FAA-E-2968
Date: 5/27/03

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

DETAIL SPECIFICATION

STEADY BURNING, SEMI FLUSH APPROACH LIGHT UNITS FOR THE MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)

Product Team for Navigation
and Landing Systems

AND-740

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited

1. SCOPE AND CLASSIFICATION

1.1 Scope. The equipment covered by this specification is a steady burning, semi flush approach light unit for the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) installed in paved operational surfaces of airport runways normally used by aircraft and airport service vehicles.

1.2 Classification.- The following semi flush approach light units are covered by this specification:

1.2.1 Style.

Style I	Medium intensity approach light	Unidirectional: White
Style II	Medium intensity approach light(threshold)	Unidirectional: Green

1.4. Features.- To ensure maximum performance, the following features are included:

(a) Installation on L-868 light base (Paragraph 3.2)
(b) Maximum input power to the light unit is 200 watts (Paragraph 3.2)
(c) Resistance to runway de-icers and anti-icers is required (Paragraph 3.4)
(d) Stainless steel or aluminum is required for top cover (Paragraph 3.4.1)
(e) 12 minutes is maximum time for lamp replacement (Paragraph 3.5.1)
(f) Maximum weight of the light unit is 44 pounds (Paragraph 3.5.1)
(g) 1/2" is the maximum projection above the runway pavement (Paragraph 3.5.2)
(h) 1/16" is the minimum radius on exposed exterior surfaces (Paragraph 3.5.2)
(i) Maximum slope of the top surface is 12° (Paragraph 3.5.2)
(j) An internal flange to restrain each lens is required or alternatively a wedge shaped lens and mating aperture (Paragraph 3.5.2)
(k) Torqueing instructions provided via metal plate (Paragraph 3.5.3)
(l) 1,000 hour minimum lamp operational lifetime (Paragraph 3.5.4.1)

2. APPLICABLE DOCUMENTS

2.1 FAA Documents.- The following FAA Specifications and Advisory Circulars, of the issues specified in the invitation for bids or screening information request, form a part of this specification and are applicable as specified.

2.1.1 FAA Specifications.

FAA-D-2494	Technical Instruction Book Manuscripts; Electronic, Electrical, and Mechanical Equipment, Requirements for Preparation of Manuscript and Production of Books
FAA-E-2803	Potential Isolation Transformers for Airport Lighting Systems
FAA-G-2100	Electronic Equipment, General Requirements

2.1.2 FAA Advisory Circulars.

AC 150/5345-26	Specification for L-823 Plug & Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Base, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-53	Airport Lighting Equipment Certification Program

2.2 Military and Federal Publications.- The following military and federal publications, of the issues specified in the invitation for bids or screening information request, form a part of this specification and are applicable as specified herein.

2.2.1 Military Specifications.

MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-C-7989	Covers, Light Transmitting, for Aeronautical Lights, General Specification for
MIL-DTL-13924	Coating, Oxide, Black, for Ferrous Metals

2.2.2 Military Standards.

MIL-STD-276	Impregnation of Porous, Non-Ferrous Metal Castings
MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-889	Metals, Definition of Dissimilar

2.2.3 Federal Specifications.

ZZ-R-765	Rubber, Silicone; Low and High Temperature and Tear Resistant
QQ-Z-325	Zinc Coating, Electrodeposited, Requirements for

2.2.4 Federal Standards.

FED-STD-123	Marking for Shipment (Civil Agencies)

2.3 Other standard documents.- The following industry publications, or the issues specified in the invitation for bids or screening information request, form a part of this specification and are applicable as specified herein.

