

**MICHIGAN DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION -STANDARD SPECIFICATION
L-107**

Airport 8-Foot and 12-Foot Wind Cones

DESCRIPTION

1.1 This item shall consist of an airport wind cone furnished and installed in accordance with this specification at the location and in accordance with the dimensions, design, and details shown in the plans.

The work shall include the furnishing and installation of a support for mounting the wind cone, the specified wire, and a concrete foundation. The item shall also include all cable connections, conduit and conduit fittings, the furnishing and installation of all lamps, ground rod and ground connection, the testing of the installation, and all incidentals necessary to place the wind cone in operation as a completed unit to the satisfaction of the engineer.

EQUIPMENT AND MATERIALS

2.1 General.

(a) Airport lighting equipment and materials covered by 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 referenced 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 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 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.

2.2 Wind Cones. The 8-foot and 12-foot wind cones and assemblies shall conform to the requirements of AC150/5345-27, Specification for Wind Cone Assemblies.

The illuminated windcone must present a constant brightness to the pilot. As a result, the source of power for the windcone circuit must be identified.

Where a constant voltage is available, the windcone may be connected directly to the constant voltage circuit. Where the series lighting circuit is used as a power source to the windcone, a power adapter that converts constant current to constant voltage must be specified. An additional requirement for the power adapter is the output voltage must remain constant regardless of the input current. The manufacturer of the power adapter must be consulted to verify the additional load imposed on the series circuit by the power adapter.

The engineer should specify the windcone and power adapter combination recommended by the manufacturer when the power source for the windcone circuit will be the constant current series lighting circuit.

2.3 Wire. Wire in conduit rated up to 5,000 volts shall conform to Advisory Circular 150/5345-7, Specification for L-824 Underground Cables for Airport Lighting Circuits, for Rubber Insulated Neoprene Covered Wire, or Federal Specification 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.

2.4 Conduit. Rigid steel conduit and fittings shall conform to the requirements of Underwriters Laboratories Standard 6, 514, and 1242.

2.5 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 in 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.

Plastic conduit adhesive shall be solvent cement manufactured specifically for the purpose of gluing the specific type of plastic conduit and fitting.

2.6 Concrete. The concrete for foundations shall be proportioned, placed, and cured in accordance with Item P-610, Structural Portland Cement Concrete.

2.7 Paint.

(a) Priming paint for ungalvanized metal surfaces shall be a high solids alkyd primer conforming to TT-P-664D.

(b) Priming paint for galvanized metal surfaces shall be zinc dust-zinc oxide primer paint conforming to MIL-DTL-24441/19B. If necessary, add not more than ½ pint of turpentine to each gallon.

(c) Orange paint for the body and the finish coats on metal and wood surfaces shall consist of a ready-mixed non-fading paint meeting the requirements of Fed Spec. TT-E-489. The color shall be in accordance with Fed. Std. 595, Aviation Gloss orange Number 12197.

(d) White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to the Master Painter's Institute, Reference #9, Exterior Alkyd, Gloss, VOC Range E2.

(e) Priming paint for wood surfaces shall be mixed on the job by thinning the above specified aviation-orange or white paint by adding ½ pint of raw linseed oil to each gallon.

CONSTRUCTION METHODS

3.1 Installation. The hinged support or hinged pole shall be installed on a concrete foundation as shown in the plans.

3.2 Pole Erection. The Contractor shall erect the pole on the foundation following the manufacturer's requirements and erection details. The pole shall be level and secure.

3.3 Electrical Connection. The Contractor shall furnish all labor and materials and shall make complete electrical connections in accordance with the wiring diagram furnished with the project plans. The electrical installation shall conform to the requirements of the latest edition of National Fire Protection Association, NFPA-70, and National Electric Code.

If underground cable from the transformer vault to the wind cone site and duct for this cable installation under paved areas is required, 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 Airport Underground Cable, and Item L-110 Airport Underground Electrical Duct Banks and Conduits.

3.4 Booster Transformer. If shown in plans or specified in job specifications, a booster transformer to compensate for voltage drop to the lamps shall be installed in a suitable weatherproof housing. The booster transformer shall be installed as indicated in the plans and described in the proposal or plans. If the booster transformer is required for installation in the transformer vault, it shall be installed in accordance with and paid for as Wind Cone, in place-per unit.

3.5 Ground Connection and Ground Rod. The Contractor shall furnish and install a ground rod, grounding cable, and ground clamps for grounding the "A" frame of the 12-foot assembly or pipe support of the 8-foot support near the base. The ground rod shall be of the type, diameter and length specified in Item L-108, Airport Underground Cable, or the plans and shall be copper or copper clad. The ground rod shall be driven into the ground adjacent to the concrete foundation (minimum distance from foundation of 2 feet) so that the top is at least 6 inches below grade. The grounding cable shall consist of No. 4 AWG bare stranded copper wire or larger and

shall be firmly attached to the ground rod by means of a ground connector or clamp by exothermic welding. The other end of the grounding cable shall be securely attached to a leg of the frame or to the base of the pipe support with non-corrosive metal and shall be of substantial construction. The resistance to ground shall not exceed 25 ohms.

3.6 Painting. Three coats of paint shall be applied (one prime, one body, and one finish) to all exposed material installed under this item except the fabric cone, obstruction light globe, and lamp reflectors. The wind cone assembly, if painted on receipt, shall be given one finish coat of paint in lieu of the three coats specified above. The paint shall meet the requirements of Fed. Spec. TT – E-489. The color shall be in accordance with Fed. Std. 595, Aviation Gloss Orange Number 12197.

3.7 Lamps. The contractor shall furnish and install lamps as specified by the manufacturer.

3.8 Chain and Padlock. The Contractor shall furnish and install a suitable operating chain for lowering and raising the hinged top section. The chain shall be attached to the pole support in a manner to prevent the light fixture assembly from striking the ground in the lowered position.

A padlock shall also be furnished by the Contractor on the 8-foot wind cone for securing the hinged top section to the fixed lower section. Keys for the padlock shall be delivered to the Engineer.

METHOD OF MEASUREMENT

4.1 The quantity to be paid for under this item shall be the number of wind cones installed as completed units in place, accepted, and ready for operation.

BASIS OF PAYMENT

5.1 Payment will be made at the contract unit price for each completed and accepted job. 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 the nomenclature and seven digit item number specified in the plans and proposal for wind cone installations.

The first three digits of any item number for work included under this specification shall be 107, i.e. 107XXXX.

MATERIAL REQUIREMENTS

AC 150/5345-7	Underground Cable for Airport Lighting circuits
AC 150/5345-27	Wind Cone Assemblies
Fed. Spec. TT-E-489	Enamel, Alkyd, Gloss, Low VOC content
Fed. Spec. J-C-30	Cable and Wire (Power, Fixed Installation)
Fed. Spec. W-P-115	Panel, Power Distribution
FED STD 595	Colors Used in Government Procurement
MIL-DTL-24441/20	Paint, Epoxy-Polyamide, Green Primer, Formula 150, Type III
NFPA-70	National Electric Code
Underwriters Laboratories Standard 6	Rigid Metal Conduit
Underwriters Laboratories Standard 514	Fitting for Conduit and Outlet Boxes
Underwriters Laboratories Standard 1242	Intermediate Metal Conduit
Master Painter's Institute	

Approved: December 4, 2006