Cancelled 150/5345-48

Federal Aviation Agency

ADVISORY CIRCULAR

AC NO:	AC 150/5345-20
	AIRPORTS
EFFECTIVE:	6/24/64

Reprinted 8/25/67
Incorporates Changes
1 thru 3

SUBJECT: SPECIFICATION FOR L-802 RUNWAY AND STRIP LIGHT

1. PURPOSE. This circular describes the subject specification requirements for a runway and strip light. 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 cancels and replaces Federal Aviation Agency Specification L-802, "Runway and Strip Light", dated October 1, 1962. Substantive changes made in this circular consist of deleting requirements for multiple circuit equipment and adding a holding band to the lens assembly.

3. SCOPE OF SPECIFICATION. The specification requirements are for an elevated light for use on runways and landing strips. The unit shall consist essentially of an optical system, lamp and socket mounted in a metal fitting, connecting leads, and a mounting assembly. The referenced insulating transformer is used to supply light units from a series circuit. The insulating transformer, lamps, and the airport light base and transformer housing are not a part of the fixture covered by this specification and are referenced for design purposes only.

4. APPLICABLE SPECIFICATIONS AND STANDARD. 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-591 - Aluminum Alloy Die Castings.

      (2) QQ-A-601 - Aluminum-Alloy Sand Castings.

      (3) WW-C-563 - Conduit, Metal, Rigid; and Bend and Elbow, Electrical Conduit, Thin-Wall Type (EMT).

      (4) Federal Standard No. 595 - Colors.

b. Military Specifications.

(1) MIL-C-7989 - Covers, Light Transmitting, for Aeronautical Lights, General Specification for.

(2) MIL-C-25050 - Colors, Aeronautical Lights and Lighting Equipment, General Requirements for.

c. WITHDRAWN - CHANGE 1.

d. FAA Specifications.

(1) Specification for L-809 Airport Light Base and Transformer Housing (AC 150/5345-6).

(2) L-833 - Individual Lamp Series-to-Series Type Insulating Transformer for 600 Volt or 3000 Volt Series Circuits.

(3) L-823 - Plug and Receptacle, Cable Connectors.

5. SOURCE OF APPLICABLE SPECIFICATIONS AND STANDARD.

a. Obtain copies of Federal specifications and standard from the Business Service Centers of the General Services Administration Regional Offices.

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

c. WITHDRAWN - CHANGE 1.

d. Obtain copies of FAA specifications from the Federal Aviation Agency, * Printing Branch, HQ-438, Washington, D.C. 20553. *

6. PERFORMANCE REQUIREMENTS.

a. The light shall be designed to provide a light distribution in accordance with the candela values shown on Figures 1, 2, 3, and 4, when tested as described in paragraph 8a.

b. When color is specified, the candela values shall be not less than those obtained by multiplying the candela values shown on the applicable photometric curves of this specification by 0.400 for yellow and 0.150 for green.

c. All current carrying parts shall have a capacity of at least 10 amperes.

d. The unit shall be designed and constructed for continuous service under the following operating conditions:

(1) Temperature. Any ambient temperature from a minimum of -45° F. to a maximum of +120° F. at sea level.

(2) Weather. Continuous outdoor operation under all normal weather conditions, including wind velocities up to 200 miles per hour.

7. DETAIL REQUIREMENTS.

a. Optical System. The optical system shall consist of a glass lens assembly and may include a reflector or a baffle shield. The lens shall have flange and inside minimum dimensions as shown in Figure 5. Lenses shall be fabricated from heat-resistant glass conforming to Military Specification MIL-C-7989, Class B. Color lenses or color screens shall conform to Military Specification MIL-C-25050, Type I, of the grade having the highest practical transmission.

b. Socket. The socket shall be the medium prefocus base type and shall be mounted rigidly in the metal fitting. The socket shall have a rating suitable for the service intended.

c. Lamps. A 30- or 45-watt series lamp, C-2V filament, T-10 clear bulb, 1-1/2 inch light center length, 3-15/16 inch maximum overall length, 1000 hour, medium prefocus base shall be used.

d. Fitting. All metal parts of the fitting shall be fabricated from nonferrous metal. Copper bearing hardware in contact with aluminum shall be cadmium, nickel, or zinc plated. Aluminum sand castings shall conform to Federal Specification QQ-A-601, Alloy 43 or 214, and aluminum die castings shall conform to Federal Specification * QQ-A-591, Alloy 13, A13, or 360. *

(1) The fitting shall support the lens assembly and a natural or synthetic rubber gasket shall be provided for seating the lens. A continuous metal band fitted with a trunk latch, or an acceptable equal, to assure a positive holding of the lens assembly shall be provided. The fitting shall include a means for leveling the optical system when mounted on the central column. The leveling adjustment shall be accessible from above with lens removed. The fitting shall be provided with a slip fitter to receive the central column of one-inch National Electrical Code thin-wall conduit; and means shall be provided to securely fasten the column in place.