ANSI/ASQC Z1.4	Sampling Procedure for Inspection by Attributes
ANSI/ASQC-Q9003	Quality Systems, Model for Quality Assurance In Final Inspection and Test
ANSI B46.1	Surface Texture (Surface Roughness, Waviness, and Lay)
ASTM A890/A890M	Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-resistant, Duplex (Austenitic/Ferritic) for General Application
ASTM D3951	Standard Practice for Commercial Packaging
ASTM D4169	Standard Practice for Performance Testing of Shipping Containers and Systems
IES LM-35	Photometric Testing of Floodlights Using Incandescent Filament or Discharge Lamps
SAE-AMS-A-21180	Aluminum-Alloy Castings, High Strength
SAE-AS25050	Colors, Aeronautical Lights And Lighting Equipment, General Requirements For

Copies of this specification and other applicable FAA publications may be obtained from the Contracting Officer in the Federal Aviation Administration office issuing the invitation for bids or screening information request. Requests should fully identify material desired, i.e., specification, standard, amendment and drawing number. Requests should cite the invitation

for bids, screening information request, contract involved or other use to be made of the requested material.

FAA Advisory Circulars may be obtained from the Department of Transportation, General Services Division, M-45, Washington, DC 20590: Phone (202) 267-3115, 3161, and 8329, or may be obtained electronically from http://www.faa.gov/arp/150acs.htm (Design, Construction & Maintenance).

Information on obtaining copies of federal specifications and standards may be obtained from General Services Administration offices in Atlanta; Auburn, WA; Boston; Chicago; Denver; Fort Worth; Kansas City, MO.; Los Angeles; New Orleans; New York; San Francisco; and Washington, DC

ASTM documents may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428, or from: http://www.astm.org/cgi-bin/SoftCart.exe/STORE/store.htm?E+mystore.

American National Standards Institute/American Society for Quality Control (ANSI/ASQC) documents may be obtained from the ASQC, 611 East Wisconsin Avenue, Milwaukee, WI 53202.

Single copies of military specifications and standards may be obtained from the Contracting Officer in the Federal Aviation Administration office issuing the invitation for bids or screening information request. Requests should cite the invitation for bids, screening information request, or contract for which the material is needed. Mail requests, if found acceptable, will be forwarded to a military supply depot for filling; hence, ample time should be allowed.

Military specifications and standards and federal and GSA specifications and standards may be downloaded by accessing http://assist.daps.mil and then selecting the button for ASSIST Quick Search.

American National Standards Institute (ANSI) documents can be obtained electronically from http://webstore.ansi.org/ansidocstore/shopper_lookup.asp. Paper standards are available through Global Engineering Documents.

Society of Automotive Engineers (SAE) documents may be obtained from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Phone: (412) 776-4841.

Illuminating Engineering Society of North America (IESNA) documents may be obtained from IES at http://www.iesna.org/.

3. REQUIREMENTS.

3.1 Equipment to be furnished.- Each light unit furnished by the contractor shall be complete in accordance with all specification requirements. Each light unit of a given style furnished under this specification on a given contract shall be identical with all other such light units.

Light bases shall not be furnished with the light units. However, FAA certified light bases shall be provided for testing purposes as specified in paragraph 4 herein.

Transformers may or may not be required with the light units - the conditions under which they are required are given below. However, transformers shall be provided for testing purposes as specified in paragraph 4 herein. The transformer will be installed in the same light base as the light unit.

Depending on the contractor's design, one of the following scenarios is applicable:

1. Transformers not required.
2. Transformers meet the requirements of FAA-E-2803 [POTENTIAL ISOLATION TRANSFORMERS FOR AIRPORT LIGHTING SYSTEMS] for constant voltage design, and transformers shall not be delivered with each light unit.
3. Transformers do not meet the requirements of FAA-E-2803 and therefore a transformer shall be delivered with each light unit. Technical changes are needed to enable the FAA to revise the FAA-E-2803 transformer specification. A complete detailed description of these technical changes shall be delivered to the FAA Contracting Officer at no additional cost to the FAA. An additional quantity of transformers shall be delivered to the FAA for use as spare parts peculiar.

3.1.1 Interchangeability.- All individual parts of one light unit shall be interchangeable with the same parts of all other such light units of a given style delivered on the same contract.

