Cancelled See 29A

Federal Aviation Agency

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ADVISORY CIRCULAR

SUBJECT: FAA SPECIFICATION L-852, LIGHT ASSEMBLY, AIRPORT TAXIWAY CENTERLINE

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1. PURPOSE. This circular describes FAA Specification L-852, Light Assembly, Airport Taxiway Centerline, for the guidance of the public.

3. DESCRIPTION OF SPECIFICATION. This equipment specification establishes the performance requirements and pertinent construction details for bidirectional semiflush inset light assemblies to be used for lighting airport taxiway centerlines.

3. HOW TO OBTAIN THIS CIRCULAR. Additional copies of this circular, AC 150/5345-29, FAA Specification L-852, Light Assembly, Airport Taxiway Centerline, may be obtained from the Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590.

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION SPECIFICATION

LIGHT ASSEMBLY, AIRPORT TAXIWAY CENTERLINE

1. SCOPE.

1.1 Scope.-This specification sets forth the requirements for a bidirectional semiflush inset light assembly. The light assembly has been designed for mounting in airport pavements and for providing light on the centerlines of taxiways. Two types of light assemblies are covered by this specification:

Type I - For installation directly in a hole drilled in the pavement.

Type II - For installation on a mounting base installed in a hole drilled in the pavement.

2. APPLICABLE DOCUMENTS.

2.1 Military and Federal publications.-The following documents, of the issues in effect on the date of this specification, form a part of this specification and are applicable to the extent specified herein.

2.1.1 Military specifications.

MIL-C-7989	Covers, Light-Transmitting, for Aeronautical Lights, General Specification for
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirements for
MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for

2.1.2 Military standard.

MS 33586	Metals, Definition of Dissimilar

2.1.3 Federal specifications.

QQ-P-416	Plating, Cadmium (Electrodeposited)
QQ-Z-325	Zinc Coating, Electrodeposited
ZZ-R-765	Rubber, Silicone: Low and High Temperature and Tear Resistant

2.1.4 National Bureau of Standards document.

Handbook H28	Screw Thread Standards for Federal Services

2.1.5 FAA specification.

AC 150/5345-22	Specification for L-834 Individual Lamp Series-To-Series Type Insulating Transformer for 5000 Volt Series Circuit

(Copies of this and other FAA specifications may be obtained from the Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590).

(Copies of Military specifications and standards may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120).

(Information on obtaining copies of Federal specifications may be obtained from General Services Administration offices in Washington, D.C., Seattle, San Francisco, Denver, Kansas City, Chicago, Atlanta, New York, Boston, Dallas, and Los Angeles).

(Copies of Bureau of Standards documents may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402).

3. REQUIREMENTS.

3.1 General.-Unless specifically noted otherwise, the requirements listed below shall apply to both Type I and Type II light assemblies.

3.1.1 Equipment to be furnished.-Each light assembly shall be complete in accordance with all specification requirements noted herein. Any feature or item necessary for the proper operation in accordance with the requirements of this specification shall be incorporated even though that feature or item may not be specifically described below.

3.2 Performance requirements.

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 the intensity distribution requirements shown in Figure 1.

3.2.2 Environmental conditions.-The light assembly shall be capable of performing satisfactorily under the following conditions:

3.2.2.1 Temperature.-Temperature which ranges from -43°C. to +55°C. See sections 4.1.3 and 4.1.5.

3.2.2.2 Temperature shock.-Thermal shock as required in section 4.1.4.

3.2.2.3 Humidity.-Relative humidity up to 100 percent including conditions wherein condensation takes place in the form of both water and frost. See section 4.1.11.

3.2.2.4 Vibration.-Vibration as required in section 4.1.1.

3.2.2.5 Static load.-Static load as required in section 4.1.9.

3.3 Design requirements.

3.3.1 General.-The general overall design of both Type I and Type II light assemblies shall conform to the shape of a shallow right cylinder.

3.3.2 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 7.938 inches ±0.050 inch. At the periphery, the depth shall be one inch ±0.050 inch. As required, the top surface of the light assembly may slope upwards from the periphery so as to form a maximum protrusion of 3/8-inch above the adjacent paved surface when properly installed in the pavement. In forming the permissible 3/8-inch 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 10 degrees.

