Federal Aviation Agency

ADVISORY CIRCULAR

AC NO: 150/5345-36
AIRPORTS
EFFECTIVE:
2/3/65

SUBJECT: SPECIFICATION FOR L-808 LIGHTED WIND TEE

---

1. PURPOSE. This circular describes the subject specification requirements for a lighted wind tee. The specification is for the guidance of the public, and its use is required for project activity under the Federal-aid Airport Program.

2. CANCELLATION. This advisory circular replaces Federal Aviation Agency Specification L-808, "Specification for Lighted Wind Tee", dated December 15, 1961, without substantive change.

3. SCOPE OF SPECIFICATION. The specification requirements are for a wind tee consisting essentially of a structure in the shape of a single stroke "T", when viewed from above, complete with lighting system, supporting shaft and bearings, base housing and the necessary electrical connections between the lamp and base. The wind tee shall be a free swinging type.

4. APPLICABLE SPECIFICATIONS. The following specifications and standard of the issue in effect on the date of application for qualification (see paragraph 9) apply to this circular. This circular shall govern in case of conflict.

   a. Federal Specifications and Standard.

      (1) QQ-A-601, Aluminum-Alloy Sand Castings.

      (2) Federal Standard No. 595 - Colors.

      (3) J-C-103-Cable, Power, Electrical, (Rubber-Insulated, General Purpose) and Wire, Electrical, (Rubber-Insulated, General Purpose).

      (4) TT-P-641-Primer, Paint; Zinc Dust-Zinc Oxide (For Galvanized Surfaces).

---

(5) TT-R-191-Red Lead, Dry and Paste-In-Oil.

(6) TT-P-465-Pigment, Zinc-Yellow (Zinc Chromate), Dry.

b. Military Specification. MIL-C-25050-Colors, Aeronautical Lights and Lighting Equipment, Specification for.

5. SOURCE OF APPLICABLE SPECIFICATIONS AND STANDARD.

a. Obtain copies of Federal specifications and standard from the appropriate Regional General Services Administration Office.

b. Obtain copies of military specifications from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia 20, Pennsylvania, Attn: Code CDS.

6. PERFORMANCE REQUIREMENTS.

a. The wind tee shall indicate true wind direction within 5 degrees when the wind is 4 miles per hour.

b. The tee, assembled complete and mounted on its base, shall be strong enough to withstand a wind of 120 miles per hour with the tee swinging free and covered by ice of ½-inch thickness or an equivalent load.

c. The tee shall be designed and constructed for continuous service under any ambient temperature from a minimum of -45°F. to a maximum of +120°F. at sea level.

7. DETAIL REQUIREMENTS.

a. The tee shall consist of a stroke, a head and a tail. The length of the stroke shall not be less than 18 feet, excluding tail, and the length of the head shall not be less than 12 feet nor more than two-thirds of the stroke. In vertical cross section, the stroke and head shall not be less than 18 inches across the lower horizontal surface and each side shall be not less than 10 inches and shall be sloped upward at approximately 45 degrees for both horizontal and vertical visibility. The stroke shall terminate in a wedge shaped vertical tail. Each side of the tail shall have an area not less than 12 square feet.

b. The tee shall be fabricated of metal not thinner than #20 B&S gauge, fastened to a metal framework or of heavier sheet metal designed to be self supporting. The tee shall be designed so that it may be disassembled into four or more major parts for convenience in shipping. Joints between major parts shall be designed for ease of assembly in the field and each of these parts shall be completely wired with plugs or receptacles provided for connection to the wiring in adjacent major parts. Joints within major parts shall be securely closed so that they will not loosen under vibration.

c. Provision shall be made for balancing the tee on the shaft after installation. This may be accomplished by using a counterweight supported by an open framework or by providing a receptacle in the body of the tee in which the necessary balancing weight is placed. For either method means shall be provided for securely holding the balancing weight or weights in place. If a receptacle is provided, it shall be constructed to drain off any water from rain, snow, and hail. Sand, small gravel, or similar material whose weight changes appreciably when water is added will not be permitted for use as balancing weights.

d. Lighting shall be of the incandescent lamp type with not less than 18 fixtures equidistantly spaced not over 12 inches apart on the stroke and not less than 12 fixtures equidistantly spaced not over 12 inches apart on the head. The fixtures shall be securely fastened to the head and stroke in an upright position. The fixtures shall be of cast aluminum conforming to Federal Specification QQ-A-601, Alloy 43 or 214, and shall rigidly support a porcelain medium screw socket correctly positioned for a 25-watt, 115-volt, A-19 clear bulb. The fixture shall provide a watertight fastening for color hood or globe without the use of glass threads.