(2) Provision shall be made to install and position the lamp and the socket with respect to the lens assembly to provide the light distribution specified in Figures 1, 2, 3, and 4.

e. Keying and Orientation.

(1) The lens assembly shall be keyed to the fitting to provide, at all times, the light distribution specified herein. The keying shall limit rotation to not more than 2^{o}.

(2) The outside of the fitting shall be marked to indicate correct orientation with respect to the runway or strip centerline. Provision shall be made for rotation of the fitting after installation to achieve correct orientation.

f. Leads.

(1) A connecting lead assembly shall be supplied to make connections between the socket and the receptacle on the secondary lead of the insulating transformer. This lead shall consist of an appropriate length of two-conductor, 300-volt minimum, No. 16 AWG stranded wire conforming to provisions of the Underwriters' Laboratories, Inc., requirements for Type SJ cord. The lead shall be connected to the socket and terminate in a plug conforming to Figure 1a of Specification L-823, "Plug and Receptacle, Cable Connectors".

(2) A cable clamp, or similar device, shall be provided in the fitting to secure the connecting lead assembly to prevent strain at the socket terminals.

g. Mounting Assembly. The mounting assembly shall consist of a breakable coupling, pipe column, and base plate or stake, as required. The overall height of the unit, mounted in place, shall not exceed 14 inches above ground level. All parts of the mounting assembly shall be made of nonferrous metal or ferrous metal protected against corrosion. Aluminum sand castings shall conform to Federal Specification QQ-A-601, Alloy 43 or 214, and aluminum die castings shall conform to Federal Specification QQ-A-591, * Alloy 13, A13, or 360. *

(1) Stake Mounting. This mounting shall consist of a supporting column, a breakable coupling, mounting fitting, and a metal stake.

(a) The column shall be one-inch National Electrical Code thin-wall steel conduit of the length required and shall conform to Federal Specification WW-C-563.

(b) The breakable coupling shall have a 1½-12UNF-2A male external thread for mounting into the tapped stake fitting. The coupling shall have a "shearing groove" produced by scoring, molding, etc., which will withstand a static load of 250 pounds with less than ½-inch deflection when the load is applied perpendicular to the axis of the coupling at a point 12 inches above the shearing groove; and the coupling shall break cleanly at the groove when a static load of 400 pounds is applied at the same point. The breakable coupling shall have a hexagonal section between the thread and the shearing groove to facilitate removal of a broken coupling. The breakable coupling shall also be provided with one or more drainage holes near the shearing groove. The unthreaded end shall be designed to receive the one-inch thin-wall conduit supporting column and to fasten the column in place.

* (c) The metal stake shall be made of steel angle 3" x 3" x 3/16"* with a minimum length of 30 inches. At the top of the stake, a suitable tapped fitting shall be bolted or welded to the stake for receiving the breakable coupling. In addition, a removable split holding cup or other holding device shall be provided on the fitting. The fitting and holding device shall be designed to accommodate and hold the rubber receptacle (Figure 1c of Specification L-823) of the transformer secondary lead in a positive position near the disconnect point. The metal stake and the breakable coupling fitting shall be so designed that, when assembled, the shearing groove of the coupling shall not be below the top of the stake. A steel clip shall also be attached to the stake in the manner shown on Figure 6, for holding in place the plugs and receptacles of the primary leads of the insulating transformer. A grounding terminal or lug to accommodate wire sizes AWG No. 8 to No. 4 for connection of a grounding conductor shall be provided as shown on Figure 6.

(2) Base Mounting. This mounting shall consist of a supporting column, a breakable coupling, and a metal base cover plate with a gasket.

(a) The column shall meet the requirements of paragraph 7g(1)(a).

(b) The breakable coupling shall meet the requirements of paragraph 7g(1)(b).

(c) The metal base cover plate shall be cast or fabricated to fit a base conforming to AC 150/5345-6, "Specification for L-809 Airport Light Base and Transformer Housing". A tapped opening to receive the breakable coupling specified above shall be provided. A removable split holding cup or ring shall be provided to hold a disconnecting receptacle conforming to Figure 1c of Specification L-823 to the bottom surface of the base plate in a manner that a watertight seal can be obtained.

(d) A rubber gasket, having a minimum thickness of 1/8-inch and dimensions to fit the bolt circle of the base flange shown on Figure 1 of AC 150/5345-6, "Specification for L-809 Airport Light Base and Transformer Housing", shall be supplied to obtain a watertight seal between the base and cover plate.

(e) When the column, breakable coupling, and base plate are assembled, the disconnecting plug specified in paragraph 7f(1) shall be located near the shearing groove of the coupling.

h. Painting. Paint for finish coat shall be high quality enamel suitable for the drying process used. The color shall conform to Federal Standard No. 595, Table X, Aviation Yellow, No. 13538. Paint for the prime coat shall be suitable for the metal treatment involved. The parts of the unit to be painted and the number of coats to be applied to the surfaces of each part are as follows:

(1) Base plate and mounting fitting on stake exterior surfaces--one prime and one finish coat.