3.3.3 Type II light assembly.-The Type II light assembly shall require a mounting base, as shown in Figure 2 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 0.750 inch ±0.050 inch 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 6.521 inches (+0 inch -0.020 inch). The inside fillet formed by the protrusion shall have a maximum radius of 1/32-inch. 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 2. Each hole shall be 7/16-inch 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 0.400 inch, $\pm$0.030. 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 Construction requirements.

3.4.1 General.-Each light assembly shall contain a lamp, lampholder, lamp by-pass device and holder, lenses, green color filters, color filter holders, current carrying parts, and other components as required to make up a complete assembly. Means shall be provided for relamping, servicing the by-pass device, cleaning interior optical surfaces, and for general in-service maintenance and upkeep of critical components. An exterior protective rib shall be provided in each light channel to mitigate damage to lenses by snowplows and aircraft tailhooks.

3.4.2 Metal.-The metal components, excluding machine screws, nuts, and washers, shall have a minimum tensile strength of 50,000 psi and a minimum Brinell hardness of 163.

3.4.2.1 Dissimilar metals.-Dissimilar metals in contact with each other which lead to electrolytic action shall not be used. Dissimilar metals are as defined in MS 33586.

3.4.3 Construction alternates.-Variations in construction, design, and arrangement of critical components of the light assembly are permitted that are consistent with good manufacturing practices, and which produce a fixture that meets all performance, dimensional, test, and other requirements of this specification. As an example, all components such as lamp, lenses, by-pass device, and current carrying parts may be mounted in the interior cavity of the light assembly with only gasketed relamping cover provided for the in-service maintenance described above. Another permissible alternate construction is where some, or all, critical parts are attached

to the underneath side of the gasketed relamping cover. An additional permissible construction alternate for facilitating maintenance is the use of a sealed, or encapsulated, insert containing all critical components, including the lamp. In this construction, the interior cavity which receives the sealed insert shall contain electrical contacts, studs, or connectors which mate with appropriate counterpart contacts or connectors on the underside of the insert to form watertight electrical connections when the sealed insert is bolted or otherwise fastened in place in the fixture assembly. If electrical contacts or studs are used, these contacts shall be constructed so as to be removable after the light unit has been installed in the pavement. Except for the electrical connections, no gasketing or sealing is required between the self-contained, sealed insert and the cavity surfaces. The prime feature of this construction alternate shall be quick and easy replacement of inserts during field maintenance to reduce "down time" of an installed system. This type of construction shall permit relamping and general rehabilitation of the inserts in an electrical shop off the field operations area.

3.4.4 Component parts.

3.4.4.1 Lamp.-The lamp used shall be a tungsten - halogen, pre-focused, 6.6-ampere series lamp, having a nominal rating of 65 watts and a rated life of 1000 hours.

3.4.4.2 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 Figure 1. The lampholder shall be indexed to prevent improper relamping.

3.4.4.3 Lamp by-pass and holder.-A by-pass device, which immediately closes an auxiliary circuit around the lamp on failure of the lamp, shall be provided with each light assembly. 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.

3.4.4.4 Current carrying members.-Current carrying components shall be of non-corrosive, high conductivity materials. Aluminum shall not be acceptable for this purpose. Wires and current carrying parts requiring insulation shall be insulated for a minimum of 600 volts. Electrical contacts shall be made of coin-silver material or other equally high conductivity corrosion resisting materials. Current carrying parts, contacts, and connectors shall have a current carrying capacity of 1.5 times the normal operating current.

3.4.4.5 Optical components.-All glass prisms, lenses, and filters shall be Class B of MIL-C-7989, except they shall be tempered to withstand the temperature shock specified in section 4.1.4. Plastic prisms, lenses, and reflectors, if used, shall be Class D of MIL-C-7989.

3.4.4.6 Reflectors.-Reflectors, if used, shall be provided with a finish of high specular reflectivity and shall be protected, insofar as possible, from dirt, tarnishing, and corrosion.

3.4.4.7 Light color filters.-Colored lights shall be obtained by adding color filters to white lights. The color filters shall be glass and shall comply with the requirements for nondiffusing ware, Type I, Grade B, in accordance with MIL-C-25050.

