



SECTION 74 – AIRPORT OBSTRUCTION LIGHTS (FAA L-119)

74-1 GENERAL

The Contractor shall perform all work required by the plans and specifications for construction of obstruction lights in accordance with the Standard Specifications, except as specified otherwise in FAA Specification Item L-119, as included and modified hereafter, and as shown on the Plans.

It shall also include all mandreling, installation of pulling rope, conduit fittings, capping, and the testing of the installation as a completed, operational system, to the satisfaction of the Owner and Engineer. The Contractor shall protect the existing pavement and utilities from damage by use of any equipment with tracks, stabilization feet, hydraulic fluids, etc., during the construction of this item.

ITEM L-119 AIRPORT OBSTRUCTION LIGHTS

DESCRIPTION

119-1.1 This item shall consist of furnishing and installing obstruction lights in accordance with these specifications. Included in this item shall be the furnishing and installing of stainless steel 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 cross arms, 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

119-2.1 GENERAL.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified and listed under Advisory Circular (AC) 150/5345-53, Airport Lighting Equipment Certification Program.

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.

c. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not materially comply with these specifications shall be removed, when directed by the Engineer and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.



d. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be boldly and clearly made with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in project accruing directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Contractor's submittals shall be neatly bound in a properly sized 3-ring binder, tabbed by specification section. The Engineer reserves the right to reject any and all equipment, materials or procedures, which, in the Engineer's opinion, does not meet the system design and the standards and codes, specified herein.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

119-2.2 OBSTRUCTION LIGHTS. The obstruction lights shall conform to the requirements of AC 150/5345-43, Specification for Obstruction Lighting Equipment.

119-2.3 ISOLATION TRANSFORMERS. Where required for series circuits, the isolation transformers shall conform to the requirements of AC 150/5345-47, Isolation Transformers for Airport Lighting Systems.

119-2.4 TRANSFORMER HOUSING. Transformer housings, if specified, shall conform to AC 150/5345-42, Specification for Airport Light Base and Transformer Housings, Junction Boxes, and Accessories.

119-2.5 CONDUIT. For use above ground, rigid steel conduit and fittings shall be in accordance with Underwriters Laboratories Standard 6, 514, and 1242.

119-2.6 PLASTIC CONDUIT (for use below grade only). Plastic conduit and fittings shall conform to the requirements of Fed. Spec. W--C-1094 and Underwriters Laboratories Standards UL-651 and shall be one of the following, as shown on the plans:

- a. Type I--Schedule 40 PVC suitable for underground use either direct-buried or encased in concrete.
- b. Type II--Schedule 40 PVC suitable for either above ground or underground use.

119-2.7 WIRES. Wires in conduit rated up to 5,000 volts shall conform to AC 150/5345 7, Specification for L-824 Underground Electrical Cable 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-2, 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 ANSI/ICEA S-70-547-1992.

119-2.8 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 as specified in the plans or specifications.

CONSTRUCTION METHODS

119-3.1 PLACING THE OBSTRUCTION LIGHTS. The 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.

119-3.2 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 step being 5 feet above ground level. Steps shall be installed alternately 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 cross arm. In addition, the sleeve shall be at least 18 inches below the conductors on the lower cross arm. The details of this installation shall be in accordance with the plans.

119-3.3 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 1-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.

119 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 cooling towers 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.

119-3.5 SERIES ISOLATION TRANSFORMERS. The L-810 series obstruction light does not include a film cutout; therefore, an isolation 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.

119-3.6 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 as described in Specification Sections 69 and 71 (FAA Item L-108, Underground Power Cable for Airports, and Item L-110, Airport Underground Electrical Duct Banks and Conduit).

119-3.7 LAMPS. The Contractor shall furnish and install in each unit one or two lamps, as required, conforming to the manufacturer's requirements.

119-3.8 TESTS. The installation shall be fully tested by continuous operation for not less than 1/2 hour as a completed unit prior to acceptance. These tests shall include the functioning of each control not less than 10 times.

MATERIAL REQUIREMENTS

AC 150/5345-7 Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits

AC 150/5345-42 Specification for Airport Light Base and Transformer Housing, Junction Boxes, and Accessories

AC 150/5345-43 Specification for Obstruction Lighting Equipment

AC 150/5345-47 Isolation Transformers for Airport Lighting Systems

ANSI/ICEA S-70-547-1992 Weather-Resistant Polyolefin-Covered Wire and Cable

FED SPEC J-C-30 Cable and Wire, Electrical (Power, Fixed Installation) (cancelled; replaced by AA-59544 Cable and Wire, Electrical (Power, Fixed Installation))

END OF ITEM L-119

74-2 METHOD OF MEASUREMENT

Obstruction lights shall be measured by the number of double, or single obstruction lights installed as complete units in place, accepted by the engineer and ready for operation.



Other wire and cable connections, the furnishing and installing of all necessary conduits and fittings, insulators, pole steps, pole cross arms, the painting of poles and pipes and the furnishing and installing of all lamps and installing of insulating transformers including 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 shall be included in the unit price bid for the work.

74-3 BASIS OF PAYMENT

Payment will be made at the contract unit price for each completed and accepted double or single obstruction light installed by the contractor. 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 in accordance with the provisions and intent of the plans and specifications.

The accepted quantity of wind cones will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

No separate payment will be made for constructing the item under construction sequencing restrictions, including limited access or nighttime work areas.

Payment will be made under:

- Item 74.1 Single Airport Obstruction Lights..... per each
- Item 74.2 Double Airport Obstruction Lights..... per each

END OF SECTION 74