3.2 General functional requirements.- The steady burning, semi-flush approach light units specified herein shall be designed for use in airport runways as a unidirectional light. The light units will be subjected to the forces of aircraft landing, taking off, and taxiing, as well as airport service vehicles with and without snow chains, including snowplows, wire brush sweeping equipment and snow blowers. The light units shall be designed for mounting in a light base having the geometry and dimensions of the Type L-868 light base, size B (see AC 150/5345-42, SPECIFICATION FOR AIRPORT LIGHT BASE, TRANSFORMER HOUSINGS, JUNCTION BOXES, AND ACCESSORIES). The light base will be embedded in a concrete or asphalt runway. Input power to each light unit shall not exceed 200 watts (W).

3.3 Environmental requirements.- The light units shall achieve required performance under the following environmental conditions:

3.3.1 Temperature.- Any ambient temperature from -67° Fahrenheit (F) (-55° centigrade (C)) to +131°F (+55°C).

3.3.2 Altitude.- Sea level to 10,000 feet above sea level.

3.3.3 Sand and dust. - Exposure to wind blown sand and dust particles as may be encountered in arid regions.

3.3.4 Corrosive fog. - Exposure to corrosive salt and corrosive potassium acetate atmospheres.

3.3.5 Humidity. - Up to 100 percent from sea level to 10,000 feet above sea level and 131°F (55°C).

3.3.6 Thermal shock. - When operating at maximum temperature, the top surface of the light unit, including the light window, shall withstand thermal shock such as would be imposed by spraying or flooding with cold water.

3.3.7 Rain. - Exposure to wind blown rain.

3.4 Materials and components. - Materials and equipment components shall be as specified herein. The components shall have adequate capacity and shall not be operated in excess of the component contractor's recommended rating. All parts of the light unit shall withstand corrosion and oxidation when subjected to continuous operating temperature in the confined atmosphere of the light base and when exposed to chemicals typically present, including but not limited to oil, gasoline, aircraft fuel, de-icing and anti-icing fluids.

3.4.1 Metals. - Metals shall withstand the mechanical stresses involved and shall be inherently corrosion resistant, or suitably protected after fabrication, to prevent corrosion under the service conditions, as specified in paragraph 3.3. The use of dissimilar metals in contact with one another shall be avoided wherever practicable. However, if the use of dissimilar metals cannot be avoided, they shall be in accordance with MIL-STD-889. Ferrous metals shall be galvanized or given other equal corrosion protection. Copper bearing hardware in contact with aluminum shall be plated with nickel or zinc. Stainless steel or aluminum shall be used for the top cover.

3.4.1.1 Stainless steel. - Stainless steel, if used for the top cover, shall meet the requirements of ASTM A890/A890M

3.4.2 Hardware. - All bolts, studs, nuts, washers and other similar fasteners used in the light unit and base shall be fabricated from either 18-8, 410, or 416 stainless steel, passivated and free from discoloration. Lock washers shall be made of 410 stainless steel. Bolts subject to direct stresses resulting from forces applied to the top surface of the light unit shall be high strength corrosion resistant type Nitronic 60 stainless steel, and shall be used in combination with NordLock®, or equivalent, lock washers.

3.4.3 Current-carrying components. - Current-carrying components shall be fabricated of non-corrosive, high-conductivity materials. Aluminum shall not be used for this purpose. Electrical contacts shall be made of coin silver material or equal material. All current-carrying parts requiring insulation shall be insulated for at least 600 volts and shall be designed for a current-carrying capacity of at least 1.5 times the maximum operating current.

3.4.4 Protective coatings. - Protective coatings used for prevention of corrosion shall be as specified below:

3.4.4.1 Anodizing. - Aluminum parts of the light unit which would be exposed to continuous moisture, salt laden atmosphere, or mechanical damage shall be Teflon penetrated hard coat anodized to meet the requirements of MIL-A-8625, Type III, or shall of an alloy resistant to corrosion caused by runway deicing and anti-icing solutions, including potassium acetate. Other aluminum parts shall be anodized per MIL-A-8625, Type I, or Type II, Class 1 or Class 2, as applicable.

3.4.4.2 Black oxide finish.- Bolts or screws made of 410 or 416 stainless steel shall be given a black oxide finish in accordance with MIL-DTL-13924, Class 3, after heat treatment.