3.4.4.8 Color filter holder.-Color filter holders shall be provided with each light assembly. These holders shall consist of suitable stainless steel clips or other means to hold filters firmly in place. Glass tape shall not be used to hold either the clips or filters.

3.4.4.9 Bolts, studs, nuts, and washers.-All bolts, studs, nuts, washers, and other similar fasteners used in the fixture assembly shall be fabricated from 18-8 stainless steel. All screw threads shall be Class 2 fit in accordance with Handbook H28. This requirement does not apply to current carrying components.

3.4.4.9.1 Hold-down bolts for Type II fixtures.-To hold the Type II fixture in place on the mounting base, four hex-head bolts shall be furnished. These shall be 3/8-inch in diameter, 7/8-inch in length, and suitably threaded for use in the tapped holes of the mounting base as shown in Figure 2. In addition, four 3/8-inch internal tooth-lock washers shall be furnished for use under the bolt heads.

3.4.5 Fixture leads.-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 nineteen (19) strands. Each lead shall have a minimum length of eighteen (18) inches and a maximum overall diameter of 0.20 inch. The connection between the wire and its contact shall be sealed with a high heat-resistant insulating material. 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.

3.4.5.1 Special provisions for fixture leads.-For the Type I light assemblies, 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 or 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.

3.4.6 Gaskets.-Gaskets for covers, lenses, or other parts requring sealing or cushioning interfaces shall be made of silicone rubber conforming to Federal Specification ZZ-R-765 unless prior approval of the procuring agency is obtained for use of other materials that can be demonstrated to be equal or superior in performance.

3.4.7 Sealing compounds.-Sealing compounds used to seal in place lenses, reflectors, or other parts, or for use in sealing around power entrances, shall be of types that remain essentially mastic and retain all the necessary necessary adhesive, insulative, and water sealing properties after periods of extensive use.

3.4.8 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 2, Type I of Federal Specification QQ-Z-325 or cadmium conforming to Class 1, Type I of Federal Specification QQ-P-416. The plating shall be applied as required by the applicable specification.

3.4.9 Finishing of surfaces.-All surfaces of the finished light assembly shall be smooth, without burrs or sharp edges. The top surface protruding above the pavement, when installed, shall contain no bolts, bolt heads, nuts, or other protrusions above the smooth top surface that could be damaged by snowplow blades, by aircraft tailhooks, or by vehicles. In addition, all edges above the pavement including the metal edges above the lens, the top edges of the light channels and ribs, and the top edge of the outer periphery of the finished assembly shall be rounded to not less than 1/8-inch radius.

3.4.10 Adjustment and repairs.-Each light assembly shall be so constructed that routine adjustments and repairs can be made easily with tools normally available commercially.

3.4.11 Fungus-proof materials.-This section is not applicable unless specifically specified in the Government document. Materials that are nutrients for fungi shall not be used 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.

3.4.12 Orientation reference.-To facilitate orientation of the light assembly during installation, the center of each light channel shall be clearly marked. With each taxiway centerline lighting system, the manufacturer shall provide an alignment device acceptable to the Federal Aviation Administration, Airports Service, Washington, D.C. 20590, to facilitate installation of the fixture in the pavement.

3.4.13 Closed cell foam block.-A closed cell foam block such as "Foam-Thane," 5 3/4 inches in diameter and 3/4 inch thick shall be installed inside each Type II mounting base. "Foam-Thane" may be secured from the Pittsburgh Corning Corporation. In freezing weather, this block shall act as a cushion and prevent ice damage to the light unit.

3.4.14 Plywood covers.-A plywood cover shall be furnished with each mounting base of the Type II light assemblies to facilitate installation of the mounting base with the fixture removed. This plywood cover shall be mounted on, and concentric with, the mounting base in lieu of the fixture assembly. Prior to mounting on the base, the perimeter of this cover shall be immersed to a depth of at least 1.5 inches in melted paraffine and rotated one complete turn. Such treatment shall provide a non-adhesive surface to the top, edge, and bottom contact surfaces of the cover. The cover furnished shall be of exterior commercial Grade C-D, 5-ply plywood, 3/4-inch thick. It shall be 8 inches in diameter (+1/8-inch or -0) and shall contain four holes corresponding to the tapped holes in the mounting base flange. These holes shall be 7/16 inch in diameter and shall be counterbored on the Grade D side 1 1/8 inches in diameter to a depth of 1/4 inch. The Grade D side of the cover shall have painted on it a suitable reference line to indicate the light axis.

