AC NO: 150/5345-46

DATE: July 11, 1975

ADVISORY CIRCULAR

SPECIFICATION FOR SEMIFLUSH AIRPORT LIGHTS

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

Initiated by: AAS-550

AC NO: 150/5345-46

DATE: July 11, 1975

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: SPECIFICATION FOR SEMIFLUSH AIRPORT LIGHTS

1. PURPOSE. This circular describes specifications for L-850 and L-852 semiflush light assemblies for use on airport runways and taxiways.

2. CANCELLATION. The following advisory circulars are cancelled:

   a. Advisory Circular 150/5345-37C, FAA Specification L-850, Light Assembly, Airport Runway Centerline and Touchdown Zone, dated June 27, 1972.

   b. Advisory Circular 150/5345-15, Specification for L-842 Airport Centerline Light, dated January 6, 1964.

   c. Advisory Circular 150/5345-16, Specification for L-843 Airport In-Runway Touchdown Zone Light, dated January 20, 1964.

   d. Advisory Circular 150/5345-17, Specification for L-845 Semiflush Inset Prismatic Airport Light, dated March 3, 1964.

   e. Advisory Circular 150/5345-19, Specification for L-838 Semiflush Prismatic Airport Light, dated May 11, 1964.

   f. Advisory Circular 150/5345-29A, FAA Specification for L-852, Light Assembly, Airport Taxiway Centerline, dated April 28, 1971.

3. REFERENCES. Publications that may be used in connection with this advisory circular are listed in paragraph 2 of the specification.

4. DESCRIPTION OF SPECIFICATION. This equipment specification establishes the performance requirements and pertinent construction details for omnidirectional, unidirectional, and bidirectional semiflush inset light assemblies to be used for lighting airport runways and taxiways.

Initiated by: AAS-550

5. EXPLANATION OF REVISION. Prior to publication of this circular, manufacturing specifications for semiflush lights were contained in six separate advisory circulars. This circular contains all equipment specifications for semiflush airport lights. Major additions include:

   a. The isocandela curves for runway edge and threshold lights and for omnidirectional taxiway lights.

   b. Dimensional requirements for these new classes of lights.

6. HOW TO OBTAIN THIS CIRCULAR. Additional copies of this advisory circular can be obtained, free of charge, from the Department of Transportation, Publications Section, TAD-443.1, Washington, D.C. 20590.

William V. Vitale

WILLIAM V. VITALE
Director, Airports Service

TABLE OF CONTENTS

1. SCOPE AND CLASSIFICATION.

1.1 Scope. - This specification covers semiflush lighting equipment to be used in airport runway and taxiway pavements.

1.2 Classification. - The two categories of semiflush lighting equipment covered by this specification are:

L-850 Runway Lights:
- Class A, Bidirectional Centerline Lights
- Class B, Unidirectional Touchdown Zone Lights
- Class C, Bidirectional Edge Lights
- Class D, Bidirectional Threshold Lights

L-852 Taxiway Lights:
- Class N-1, Narrow Beam Unidirectional
- Class N-2, Narrow Beam Bidirectional
- Class W-1, Wide Beam Unidirectional
- Class W-2, Wide Beam Bidirectional
- Class O, Omnidirectional, for Snow Areas
- Class Q, Omnidirectional, for No Snow Areas

2. APPLICABLE DOCUMENTS.

2.1 General. - The following documents, of the issue in effect on the date of application for qualification tests, form a part of this specification and are applicable to the extent specified herein:

2.1.1 FAA Specifications. - Copies of the following FAA specifications may be obtained from the Department of Transportation, Publications Section, TAD-443.1, Washington, D.C. 20590.

AC 150/5345-1, Approved Airport Lighting Equipment.

AC 150/5345-26, Specification for L-823 Plug and Receptacle, Cable Connectors.

AC 150/5345-42, FAA Specification L-857, Airport Light Bases, Transformer Housings, and Junction Boxes.

2.1.2 Military Specifications. - Copies of the following military specifications may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120, Attention: Code CDS:

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

MIL-C-25050, Color, Aeronautical Lights and Lighting Equipment, General Requirements for.

MIL-P-26915 (USAF), Primer Coating, Zinc Dust Pigmented, for Steel Surfaces.

MIL-STD-810B, Environmental Test Methods.

MIL-STD-889, Dissimilar Metals.

2.1.3 Federal Specifications. - Copies of the following Federal specifications may be obtained from the Business Service Centers of the General Services Administration Regional Offices:

QQ-Z-325, Zinc Coating, Electrodeposited, Requirements for.

QQ-P-416, Plating, Cadmium (Electrodeposited).

ZZ-R-765, Rubber, Silicone.

2.1.4 American Standard. - Copies of ASA B46.1-1962, Surface Texture, Waviness and Lay, may be obtained from the American National Standard Institute, 1430 Broadway, New York, New York 10018.

3. REQUIREMENTS.

3.1 Performance Requirements, L-850.

3.1.1 Photometric Output.

Class A - Figure 1
Class B - Figure 2
Class C - Figure 4
Class D - Figure 5

3.1.2 Lamp Rating. - The lamp(s) in each class of light top assembly shall be series lamp(s) having a nominal rating of 200 watts. They shall have a rated average life of at least 500 hours and shall have a 6.6 ampere filament.

3.1.3 Power Requirements. - In each class of top assembly, all current-carrying parts requiring insulation shall be insulated for at least 600 volts and shall have a current-carrying capacity of 1.5 times the normal operating current. The total input power to Class A or B lights shall not exceed 220 watts. Total input power to Class C or D lights shall not exceed 440 watts.

3.1.4 Base Requirements.

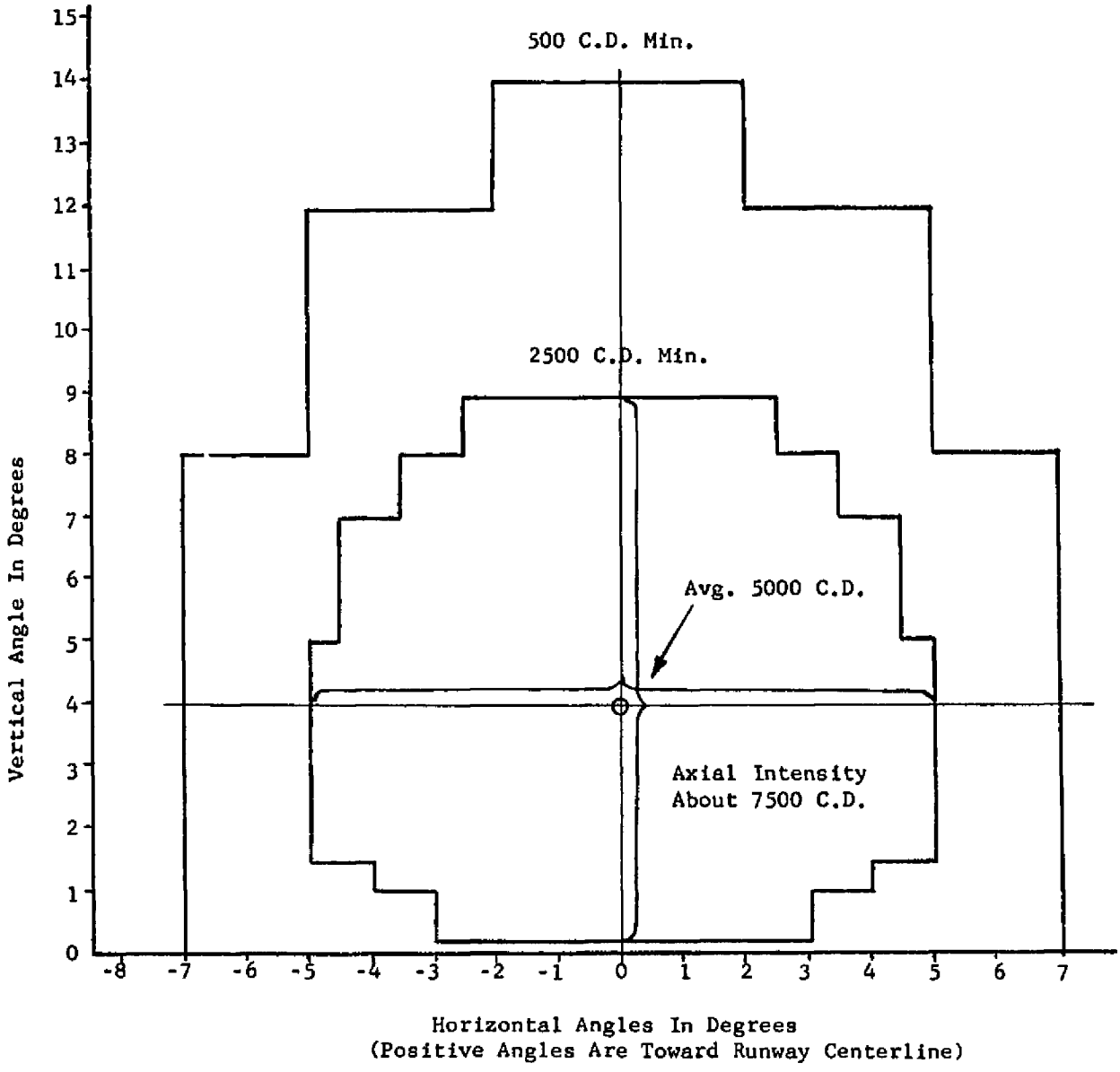
L-850-A -Bidirectional centerline light for use on a 12-inch (30.5 CM) diameter Type II L-857 base.

ERRATA SHEET

AC 150/5345-46 CHG 1, titled Change 1 to AC 150/5345-46, Specification for Semiflush Airport Lights, dated September 9, 1975, requires the following page changes:

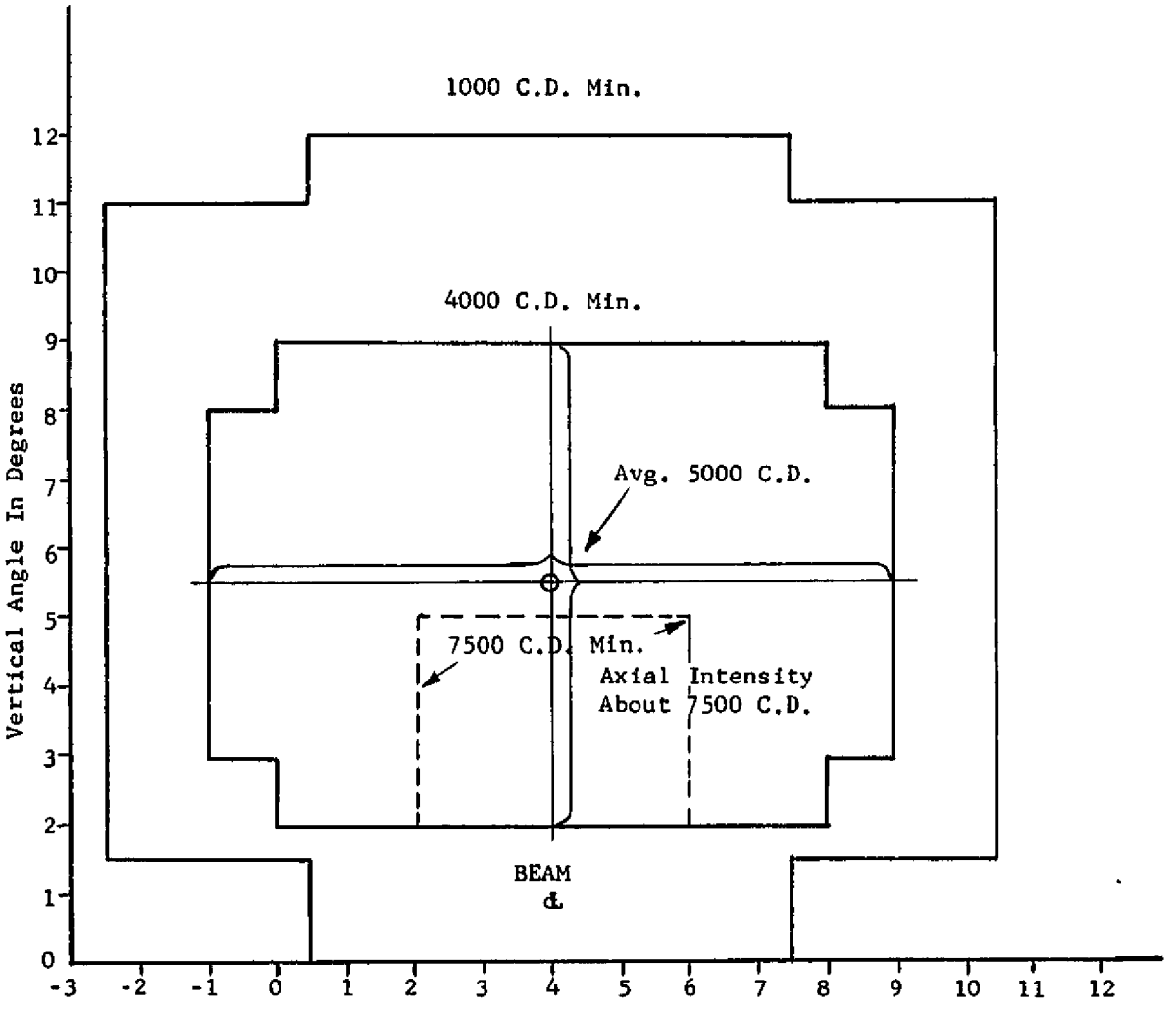
Remove Pages	Dated	Insert Pages	Dated
Appendix 1,		Appendix 1,	
Page 1 (Figure 4)	9/9/75	Page 1 (Figure 1)	9/9/75
Page 2 (Figure 2)	9/9/75	Page 2 (Figure 2)	9/9/75
Page 3 (Figure 3)	9/9/75	Page 3 (Figure 3)	9/9/75
Page 4 (Figure 1)	9/9/75	Page 4 (Figure 4)	9/9/75

Initiated by: AAS-503
11/20/75



NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

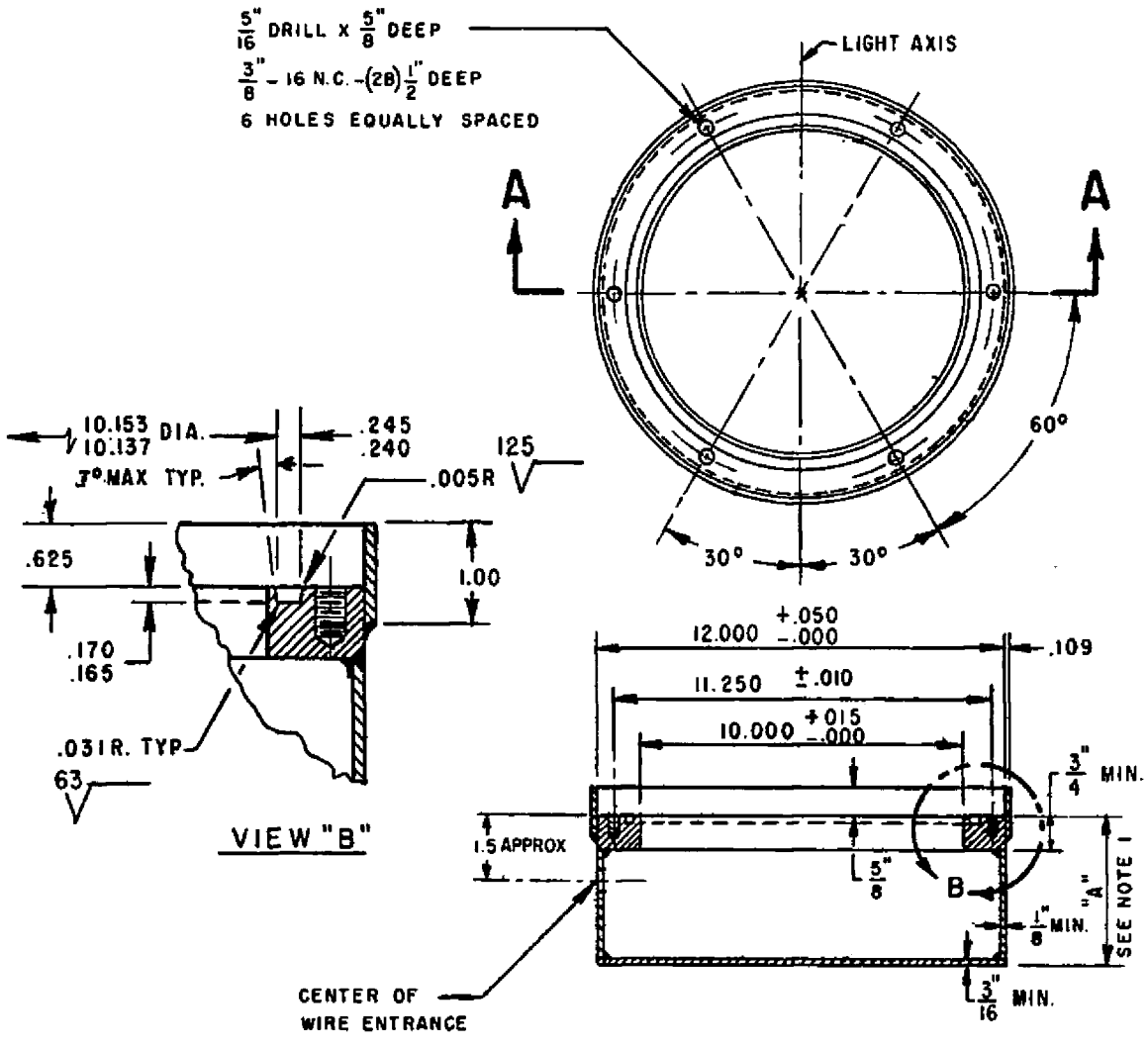
FIGURE 1. L-850-A ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT. (Bidirectional Top Assembly)



Horizontal Angles in Degrees (Positive Angle is Toward Runway Centerline).

NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

FIGURE 2. L-850-B ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT. (Unidirectional Top Assembly)

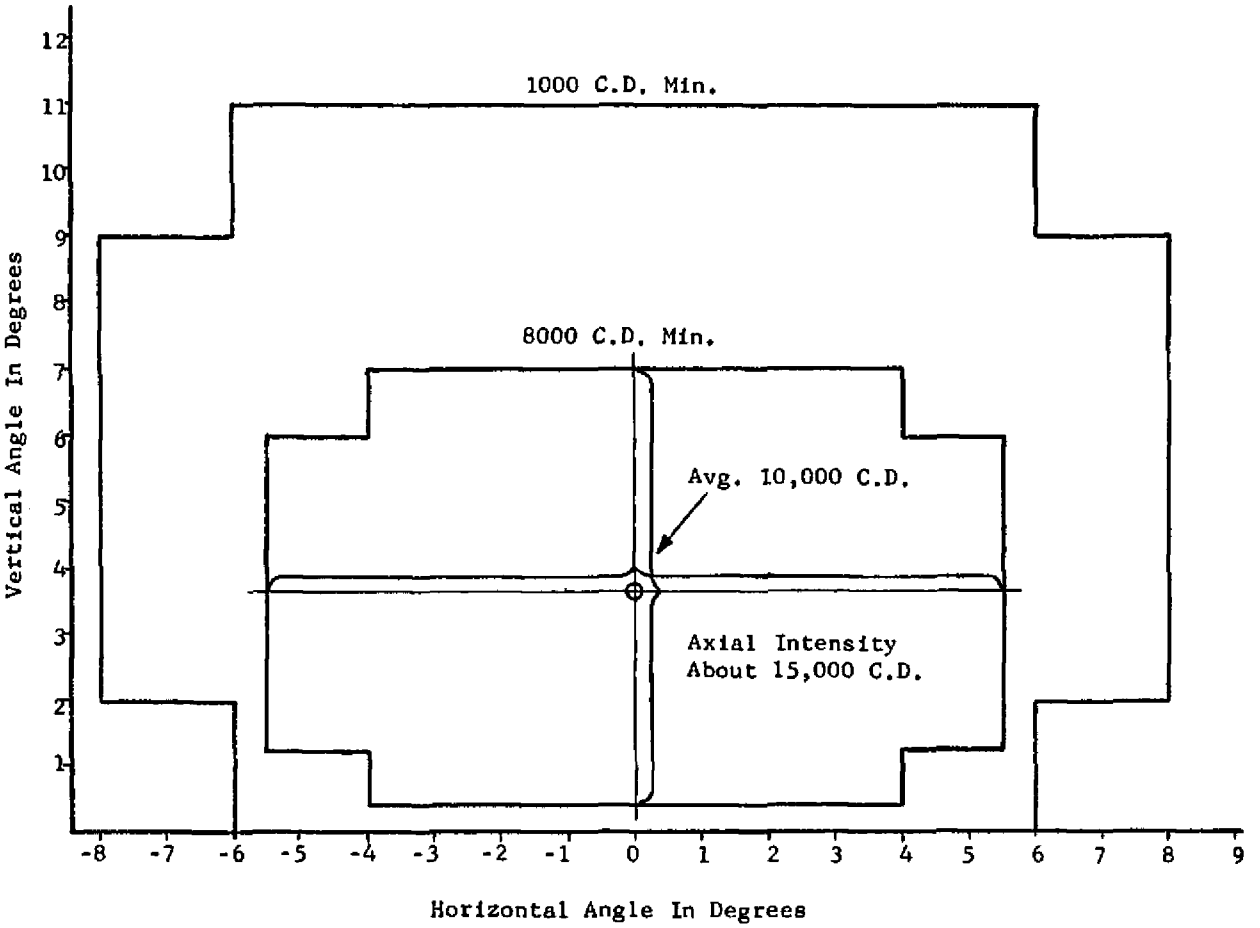


SECTION A-A

NOTES

1. STANDARD DIMENSION "A" $2.75^{+0.1}_{-0.0}$ DIMENSIONS MAY BE VARIED TO MEET SPECIAL CONDITIONS.
2. CLEAR INSIDE SPACE BELOW BOTTOM OF FLANGE SHALL BE NOT LESS THAN 11 INCHES IN DIAMETER, CONCENTRIC ABOUT THE CENTER OF THE BASE, WITH A DEPTH OF 1.75 INCHES FOR STANDARD BASE.
3. NORMAL MILL TOLERANCES OF MATERIAL WILL BE ACCEPTABLE.
4. THE BOTTOM SHALL BE FLAT, WITH NO UPWARD DEVIATION AND MAXIMUM DOWNWARD DEVIATION OF 0.25
5. WHERE NOT SPECIFIED, DIMENSIONS SHALL BE HELD WITHIN A TOLERANCE OF ±0.05.
6. THERE SHALL BE METAL TO METAL CONTACT BETWEEN THE TOP FITTING AND BASE RECEPTACLE.
7. ANTI ROTATIONAL AND ANTI UPLIFT PROTRUSION OR INDENTATION BE PROVIDED AS DESCRIBED IN PAR 3.5.2. .

FIGURE 3. RECEPTACLE



NOTE: 0° in horizontal axis corresponds to 3½° toe-in angle toward the runway centerline.

FIGURE 4. L-850-C ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.

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FEDERAL AVIATION ADMINISTRATION
Washington, D.C. 20591

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CHANGE

AC NO: 150/5345-46 CH 1

DATE: September 9, 1975

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: CHANGE 1 TO AC 150/5345-46, SPECIFICATION FOR SEMIFLUSH AIRPORT LIGHTS

1. PURPOSE. This change transmits figures which did not print clearly when the basic advisory circular was printed.

2. EXPLANATION OF CHANGE. Figures 1, 2, 4, 9, and 10 have been reprinted and transmitted by this change because some of the art work was illegible in the basic circular--no change has been made to the figures.

3. HOW TO OBTAIN ADDITIONAL COPIES OF THIS CHANGE. Additional copies of this Change 1 to AC 150/5345-46, Specification for Semiflush Airport Lights, may be obtained free of charge from the Department of Transportation, Publications Section, TAD-443.1, Washington, D.C. 20590.

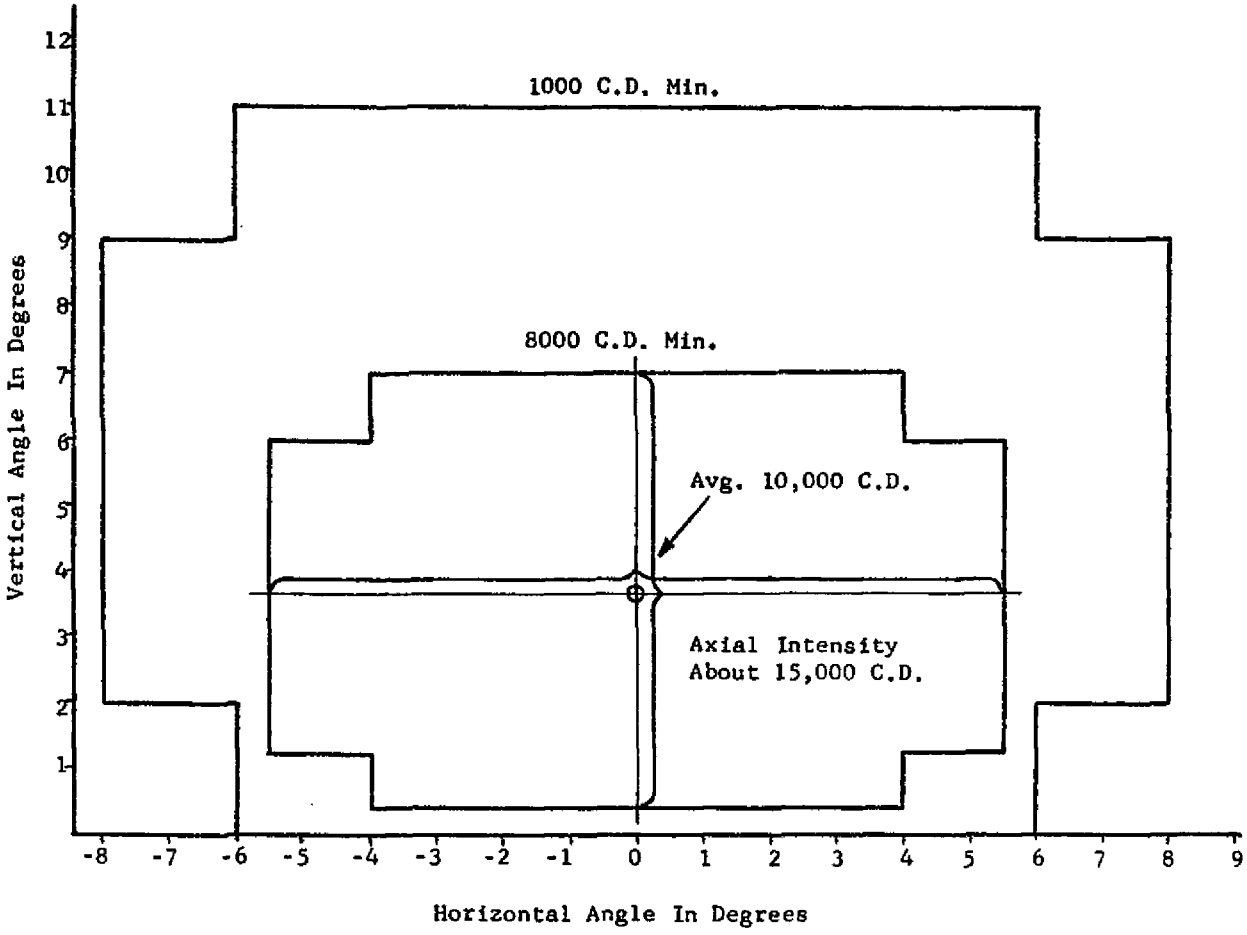
4. PAGE CONTROL CHART.

Remove Pages	Dated	Insert Pages	Dated
Appendix 1, Page 1	7/11/75	Appendix 1, Page 1	9/9/75
Page 2	7/11/75	Page 2	9/9/75
Page 3	7/11/75	Page 3	7/11/75
Page 4	7/11/75	Page 4	9/9/75
Page 9	7/11/75	Page 9	9/9/75
Page 10	7/11/75	Page 10	9/9/75

William V. Vitale

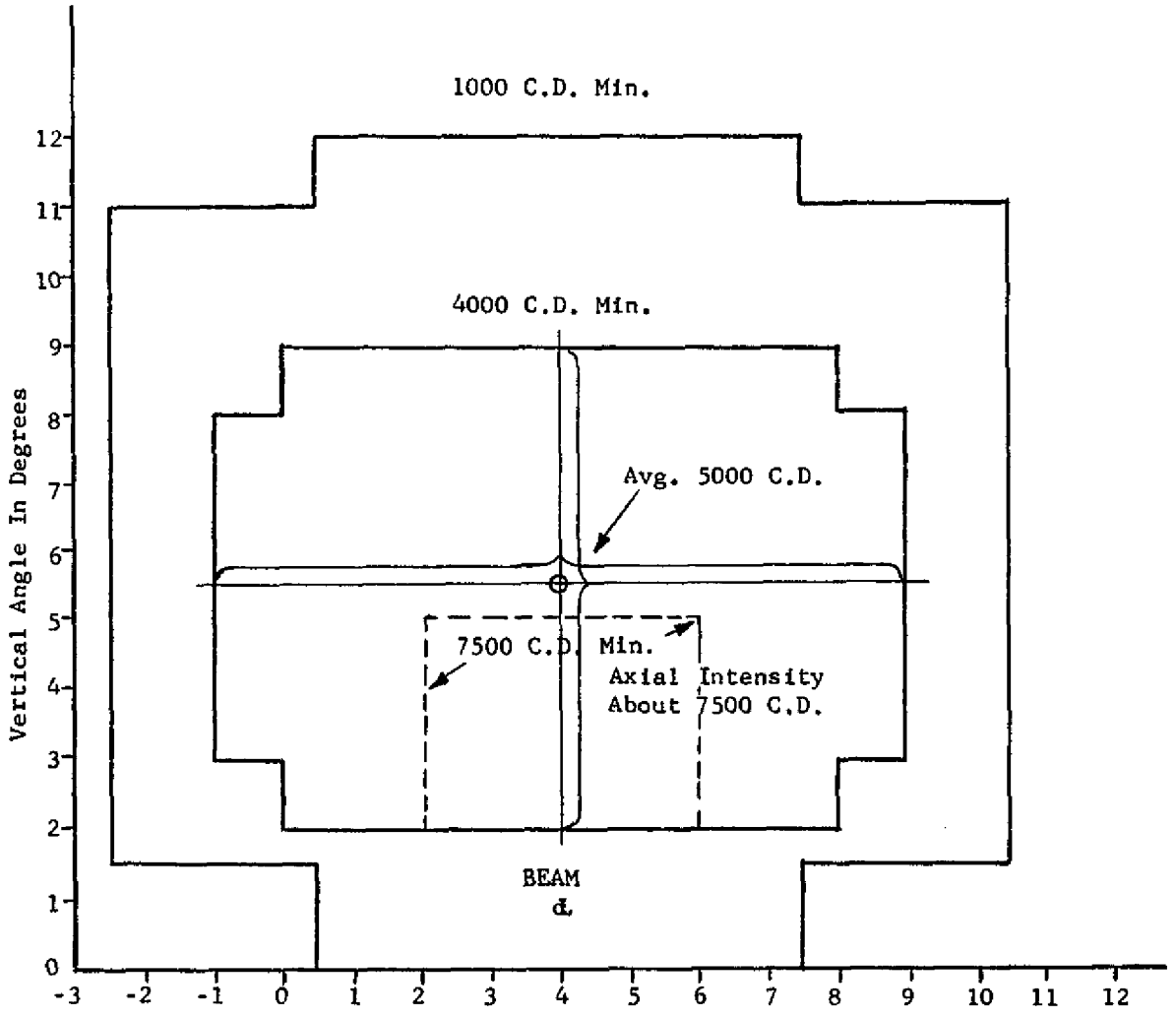
WILLIAM V. VITALE
Director, Airports Service

Initiated by: AAS-503



NOTE: 0° in horizontal axis corresponds to 3½° toe-in angle toward the runway centerline.

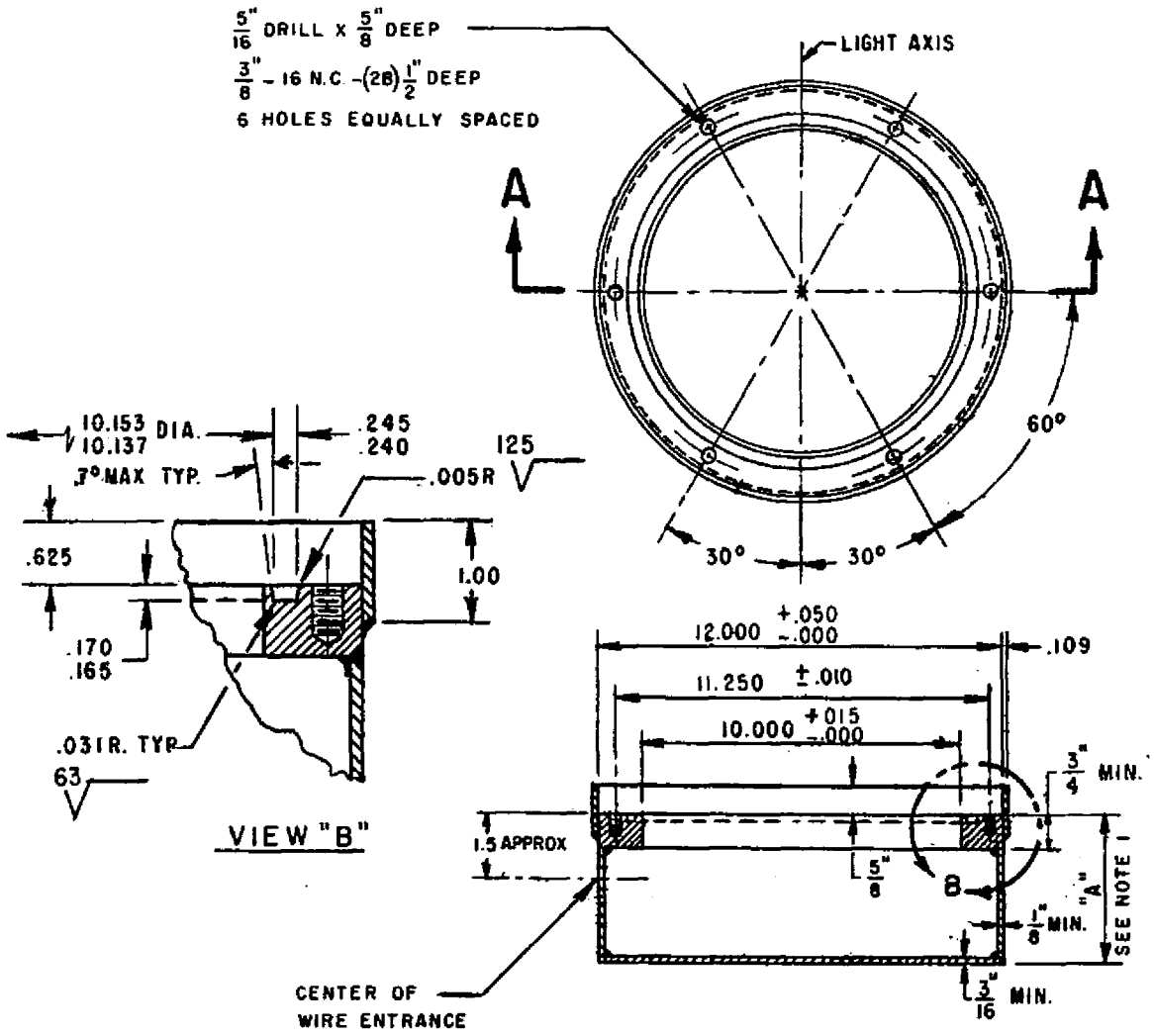
FIGURE 4. L-850-C ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.



Horizontal Angles in Degrees (Positive Angle is Toward Runway Centerline).

NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

FIGURE 2. L-850-B ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT. (Unidirectional Top Assembly)



SECTION A-A

NOTES

1. STANDARD DIMENSION "A" $2.75^{+0.1}_{-0.0}$ DIMENSIONS MAY BE VARIED TO MEET SPECIAL CONDITIONS.
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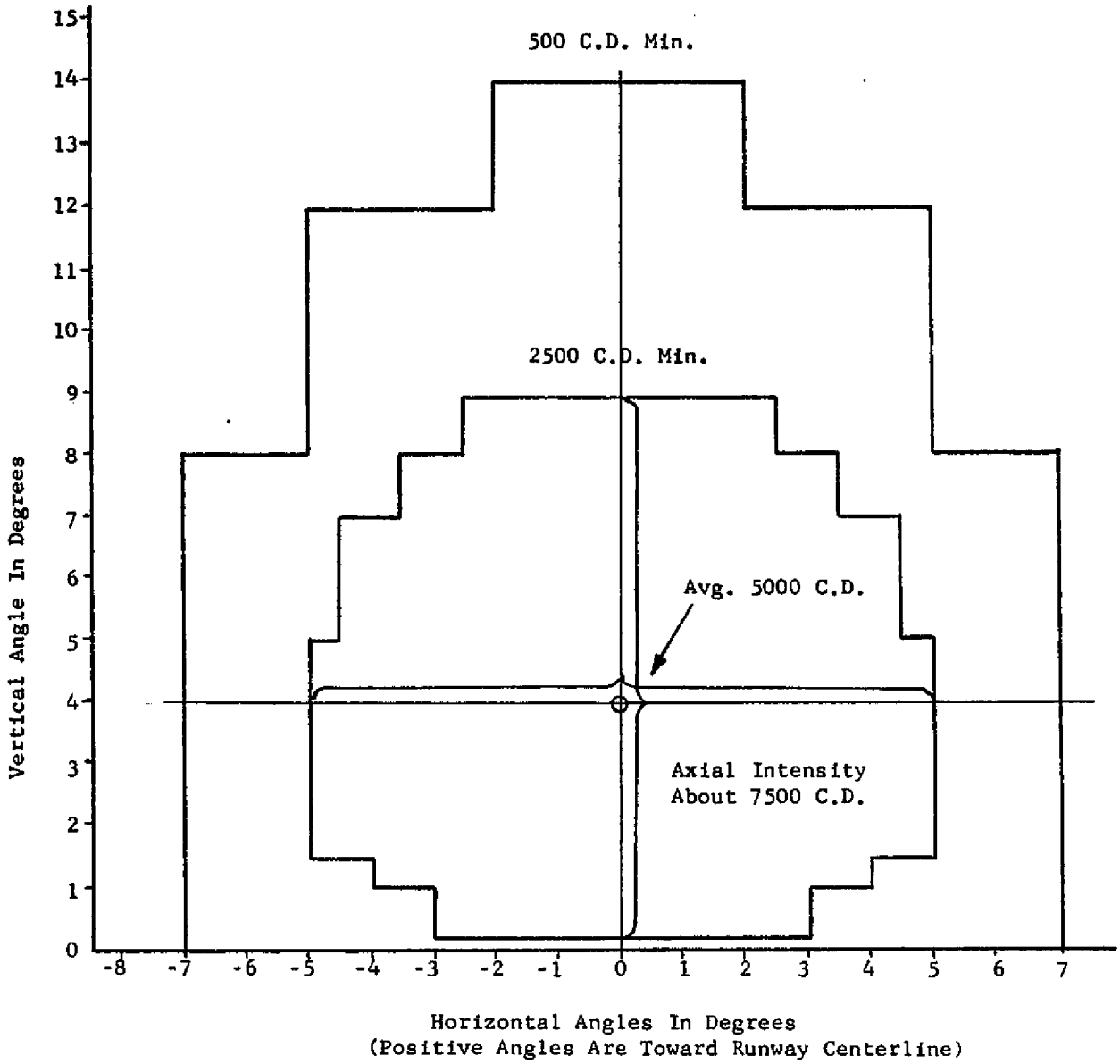
3. NORMAL MILL TOLERANCES OF MATERIAL WILL BE ACCEPTABLE.
4. THE BOTTOM SHALL BE FLAT, WITH NO UPWARD DEVIATION AND MAXIMUM DOWNWARD DEVIATION OF 0.25
5. WHERE NOT SPECIFIED, DIMENSIONS SHALL BE HELD WITHIN A TOLERANCE OF ±0.05.
6. THERE SHALL BE METAL TO METAL CONTACT BETWEEN THE TOP FITTING AND BASE RECEPTACLE.
7. ANTI ROTATIONAL AND ANTI UPLIFT PROTRUSION OR INDENTATION BE PROVIDED AS DESCRIBED IN PAR 3.5.2.