e. The color hood shall be of adequate size to house the lamp without breakage from the heat of the lamp and shall be aviation green as defined in Specification MIL-C-25050. Glass threads shall not be used as a means of attaching the hood to the fixture. The hood shall provide no optical control of the light distribution.

f. All wiring to the lamps shall be concealed within the stroke and head of the tee and shall enter the fixtures through the fixture supports. Major parts shall be wired at the factory. Wire shall conform to Federal Specification J-C-103, Type RH or RW, and shall be secured in place in the stroke and head of the tee.

g. The base shall house all mechanical and electrical accessories and shall guide and support the shaft. It shall have means of access to the interior without removing the tee. Cover plates or access doors shall be gasketed and bolted so that they shall be watertight.

h. The shaft shall be of adequate size to support the tee and enable it to operate without failure under the general requirements listed above. It shall be bolted to the stroke of the tee not over 66 inches from the rear of the head and as close to the head as possible in order to provide the optimum "drag" on the tail consistent with the balance point of the tee and any counterweight. Adequate ball or roller bearings shall be provided to carry the thrust and radial load on the shaft. A watertight seal shall be provided between the base and the shaft.

i. Leveling bosses or platforms shall be provided on top of the base cover to facilitate leveling during installation. The base shall make provision for leveling and for mounting on a concrete pedestal having a 2-foot square top surface.

j. Two slip rings shall be provided on the main shaft to permit the transfer of power. Suitable brushes bearing on the slip rings shall be mounted in the base. A terminal block shall be located in an accessible place in the base and all connections shall be appropriately marked.

k. The inside of the stroke and head of the tee shall be painted with one prime coat and two coats of a suitable protective paint. The outside shall be painted with one prime coat and two body and one finish coats of aviation yellow paint. Prime coats for galvanized metal surfaces shall be zinc dust-zinc oxide primer conforming to Federal Specification TT-P-641. Prime coats for ungalvanized metal surfaces shall be red lead in oil or zinc chromate conforming respectively to Federal Specifications TT-R-191 and TT-P-465. Aviation yellow paint shall conform to Federal Standard No. 595, Colors, Table X, Aviation Yellow No. 13538. If ferrous metal is used for the base it shall either be galvanized or painted inside with the priming specified above. The outside of the base shall be painted as described above for the tee.

8. TESTING.

a. Qualification Testing. A production sample lighted wind tee shall be tested as follows:

(1) Ice Loading Test.

(a) Bags loaded with sand or other material such as lead shot shall be stored inside or hung on the stroke and head of the tee. The bags shall be spaced not over 12 inches apart and each bag shall weigh approximately the same amount. The total weight applied in this manner shall not be less than 40 pounds for each linear foot of the head and stroke of the tee.

(b) The weight load applied in this test shall remain in place for a minimum of 30 minutes.

(c) The test shall be made with the tee completely assembled and installed in an operating condition.

(2) Wind Resistance Test.

(a) A static load of 750 pounds shall be applied in a horizontal direction on the central shaft support and bearings at a point approximately where the shaft enters the bottom of the tee. This test may be accomplished by placing a sling around the structure of the tee at any suitable point to give a pull on the shaft and bearings.

(b) The static load shall be applied to the tee for a period of at least 10 minutes.

(c) The test shall be made while the tee is loaded as in the ice loading test described in paragraph 8a(1).

(3) True Wind Direction Test. The movement of the tee about the shaft shall be tested for conformance with the requirements of paragraph 6a. This test shall be made after completing the ice loading and wind resistance tests described in paragraphs 8a(1) and (2).

b. Production Testing. The tests specified in paragraph 8 shall be made on each lighted wind tee after final assembly and each wind tee shall successfully withstand these tests.

c. Additional Inspections and Tests. Additional inspections and tests will be made as deemed necessary by the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, to determine compliance with this specification.