3.4.15 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.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Qualification testing.-Qualification of a Type II light unit shall serve as qualification for the Type I light unit if the designs are identical except for the mounting provisions on the mounting base. If the designs are not identical, then each type of light unit shall undergo all applicable tests. The manufacturer shall furnish a light assembly to a testing laboratory acceptable to the Federal Aviation Administration, Airports Service, Washington, D.C. 20590, for testing in accordance with the tests specified herein. Laboratory approval shall be based on the laboratory personnel and equipment. Airports Service, upon request of the contractor, will provide names of approved testing laboratories. All tests shall be performed in the order shown except for the plating and humidity tests (see paragraphs 4.1.8 and 4.1.11) and may be witnessed by a representative of FAA, Airports Service. Filters shall be in place for all tests other than the photometric tests specified in paragraph 4.1.2. 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 testing after the cause of the failure has been corrected. Prior to tests, all hold-down bolts of the light assembly being tested 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 FAA, Airports Service, for inspection, review, and approval in accordance with this specification. When approved, the name of the qualified manufacturer and a description of his equipment will be included in AC 150/5345-1A, Approved Airport Lighting Equipment. The manufacturer shall bear all testing costs.

4.1.1 Vibration tests.-The Type I light assembly, or the Type II assembly consisting of fixture and its mounting base, 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 fixture assembly or mounting base to hold it in place on the test table. With the lamp in place an electrical shunt shall be installed across the terminals of the lamp 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:

(1) In a direction perpendicular to the plane of the test table, i.e., vibrated vertically.

(2) Vibrated horizontally in a direction parallel to the light axis, i.e., parallel to the line through the centers of the light channels.

(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.-To test the ability of the completely assembled light unit, exclusive of the lamp, to withstand vibration, the light assembly shall be vibrated in each direction through frequency ranges of 10 to 2,000 CPS at a double amplitude not exceeding 0.50 inch until the G's shown in Table I are reached. To test performance of the lamp in place in the fixture during vibration, a new lamp shall be installed, the lamp shunt shall be removed, and the light assembly shall again be vibrated in three mutually perpendicular planes through the frequencies shown in Table I until the acceleration reaches 3 G's in each plane. The duration of each sweep in each case shall be 10 minutes. Electrical continuity shall be continuously monitored through the vibration tests.

TABLE I - VIBRATION FREQUENCIES

Acceleration G's	Frequency CPS
10	10 to 500
15	500 to 2000

4.1.1.3 Inspection.-Physical inspection of the light assembly and the lamp shall be made to determine if there is mechanical failure of any component part or the loosening of any parts of fasteners. Continuity testing shall be used to reveal failure of electrical contacts or electrical circuits or failure of lamp filament.

4.1.2 Photometric tests.-The optical performance of the light assembly shall be determined by photometric readings with a clear lens and the type lamp for which the unit is designed. The lamp shall be operated at its rated current. The photometric axis of the 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 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 both beams of the light assembly at each lateral degree, at elevation angles of 0^{o}, 1^{o}, 2^{o}, 3^{o}, 4^{o}, 5^{o}, 6^{o}, 7^{o}, 8^{o}, 9^{o}, and 10^{o}, and the intensities shall meet the intensity distribution requirements of Figure 1.

4.1.3 High temperature test.-The light assembly shall be subjected to an ambient environment temperature of +55°C. (±2°C.) for a period of seven hours with the lamp operating at rated current. Any abnormal bulb blackening, blistering, smoking, corrosion, or other evidence of heat damage to any part shall be cause for rejection.

4.1.4 Cycling and temperature shock test. The light assembly 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 unit shall be de-energized and immediately submerged under at least one 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 unit shall be subjected to a repetition of the above tests until a total of three "on-off" cycles have been completed. The unit 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 critical lamp and optical cavities of the assembly, damage to any part of the unit, or equipment failure during the tests shall be cause for rejection.

4.1.5 Low temperature test.-The light assembly shall be totally immersed in water and while immersed, subjected to a low temperature of -43°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.