FIGURE 3. RECEPTACLE



NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

FIGURE 1. L-850-A ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT. (Bidirectional Top Assembly)

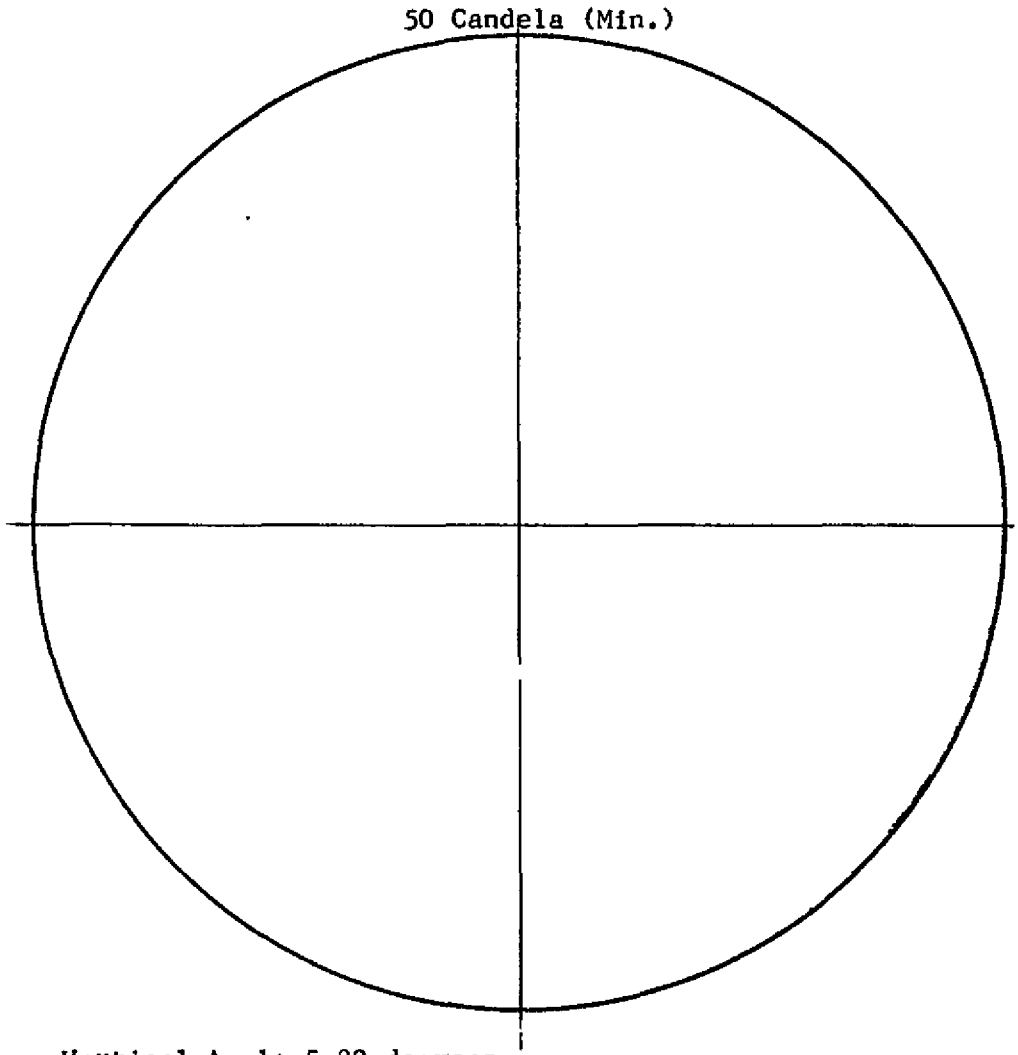
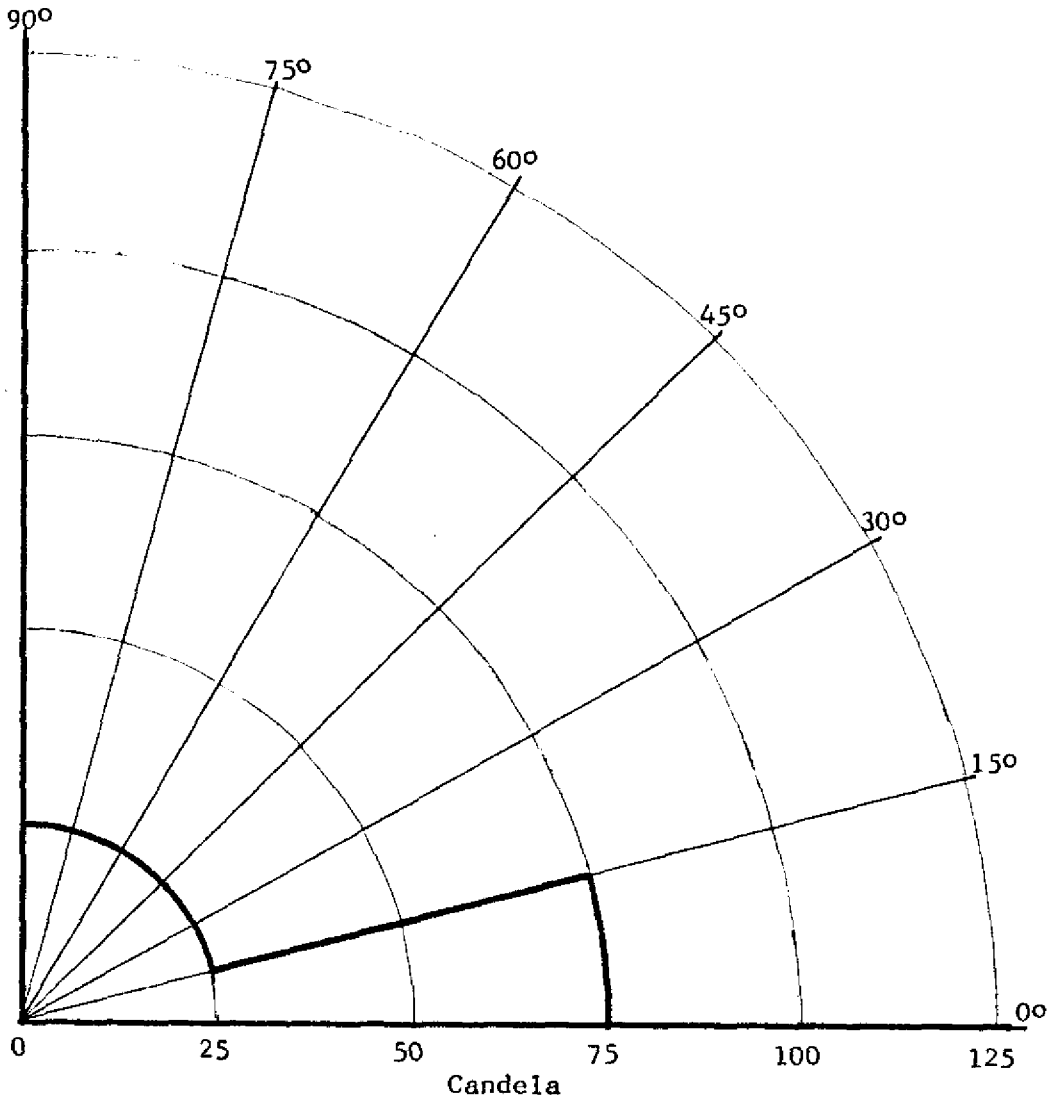


FIGURE 9. L-852-O ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.



Average Candela Output At Various Vertical Angles

NOTE: A 25 percent reduction of candela output is allowed at structural ribs.

FIGURE 10. L-852-Q ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1975— 632-444/550

AC 150/5345-46

CHANGE 2

DATE 7/16/79

ADVISORY CIRCULAR

CHANGE

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: Change 2 to SPECIFICATION FOR SEMIFLUSH AIRPORT LIGHTS--
Adds Unidirectional Threshold Light

1. PURPOSE. This Change adds a unidirectional threshold light for use with a medium intensity approach light system.

The Change number and date of changed material is carried at the top of each page. Changes are indicated by asterisks located in the margins. Pages having no changes retain the same heading information.

PAGE CONTROL CHART

Remove Pages	Dated	Insert Pages	Dated
i, 1, 2, 3, 4,	7/11/75	i, 1, 2, 3,	7/16/79
5, 6, 17, 18	7/11/75	4, 5, 6, 17	7/16/79
Appendix 1		18	7/11/75
5, 6	7/11/75	Appendix 1	
		5	7/11/75
		6, 6-1 (and 6-2)	7/16/79

William V. Vitale

WILLIAM V. VITALE
Acting Director
Office of Airport Standards

Suggest filing this transmittal at the back of the AC. It will provide a reference authority for changes, a method of determining that all Changes have been received, and a check for determining if the AC contains the proper pages.

Initiated by: AAS-200

TABLE OF CONTENTS

1. SCOPE AND CLASSIFICATION.

1.1 Scope. - This specification covers semiflush lighting equipment to be used in airport runway and taxiway pavements.

1.2 Classification. - The two categories of semiflush lighting equipment covered by this specification are:

L-850 Runway Lights:
- Class A, Bidirectional Centerline Lights
- Class B, Unidirectional Touchdown Zone
- Class C, Bidirectional Edge Lights
- Class D, Bidirectional Threshold Lights
- * Class E, Unidirectional Threshold Lights *

L-852 Taxiway Lights:
- Class N-1, Narrow Beam Unidirectional
- Class N-2, Narrow Beam Bidirectional
- Class W-1, Wide Beam Unidirectional
- Class W-2, Wide Beam Bidirectional
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2.1 General. - The following documents, of the issue in effect on the date of application for qualification tests, form a part of this specification and are applicable to the extent specified herein:

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AC 150/5345-26, Specification for L-823 Plug and Receptacle, Cable Connectors.

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MIL-C-25050, Color, Aeronautical Lights and Lighting Equipment, General Requirements for.

MIL-P-26915 (USAF), Primer Coating, Zinc Dust Pigmented, for Steel Surfaces.

MIL-STD-810B, Environmental Test Methods.

MIL-STD-889, Dissimilar Metals.

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QQ-P-416, Plating, Cadmium (Electrodeposited).

ZZ-R-765, Rubber, Silicone.

2.1.4 American Standard. - Copies of ASA B46.1-1962, Surface Texture, Waviness and Lay, may be obtained from the American National Standard Institute, 1430 Broadway, New York, New York 10018.

3. REQUIREMENTS.

3.1 Performance Requirements, L-850.

3.1.1 Photometric Output.

Class A - Figure 1
Class B - Figure 2
Class C - Figure 4
Class D - Figure 5
* Class E - Figure 5-1 *

3.1.2 Lamp Rating. - The lamp(s) in each class of light top assembly shall be series lamp(s) having a nominal rating of 200 watts. They shall have a rated average life of at least 500 hours and shall have a 6.6 ampere filament.

3.1.3 Power Requirements. - In each class of top assembly, all current-carrying parts requiring insulation shall be insulated for at least 600 volts and shall have a current-carrying capacity of 1.5 times the normal operating *current. The total input power to Class A, B, or E lights shall not exceed 330 watts. Total input power to Class C or D lights shall not exceed 440 * watts.

3.1.4 Base Requirements.

L-850-A -Bidirectional centerline light for use on a 12-inch (30.5 CM) diameter Type II L-857 base.

L-850-AS - Bidirectional centerline light for use on a shallow inset base (shown in Figure 3).

L-850-B - Unidirectional touchdown zone light for use on a 12-inch (30.5 CM) diameter Type II L-857 base.

L-850-BS - Unidirectional touchdown zone light for use on a shallow inset base (shown in Figure 3).

L-850-C - Bidirectional edge light for use on a 15-inch (38 CM) diameter Type II L-857 base or for retrofitting on the former L-837 16-inch (40.6 CM) diameter base.

L-850-D - Bidirectional threshold light for use on a 15-inch (38 CM) diameter Type II L-857 base or for retrofitting on the former L-837 16-inch (40.6 CM) diameter base.

* L-850-E - Unidirectional threshold light for use on a 15-inch (38 CM) diameter Type II L-857 base. *

3.2 Performance Requirements - L-852.

3.2.1 Intensity Distribution. - When the lamp in the light assembly is operated at rated current and all components have reached normal operating temperatures, each light beam shall meet its respective intensity distribution requirements as shown in Figure 7, 8, 9, or 10.

3.2.2 Lamp Rating. - The lamp in each class of light top assembly shall be a 6.6 ampere series lamp having a nominal rating of 65 watts for the L-852-W, 45 watts for the L-852-N, and 100 watts for the L-852-O and L-852-Q. All lamps shall have a rated average life of at least 1,000 hours. Requirements for Category III landing minima may alter these specifications.

3.2.3 Power Requirements. - In each class of top assembly, all current-carrying parts requiring insulation shall be insulated for at least 600 volts and shall have a current carrying capacity of 1.5 times the normal operating current.

3.2.4 Base Requirements.

Type I Light Assembly - 8-inch (20.3 CM) diameter for inset directly in the pavement.

Type II Light Assembly - 8-inch (20.3 CM) diameter for installation on a shallow inset base (shown in Figure 6).

Type III Light Assembly - 10-inch (25.4 CM) diameter for installation on a 10-inch (25.4 CM) Type II L-857 base.

Type IV Light Assembly - for installation on a 12-inch (30.5 CM) diameter Type II L-857 base or shallow inset base (shown in Figure 3).

L-852-N and L-852-W shall be manufactured as Type I, II, III or IV.

L-852-O and L-852-Q shall be manufactured as Type III or IV.

3.3 Environmental Conditions. - Each class and type of light assembly shall be capable of performing satisfactorily under the following conditions:

3.3.1 Temperature. - Temperature which ranges from +55° C. to -55° C. See paragraphs 4.1.4 and 4.1.6.

3.3.2 Temperature Shock. - Temperature shock as required in paragraph 4.1.3.

3.3.3 Humidity. - Relative humidity up to 100 percent including conditions where condensation takes place in the form of both water and frost. See paragraph 4.1.10.

3.3.4 Vibration. - Vibration as required in paragraph 4.1.1.

3.3.5 Static Load. - Static load as required in paragraph 4.1.13.

3.3.6 Shock Test. - Mechanical shock as required in paragraph 4.1.11.

*3.3.7 Hydraulic Impact. - The L-850A, B, and E light units shall be designed to withstand, without damage, hydraulic pressures which may be formed by aircraft tires moving at high speeds during operations in wet weather. See paragraph 4.1.12. *

3.4 Design Requirements for Light Assemblies.

3.4.1 Top Assembly. - The metal components for top assembly, excluding bolts, nuts, and washers which are specified elsewhere, shall be fabricated from a ferrous metal capable of meeting the load requirements. Steel having a minimum tensile strength of 50,000 p.s.i. (3515 kgs./sq. cm) and a minimum hardness of 163 Brinell has been used successfully. In areas of heavy snows, the procuring agency may specify that the minimum tensile strength and hardness be increased to Rockwell C 40-50 if suitable precautions are taken to avoid low temperature brittleness. Pry bar slots, indentations, or other suitable provisions shall be made for prying or jacking the top assembly free of the base receptacle when the light assembly is installed in the pavement.

3.4.1.1 Dimensional Requirements - L-850 Light Assemblies.

3.4.1.1.1 Class A and B Light Assemblies. - The principal critical dimensions of the Class A and B top assemblies shall be as listed in this

paragraph and as shown in Figure 3. The outside diameter of the upper portion of the top assembly shall be 11.94 inches, (30.33 CM) ± 0.05 inch (.13 CM). As its outer diameter, the overall thickness of the flange portion that rests on the base flange shall be 0.75 inch (1.90 CM) ± 0.05 inch, (.13 CM).

The top assembly flange shall have a portion extending at least 1/4 inch down into the base receptacle to restrict side motion and resist shear action when the unit is struck. The diameter of this extension into the base receptacle shall be 9.94 inches (25.25 CM) +0.00 inch (.00 CM) -0.01 inch (.025 CM). The protrusion into the base receptacle shall contain no fillet or other obstruction to prevent metal-to-metal seating of the bearing surface on the base receptacle. No part of the top assembly shall be more than 1.25 inches (3.18 CM) above the bearing surface of the flange.

All interfaces of the top assembly and base receptacle shall be machined to the same finish as shown in Figure 3. The flange of the upper portion of the top assembly shall have 6 bolt holes equally spaced 60 degrees apart on a bolt-hole diameter of 11.25 inches (28.57 CM), ± 0.01 inch (.025 CM). The bolt holes shall be counterbored or recessed so that the resultant thickness of metal left between the bottom of the counterbored holes and the underneath flange surface is 0.40 inch (1.02 CM) ± 0.015 inch (.038 CM). The bolt holes shall each be 7/16 inch (1.11 CM) in diameter and untapped except for 2 of the bolt holes, 180 degrees apart, which shall be provided with 1/2-13 inch threads for lifting the top assembly. The counterbored holes shall be of sufficient diameter to permit easy removal of the bolts with a standard socket wrench. The light channel(s) shall be centered between the bolt holes. The light channels for the Class A top assembly shall be oriented so that the centers of the two light beams emitted are 180 degrees apart.

The external portion of the top surface extending above the pavement shall be smoothly sloped upward from the edges at angles not exceeding 12 degrees in the direction parallel to the light channel(s) and not exceeding 15 degrees in all other directions. These maximum slope angles shall not apply to the light channels, optical windows, and such indentations as bolt-hole recesses.

The top assembly may be provided with an external rib or other suitable means in the area of the lens(es) to mitigate damage to the head assembly due to action of snowplow blades and aircraft tailhooks.

