 8 or 10 inches long, respectively.
- Reflectors shall be highly polished specular aluminum type.

- All traffic signals shall be arranged for span wire or pole mounting.
- Glass lenses, number and size, shall be as indicated on the intersection drawing. These lenses shall meet the latest ITE standards for lenses.
- All signal optical units shall produce standard (ITE definition) light distributions.
- All traffic signals and signal service entrance fixtures shall be painted according with the following:

Finish on body of signal, outside of hood, doors and service entrance fixture - Federal Yellow.

Finish on inside of hood - Flat Black.

Paint requirements:

1st coat (all surfaces) - Epon oxide baking primer, Federal Spec. TT-P-636.  
2nd coat (all surfaces) - Medium gray alkyd urea exterior baking enamel, Federal Spec. TT-E-480B.  
3rd coat (yellow surface) - Federal Yellow alkyd urea exterior baking enamel, Federal Spec. TT-E-489B, color 13538.  
3rd coat (Flat Black surfaces) - Alkyd urea black synthetic, heat resisting glyceryl phthalate type 4, instrument black, Military Spec. E-5557.

- Stainless steel latching devices and span wire hangers shall not be painted.
- Balance adjustors shall be installed if necessary to maintain the traffic signals in a vertical position.
- The component parts for assembling traffic signal heads shall consist of the following for span wire mounting:
  - Galvanized span wire hanger for messenger wire.
  - Balance adjustor.
  - 1-1/2" service entrance head with galvanized nipple.
  - Traffic signal heads of the number and size of faces and sections indicated on the intersection drawing, including 8 or 12 inch red, and 8 or 12 inch yellow and green lenses with all required components, including 1-1/2" top and bottom bracket assemblies and 1-1/2" galvanized rigid conduit drop pipe (variable length), to lock the signals in place and provide a water and dust tight installation.
  - All other incidentals necessary to make the assembly complete.

The component parts for assembling traffic signal heads shall consist of the following for pole mounting:

- Top and bottom brackets.
- Pole hub fittings and stainless steel band.
- One, 8", three section traffic signal including red, yellow and green lenses with required components to lock the signals in place and provide a water and dust tight installation.
- All other incidentals necessary to make the assembly complete.

- The Contractor shall furnish and install a traffic signal lamp in each traffic signal section. Signal lamps shall conform to the requirements of "A Standard for Traffic Signal Lamps" as approved by the Institute of Traffic Engineers (ITE) Board of Direction on December 26, 1967 with the following exceptions and qualifications:

- Brass screw bases shall be required.
- Lamp sizes shall be as follows with a rated life of 6,000 hours.

Lamp Size & Color	Watts	Light Center Length
(1) 12" diameter red, green or green arrow	150	3"
(2) 12" diameter yellow	69	3"
(3) 8" diameter red or green	121	2-7/16"
(4) 8" diameter yellow	69	2-7/16"

Lamps shall be installed with the open portion of the filament in the upward position.

Cost of furnishing and installing lamps shall be included in the bid price of each item requiring lamps.

- Signals shall be installed such that the lowest point of the signal is sixteen (16) to seventeen (17) feet above the pavement surface.

Payment for Item 625 "Traffic Signal Heads, by Type" will be made at the contract unit price for each signal head, by type, mounted in place, tested and accepted.

## 625 LOOP DETECTOR AMPLIFIER

The loop detector amplifier is an electronic device that will detect the presence or motion of a mass of metal. This detection is accomplished by the passage of a car over a wire loop imbedded in the roadway.

The amplifier shall conform to the following:

- The detector shall operate satisfactorily at any temperature between -30°F. and +165°F.
- The operating voltage shall be 115 volt, 60 cycle.
- The internal circuitry shall be incorporated into printed circuit board assemblies.
- The detector shall generate a sine wave form of signal.
- No external equipment shall be necessary for installation, tuning or sensitivity adjustments.
- Various types of outputs shall be available including pulse and presence. These outputs shall be available by switching from one to the other without changing any internal parts.
- All transistors, crystals, and relays shall be of the plug-in type to facilitate replacement.
- The amplifier and power supply shall be capable of driving several loops from the one source. The amplifier shall be capable of detecting vehicles in a total area of up to 400 sq. ft. and shall properly function with lead-in lengths totaling up to 750 feet.

The above types of loop detector amplifiers and power supply shall be Automatic Signal No. LD-1, or LD-2 Decatur No. L.S.M.H. or Eagle Signal Company, EW 65 or approved equal.

Payment for Item 625 "Loop Detector Amplifier" will be made at the contract unit price for each detector amplifier, completely wired and installed in controller cabinet.