4.1.6 Insulation resistance test.-The light assembly shall be operated at rated current in distilled water with a power source isolated from ground at room temperature until the voltage across the leads has maintained a stable value for at least 10 minutes. The stabilized value of voltage at rated current shall be measured and recorded. The light unit, except for the ends of the leads, shall then be completely submerged in a bath containing a saturated salt solution and operated continuously. The salt water bath shall be adequately grounded. A uniform temperature between 16°C. to 27°C. shall be maintained throughout the solution by occasional stirring. The current through the leads shall be maintained at rated current during this immersion. After three hours or more of operation in the bath, the voltage across the leads shall be adjusted to, and maintained at, the recorded value. Current readings shall be taken under the following conditions:

(1) With one lead grounded.

(2) With the ground removed from the first lead and the other lead grounded.

(3) With neither of the leads grounded.

If any of the three current readings exceed rated current by more than 1.5 percent, the light shall be rejected.

4.1.7 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, with mounting base if it is a Type II, 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 five 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 and at room temperature. After this, all sand shall be removed and the photometric performance of the unit shall be measured as described in section 4.1.2. Intensities shall be not less than 80 percent of the intensities specified in Figure 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.

4.1.8 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. A separate unit may be used for the plating tests.

4.1.9 Load test.-This shall be a static load test on a complete assembly. If a Type II 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 seven inches in diameter and one-inch thick, having a Shore A hardness of 55 to 70. A total load of 35,000 pounds shall be applied uniformly over the area of the rubber at a rate not greater than 10,000 pounds 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.

4.1.10 Leakage test.-This test shall be performed after the light assembly has undergone the load test described in section 4.1.9. For the leakage test the access cover of the fixture, or removable insert, shall be securely fastened in place per the manufacturer's specifications. A suitable means for pressurizing the lamp and optical cavity, with compressed air or inert gas, shall be provided. Prior to performing this test, the two wire leads shall be subjected to a 20-pound tension for five minutes to test the integrity of the seal where the leads enter the fixture assembly. With a minimum internal pressure of 10 psi, the assembled unit shall be tested using a bubble test material (high-foam detergent producing a low surface tension). The light unit shall be considered watertight if no air bubbles appear.

4.1.11 Humidity test.-The light assembly shall withstand a humidity test conducted in accordance with procedure III of Specification MIL-E-5272 for 360 hours. Any evidence of damage, rusting,or corrosion shall be cause for rejection. A separate unit may be used for the humidity tests.

4.1.12 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.

4.1.12.1 Bypass test procedure.-Three 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:

(1) With 6.6 amperes flowing through the primary of the transformer for a minimum of three hours, disconnect a lamp in one fixture. The bypass device shall operate within a one-second period. Without de-energizing the circuit, reduce the current to 3.4 amperes and disconnect a lamp in one of the remaining fixtures. The bypass device shall operate within a one-second period.

(2) 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 3.4 amperes output level, and then energize the circuit. The bypass device shall operate within a one-second period. Repeat the above procedure with the constant current supply set for 6.6 amperes.

4.1.13 Light filter certification.-Certification that glass light filters provided with the light unit comply with the requirements of specification MIL-C-25050 shall be supplied to the Federal Aviation Administration, Airports Service, Washington, D. C. 20590.

4.2 Production testing.-Each Type I and Type II light assembly shall be subjected to production type photometric and leakage tests described herein. For the production type photometric tests, a goniometer shall not be required. A testing method to demonstrate that the CD output conforms to the requirements of Note (d), Figure 1, shall be used. The method used shall have the prior approval of the Federal Aviation Administration, Airports Service, Washington, D.C. 20590. Each light beam of each production unit shall be tested in this manner to demonstrate that light intensities in at least six critical points, as shown on the isocandela curve of Figure 1, meet or exceed the minimum requirements at these points. Leakage tests on production units shall be accomplished by means of a standard test cover that can be used on different lamp-optical cavities. This test cover shall be properly fitted with pressure fittings to permit the internal pressure of each assembly to be raised to 10 psi. No units which have been tested and have failed to meet these production tests shall be shipped in fulfillment of an order. These tests shall be performed by the manufacturer and may be witnessed by a Government representative. Each light assembly shall be identified by a serial number and test records kept by the manufacturer for at least two years. These records shall be available to the Federal Aviation Administration upon written request.