3.4.1.1.2 Class C, D, and E Light Assemblies. - The Class C, D, and E light assemblies shall be 17.25 inches (43.81 CM) in diameter, ± 0.09 inch (0.23 CM) and have a mounting ring which has six 7/16-inch diameter holes on a 14.25-inch (36.19 CM), ± 0.010-inch (0.025 CM) diameter bolt circle suitable for mounting to a L-857 15-inch (38.10 CM) Type II base receptacle. The mounting ring shall also have a portion extending at least 0.25 inch (0.635 CM) down into the receptacle. The diameter of this extension shall be 12.25 inches (31.11 CM), ± 0.010 inch (0.025 CM). The protrusion into the L-857 base shall contain no fillet or other obstruction to prevent

metal-to-metal seating. At its outer diameter, the overall thickness of the flange portion that rests on the L-857 base shall be 1.25 inches (3.175 CM), ± 0.06 inches (0.152 CM).

*The top assembly of the Class C, D, and E lights shall be a sealed unit capable of being easily inserted and removed from the mounting ring. It shall be capable of resisting all static and dynamic wheel loads without damage. The optical head shall attach to the mounting ring by means of at least six 3/8-inch -16 N.C. bolts on an 11.250-inch (28.57 CM), ± 0.010 inch (0.025 CM) diameter bolt circle. The bolt holes shall be located so that four of the holes will be located 30 degrees from an axis which would be perpendicular to the runway centerline. The remaining two bolts will be 60 degrees from the other bolts on a line parallel to the runway *centerline. Class C, D, and E lights only may protrude 1 inch (2.5 CM) above the pavement surface. *

3.4.1.2 Dimensional Requirements - L-852.

3.4.1.2.1 Type I Light Assembly. - The Type I light assembly shall not require a mounting base for installation in the pavement. The outside diameter shall be 7.94 inches (20.17 CM), ± 0.09 inch (0.23 CM). At the periphery, the depth shall be 1.050 inch (2.67 CM), ± 0.050 inch (0.127 CM). As required, the top surface of the light assembly may slope upwards from the periphery so as to form a maximum protrusion of 0.375 inch (0.95 CM) above the adjacent paved surface when properly installed in the pavement. In forming the permissible 0.375-inch (0.95 CM) rise of the convex top surface, the maximum upward slope of any portion of the top surface, excluding bolt holes, light channels, and recesses for lenses and lens faces, shall not exceed 12 degrees.

3.4.1.2.2 Type II Light Assembly. - The Type II light assembly shall require a mounting base, as shown in Figure 3 of this specification, for installation in the pavement. The diameter and the top surface contour requirements shall be identical to those of the Type I light assembly. The thickness measured at the periphery of the Type II light assembly, or fixture, shall be 0.75 inch (1.90 CM), ± 0.05 inch (0.127 CM) and there shall be a cylindrical protrusion of .25 inch (0.635 CM) to .30 inch (0.762 CM) downward into the mounting base to restrict shear action and side motion with respect to the mounting base. The diameter of this protrusion into the mounting base shall be 6.52 inches (16.56 CM), +0 inch (0 CM) - 0.02 inch (0.05 CM). The inside fillet formed by the protrusion shall have a maximum radius of 1/32 inch (0.08 CM). The mating surfaces between fixture and mounting base shall be smooth and free from burrs or other obstructions that would prevent satisfactory metal-to-metal seating of the bearing surfaces. In unbolted condition, the seating of fixture on mounting base shall be firm, solid, and without discernible rocking motion when subjected to hand pressure. The flange of the fixture assembly shall have four bolt holes spaced as shown in Figure 3. Each hole shall be

receptacle having a suitable means for pressurizing and all bolts torqued to the manufacturer's specifications. Prior to performing this test, the two wire leads shall be subjected to a 30-pound (13.6 KG) tension for 5 minutes to test the integrity of the seal where the leads enter the base receptacle. With a minimum internal pressure of 20 p.s.i. (1.41 KG/Sq. CM), the assembled unit shall be tested using a bubble test material (high foam detergent producing a low-surface tension). The assembly shall be considered watertight if no air bubbles appear.

4.1.10 Humidity Test. - The light assembly shall withstand a humidity test conducted in accordance with Procedure III of MIL-STD-810B for 360 hours. Any evidence of damage, rusting, or corrosion shall be cause for rejection.

* 4.1.11 Shock Test. - For L-850A, B, and E only, the assembled unit shall be mounted rigidly on either a 1-inch-thick (2.5 CM) steel plate or a 4-inch (10 CM) or thicker concrete base. The dimensions of the steel or concrete base shall be at least 3x3 feet (1x1 Meters). The light fixture shall be turned on at full brightness for at least 2 hours prior to starting the test. With the light still on at full brightness, a steel ball weighing 5 pounds (2.27 KG) shall be dropped at the center of the top assembly from a height of 6 feet (1.83 Meters). The steel ball shall be dropped 10 times on the light fixture with a 5-minute interval between each drop. Upon conclusion, the light fixture shall be opened to determine if the optical assembly has been damaged or any component displaced in any way.

4.1.12 Hydraulic Impact Test. - For L-850A, B, and E only, the light assembly shall be submerged in water to a depth of approximately 1/2 inch (1.27 CM). 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 (4.54 CM) diameter piston. The chamber shall be filled with water and purged of all air. A 5-pound (2.27 KG) steel ball shall be dropped 6 feet (1.73 Meters) onto the steel piston. 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. *

4.1.13 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 (1360 KG) 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.

4.1.14 Lamp Bypass Test. - The light assembly shall be subjected to a test as described below to determine if the lamp bypass device (incorporated in the fixture) will immediately close an auxiliary circuit around the lamp when its filament opens.

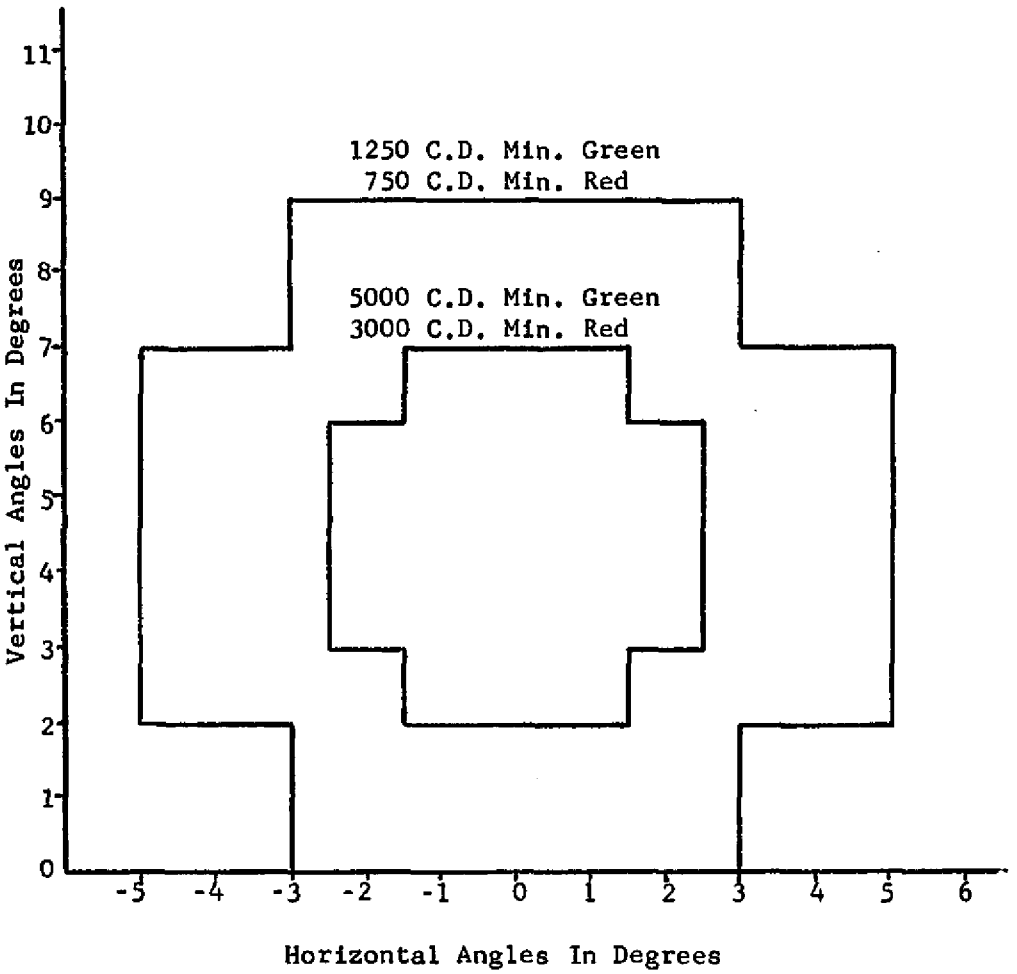
4.1.14.1 L-850 Light Assemblies. - Lamp bypass equipment will be tested to demonstrate the ability to operate at 6.6, 5.2, 4.1, 3.4, and 2.8 amperes within 5 seconds. The source of energy for testing the bypass device shall be the output of an isolation transformer; the size (rating) of the transformer shall be that which is normally used with the lamp.

4.1.14.2 L-852 Light Assemblies. - Two L-852-O or -Q light units, three L-852-W light units or four L-852-N light units shall be assembled to simulate actual operating procedures and connected across the secondary of a 200-watt, Specification L-834 transformer. The primary of the 200-watt transformer shall be connected to a constant current supply. An open lamp filament shall be simulated under the following conditions:

With 6.6 amperes flowing through the primary of the transformer for a minimum of 3 hours, disconnect a lamp in one fixture. The bypass device shall operate within a 5-second period. Without de-energizing the circuit, reduce the current to 4.8 amperes and disconnect a lamp in one of the remaining fixtures. The bypass device shall operate within a 5-second period. With the circuit de-energized, restore the circuit to its original state of readiness, disconnect the lamp in one fixture, set constant current supply for 4.8 amperes output level, and then energize the circuit. The bypass device shall operate within a 5-second period. Repeat the above procedure with the constant current supply set for 6.6 amperes.

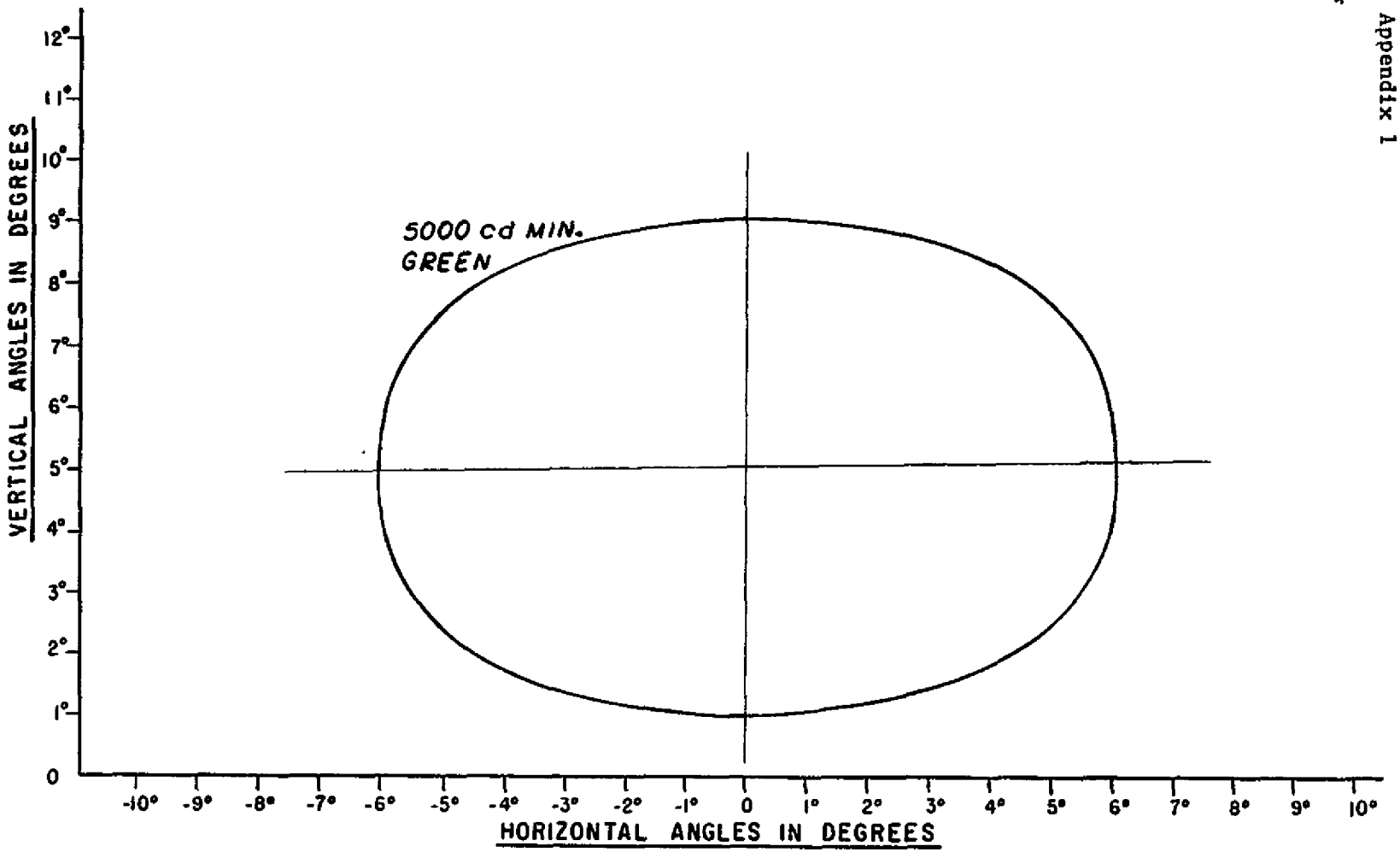
4.1.15 Surface Temperature Test. - Tests shall be conducted with each type of light unit to assure that maximum temperature on top of the inset light will not exceed 160° C. (320° F.) when the light is covered with the tire of a heavy ground vehicle for a period of 10 minutes. The light unit shall be operated at high intensity for at least 2 hours, before this 10-minute test period, in still air whose ambient temperature is 25° C. (77° F.). The thermocouple shall be located between the hottest point of the lamphead and the tire to register the test temperature.

4.2 Production Testing. Each class of top assembly shall be subjected to photometric and leakage tests. In the photometric tests, the applicable top assembly shall meet the intensity distribution requirements of the appropriate figure of Appendix 1. 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 4.1.9. 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. (1.41 KG/Sq. CM). 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



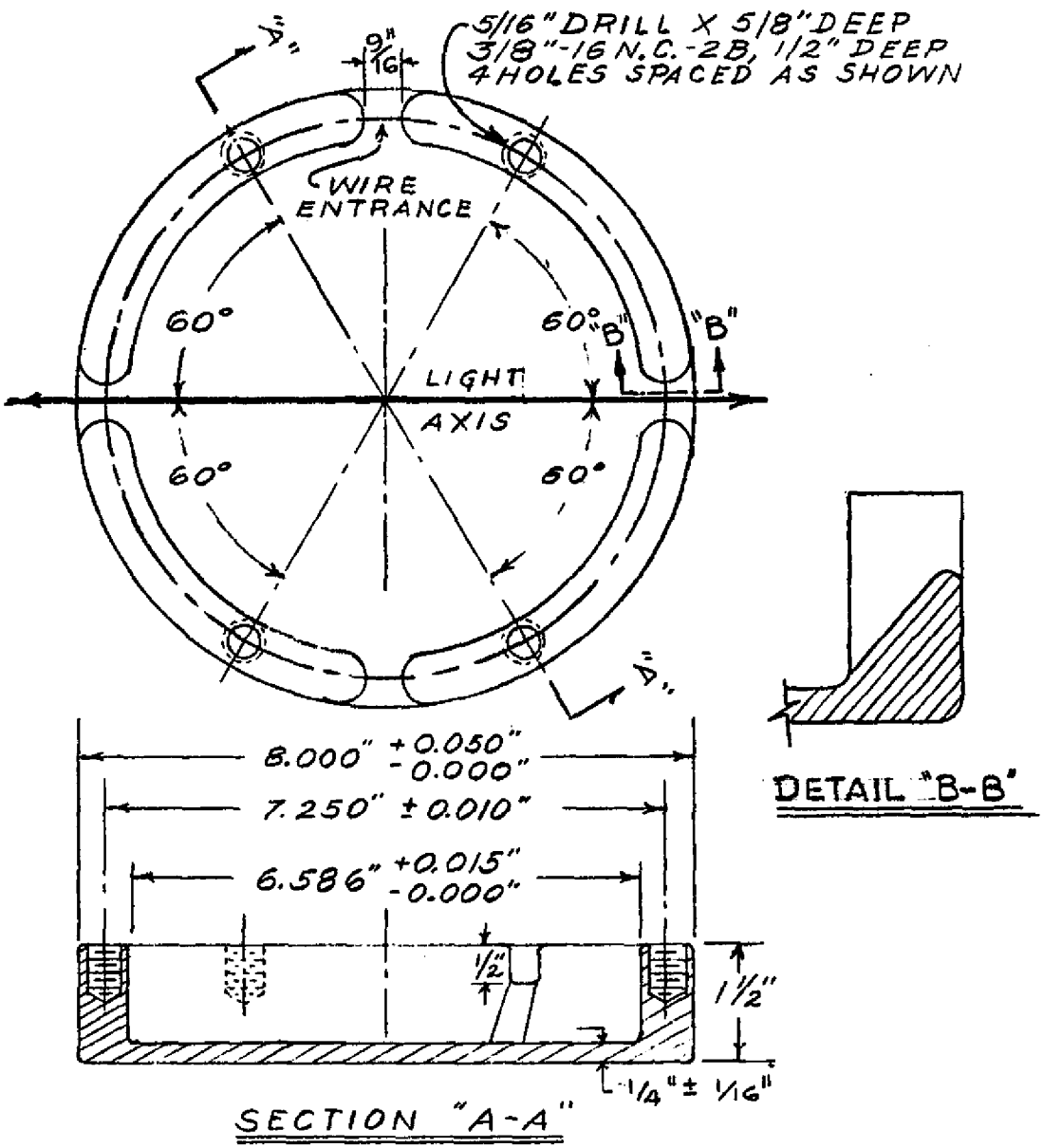
NOTE: Photometric measurements must be made in the actual aviation color required after a fifteen minute warm-up period at full rated power.

FIGURE 5. L-850-D ISOCANDELA CURVES



NOTE: PHOTOMETRIC MEASUREMENTS MUST BE MADE IN THE ACTUAL AVIATION COLOR REQUIRED AFTER A FIFTEEN MINUTE WARMUP PERIOD AT FULL POWER.

FIGURE 5-1. L-850-E ISOCANDELA CURVE



NOTES:

1. Shape of base to be section of a right cylinder with a flat bottom as shown.
2. Where not specified, dimensions shall be held within a tolerance of ± 1/32 inch.
3. The inside top edge of the mounting flange shall be rounded to a radius of 1/8 inch (+ 1/32 inch; -0 inch).
4. Vertical edges of the wire entrance slots shall be rounded to radii of 1/4 inch (+ 1/32 inch). Wire entrance slots may be slanted to interior to allow space for wires.

FIGURE 6. MOUNTING BASE FOR L-852 TYPE II LIGHT ASSEMBLY

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FEDERAL AVIATION ADMINISTRATION
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CHANGE 3

DATE 1/4/82

ADVISORY CIRCULAR

CHANGE

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: Change 3 to SPECIFICATION FOR SEMIFLUSH AIRPORT LIGHTS-Revises Equipment Qualification Procedures

1. PURPOSE. This Change revises the procedures for obtaining equipment qualification approval as contained in paragraph 4.