(2) Supporting column, breakable coupling, and top fitting (fixture) exterior surfaces--one prime and one finish coat.

i. Parts List and Installation Instructions. A complete parts list and installation instructions shall be furnished with each new installation and with individual assemblies shipped for maintenance or replacement purposes. Sufficient drawings or illustrations shall be provided to indicate clearly the method of installation.

8. APPROVAL TESTING. One light fixture consisting of an optical system, lamp and socket mounted in a metal fitting, connecting leads, and mounting assembly shall be subjected to the physical tests described below, the performance requirements under paragraph 6, and the applicable detail requirements under paragraph 7.

a. The optical performance of the unit shall be determined by photometric readings taken with a clear lens and the 30 watt series lamp listed in paragraph 7c. The lamp shall be operated at, or corrected to, its rated lumen output on stabilized voltage or current. The curve, to determine photometric compliance, may be shifted a maximum of 1^{o} to either side, horizontally or vertically, with reference to the applicable specification curve. The maximum candela restriction indicated on Figure 1 shall apply from 0^{o} to 15^{o} above the horizontal.

b. Additional inspection 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. The manufacturer shall furnish a sample light fixture to a disinterested 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 lighting fixture 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.

a. In addition to the test performed by the above disinterested laboratory, the manufacturer shall:

(1) Furnish a production model to the Airports Service for physical inspection. Cost of submitting the production model shall be borne by the manufacturer.

(2) Furnish a certification of compliance from the lens manufacturer showing that the lenses conform to the detail requirements specified in paragraph 7, to the Airports Service for review and approval.

(3) Furnish certified factory test reports showing that the breakable coupling meets the static load requirements of paragraph 7g(1)(b). All tests of the breakable coupling shall be performed with the couplings screwed tightly in a base plate which has been bolted to a rigid foundation. For these tests, there shall be inserted in the breakable coupling a 16-inch length of round aluminum rod suitably turned down at one end to fit tightly in the breakable coupling. The load shall be applied at not more than 50 pounds per minute until the coupling breaks. It is required to test and break five couplings and use the average result obtained in determining the static load tests. The average breaking strength shall not exceed 400 pounds. A description of the test methods, together with test results, shall accompany the request for approval.

(4) Furnish parts list, installation instructions, and drawings to the Federal Aviation Agency, Airports Service, Washington, D.C. 20553, for review and approval.

b. Upon approval of the disinterested testing laboratory's test reports and the additional data required in paragraph 9a, which have shown satisfactory conformance to specification requirements, the Airports Service will list the name of the qualified manufacturer and a description of their light fixture in Advisory Circular 150/5345-1, Approved Airport Lighting Equipment.

c. 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 light fixtures 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 150/5345-20 CH 2, Specification for L-802 Runway and Strip Light, * from the Federal Aviation Agency, Printing Branch, HQ-438, Washington,* D.C. 20553.