5. PREPARATION FOR DELIVERY.

5.1 Light fixture.-The Type I and Type II light fixtures shall be prepared for delivery as assembled units ready for installation. 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 mounting base for Type II light assemblies shall be prepared for delivery as a separate component.

5.1.1 Fixture packaging.-Each assembled unit shall be individually packaged 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.

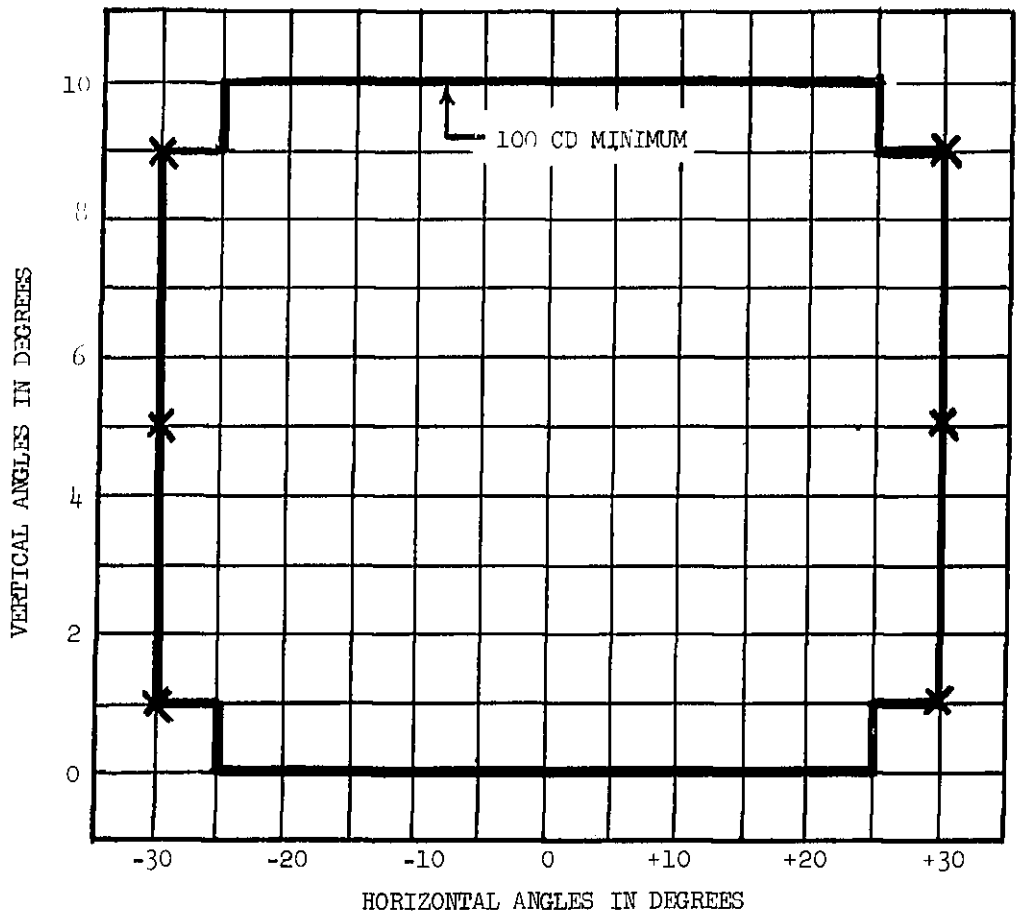
5.1.2 Mounting base.-The internal tooth lock washers shall be packed in a separate envelope and placed inside the base. The top surface of the flange shall have a wax film not exceeding 0.001 inch in thickness. The plywood cover required to be furnished with the mounting base shall be properly positioned and secured to the top of the mounting base with the hold-down bolts which are required for later use in installation for mounting the Type II fixture on the mounting base.

5.2 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. NOTES.