2. EXPLANATION. Procedures for obtaining equipment qualification approval are now contained in AC 150/5345-1G, Approved Airport Lighting Equipment, and supersede those contained in paragraph 4 of this advisory circular.

3. FILING THIS CHANGE. This Change should be filed on the front of the advisory circular. Page changes to reflect this revision will be made at a later date.

Leonard E Mudd
LEONARD E. MUDD
Director, Office of Airport Standards

Suggest filing this transmittal at the back of the AC. It will provide a reference authority for changes, a method of determining that all Changes have been received, and a check for determining if the AC contains the proper pages.

Initiated by: AAS-200

L-850-AS - Bidirectional centerline light for use on a shallow inset base (shown in Figure 3).

L-850-B - Unidirectional touchdown zone light for use on a 12-inch (30.5 CM) diameter Type II L-857 base.

L-850-BS - Unidirectional touchdown zone light for use on a shallow inset base (shown in Figure 3).

L-850-C - Bidirectional edge light for use on a 15-inch (38 CM) diameter Type II L-857 base or for retrofitting on the former L-837 16-inch (40.6 CM) diameter base.

L-850-D - Bidirectional threshold light for use on a 15-inch (38 CM) diameter Type II L-857 base or for retrofitting on the former L-837 16-inch (40.6 CM) diameter base.

3.2 Performance Requirements - L-852.

3.2.1 Intensity Distribution. - When the lamp in the light assembly is operated at rated current and all components have reached normal operating temperatures, each light beam shall meet its respective intensity distribution requirements as shown in Figure 7, 8, 9, or 10.

3.2.2 Lamp Rating. - The lamp in each class of light top assembly shall be a 6.6 ampere series lamp having a nominal rating of 65 watts for the L-825-W, 45 watts for the L-852-N, and 100 watts for the L-852-O and L-852-Q. All lamps shall have a rated average life of at least 1,000 hours. Requirements for Category III landing minima may alter these specifications.

3.2.3 Power Requirements. - In each class of top assembly, all current-carrying parts requiring insulation shall be insulated for at least 600 volts and shall have a current carrying capacity of 1.5 times the normal operating current.

3.2.4 Base Requirements.

Type I Light Assembly - 8-inch (20.3 CM) diameter for inset directly in the pavement.

Type II Light Assembly - 8-inch (20.3 CM) diameter for installation on a shallow inset base (shown in Figure 6).

Type III Light Assembly - 10-inch (25.4 CM) diameter for installation on a 10-inch (25.4 CM) Type II L-857 base.

Type IV Light Assembly - for installation on a 12-inch (30.5 CM) diameter Type II L-857 base or shallow inset base (shown in Figure 3).

L-852-N and L-852-W shall be manufactured as Type I, II, III or IV.

L-852-O and L-852-Q shall be manufactured as Type III or IV.

3.3 Environmental Conditions. - Each class and type of light assembly shall be capable of performing satisfactorily under the following conditions:

3.3.1 Temperature. - Temperature which ranges from +55° C. to -55° C. See paragraphs 4.1.4 and 4.1.6.

3.3.2 Temperature Shock. - Temperature shock as required in paragraph 4.1.3.

3.3.3 Humidity. - Relative humidity up to 100 percent including conditions where condensation takes place in the form of both water and frost. See paragraph 4.1.10.

3.3.4 Vibration. - Vibration as required in paragraph 4.1.1.

3.3.5 Static Load. - Static load as required in paragraph 4.1.13.

3.3.6 Shock Test. - Mechanical shock as required in paragraph 4.1.11.

3.3.7 Hydraulic Impact. - The L-850A and B light units shall be designed to withstand, without damage, hydraulic pressures which may be formed by aircraft tires moving at high speeds during operations in wet weather. See paragraph 4.1.12.

3.4 Design Requirements for Light Assemblies.

3.4.1 Top Assembly. - The metal components for top assembly, excluding bolts, nuts, and washers which are specified elsewhere, shall be fabricated from a ferrous metal capable of meeting the load requirements. Steel having a minimum tensile strength of 50,000 p.s.i. (3515 kgs./sq. cm) and a minimum hardness of 163 Brinell has been used successfully. In areas of heavy snows, the procuring agency may specify that the minimum tensile strength and hardness be increased to Rockwell C 40-50 if suitable precautions are taken to avoid low temperature brittleness. Pry bar slots, indentations, or other suitable provisions shall be made for prying or jacking the top assembly free of the base receptacle when the light assembly is installed in the pavement.

3.4.1.1 Dimensional Requirements - L-850 Light Assemblies.

3.4.1.1.1 Class A and B Light Assemblies. - The principal critical dimensions of the Class A and B top assemblies shall be as listed in this

3.5.1.4 Lamp By-Pass and Holder. - An electrical by-pass device, which immediately closes an auxiliary circuit around the lamp on failure of the lamp, shall be available for each light assembly. At option of the purchaser, these devices may be specified for shipment. A film disc cutout or other suitable device may be used for this function. A suitable holder shall be furnished for mounting this device. Necessary wires or current-carrying members shall be installed to provide a path for the current to flow through the by-pass device when the filament opens.

3.5.1.5 Current-Carrying Components. - Electrical current-carrying components shall be fabricated of noncorrosive, high-conductivity materials. Aluminum shall not be acceptable for this purpose. Electrical contacts shall be made of coin silver or equal material.

3.5.1.6 Dissimilar Materials. - Dissimilar materials in contact with each other which will lead to electrolytic corrosive action shall not be used. Dissimilar metals are as defined in MIL-STD-889, Dissimilar Metals.

3.5.1.7 Finish. - All surfaces of the finished top assembly shall be smooth, without burrs or sharp edges. All "O" ring grooves shall have a surface finish of 64 rms maximum as defined in American Standard ASA B46.1. In addition, all edges above the pavement including the metal edges above the lens(es), the top edges of the light channel(s) and rib(s), and the top edge of the outer periphery of the finished top assembly shall be rounded to not less than 1/16 inch (0.159 CM) radius.

3.5.1.8 Protective Plating. - All ferrous castings, structural, and hardware parts of the light assembly not made of stainless steel shall be plated after fabrication, machining, and drilling. This plating shall be zinc conforming to Class 1, Type II, of Federal Specification QQ-Z-325; or cadmium conforming to Class 1, Type II, of Federal Specification QQ-P-416. The plating shall be applied as required by the applicable specification.

3.5.1.9 Color of Light. - Unless otherwise specified, the light emitted from all assemblies shall comply with the color requirements of MIL-C-25050 for aviation colors. When filters are installed, all photometric requirements shall be measured in the applicable color. Certification of compliance with this specification shall be furnished to the Federal Aviation Administration, Airports Service, Washington, D.C. 20591.

3.5.1.10 Reflectors. - All reflectors utilized in a lamp optical assembly shall be provided with a finish of high specular reflectivity and shall be protected from dirt, tarnishing, and corrosion.

3.5.1.11 Optical Components. All prisms, lenses, filters, and reflectors shall be Grade B of MIL-C-7989, except that one or more parts may also be tempered to withstand the thermal shock specified in paragraph 4.1.4.

3.5.1.12 Adjustments and Repairs. - Each class of top assembly shall be so constructed that adjustments and repairs can be made easily by maintenance personnel with normally available commercial tools.

3.5.1.13 Fungus-Proof Materials. - Materials that are nutrients for fungi shall not be used in the top assembly where it is practical to avoid them. When used and not hermetically sealed, they shall be treated with a fungicidal agent acceptable to the procuring activity. However, if they will be used in a hermetically sealed enclosure, fungicidal treatment will not be necessary.

3.5.2 Base Receptacle. - The inset base receptacle shall be fabricated as shown in Figure 3. It shall be fabricated from a suitable ferrous material by welding, drawing, or casting; and the dimensions shown in the figures, except references to welding, shall apply to all fabricating methods. The exterior surface, in addition to the protrusion for the sealing of the leads, shall have protrusions or indentations to prevent rotation or uplift of the fixture in the pavement hole. Protrusions shall be symmetrically spaced and provide a total of at least 0.5 square inch (3.23 sq. CM). Indentations shall provide a total of at least 1 square inch (6.45 sq. CM) of area against uplift and rotation.

3.5.2.1 Flange. - The top face and inside edge of the flange shall be machine finished. Six blind holes, at least 5/8 inch (1.59 CM) deep and tapped 3/8 inch - 16 N.C. at least 1/2 inch (1.27 CM) shall be provided in the top face. After the protective plating has been applied, the flange shall conform to the requirements shown in Figure 3. The level of the top surface of the flange shall be such that it shall not vary more than 0.01 inch (0.025 CM) from a reference plane perpendicular to the vertical axis of the cylindrical body. Surface finishes shall be determined as roughness height ratings in micro inches in accordance with American Standard ASA B46.1. The effect of flaws shall be included in the roughness height measurements.

3.5.2.2 Welding. - When a welding process is used, all welding shall consist of continuous watertight welds of a strength at least equal to the material welded.

3.5.2.3 Protective Plating. - After fabricating, machining, and drilling, the entire base receptacle shall be plated for corrosion protection. This plating shall be zinc per Class 1 (0.001 inch thick) (0.0025 CM), Type II, of Federal Specification QQ-Z-325 or cadmium conforming to Class 1 (.00050 inch (0.0013 CM) thick), Type II, of Federal Specification QQ-P-416. The plating shall be applied as required by the applicable specification.

3.5.2.4 Protective Painting. - After the protective plating has been applied to the receptacle, all inside surfaces of the inset bases, including the underside of the cover flange, shall be given one coat of paint in compliance with Military Specification MIL-P-26915.

3.5.3 Fixture Leads.

3.5.3.1 Leads - L-850. - Two leads shall be furnished with each type of inset base receptacle to supply power to the lamp. The leads shall enter the base receptacle through the wire entrance shown in Figure 3. The wire entrance shall be sealed in the factory to assure a water and air tight seal. The integrity of the seal shall be checked as specified in paragraphs 4.1.5 and 4.1.9. The seal and wire shall be installed to prevent water from wicking into the base. The method used in sealing the leads shall not result in a protrusion of more than 1/4 inch (0.635 CM) on the exterior surface of the base receptacle. On the interior surface, the sealing method shall not result in an encroachment on the minimum free interior space specified in Note No. 2 in Figure 3. The leads on the inset fixtures shall be terminated inside the base by means of Number 8 screw terminals appropriately insulated from the base receptacle. The lead wires used to connect the top fitting terminals with the screw terminals in the base shall have suitable lugs on both ends; except that for use with L-857 base, the leads shall terminate in an L-823 connector, Figure 1 (a) as shown in AC 150/5345-26A.

3.5.3.1.1 Rating. - The leads shall be single conductors with suitable insulation rated for at least 600 volts. The exterior leads sealed in the base shall have wires with insulation rated for at least 125° C. operation. The replaceable interior leads shall have wires with insulation rated for at least 250° C. operation.

3.5.3.1.2 Conductors. - The lead conductors shall be copper No. 12 AWG with at least 19 strands.

3.5.3.1.3 Length. - The leads shall have sufficient length inside the base receptacle to permit servicing of the top assembly without requiring disconnection of the wires. External leads are to be at least 18 inches (45.72 CM) long.

3.5.3.2 Fixture Leads - L-852. - Two fixture, or "pigtail," leads shall be provided for introducing power into each light assembly. The pigtail leads shall be single conductor, 600 volt, No. 12 AWG, with plastic insulation suitable for 105° C. and shall contain at least 19 strands. For Type I and II fixtures, each lead shall have a minimum length of 18 inches (45.72 CM). For Type III fixture, each lead shall have a minimum length of 24 inches (60.96 CM). The maximum overall diameter of the lead shall be 0.20 inch (0.51 CM). The connection between the wire and its contact shall be sealed with a high heat-resistance insulating material. Where the ends of the leads are exposed during shipment, they shall be factory-sealed to prevent entrance of moisture. The leads shall be suitably and permanently connected to insulated current-carrying members extending through the bottom of the fixture assembly. Insulating sleeves shall be teflon or equally suitable material. The permanent connections of leads to fixture current-carrying members shall be effectively sealed to

preclude entrance of moisture to the fixture interior. The method of sealing shall also preclude any wicking action of water into fixture interior. Type III and Type IV fixture leads shall have L-823 (Figure 1 (a) AC 150/5345-26) connector plug to connect to the transformer below).

3.5.3.2.1 Special Provisions for Fixture Leads. - For the Type I light assembly, where the fixture is to be mounted directly in a drilled hole and not on a mounting base, suitable channels, wireways, and recesses shall be provided for the leads in the underside of the fixture to avoid mechanical damage to leads during installation. The channels of wireways shall permit leads to emerge from the fixture periphery in any of four quadrants. Two of these exit points shall lie on a line parallel to the axis of the light beams. For the Type II light assembly, no channels or wireways are required underneath the fixture itself, since the mounting of the fixture on the mounting base affords adequate space for arrangement of leads as required for installation. For the Type III and Type IV light assemblies, it is expected that the base will be connected by a conduit system. The Type IV light assembly may also be mounted in a shallow inset receptacle as described in Figure 3.

3.5.4 "O" Ring Gasket. - The "O" ring gasket for use in the "O" ring groove of the cover flange of the base receptacle shall be molded from silicone rubber conforming to Federal Specification ZZ-R-765.

3.5.5 Hold-Down Bolts. - Six hex-head machine screws, 3/8 inch - 16 N.C., 7/8 inch (2.22 CM) in length, and suitable for use in the tapped holes in the flange as shown in Figure 3, shall be furnished. These shall be used for fastening the top assembly to the base receptacle. In addition, six 3/8 inch external tooth lock washers shall be furnished for use under the bolt heads. Bolts and lock washers shall be fabricated of 410 stainless steel.

3.5.6 Plywood Covers. - A plywood cover shall be furnished with each base receptacle when it is needed to protect the machined flange surface during shipment, handling, and installation. This plywood cover shall be mounted on and concentric with the base receptacle in lieu of the top assembly. Prior to mounting on the base, the perimeter of this cover shall be immersed to a depth of at least 2.0 inches (5.08 CM) in melted paraffin and rotated one complete turn. Such treatment shall provide a nonadhesive surface to the top, edge, and bottom contact surfaces of the cover. The cover furnished shall be of exterior commercial Grade C-D, five-ply plywood, or approved equal, 3/4 inch (1.91 CM) thick. It shall be 12 inches (30.48 CM) in diameter (+3/8 inch or -0 inch) (+0.95,-0.0 CM) and shall contain six holes corresponding to the tapped holes in the diameter and shall be counterbored on the Grade D side 1-1/8 inches (2.86 CM) in diameter to a depth of 1/4 inch (0.635 CM). The Grade D side of the cover shall have painted on it a suitable reference line to indicate the light axis.

3.5.7 Parts List and Installation Instructions. - A complete parts list and installation instructions shall be furnished with each shipment of light assemblies or each shipment of light assembly components. Sufficient drawings or illustrations shall be provided to indicate clearly the method of assembly and installation. Theory of operation shall be described in this manual.

3.5.8 Alignment Device. - Each shipment of 10 or more light assemblies shall have an alignment device suitable for installing inset light fixtures in the holes in the pavement.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Qualification Testing. - Each class of top assembly shall be tested in accordance with the applicable tests cited below and in a testing laboratory acceptable to the Federal Aviation Administration, Airports Service, Washington, D.C. 20591. These tests shall be performed in the order shown and may be witnessed by a representative of FAA, Airports Service. This testing is required to certify the manufacturer's ability to produce a light assembly meeting the requirements of this specification. More than one light assembly may be submitted for the tests. In the event a light assembly fails, it may be resubmitted for test after the cause of the failure has been corrected. Prior to tests, the top assembly hold-down bolts shall be torqued to a value specified by the manufacturer. The manufacturer shall furnish one light assembly, two certified copies of the testing laboratory's report, and installation instructions to the Airports Service of the FAA for inspection, review, and approval. When approved, the name of the qualified manufacturer and a description of his equipment will be included in AC 150/5345-1, Approved Airport Lighting Equipment. The manufacturer shall bear all testing costs.

4.1.1 Vibration Tests. - The base receptacle shall be mounted securely in place on the surface of the test table of the vibration testing machine. It shall be mounted in a horizontal position corresponding to its position in place on a runway. Small angles or brackets may be welded to the base receptacle to hold it in place on the test table. The top assembly, with an electrical shunt across the lamp terminals, and with the lamp in place, shall be installed in the receptacle with provisions to determine whether continuity of the electrical circuit is maintained during the tests.

4.1.1.1 Vibration Planes. - The light assembly, mounted in place on the test table as specified above, shall be vibrated in three planes, or directions of vibration, as follows:

4.1.1.1.1. - In a direction perpendicular to the plane of the test tables; i.e., vibrated vertically.

4.1.1.1.2. - Vibrated horizontally in a direction parallel to the light axis; i.e., parallel to the line through the centers of the light channels.

4.1.1.1.3. - Vibrated horizontally in a direction at right angles to the light axis; i.e., normal to the line through the centers of the light channels.

4.1.1.2. Vibration Frequencies. - This test shall be conducted in two parts, if required. In the initial test, the light assembly shall be vibrated in each direction through frequency ranges of 20 to 2,000 CPS until the G's shown in Table 1 are reached. The duration of each sweep on the light assembly shall be 10 minutes and electrical continuity shall be continuously monitored through the initial vibration tests. If the lamp envelope and filament remain intact, the vibration tests are considered complete. If the lamp envelope and/or filament fail, the second part of the test shall be initiated. In the second part, the shunt shall be removed from the lamp terminals, the damaged lamp shall be removed from the lampholder, and a new lamp of the type specified for use in the light assembly shall be inserted in the lampholder. Without energizing the lamp filament, the light assembly shall be vibrated again, as specified in paragraph 4.1.1.1. through the frequencies shown in Table 1, until the acceleration reaches three G's in each plane. The duration of each sweep on the light assembly shall be 10 minutes.

TABLE 1. Vibration Frequencies

Acceleration G's	Frequency CPS
10	20 to 500
15	500 to 2,000

4.1.1.3 Inspection. - After the above required tests have been completed, the light assembly shall be inspected. Mechanical failure of any component, loosening of any part or fastener, or any discernible movement of lamps in lampholders during the initial test shall be cause for rejection. If the second test is required, breakage of the lamp filament and/or envelope shall also be cause for rejection.

4.1.2 Photometric Tests. - The optical performance of each class unit shall be determined by photometric measurements with the type of lamp and optical system for which the unit is designed. These tests are to follow the shock and hydraulic impact tests to determine if the lamp filament has sustained any damage. The lamp shall be operated at its rated current for a period of at least 15 minutes before measurements are made. The photometric axis of each class of fixture shall be established in relation to a fixture properly installed in the pavement with the horizontal axis lying on the

plane of the pavement passing through the center of the fixture and parallel to the runway centerline. The vertical axis shall lie on a line passing through the center of the fixture perpendicular to the pavement plane. Horizontal intensities shall be determined for each beam at one degree intervals in accordance with appropriate figures of Appendix 1. The beam intensities shall meet or exceed the values established in the appropriate figures of Appendix 1. Each class unit shall be tested with each type of filter to be used in the unit to insure that it meets the chromaticity requirements of paragraph 3.5.1.9. If any class of unit is so designed that any light channel has a negative slope and any portion of the exterior lens or prism is below pavement level, such portion shall be obscured by opaque tape. This applicable intensity distribution , in the applicable color, shall then be not less than 70 percent of that prescribed in the appropriate figure of Appendix 1.