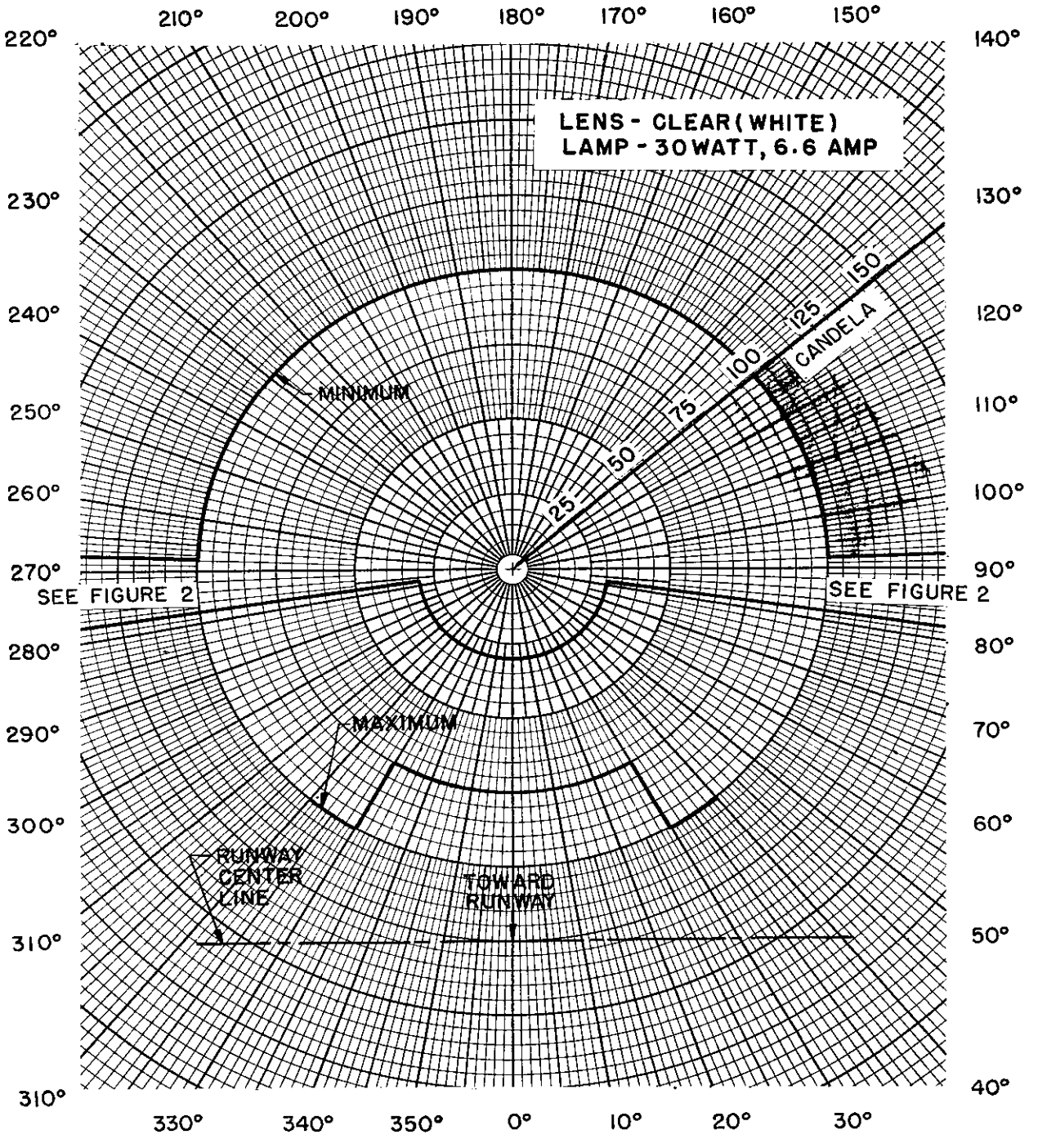


Figure 1. Horizontal Distribution Through Peak Of Beam

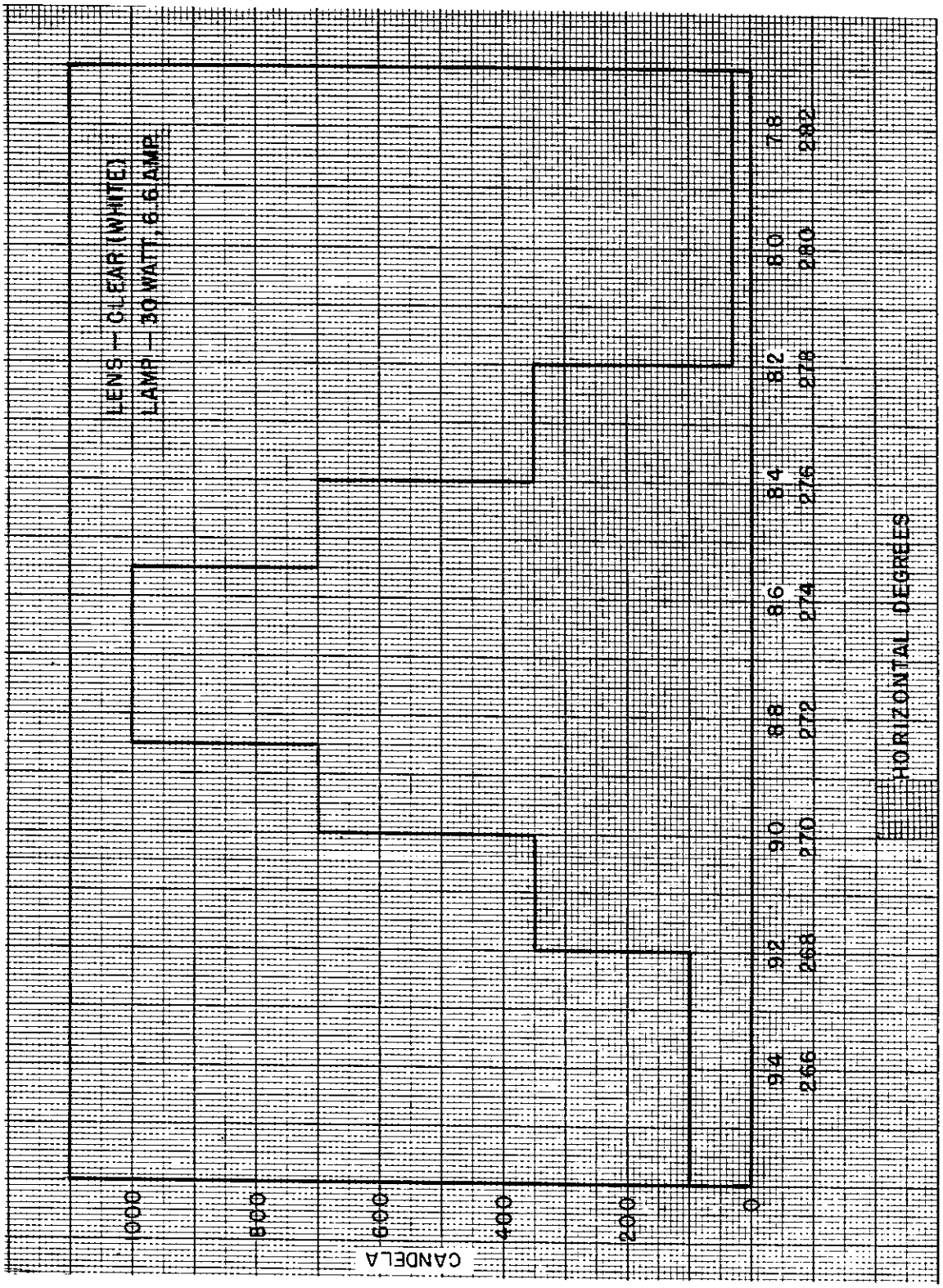