3.4.5 Light Window.- The light window shall be of borosilicate glass, or equivalent, having an average Young's Modulus of 9.1×10^6 and a Poisson's Ratio of 0.2. The light transmission ratio shall be for aviation white and shall be equal to or better than grade B.

Glass used as an optical or structural part shall meet all requirements of this specification which includes the requirement of SAE-AS25050, Grade B and MIL-C-7989 for Class B and Class C glass (Class C glass may be used if required for impact strength). Glass parts shall be supported in such a way that they will not be damaged by vibrations, shocks, or deflection of any component part. The glass shall be tempered to withstand the thermal shock specified in paragraph 4.3.7.

3.4.6 Gaskets and O-Rings.- Gaskets and O-Rings shall be capable of sustained operation at temperatures specified in paragraphs 3.3.1 and 4.3.2, and shall withstand deterioration caused by de-icing and anti-icing fluids. Gaskets and O-Rings shall be low compression set silicone rubber conforming to ZZ-R-765, Class IIB Grade 60, or better, or neoprene.

3.4.7 Sealing compounds.- Compounds used for sealing shall be run-proof and shall not harden or crack. They shall remain mastic, and not lose water sealing properties after exposure under the environmental conditions specified in paragraph 3.3 and shall withstand deterioration caused by de-icing and anti-icing fluids.

3.4.8 Fungus-proof materials.- Materials that are nutrients for fungi shall not be used in the light units.

3.5 Design requirements.

3.5.1 General.- The light unit shall consist of a top cover assembly, optical assembly and bottom cover assembly. The light unit shall be constructed so that adjustments and repairs can be made easily. All interior components of the light unit must be easily removable for cleaning or replacement. All parts in the light unit shall be mounted in such a manner as to insure withstanding shocks and vibrations under service conditions.

Normally available commercial tools shall be used for adjustments and repairs. Means shall be provided on the light unit to permit its removal for maintenance purposes, i.e. pry bar slots, indentations, extraction devices or other suitable provisions. The design shall allow disassembling of the light unit at ambient temperature in not more than five (5) minutes, removal and replacement of the lamp(s), without the use of power tools, in not more than three (3) minutes and reassembling of the light unit in not more than four (4) minutes (including tightening to the manufacturer's recommended torques).The light unit will be mounted on an L-868 light base, size B, on an 11.25 +/- 0.010 inch diameter bolt circle) with six 3/8 inch high-strength stainless steel bolts as specified in paragraph 3.4.1.1, using a silicone or neoprene O-ring. Interface details and dimensions of L-868B light bases are shown in AC 150/5345-42 (SPECIFICATION FOR AIRPORT LIGHT BASE, TRANSFORMER HOUSINGS, JUNCTION BOXES, AND ACCESSORIES). Critical interface areas of the light unit are the outer diameter, top flange, bolt holes and throat projection. The light unit shall have an outside diameter of 11.94 inches +/-0.05 inch. The light unit shall have a projection that extends at least 1/4 inch down through the top flange of the L-868B light base. The diameter of this projection shall be 9.95 inch +0.00/-0.01 inch. The light unit shall be designed to mount on an L-868B base whose top surface is 3/4 inch below grade. The light unit bolt-hole configuration shall match the top flange of the light base. In addition, the axis between one pair of bolt holes on opposite sides of the light unit must be perpendicular to the direction of the runway centerline.

Subject to approval of the Contracting Officer, it is also acceptable for the light unit to have an outside diameter less than of 11.94 inches. Such smaller light units will be used with adapter rings which shall be provided by the contractor. The contractor-provided adapter rings shall mate with the L-868 light base, size B, on an 11.25 +/- 0.010 inch diameter bolt circle with six 3/8 inch high-strength stainless steel bolts as specified in paragraph 3.4.2, using a silicone or neoprene O-ring. The adapter ring shall be made of material which meets all other specification requirements.

All necessary bolts, O-rings, washers and lock washers for mounting the light unit on the light base, as well as a quantity of anti-seize compound shall be provided with each light unit. The anti-seize compound shall be Loctite Nickel Anti-Seize Lubricant 771, or equivalent (28 grams minimum).