4.1.3 Cycling and Thermal Shock Test. - The light assembly mounted on an inset base receptacle shall be subjected to a cycling test by operating the unit at rated current at room temperature (dry) for a period of not less than four hours. At the expiration of the "on" part of the cycle, the fixture shall be de-energized and immediately submerged under at least 1 foot of water. The temperature of the water before submersion shall be 5° C., or lower. The unit shall remain under water for at least four hours. At the expiration of the "off" part of the cycle, the fixture shall be subjected to repetition of the above tests until a total of three "on-off" cycles have been completed. The fixture shall be immediately inspected at the completion of the third cycle. Any evidence of glass breakage or lens damage, any leakage of water into the assembly, damage to any part of the unit, or equipment failure during the tests shall be cause for rejection.

4.1.4 Low Temperature Test. - The light assembly mounted on an inset base receptacle shall be totally immersed in water, and while immersed, subjected to a low temperature of minus 55° C. (±2° C.) for a period of 24 hours followed immediately by operation at rated current for 30 minutes or until free of ice. This shall be repeated for a total of three cycles. Any evidence of damage shall be cause for rejection.

4.1.5 Insulation Resistance Check. - The unit shall be subjected to a 600-volt insulation resistance test (lead to case). The initial resistance shall be at least 500 megohms. The light assembly complete with base receptacle shall then be operated for one hour at rated current and immediately submerged in a salt water solution except for the ends of the leads. The resistance test shall be repeated. Resistance shall be at least 500 megohms.

4.1.6 Accelerated Life Test. - The light assembly shall have an accelerated life test performed on it after it has successfully passed all the above tests. The light assembly, mounted on a base assembly, shall be set in dry sand in an ambient environment temperature of +55° C. (±2° C.) simulating its installation in pavement. The sand shall be at least 5 inches thick

around the sides and bottom of the light assembly. This sand shall fill any openings in the light assembly which would be below pavement level. The unit shall then be operated for at least one-half the rated lamp life at rated current. Light units being supplied with filters should have filters in place during this test. The temperature on the top shall be measured and the temperature shall not exceed 150° C. above ambient. After this, all sand shall be removed and the photometric performance of the unit shall be measured as described in paragraph 4.1.2. Intensities shall not be less than 80 percent of the intensities specified in the appropriate figure of Appendix 1. After this test, the light assembly shall be taken apart and thoroughly examined. Any visible deformation, blistering, evidence of heat damage, or corrosion shall be cause for rejection.

4.1.7 Protective Plating Test. - Zinc plating shall be tested by the appropriate method described in Federal Specification QQ-Z-325; cadmium plating shall be tested by the appropriate method described in Federal Specification QQ-P-416.

4.1.8 Load Test.

4.1.8.1 L-850 Light Assemblies. - This shall be a static load test. The assembled unit, with the top assembly (including gasket, lamp, and optical assembly) mounted on a base receptacle, shall be placed on a flat steel plate mounted in a standard testing machine. The load shall be applied to the top part of the fixture through a block of rubber, 11 inches (27.94 CM) in diameter and 1-1/2 inches (3.81 CM) thick, having a Shore A hardness of 55 to 70. A total load of 50,000 pounds (22,675 KG) for Class A and B and 75,000 pounds (34,020 KG) for Class C and D shall be applied uniformly over the area of the rubber at a rate not greater than 10,000 pounds (4,535 KG) per minute. The light assembly shall be considered unsatisfactory if there is any permanent deformation, cracking of material or finish, breaking, or damage to any part of the light.

4.1.8.2 L-852 Light Assemblies. - This shall be a static load test on a complete assembly. If a Type II or Type III light assembly is being tested, the mounting base shall be included as part of the assembly. The assembly shall be placed on a flat steel plate mounted in a standard testing machine. The load shall be applied to the top part of the light assembly through a block of rubber 7 inches (17.78 CM) in diameter and 1 inch (2.54 CM) thick, having a Shore A hardness of 55 to 70. A total load of 35,000 pounds (15,873 KG) shall be applied uniformly over the area of the rubber at a rate not greater than 10,000 pounds (4,535 KG) per minute. The light assembly shall be considered unsatisfactory if there is any permanent deformation, cracking of material or finish, breaking, or damage to any part of the light assembly.

4.1.9 Leakage Test. - This test shall be performed after the assembled light unit has undergone the load test described in paragraph 4.1.8. For the leakage test, the top assembly shall be securely bolted to a base

receptacle having a suitable means for pressurizing and all bolts torqued to the manufacturer's specifications. Prior to performing this test, the two wire leads shall be subjected to a 30-pound (13.6 KG) tension for 5 minutes to test the integrity of the seal where the leads enter the base receptacle. With a minimum internal pressure of 20 p.s.i. (1.41 KG/Sq. CM), the assembled unit shall be tested using a bubble test material (high foam detergent producing a low-surface tension). The assembly shall be considered watertight if no air bubbles appear.

4.1.10 Humidity Test. - The light assembly shall withstand a humidity test conducted in accordance with Procedure III of MIL-STD-810B for 360 hours. Any evidence of damage, rusting, or corrosion shall be cause for rejection.

4.1.11 Shock Test. - (For L-850A and B only) the assembled unit shall be mounted rigidly on either a 1-inch-thick steel plate or a concrete base at least 4 inches thick. The dimensions of the steel plate or the concrete base shall be at least 3 feet by 3 feet. The light fixture shall be turned on at full brightness for at least 2 hours prior to starting the test. With the light still on at full brightness, a steel ball weighing 5 pounds (2.27 KG) shall be dropped at the center of the top assembly from a height of 6 feet (1.83 Meters). The steel ball shall be dropped 10 times on the light fixture with a 5-minute interval between each drop. Upon conclusion, the light fixture shall be opened to determine if the optical assembly has been damaged or any component displaced in any way.

4.1.12 Hydraulic Impact Test. - For L-850A and B only, the light assembly shall be submerged in water to a depth of approximately 1/2 inch (1.27 CM). 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 (4.54 CM) diameter piston. The chamber shall be filled with water and purged of all air. A 5-pound (2.27 KG) steel ball shall be dropped 6 feet (1.73 Meters) 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.

4.1.13 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 (1360 KG) 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.

4.1.14 Lamp Bypass Test. - The light assembly shall be subjected to a test as described below to determine if the lamp bypass device (incorporated in the fixture) will immediately close an auxiliary circuit around the lamp when its filament opens.

4.1.14.1 L-850 Light Assemblies. - Lamp bypass equipment will be tested to demonstrate the ability to operate at 6.6, 5.2, 4.1, 3.4, and 2.8 amperes within 5 seconds. The source of energy for testing the bypass device shall be the output of an isolation transformer; the size (rating) of the transformer shall be that which is normally used with the lamp.

4.1.14.2 L-852 Light Assemblies. - Two L-852-O or -Q light units, three L-852-W light units or four L-852-N light units shall be assembled to simulate actual operating procedures and connected across the secondary of a 200-watt, Specification L-834 transformer. The primary of the 200-watt transformer shall be connected to a constant current supply. An open lamp filament shall be simulated under the following conditions:

With 6.6 amperes flowing through the primary of the transformer for a minimum of 3 hours, disconnect a lamp in one fixture. The bypass device shall operate within a 5-second period. Without de-energizing the circuit, reduce the current to 4.8 amperes and disconnect a lamp in one of the remaining fixtures. The bypass device shall operate within a 5-second period. With the circuit de-energized, restore the circuit to its original state of readiness, disconnect the lamp in one fixture, set constant current supply for 4.8 amperes output level, and then energize the circuit. The bypass device shall operate within a 5-second period. Repeat the above procedure with the constant current supply set for 6.6 amperes.

4.1.15 Surface Temperature Test. - Tests shall be conducted with each type of light unit to assure that maximum temperature on top of the inset light will not exceed 160° C. (320° F.) when the light is covered with the tire of a heavy ground vehicle for a period of 10 minutes. The light unit shall be operated at high intensity for at least 2 hours, before this 10-minute test period, in still air whose ambient temperature is 25° C. (77° F.). The thermocouple shall be located between the hottest point of the lamphead and the tire to register the test temperature.

4.2 Production Testing. Each class of top assembly shall be subjected to photometric and leakage tests. In the photometric tests, the applicable top assembly shall meet the intensity distribution requirements of the appropriate figure of Appendix 1. 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 4.1.9. 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. (1.41 KG/Sq. CM). 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 FAA upon written request.

5. PREPARATION FOR DELIVERY.

5.1 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.

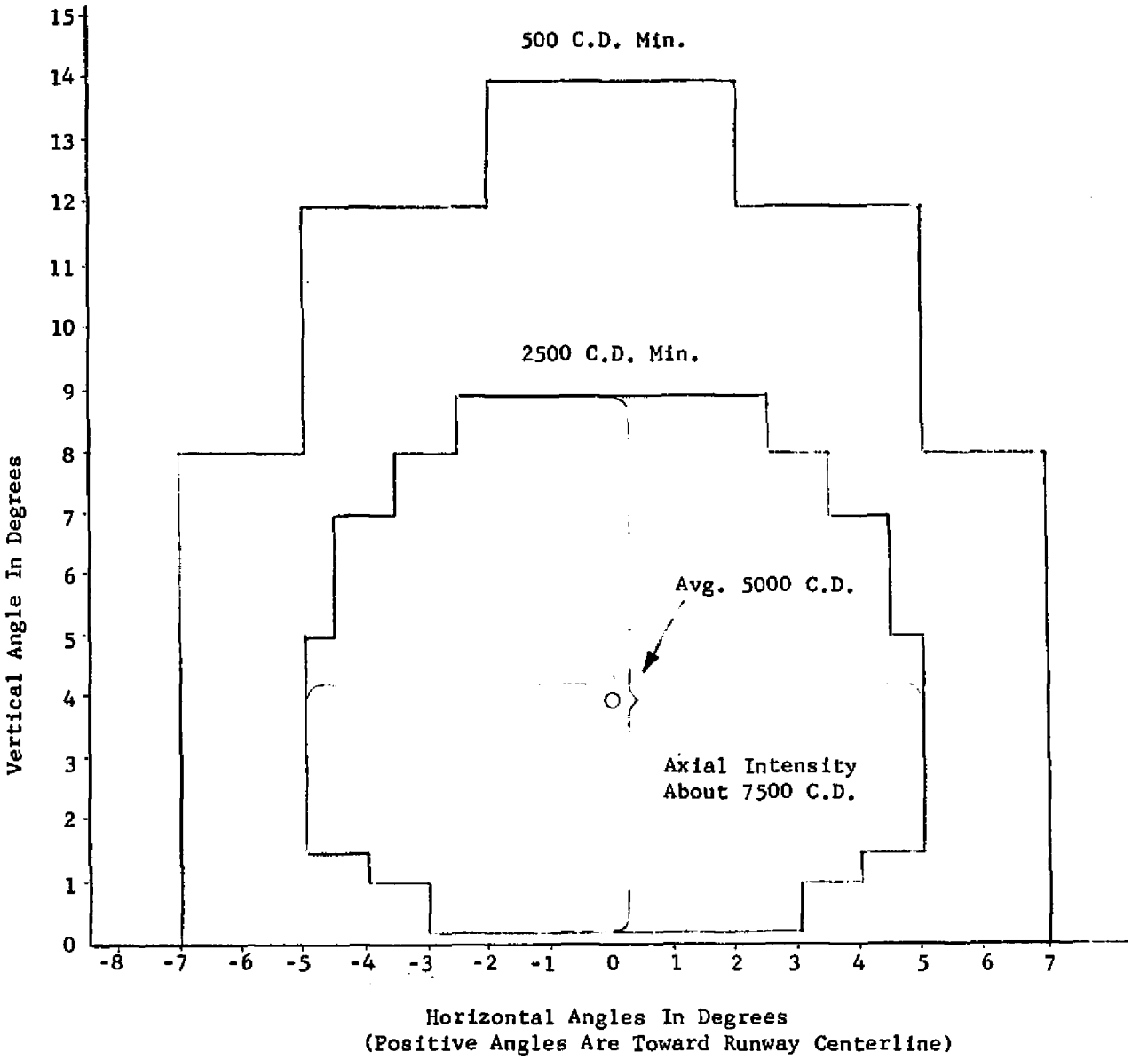
5.2 Fixture Packaging. - Each assembled unit shall be individually packaged in a durable, domestic type, corrugated cardboard carton. It shall be cushioned properly inside the carton to provide the necessary mechanical and physical protection of the fixture and its component parts. For convenience of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

5.3 Base Receptacle. - When the base receptacle is shipped separately, the lockwashers, 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 fixture on the base receptacle.

5.4 Shipping Marking. - The light assembly cartons or wooden containers and the mounting base plywood covers shall be durably and legibly marked with:

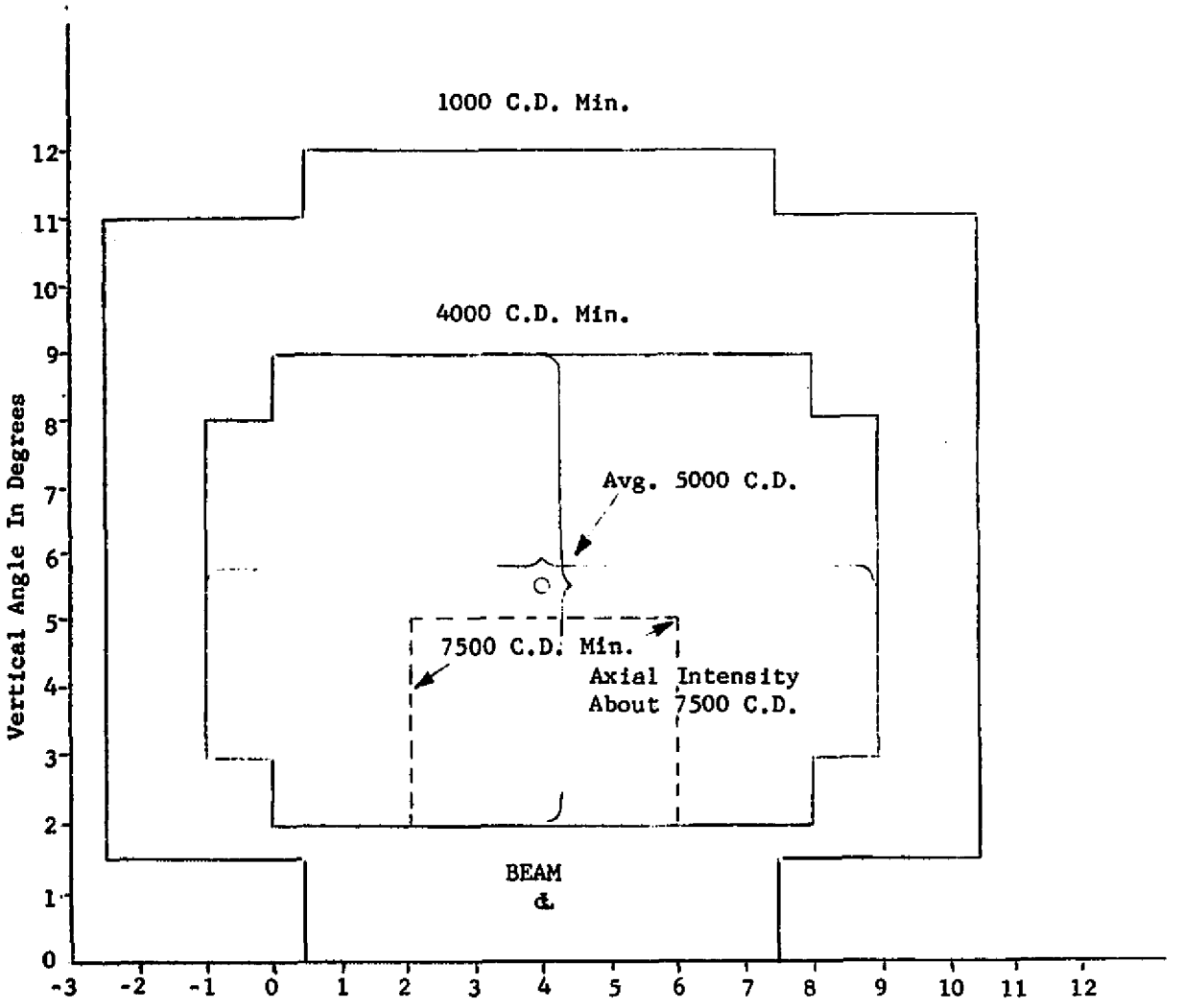
Consignee's Name and Address
Component Name and Part No.
Specification No.
Contract No.
Manufacturer's Name and Address

6. WARRANT. - The light fixture manufacturer shall warrant that the fixture meets this specification and that it is free from material and manufacturing defects. In addition, the light fixture manufacturer shall warrant that this unit shall not suffer mechanical degradation except for normal surface wear, when subjected to landings, rollover, turning, and braking loads by civil or military aircraft traffic. This warrant shall extend for a period of one year after the start of installation with a maximum of two years from the date of shipment. This warrant does not apply to lamps that exceed their expected life.



NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

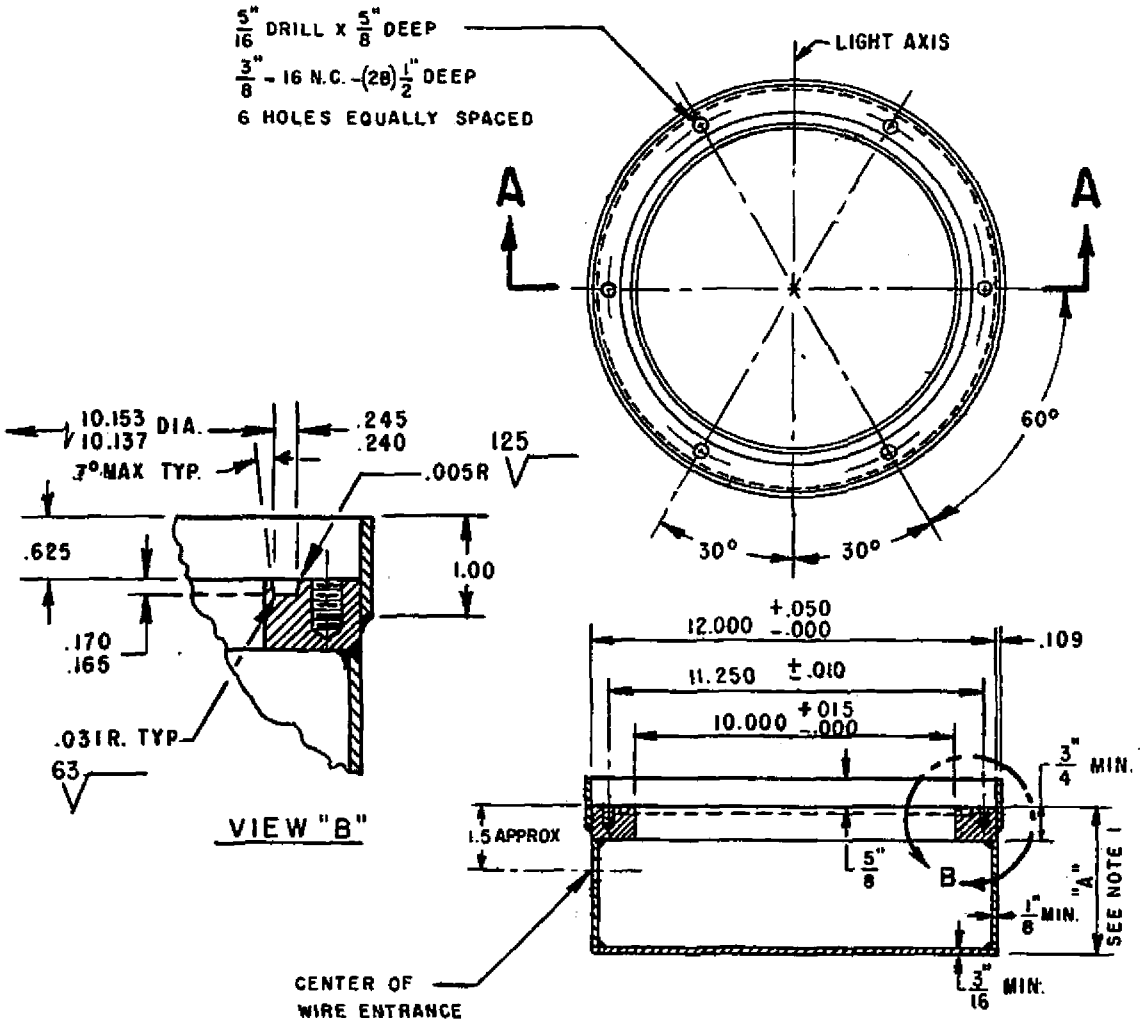
FIGURE 1. L-850-A ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT. (Bidirectional Top Assembly)



Horizontal Angles in Degrees (Positive Angle is Toward Runway Centerline).

NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

FIGURE 2. L-850-B ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT. (Unidirectional Top Assembly)

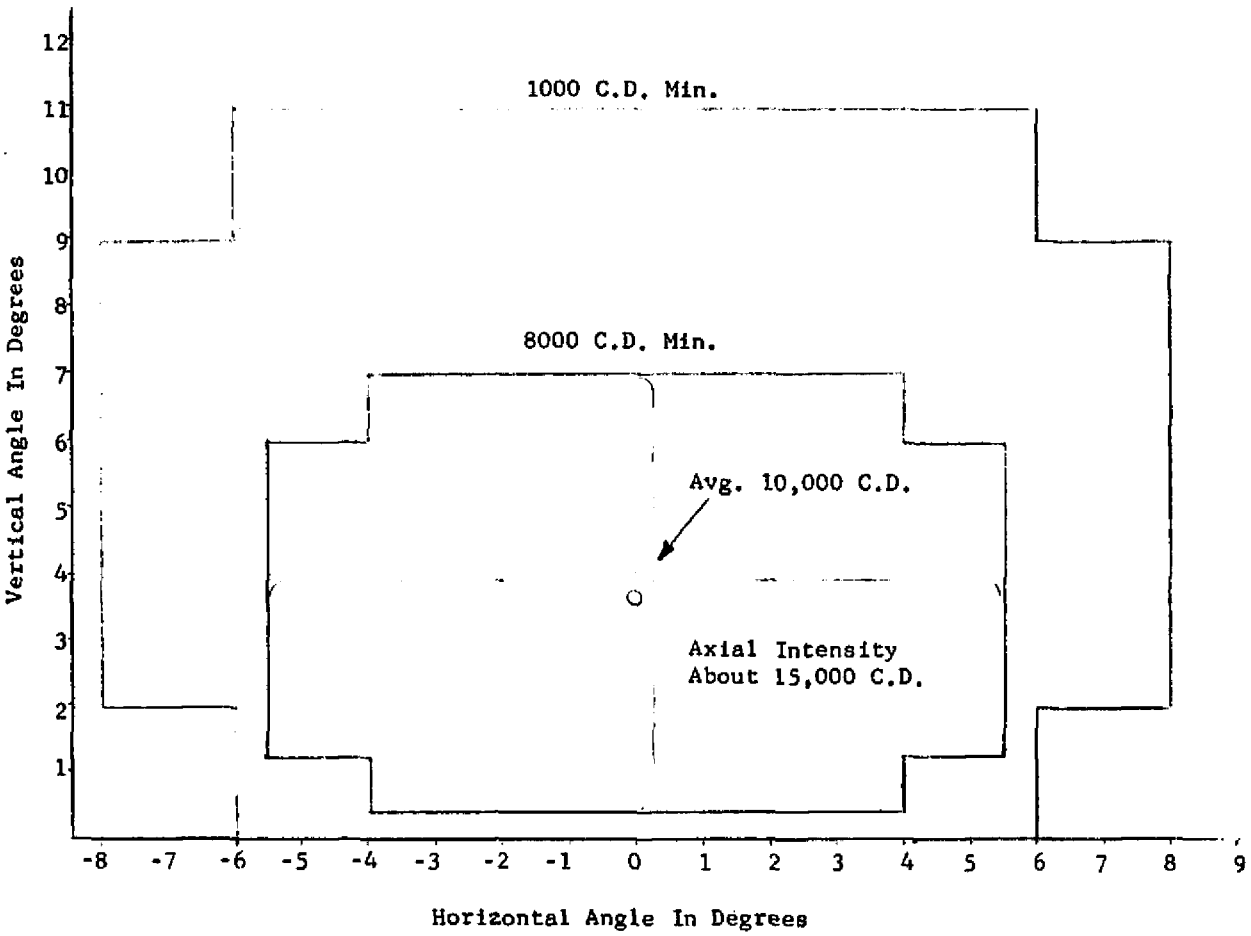


SECTION A-A

FIGURE 3. RECEPTACLE

NOTES

1. STANDARD DIMENSION "A" 2.75 $^{+0.1}_{-0.0}$ DIMENSIONS MAY BE VARIED TO MEET SPECIAL CONDITIONS.
2. CLEAR INSIDE SPACE BELOW BOTTOM OF FLANGE SHALL BE NOT LESS THAN 11 INCHES IN DIAMETER, CONCENTRIC ABOUT THE CENTER OF THE BASE, WITH A DEPTH OF 1.75 INCHES FOR STANDARD BASE.
3. NORMAL MILL TOLERANCES OF MATERIAL WILL BE ACCEPTABLE.
4. THE BOTTOM SHALL BE FLAT, WITH NO UPWARD DEVIATION AND MAXIMUM DOWNWARD DEVIATION OF 0.25
5. WHERE NOT SPECIFIED, DIMENSIONS SHALL BE HELD WITHIN A TOLERANCE OF ±0.05.
6. THERE SHALL BE METAL TO METAL CONTACT BETWEEN THE TOP FITTING AND BASE RECEPTACLE.
7. ANTI ROTATIONAL AND ANTI UPLIFT PROTRUSION OR INDENTATION BE PROVIDED AS DESCRIBED IN PAR 3.5.2. .



NOTE: 0° in horizontal axis corresponds to 3½° toe-in angle toward the runway centerline.

FIGURE 4. L-850-C ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.

paragraph and as shown in Figure 3. The outside diameter of the upper portion of the top assembly shall be 11.94 inches, (30.33 CM) ± 0.05 inch (.13 CM). As its outer diameter, the overall thickness of the flange portion that rests on the base flange shall be 0.75 inch (1.90 CM) ± 0.05 inch. (.13 CM).

The top assembly flange shall have a portion extending at least 1/4 inch down into the base receptacle to restrict side motion and resist shear action when the unit is struck. The diameter of this extension into the base receptacle shall be 9.94 inches (25.25 CM) +0.00 inch (.00 CM) -0.01 inch (.025 CM). The protrusion into the base receptacle shall contain no fillet or other obstruction to prevent metal-to-metal seating of the bearing surface on the base receptacle. No part of the top assembly shall be more than 1.25 inches (3.18 CM) above the bearing surface of the flange.

All interfaces of the top assembly and base receptacle shall be machined to the same finish as shown in Figure 3. The flange of the upper portion of the top assembly shall have 6 bolt holes equally spaced 60 degrees apart on a bolt-hole diameter of 11.25 inches (28.57 CM), ± 0.01 inch (.025 CM). The bolt holes shall be counterbored or recessed so that the resultant thickness of metal left between the bottom of the counterbored holes and the underneath flange surface is 0.40 inch (1.02 CM) ± 0.015 inch (.038 CM). The bolt holes shall each be 7/16 inch (1.11 CM) in diameter and untapped except for 2 of the bolt holes, 180 degrees apart, which shall be provided with 1/2-13 inch threads for lifting the top assembly. The counterbored holes shall be of sufficient diameter to permit easy removal of the bolts with a standard socket wrench. The light channel(s) shall be centered between the bolt holes. The light channels for the Class A top assembly shall be oriented so that the centers of the two light beams emitted are 180 degrees apart.

The external portion of the top surface extending above the pavement shall be smoothly sloped upward from the edges at angles not exceeding 12 degrees in the direction parallel to the light channel(s) and not exceeding 15 degrees in all other directions. These maximum slope angles shall not apply to the light channels, optical windows, and such indentations as bolt-hole recesses.

The top assembly may be provided with an external rib or other suitable means in the area of the lens(es) to mitigate damage to the head assembly due to action of snowplow blades and aircraft tailhooks.

3.4.1.1.2 Class C and D Light Assemblies. - The Class C and D light assemblies shall be 17.25 inches (43.81 CM) in diameter, ± 0.09 inch (0.23 CM) and have a mounting ring which has six 7/16-inch diameter holes on a 14.25-inch (36.19 CM), ± 0.010-inch (0.025 CM) diameter bolt circle suitable for mounting to a L-857 15-inch (38.10 CM) Type II base receptacle. The mounting ring shall also have a portion extending at least 0.25 inch (0.635 CM) down into the receptacle. The diameter of this extension shall be 12.25 inches (31.11 CM), ± 0.010 inch (0.025 CM). The protrusion into the L-857 base shall contain no fillet or other obstruction to prevent

metal-to-metal seating. At its outer diameter, the overall thickness of the flange portion that rests on the L-857 base shall be 1.25 inches (3.175 CM), ± 0.06 inches (0.152 CM).

The top assembly of the Class C and D lights shall be a sealed unit capable of being easily inserted and removed from the mounting ring. It shall be capable of resisting all static and dynamic wheel loads without damage. The optical head shall attach to the mounting ring by means of at least six 3/8-inch -16 N.C. bolts on an 11.250-inch (28.57 CM), ± 0.010 inch (0.025 CM) diameter bolt circle. The bolt holes shall be located so that four of the holes will be located 30 degrees from an axis which would be perpendicular to the runway centerline. The remaining two bolts will be 60 degrees from the other bolts on a line parallel to the runway centerline. Class C and D lights only may protrude 1 inch above the pavement surface.

3.4.1.2 Dimensional Requirements - L-852.

3.4.1.2.1 Type I Light Assembly. - The Type I light assembly shall not require a mounting base for installation in the pavement. The outside diameter shall be 7.94 inches (20.17 CM), ± 0.09 inch (0.23 CM). At the periphery, the depth shall be 1.050 inch (2.67 CM), ± 0.050 inch (0.127 CM). As required, the top surface of the light assembly may slope upwards from the periphery so as to form a maximum protrusion of 0.375 inch (0.95 CM) above the adjacent paved surface when properly installed in the pavement. In forming the permissible 0.375-inch (0.95 CM) rise of the convex top surface, the maximum upward slope of any portion of the top surface, excluding bolt holes, light channels, and recesses for lenses and lens faces, shall not exceed 12 degrees.

3.4.1.2.2 Type II Light Assembly. - The Type II light assembly shall require a mounting base, as shown in Figure 3 of this specification, for installation in the pavement. The diameter and the top surface contour requirements shall be identical to those of the Type I light assembly. The thickness measured at the periphery of the Type II light assembly, or fixture, shall be 0.75 inch (1.90 CM), ± 0.05 inch (0.127 CM) and there shall be a cylindrical protrusion of .25 inch (0.635 CM) to .30 inch (0.762 CM) downward into the mounting base to restrict shear action and side motion with respect to the mounting base. The diameter of this protrusion into the mounting base shall be 6.52 inches (16.56 CM), +0 inch (0 CM) - 0.02 inch (0.05 CM). The inside fillet formed by the protrusion shall have a maximum radius of 1/32 inch (0.08 CM). The mating surfaces between fixture and mounting base shall be smooth and free from burrs or other obstructions that would prevent satisfactory metal-to-metal seating of the bearing surfaces. In unbolted condition, the seating of fixture on mounting base shall be firm, solid, and without discernible rocking motion when subjected to hand pressure. The flange of the fixture assembly shall have four bolt holes spaced as shown in Figure 3. Each hole shall be

7/16-inch (1.11 CM) in diameter, untapped. The bolt holes shall be counterbored so that the resultant thickness of metal left between the bottom of the counterbored holes and the underneath flange surface is 0.40 inch (1.016 CM), ± 0.03 (0.076 CM). The counterbored holes shall be of sufficient diameter to permit easy removal of the bolts with a standard socket wrench. The light channels shall be centered between bolt holes with no bolt holes permitted in the light channels.

3.4.1.2.3 Type III Light Assembly. - The Type III light assembly shall require a mounting base complying with AC 150/5345-42, Type II, 10-inch (25.4 CM) diameter. The thickness measured at the periphery of the Type III light assembly, or fixture, shall be .75 inch (1.91 CM), ± 0.05 inch (0.127 CM) and there shall be a cylindrical protrusion of at least 1/4 inch downward into the mounting base to restrict shear action and side motion with respect to the mounting base. The diameter of this protrusion into the mounting base shall be 7.95 (+0-0.20) inches (20.19 ± 0.51 CM). The inside fillet formed by the protrusion shall have a maximum radius of 1/32 inch (0.08 CM). The mating surface between fixture and mounting base shall be smooth and free from burrs or other obstructions that would prevent satisfactory metal-to-metal seating of the bearing surface. In unbolted condition, the seating of fixtures on mounting base shall be firm, solid, and without discernible rocking motion when subjected to hand pressure. The flange of the fixture assembly shall have four bolt holes, spaced to fit the mounting base. Such a hole shall be 7/16 inch (1.11 CM) in diameter, untapped. The bolt holes shall be counterbored so that the resultant thickness of metal left between the bottom of the counterbored holes and the underneath flange surface if 0.40 inch, ± 0.03 (1.016 ± 0.076 CM). The counterbored holes shall be of sufficient diameter to permit easy removal of the bolts with a standard socket wrench. The light channels shall be centered between bolt holes with no bolt holes permitted in the light channels.

3.4.1.2.4 Type IV Light Assembly. - The principal critical dimensions of the Type IV light top assembly shall be as listed in this paragraph and as shown in Figure 3. The outside diameter of the upper portion of the top assembly shall be 11.94 inches, ± 0.05 inch (30.33 ± 0.127 CM). At its outer diameter, the overall thickness of the flange portion that rests on the base flange shall be 0.75 inch, ± 0.05 inch (1.91 ± 0.127 CM).

The top assembly flange shall have a portion extending at least 1/4 inch (0.635 CM) down into the base receptacle to restrict side motion and resist shear action when the unit is struck. The diameter of this extension into the base receptacle shall be 9.94 inches (+ 0.00 inch, -0.01 inch) (25.25 + 0.00, - 0.025 CM). The protrusion into the base receptacle shall contain no fillet or other obstruction to prevent metal-to-metal seating of the bearing surface on the base receptacle. No part of the top assembly shall be more than 1.25 inches (3.175 CM) above the bearing surface of the flange.

All interfaces of the top assembly and base receptacle shall be machined to the same finish as shown in Figure 3. The flange of the upper portion of

the top assembly shall have 6 bolt holes equally spaced 60 degrees apart on a bolt-hole diameter of 11.25 inches, ± 0.01 inch (28.58 ± 0.025 CM). The bolt holes shall be counterbored or recessed so that the resultant thickness of metal left between the bottom of the counterbored holes and the underneath flange surface is 0.40 inch, ± 0.015 inch (1.016 ± 0.038 CM). The bolt holes shall each be 7/16 inch (1.11 CM) in diameter and untapped except 2 of the bolt holes, 180 degrees apart, which shall be provided with 1/2-13 inch threads for lifting the top assembly. The counterbored holes shall be of sufficient diameter to permit easy removal of the bolts with a standard socket wrench. The light channels shall be centered between the bolt holes. The light channels for the top assembly shall be oriented so that the centers of the two light beams emitted are 180 degrees apart.

The external portion of the top surface extending above the pavement shall be smoothly sloped upward from the edges at angles not exceeding 12 degrees in the direction parallel to the light channels and not exceeding 15 degrees in all other directions. These maximum slope angles shall not apply to the light channels, optical windows, and such indentations as bolt-hole recesses.

The top assembly may be provided with an external rib or other suitable means in the area of the lenses to mitigate damage to the head assembly due to action of snowplow blades.

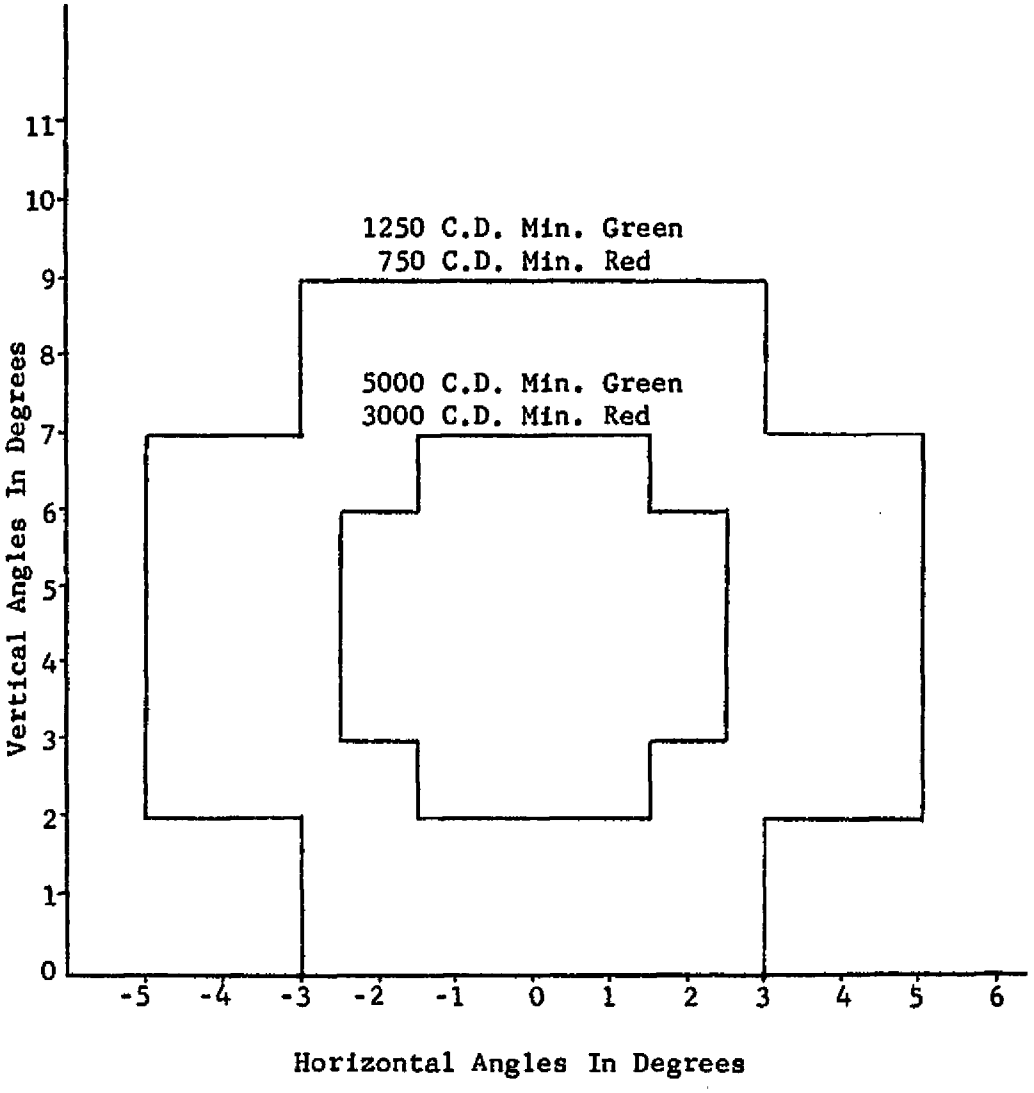
3.5 Construction Requirements and Component Parts.