Figure 2. Horizontal Distribution Through Peak Of Beam

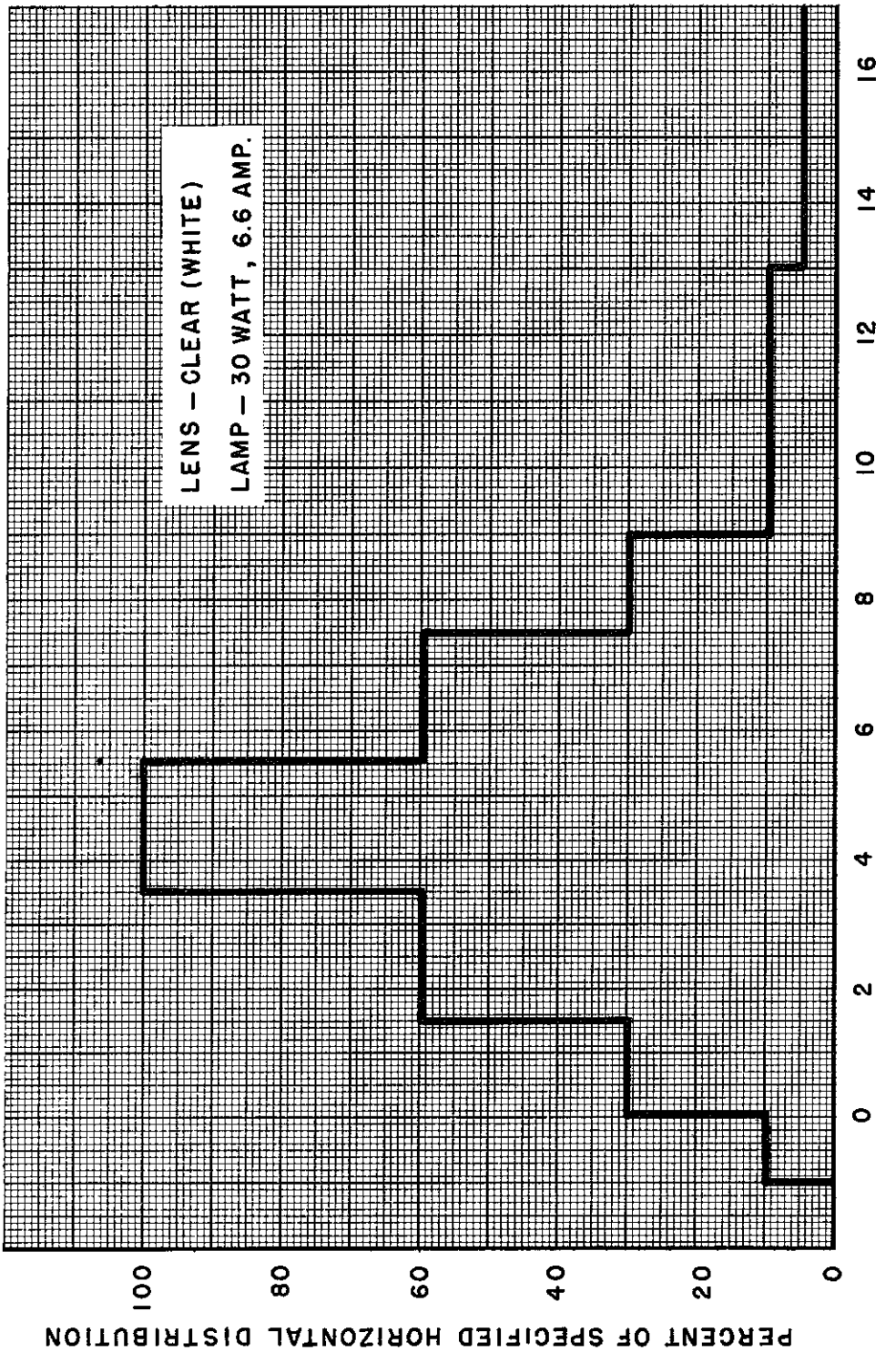


Figure 3. Vertical Distribution