The light unit shall have a 30 inch long chemically resistant two wire power lead, of the proper size, ending in a two pole, Class A, Type II, Style 1 or Style 6, chemically resistant polarized plug connector certified to AC 150/5345-26 (SPECIFICATION FOR L-823 PLUG AND RECEPTACLE, CABLE CONNECTORS). The design shall permit free standing of the light unit on a flat surface without interference from leads or other features.

The light unit shall not weigh more than forty-four (44) pounds. The light unit shall not extend more than 12.5 inches into the light base measured from the top of the light base flange.

3.5.2 Top cover assembly.- The top surfaces of the light unit shall be stainless steel or aluminum and shall be smooth and free of sharp projections which could damage tires or engage with snowplow blades. Any O-ring grooves shall have a surface finish of 64 rms maximum as defined in ANSI B46.1. The surface on the light unit that mates with the light base flange shall have a smooth finish to provide good load transfer and sealing. The seating surfaces of the mating parts shall be flat to insure seating without rocking before being secured. No part of the top surface which protrudes above finished grade, excluding recesses, light windows and light channels, shall have a slope greater than 12 degrees. No part of the light shall exceed 1/2 inch in height above the pavement. All edges above the pavement shall be rounded to not less than 1/16 inch radius.

The too cover assembly may have one, two or three light windows. Each light window of the light unit shall have an internal flange that will prevent the lens from being pushed back into the interior of the light unit. The clearances between the lens and the metal surfaces of the light unit shall prevent cracking of the lens when the light unit is subjected to the specified loads. The clearances shall be chosen such that the possibility is minimized for shards of the teflon/rubber snowplow blade edges to penetrate the area between the lens and the adjacent metal surfaces and cause leakage. Sealants or glues or other devices shall secure the lens in the light unit without leakage when subjected to the specified loads. To assure the integrity of seals and bonds after subjection to the specified loads, the sealants, glues, or other devices for securing the lens shall withstand chemicals typically present, including but not limited to oil, gasoline, aircraft fuel, de-icers and anti-icers.

A wedge shaped lens with appropriate retaining devices is also acceptable in lieu of an internal flange.

3.5.3 Bottom cover assembly.- The bottom cover shall be airtight and watertight. Seals used shall prevent breathing with internal pressure changes due to varying lamp heat. Pressure within the light unit shall not

exceed 20 psi under any operating condition. A fitting shall be supplied to allow pressurization of the sealed optical assembly. The fitting may be permanent, or it may be replaced by a plug for installation. This fitting will be used to test the seals after field maintenance.

A ground lug of an appropriate type, based on the manufacturer's design, shall be included on the bottom cover assembly. The ground lug shall be located so as to not interfere with light base insertion/extraction.

A plate, similar to the name plate, shall be attached to the bottom cover directing the installer to:

1. Apply anti-seize compound to each of the bolts when attaching the light unit to the light base.
2. Torque the bolts to a value of from 175 to 200 inch-pounds, or the contractor's recommended value in inch-pounds, if different.
3. Avoid the use of an impact wrench to tighten the bolts.

3.5.4 Optical assembly.- The optical assembly shall produce white or green light output, as required by style. The optical assembly shall contain the lamps, lamp holders, lamp retaining hardware, interior lens(es), filter(s), filter retaining hardware, reflector(s) and terminals for connecting the lamp(s) to the power leads. The reflector(s) shall be provided with a finish of high specular reflectivity and shall be protected from dirt, tarnishing and corrosion. The design of the optical assembly shall be such that no adjustment of the optics will be required in the field.

The optical components shall be keyed so that they may not be reassembled incorrectly. The lamp(s) shall be accurately and firmly positioned at the proper focal point. Any interior lenses or filters shall be securely positioned. When the light unit has been reassembled after maintenance, all components shall be properly aligned, original water resistance shall be restored, and the required photometrics shall be produced.

