

**MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS - STANDARD SPECIFICATION
L-119**

Installation of Airport Obstruction Lights

EXTRACTED FROM THE FAA "STANDARDS FOR SPECIFYING COSTRUCTION OF AIRPORTS, OCT. 24, '74

DESCRIPTION

1.1 This item shall consist of obstruction lights, for series or multiple circuits, furnished and installed in accordance with this specification, at the locations and in accordance with the dimensions, design, and details shown in the plans. Included in this item shall be the furnishing and installing of wood poles, steel or iron pipes, or other supports as required in the plans or specifications.

This item shall also include all wire and cable connections, the furnishing and installing of all necessary conduits and fittings, insulators, pole steps, pole crossarms, and the painting of poles and pipes. In addition, it includes the furnishing and installing of all lamps and, if required, the furnishing and installing of insulating transformers, the servicing and testing of the installation and all incidentals necessary to place the lights in operation as completed units to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

2.1 General.

(a) Airport lighting equipment and materials covered by FAA specifications shall have the prior approval of the Federal Aviation Administration, Airports Service, Washington, D.C. 20591, and shall be listed in Advisory Circular 150/5345-1, approved Airport Lighting Equipment.

(b) All other equipment and materials covered by other reference specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

2.2 Obstruction Lights. The obstruction lights shall conform to the requirements of Advisory

Circular 150/5345-2, Specification for L-810 Obstruction Light.

2.3 Insulating Transformers. Where required for series circuits, the insulating transformers shall conform to the requirements of Advisory Circular 150/5345-22, Specification for L-834 Individual Lamp Series-to-Series Type Insulating Transformer for 5,000 Volt Series Circuit, Type I, 100 watt.

2.4 Transformer Housing. Transformer housings, if specified, shall conform to Advisory Circular 150/5345-6, Specification for L-809 Airport Light Base and Transformer Housing.

2.5 Conduit.

(a) Fiber conduit and fittings shall be in accordance with Fed. Spec. W-C-581.

(b) Steel conduit and fittings shall be in accordance with Fed. Spec. WW-C-581.

2.6 Wires. Wires in conduit rated up to 5,000 volts shall conform to Advisory Circular 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits, for rubber insulated neoprene covered wire, or Fed. Spec. J-C-30, Type RHW, for rubber insulated fibrous covered wire. For ratings up to 600 volts, thermoplastic wire conforming to Fed. Spec. J-C-30, Types TW, THW, and THWN, shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal. Overhead line wire from pole to pole, where specified, shall conform to Fed. Spec. J-C-145.

2.7 Miscellaneous. Paint, poles, pole steps, insulators, and all other miscellaneous materials necessary for the completion of this item shall be new and first-grade commercial products. These products shall be specified in the plans or specifications.

CONSTRUCTION METHODS

3.1 Placing the Obstruction Lights. Contractor shall furnish and install single- or double-obstruction lights as specified in the proposal and shown in the plans. The obstruction lights shall be mounted on poles, buildings, or towers approximately at the location shown in the plans. The exact location shall be as directed by the Engineer.

3.2 Installation on Poles. Where obstruction lights are to be mounted on poles, each obstruction light shall be installed with its hub at least as high as the top of the pole. All wiring shall be run in not less than 1-inch galvanized rigid steel conduit. If specified, pole steps shall be furnished and installed, the lowest steps being 5 feet above ground level. Steps shall be installed alternatively on diametrically opposite sides of the pole to give a rise of 18 inches for each step. Conduit shall be fastened to the pole with galvanized steel pipe straps and shall be secured by galvanized lag screws. Poles shall be painted as shown in the plans and specifications.

When obstruction lights are installed on existing telephone or power poles, a large fiber insulating sleeve of adequate diameter and not less than 4-feet long, shall be installed to extend 6 inches above the conductors on the upper crossarm. In addition, the sleeve shall be at least 18 inches below the conductors on the lower crossarm. The details of this installation shall be in accordance with the plans.