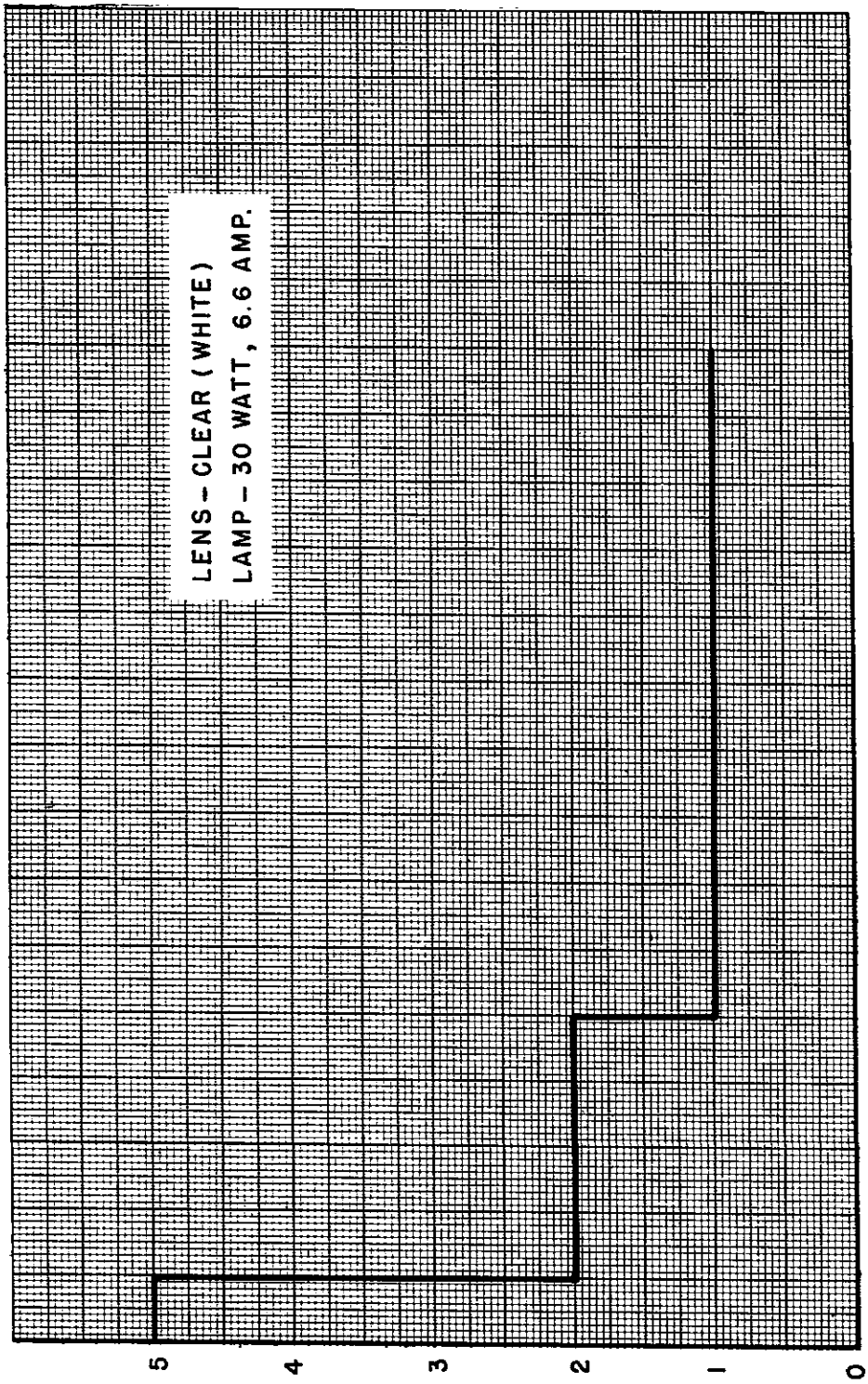
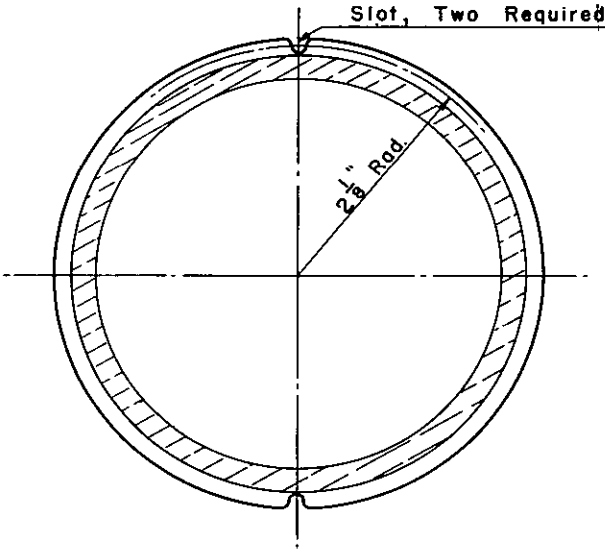
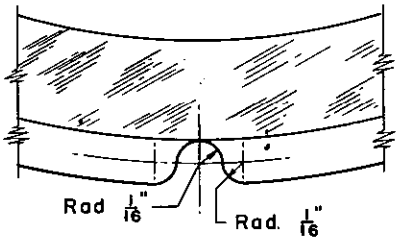