9. QUALIFICATION.

a. The manufacturer shall furnish a sample lighted wind tee to an independent testing laboratory acceptable to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, to be tested as described in paragraph 8 to obtain certification regarding the ability to manufacture the wind tee meeting the requirements of this specification. The manufacturer shall furnish two copies of the test report to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, for review and approval consideration. The cost of testing shall be borne by the manufacturer offering the equipment for approval.

b. If the manufacturer has satisfactory laboratory facilities, the tests may be performed at the factory, and such tests shall be witnessed by a representative of the Federal Aviation Agency, Airports Service, Washington, D. C. 20553. The manufacturer shall furnish written reports of these tests.

c. In addition to the tests performed by the independent laboratory and/or the manufacturer, the manufacturer shall furnish parts lists, installation instructions, and drawings to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, for review and approval.

d. Upon approval of the independent laboratory's and/or manufacturer's test reports and the additional data required in paragraph 9c, which have shown satisfactory conformance to the specification requirements, the Airports Service will list the name of the qualified manufacturer and a description of their wind tee in Advisory Circular No. 150/5345-1, "Approved Airport Lighting Equipment".

e. At any time after approval has been granted under the above conditions, a certified copy of factory test reports on the latest production run of wind tees produced under this specification shall be made available by the manufacturer upon written request from the Federal Aviation Agency, Airports Service, Washington, D. C. 20553.

10. HOW TO GET THIS CIRCULAR. Obtain additional copies of this circular, AC 150/5345-36, "Specification For L-808 Lighted Wind Tee", from the Federal Aviation Agency, Distribution Section, HQ-438, Washington, D. C. 20553.

Cole Morrow

Cole Morrow, Director
Airports Service

(11) Shock Test. The assembled unit shall be mounted rigidly on either a one-inch thick steel plate or a concrete base at least four inches thick. The dimensions of the steel plate or the concrete base shall be at least three feet by three feet. The light fixture shall be turned on at full brightness for at least two hours prior to starting the test. With the light still on at full brightness, a steel ball weighing five pounds shall be dropped at the center of the top assembly from a height of six feet. The steel ball shall be dropped 10 times on the light fixture with a five-minute interval between each drop. Upon conclusion, the light fixture shall be opened to determine if the optical assembly had been damaged or any component displaced in any way.

(12) Hydraulic Impact Test. The light assembly shall be submerged in water to a depth of approximately 1/8 inch. The upper surfaces of the light assembly around the windows shall be encased in a leak proof metal housing with a 1-3/4 inch diameter piston. The chamber shall be filled with water and purged of all air. A five-pound steel ball shall be dropped six feet onto the steel cylinder. The light shall show no visible damage after the above test has been repeated five times. The test procedure and a detailed drawing of the test setup shall be submitted to FAA for approval before this test is conducted.

(13) Horizontal Static Load Test. The light unit shall be placed in a hydraulic press with a bar attached to the top surface. A load of 3,000 pounds shall be applied parallel to the light beam. This test shall be repeated 20 times in each direction. There shall be no sign of structural damage, movement of any part, or loosening of fasteners.

(14) Lamp By-Pass Test. Lamp by-pass equipment will be tested to demonstrate the ability to operate at 6.6, 5.5, and 4.8 amperes within five seconds.

b. Production Testing. Each Class A and Class B top assembly shall be subjected to photometric and leakage tests. In the photometric tests, the Class A and Class B top assemblies shall meet the intensity distribution requirements of Figures 1 and 2, respectively.

If abbreviated photometric test methods are used for production testing, these methods must have prior approval of the FAA's Airports Service. Each top assembly shall meet the requirements of the leakage test specified in paragraph 4a(9). Leakage tests on production units shall be accomplished by means of a standard test head and a standard test base. The test head and test base shall be production units properly fitted with pressure fittings to permit the internal pressure of each assembly to be raised to 20 p.s.i. No units which have been tested and have failed to meet these production tests shall be shipped in fulfillment of an order. These tests shall be performed by the manufacturer and may be witnessed by a Government representative. Each light assembly shall be identified by a serial number and test records kept by the manufacturer for at least two years. These records shall be available to the Federal Aviation Administration upon written request.

5. PREPARATION FOR DELIVERY

a. Light Fixture. Inset light fixtures may be prepared for delivery as assembled units ready for installation or as separate components. All exterior surfaces of the fixture shall be cleaned of all oil, grease, and other foreign material, prior to packaging, to insure proper field installation. The top assembly may be prepared for delivery as a separate component. The alignment device shall be prepared for delivery as a separate component.

b. Fixture Packaging. Each assembled unit shall be individually packaged in a durable, domestic type, corrugated cardboard carton. It shall be cushioned properly inside the carton to provide the necessary mechanical and physical protection of the fixture and its component parts. For convenience of shipment, six assembled units may be packed in a suitable wooden container.

c. Base Receptacle. When the base receptacle is shipped separately, the lock washers, as well as the "O" ring gasket, shall be packed in a separate envelope and placed inside the base. The plywood cover required to be furnished with the base receptacle shall be properly positioned and secured to the top of the base receptacle with the hold-down bolts, which are required for later use in installation for mounting the Type II fixture on the base receptacle.