3.3 Installation on Beacon Tower. Where obstruction lights are installed on a beacon tower, two obstruction lights shall be mounted on top of the beacon tower using 1 inch conduit. The conduit shall screw directly into the obstruction light fixtures and shall support them at a height of not less than 4 inches above the top of the rotating beacon. If obstruction lights are specified at lower levels, the Contractor shall install not less than ½ inch galvanized rigid steel conduit with standard conduit fittings for mounting the fixtures. The fixtures shall be mounted in an upright position in all cases. The conduit shall be fastened to the tower members with “wraplock” straps, clamps, or approved fasteners spaced approximately 5 feet apart. Three coats of

aviation-orange paint shall be applied (one prime, one body, and one finish coat) to all exposed material installed under this item except obstruction light globes.

3.4 Installation on Buildings, Towers, Smokestacks, Etc. Where obstruction lights are to be installed on buildings or similar structures, the installation shall be made in accordance with details shown in the plans. The hub of the obstruction light shall be not less than 1 foot above the highest point of the obstruction except in the case of smokestacks where the uppermost units shall be mounted not less than 5 feet, nor more than 10 feet below the top of the stack. Conduit supporting the obstruction light units shall be fastened to wooden structures with galvanized steel pipe straps and shall be secured by 1 ½ inch No. 10 galvanized wood screws. Conduit shall be fastened to masonry structures by the use of expansion shields, screw anchors, or toggle bolts using No. 10, or larger, galvanized wood or machine screws. Conduit fastened to structural steel shall have the straps held with not less than No. 10 roundhead machine screws in drilled and tapped holes. Fastenings shall be approximately 5 feet apart. Three coats of aviation-orange paint shall be applied (one prime, one body, and one finish coat) to all exposed material installed under this item, except obstruction light globes.

3.5 Series Insulating Transformers. The L-810 series obstruction light does not include a film cutout; therefore, an insulating transformer is required with each series lamp. Double series units of this type require two series insulating transformers. The transformer shall be housed in a base or buried directly in the earth in accordance with the details shown in the plans.

3.6 Wiring. The Contractor shall furnish all necessary labor and materials and shall make complete electrical connections from the underground cable or other source of power in accordance with the wiring diagram furnished with the project plans. If underground cable is required for the power feed and if duct is required under paved areas, the cable and duct shall be installed in accordance with (and paid for by) linear foot measurement as described in Item

L-108, Installation of Underground Cable for Airports, and Item L-110, Installation of Airport Underground Electrical Duct.

FEDERAL SPECIFICATIONS

3.7 Lamps. The Contractor shall furnish and install in each unit one or two lamps, as required, conforming to the following requirements:
 (a) Series lamp-6.6 ampere, 1020-lumen, A-21 clear bulb, medium prefocus base.
 (b) Multiple Lamps-100, 107, or 116 watts; 115, 120, or 125 volts; A-21 clear bulb, medium screw base.

<u>Number</u>	<u>Title</u>
W-C-581	Conduit and Fittings; Non-Metallic, Rigid, (Bituminized Homogeneous Fiber).
WW-C-581	Conduit, Metal, Rigid; and Coupling, Elbow and Nipple, Electrical Conduit: Zinc-Coated.
J-C-30	Cable and Wire, Electrical (Power, Fixed Installation).
J-C-145	Cable, Power, Electrical and Wire, Electrical, (Weather-Resistant).

3.8 Tests. The installation shall be fully tested by continuous operation for not less than ½ hour as a completed unit prior to acceptance. These tests shall include the functioning of each control not less than 10 times.

METHOD OF MEASUREMENT

4.1 The quantity of lights to be paid for under this item shall be the number of single- or double-type obstruction lights installed and accepted as completed units, in place, ready for operation.

FAA SPECIFICATIONS

<u>Number</u>	<u>Title</u>
AC 150/5345-2	Specification for L-810 Obstruction Light
AC 150/5345-6	Specification for L-809 Airport Light Base and Transformer Housing
AC 150/5345-7	Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits
AC 150/5345-22	Specification for L-834 Individual Lamp Series Type Insulating Transformer for 5000 Volt Series Circuit

BASIS OF PAYMENT

5.1 Payment will be made at the contract unit price for each completed obstruction light installed, in place by the Contractor, and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under: Item L-119 - 5.1 Airport Obstruction Light, In Place – per each.