Figure 4. Vertical Distribution

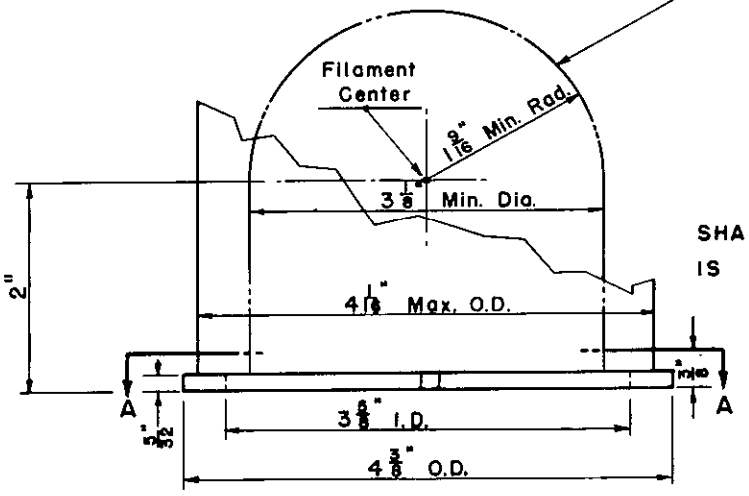


SECTION A-A



ENLARGED VIEW OF SLOT

INSIDE CLEARANCE ABOVE LINE A-A SHALL, NOT BE LESS THAN SHOWN BY PHANTOM LINE.