6.1 None



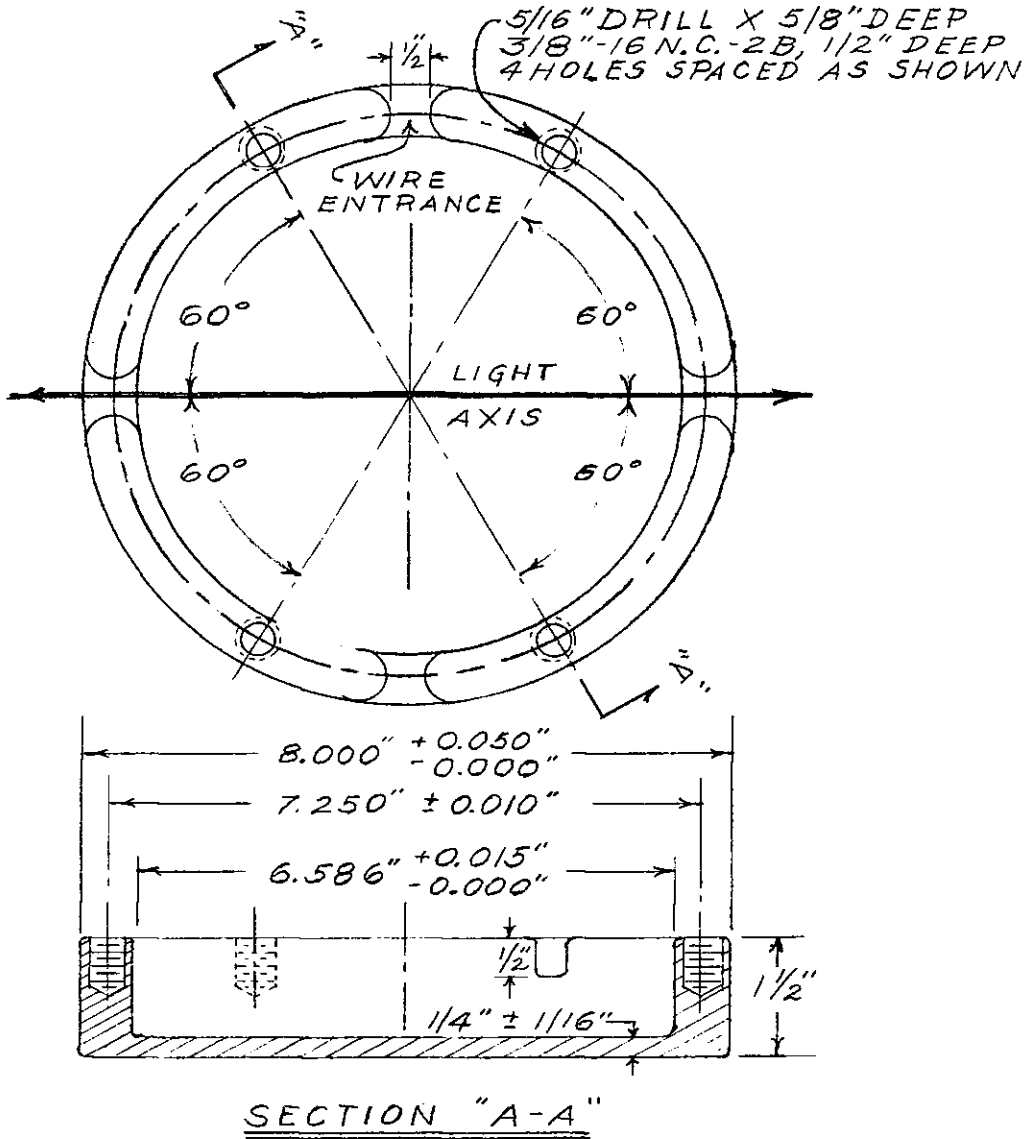
NOTES: (a) A ± 1/2 VERTICAL SHIFT AND A ± 2.5 HORIZONTAL SHIFT IS ACCEPTABLE.

(b) THE 100 CD CURVE OF THE LIGHT UNDER TEST MAY INFRINGE THE REQUIRED CURVE OF THIS FIGURE BY NO MORE THAN 50 SQUARE DEGREES. INTENSITY IN THE INFRINGED AREAS SHALL BE NOT LESS THAN 50 CD.

(c) CURVE SHOWS MINIMUM CLEAR LIGHT WITHOUT COLOR FILTERS.

(d) THE SIX CRITICAL POINTS FOR PRODUCTION TESTS ARE DESIGNATED ABOVE BY THE SYMBOL "X".

FIGURE 1. *ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT*



SECTION "A-A"

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).

FIGURE 2. MOUNTING BASE FOR TYPE II LIGHT ASSEMBLY

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