3.5.1 Optical Top Assembly. - All optical components of the light head shall be housed in a sealed assembly. This assembly may be an integral part of the top assembly or part of an encapsulated subassembly.

3.5.1.1 Rubber Materials. - Rubber, when used in the top assembly, shall be of silicone rubber suitable for the application.

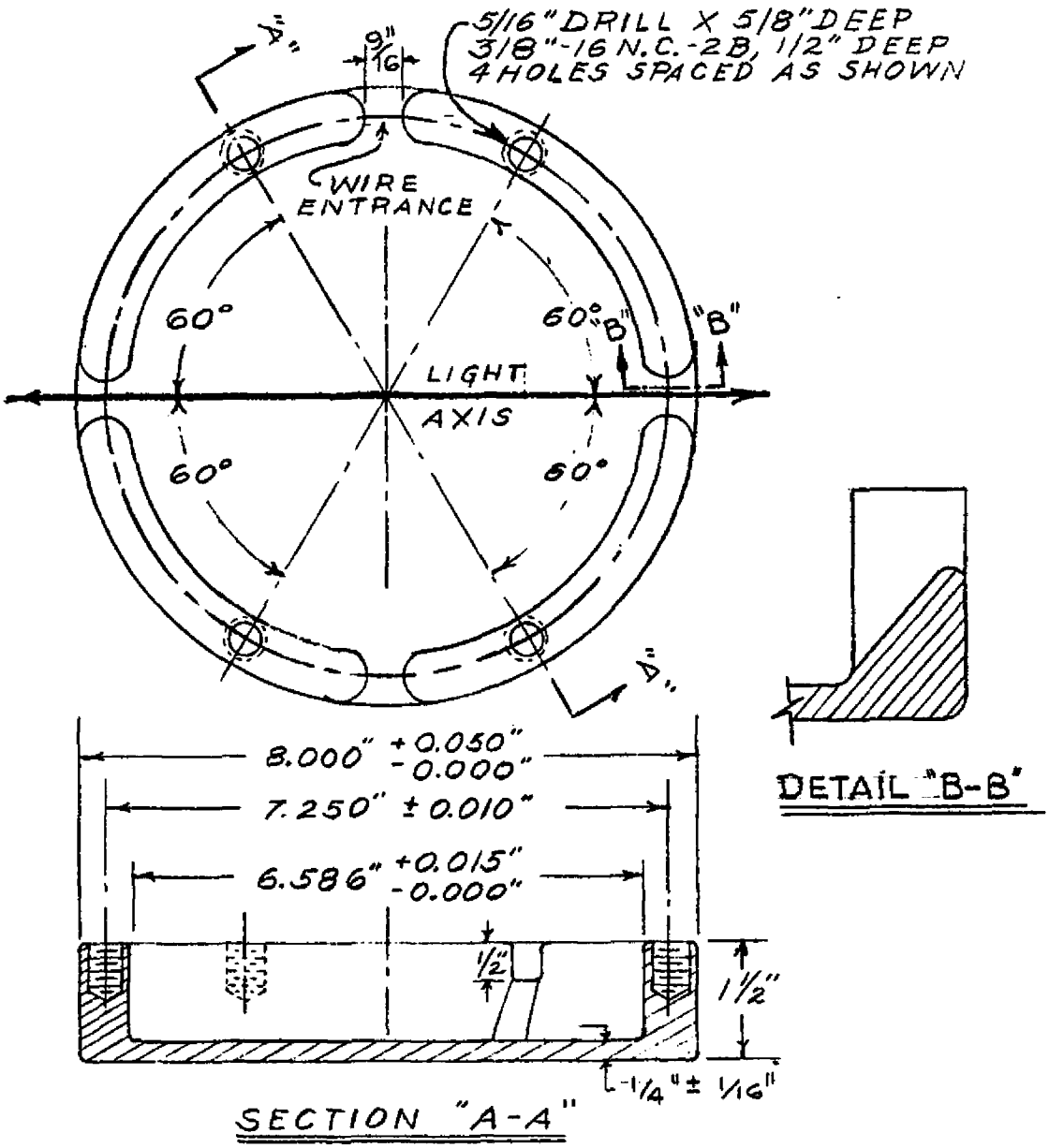
3.5.1.2 Bolts, Studs, Nuts, and Washers. - All bolts, studs, nuts, and other similar fasteners used in the fixture assembly shall be fabricated from either 18-8, 410, or 416 stainless steel, passivated and free from discoloration. Bolts or screws made of 410 or 416 stainless steel shall be given a black oxide finish in accordance with MIL-C-13924, Class 3. All lockwashers shall be made of 410 stainless steel. All screw threads shall be Class 2 or Class 3 in accordance with National Bureau of Standards Handbook H28. This requirement does not apply to current-carrying components.

3.5.1.3 Lampholder. - The lampholder shall securely and accurately position the lamp. It shall permit easy relamping without disturbing the color filter or any other element of the optical subassembly. After relamping, the light unit shall still meet the intensity distribution requirements shown in the appropriate Figure of Appendix 1. The lampholder shall be indexed to prevent improper relamping.



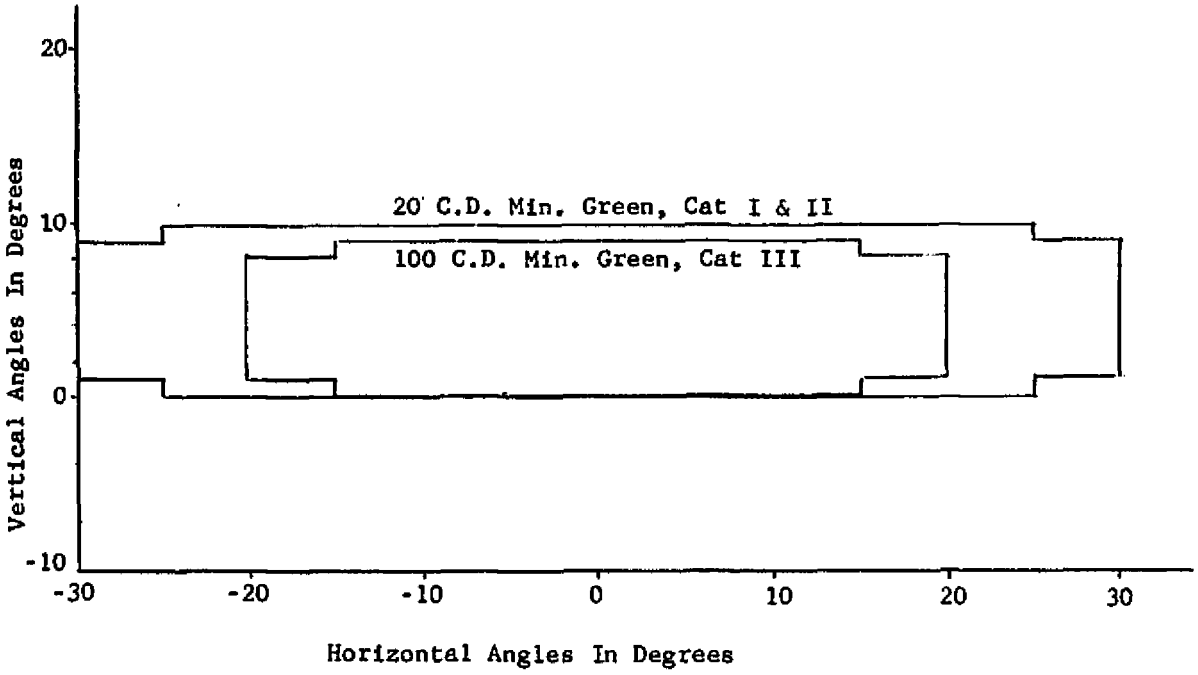
NOTE: Photometric measurements must be made in the actual aviation color required after a fifteen minute warm-up period at full rated power.

FIGURE 5. L-850-D ISOCANDELA CURVES



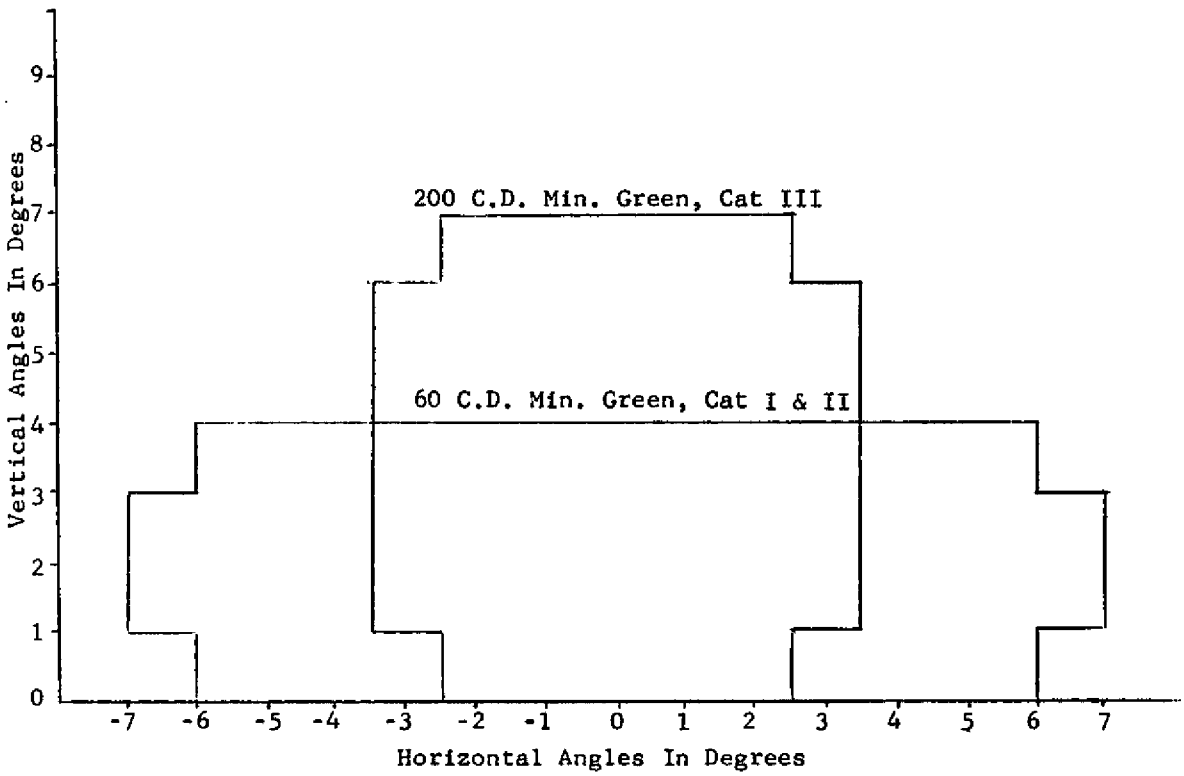
NOTES:
1. Shape of base to be section of a right cylinder with a flat bottom as shown.
2. Where not specified, dimensions shall be held within a tolerance of ± 1/32 inch.
3. The inside top edge of the mounting flange shall be rounded to a radius of 1/8 inch (+ 1/32 inch; -0 inch).
4. Vertical edges of the wire entrance slots shall be rounded to radii of 1/4 inch (± 1/32 inch). Wire entrance slots may be slanted to interior to allow space for wires.

FIGURE 6. MOUNTING BASE FOR L-852 TYPE II LIGHT ASSEMBLY



NOTE: A plus or minus one-half degree vertical shift and a plus or minus two and one-half horizontal shift is permitted for inspection, qualification, and approval procedures.

FIGURE 7. L-852-W ISOCANDELA CURVES



NOTE: A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.

FIGURE 8. L-852-N ISOCANDELA CURVES

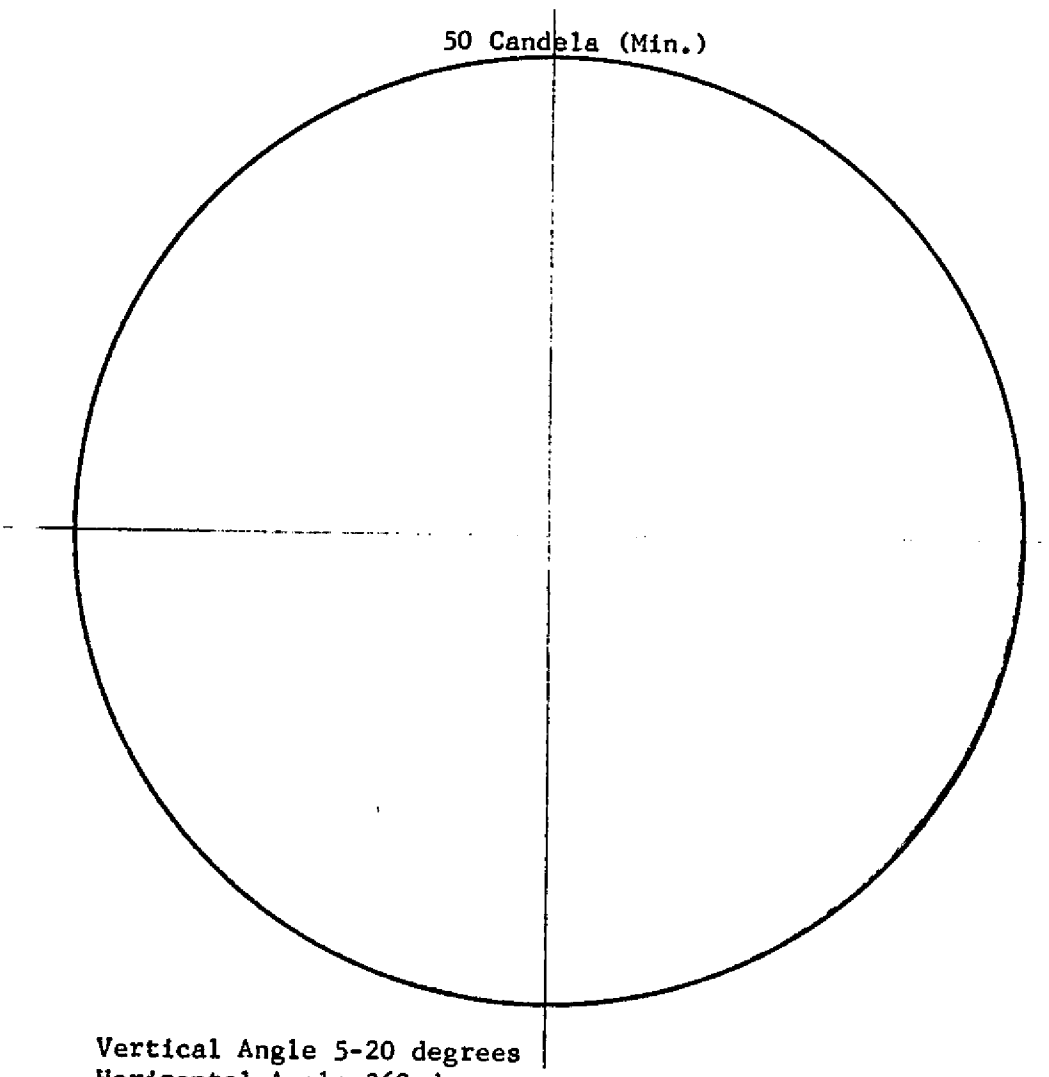
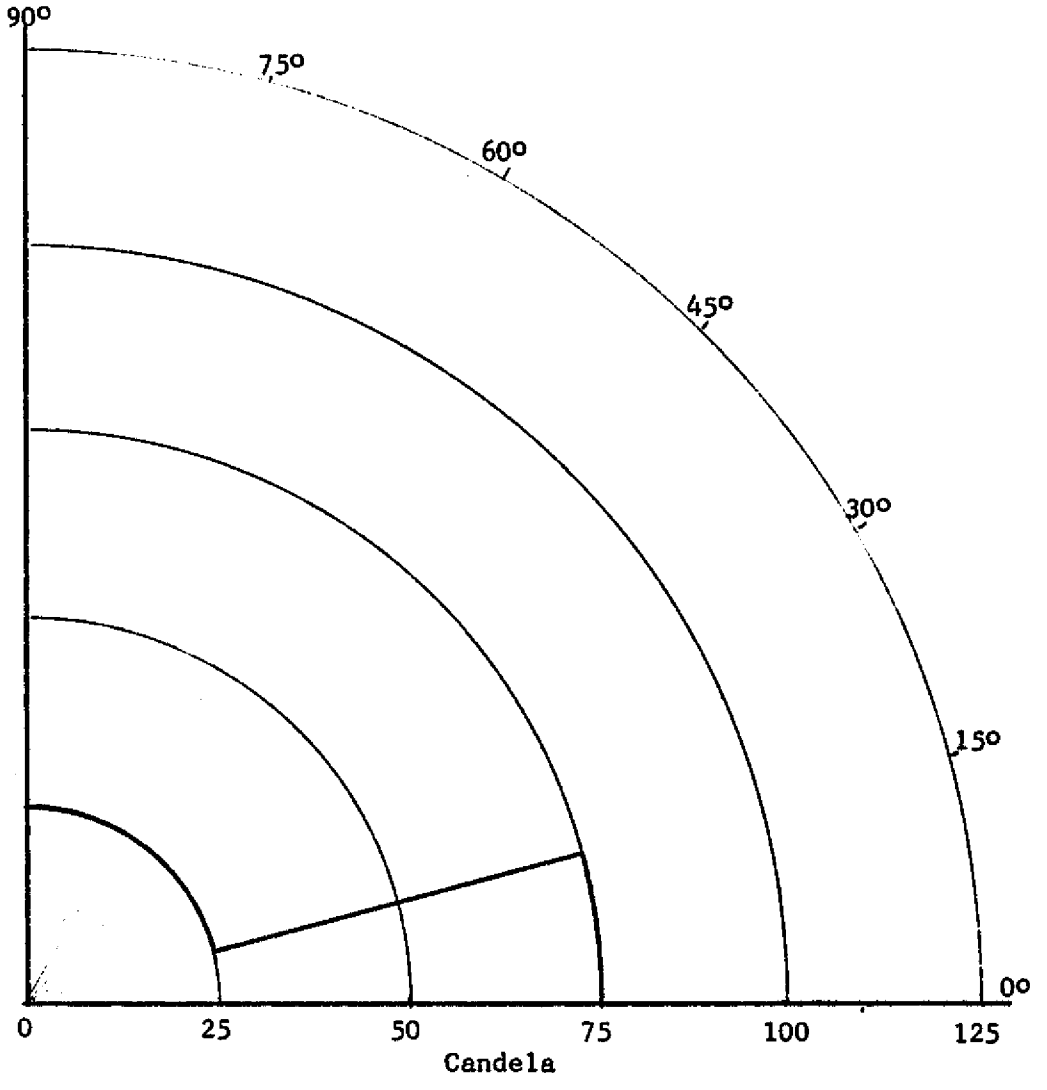


FIGURE 9. L-852-O ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.



Average Candela Output At Various Vertical Angles

NOTE: A 25 percent reduction of candela output is allowed at structural ribs.

FIGURE 10. L-852-Q ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT.

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