SHAPE ABOVE LINE A-A IS OPTIONAL

FIGURE 5

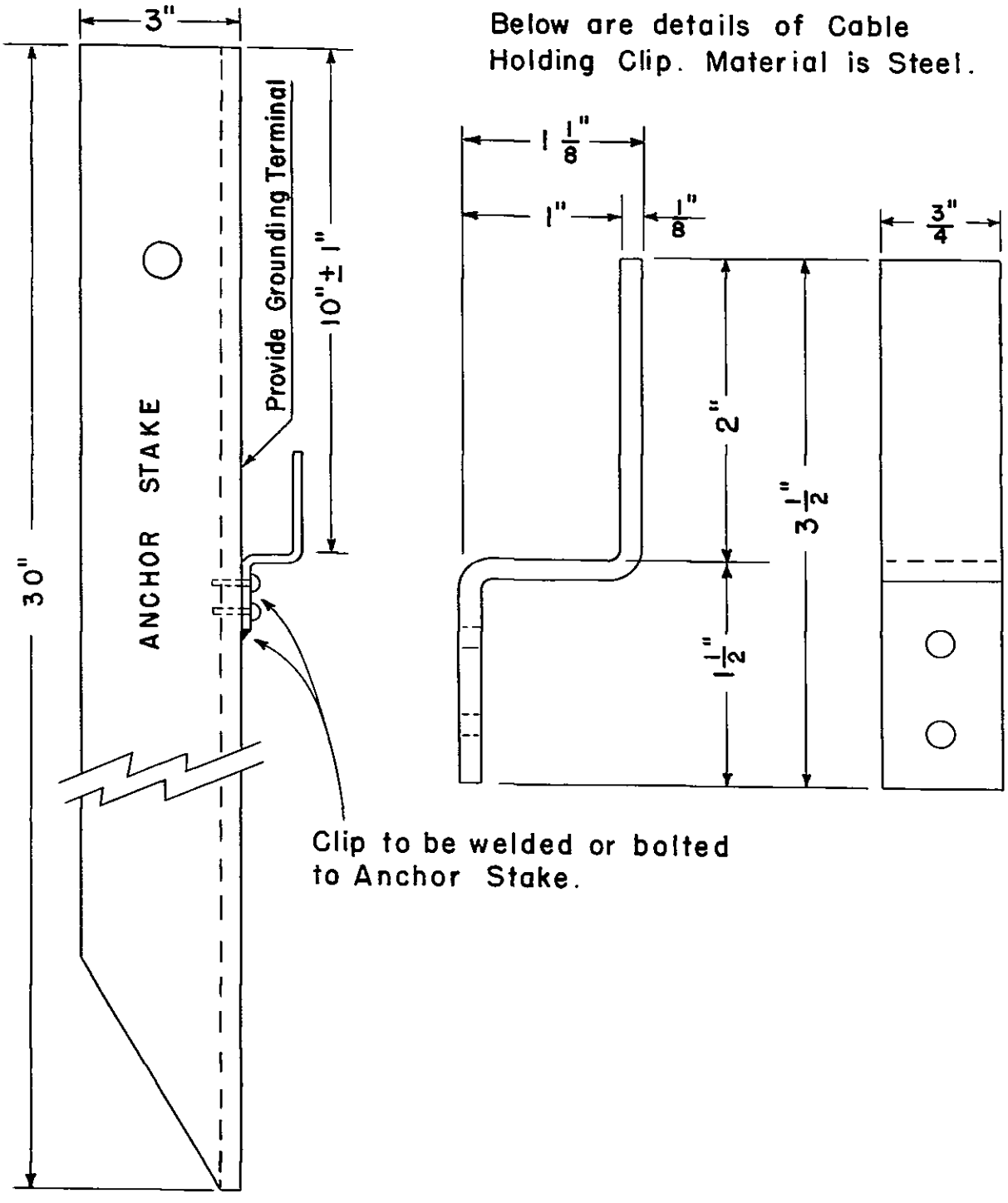


FIGURE 6 Cable Holding Clip For Anchor Stake

CHANGE

AC NO: 150/5345-20 CHG 4

DATE: 8/5/69

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: CHG 4 TO ADVISORY CIRCULAR 150/5345-20, SPECIFICATION FOR L-802 RUNWAY AND STRIP LIGHT

1. PURPOSE. This advisory circular change transmits page changes to the subject advisory circular. This change increases the wind velocity and changes the fixture leads.

2. EXPLANATION OF CHANGES. The wind velocity has been changed to 350 miles per hour on Page 3, Paragraph 6d(2). A two single-conductor lead has been added to Paragraph 7f(1), line 4, Page 4.

3. PAGE CONTROL CHART.

Remove Page	Dated	Insert Page	Dated
3	10/28/66	3	8/5/69
4	10/28/66	4	8/5/69

Clyde W. Pace, Jr.
Acting Director
Airports Service

Initiated by: AS-580

c. All current-carrying parts shall have a capacity of at least 10 amperes.

d. The unit shall be designed and constructed for continuous service under the following operating conditions:

(1) Temperature. Any ambient temperature from a minimum of -45° F. to a maximum of +120° F. at sea level.

(2) Weather. Continuous outdoor operation under all normal weather conditions, including wind velocities up to 350 miles per hour.*

7. DETAIL REQUIREMENTS.

a. Optical System. The optical system shall consist of a glass lens assembly and may include a reflector or a baffle shield. The lens shall have flange and inside minimum dimensions as shown in Figure 5. Lenses shall be fabricated from heat-resistant glass conforming to Military Specification MIL-C-7989, Class B. Color lenses or color screens shall conform to Military Specification MIL-C-25050, Type I, of the grade having the highest practical transmission.

b. Socket. The socket shall be the medium prefocus base type and shall be mounted rigidly in the metal fitting. The socket shall have a rating suitable for the service intended.

c. Lamps. A 30- or 45-watt series lamp, C-2V filament, T-10 clear bulb, 1-1/2 inch light center length, 3-15/16 inch maximum overall length, 1000 hour, medium prefocus base shall be used.

d. Fitting. All metal parts of the fitting shall be fabricated from nonferrous metal. Copper bearing hardware in contact with aluminum shall be cadmium, nickel, or zinc plated. Aluminum sand castings shall conform to Federal Specification QQ-A-601, Alloy 43 or 214, and aluminum die castings shall conform to Federal Specification QQ-A-591, Alloy 13, A13, or 360.

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(2) Provision shall be made to install and position the lamp and the socket with respect to the lens assembly to provide the light distribution specified in Figures 1, 2, 3, and 4.

e. Keying and Orientation.

(1) The lens assembly shall be keyed to the fitting to provide, at all times, the light distribution specified herein. The keying shall limit rotation to not more than 2^{o}.

(2) The outside of the fitting shall be marked to indicate correct orientation with respect to the runway or strip centerline. Provision shall be made for rotation of the fitting after installation to achieve correct orientation.

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(2) A cable clamp, or similar device, shall be provided in the fitting to secure the connecting lead assembly to prevent strain at the socket terminals.

g. Mounting Assembly. The mounting assembly shall consist of a breakable coupling, pipe column, and base plate or stake, as required. The overall height of the unit, mounted in place, shall not exceed 14 inches above ground level. All parts of the mounting assembly shall be made of nonferrous metal or ferrous metal protected against corrosion. Aluminum sand castings shall conform to Federal Specification QQ-A-601, Alloy 43 or 214, and aluminum die castings shall conform to Federal Specification QQ-A-591, Alloy 13, A13, or 360.

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(a) The column shall be one-inch National Electrical Code thin-wall steel conduit of the length required and shall conform to Federal Specification WW-C-563.