3.5.4.1 Lamp(s).- The lamp(s) shall have an average life of at least 1,000 hours at maximum intensity level while operating within the fixture. If more than one lamp is used in the light unit, they shall be operated in a series configuration. The lamp(s) shall meet all vibration, load and impact test requirements of this specification when installed in the optical assembly. The lamp(s) shall be selected for proper light output and shall be prefocused to insure consistency and repeatability of intensity and beam pattern with each lamp change. In order to prevent damage from all types of impact, the lamp(s) shall be securely seated in the optical assembly. A durable label with replacement lamp identification data shall be placed in the light unit near the lamp(s).

The light units will be powered by three discrete line voltages for the high, medium and low intensity levels. These voltages correspond to relative intensities of approximately 100 /20°/4.. The input voltages for the three steady burning lamp intensity levels are shown below:

Intensity Levels	Voltages
high	240 VAC +/- 2.5%
Medium	150 VAC +/- 2.5%
Low	100 VAC +/- 2.5%

3.5.4.2 Color filters.- Color filters may be used to produce the aviation white or aviation green light outputs, as required. Mounts shall be designed to prevent the filters from cracking due to thermal shock, vibration or impact loads.

3.5.5 Light color, intensity and distribution.- Colors of the aviation white and aviation green light outputs shall conform to SAE-AS25050. The intensities of the Style I and Style II light units shall comply with the light patterns shown in Figures 1 and 2. However, a one degree shift in the light pattern is permitted upward, left or right. A downward shift shall be not greater than 1/2 degree. The light pattern shall not cut off abruptly at the outer edges of the specified illuminated areas, but shall decrease in intensity beyond the specified area. Maximum intensity of the light units shall not exceed: Style I (white) - 25,000 candelas (CD) and Style II (green) - 25,000 CD. The beam coverage angles define the size of the ellipse. The light intensity inside the ellipse shall equal or exceed the intensity specified in Figures 1 and 2.

If the light unit has a downward sloping light channel toward the light windows which could obstruct part of the light window areas by water, the resulting light intensity with the obstructed portion of the light windows blocked out with opaque tape shall be at least 50% of the minimum value specified (no more than half the light window area shall be blocked out).

The light units shall meet chromaticity requirements of this specification at the maximum intensity level.

3.5.5.1 Style I - white light output.- When the light unit is operated at maximum intensity level, the light pattern shall be as shown in the isocandela ellipse shown in Figure 1. The minimum intensity within the isocandela ellipse shall be 10,000 CD and shall enclose an area of at least 7° by 10° as follows: Within 2° to 9° above horizontal and within 5° left to 5° right of the vertical centerline of the light unit. A slight infringement of lesser CD values is permissible, provided not more than 28 square degrees of the specified illuminated area is affected with an average light intensity not less than 8,500 CD (i.e. a square area of approximately 5.3^0 by 5.3^0, or any other combination of dimensions giving an area of 28 square degrees, 40% of the total area). Intensity within the 28 square degrees shall be at least 5,000 CD. When computing the average intensity for a test beam, the largest value used may be no more than three times the smallest axial value for that H-V axis. Test data sheets submitted shall show the original data values before averaging.

A secondary isocandela ellipse is also defined. The intensity on the secondary ellipse shall be at least 10 percent of the specified minimum intensity. The main ellipse and the 10 percent ellipse are concentric; that is, the main ellipse lies exactly in the center of the secondary ellipse. The 10 percent ellipse shall enclose an area of at least 12° by 14° as follows: from 0.5° below the horizontal to 11.5° above horizontal and within 7° left to 7° right of the vertical centerline of the light unit. The portion of the 10 percent ellipse that falls below grade may be disregarded. At least 8 points shall be measured on the 10 percent ellipse.

3.5.5.2 Style II - green light output.- When the light unit is operated at maximum intensity level, the light pattern shall be as shown in the isocandela ellipse shown in Figure 2. Each reading shall equal or exceed the 8,000 CD minimum value. The ellipse shall enclose an area of at least 8° by 12° as follows: Within 1° to 9° above horizontal and within 6° left to 6° right of the vertical centerline of the light unit.

3.5.6 Structural integrity.- The semi-flush light units shall withstand the mechanical stresses described below without damage or deterioration of performance:

ISOCANDELA CURVE FOR AVIATION WHITE APPROACH LIGHT

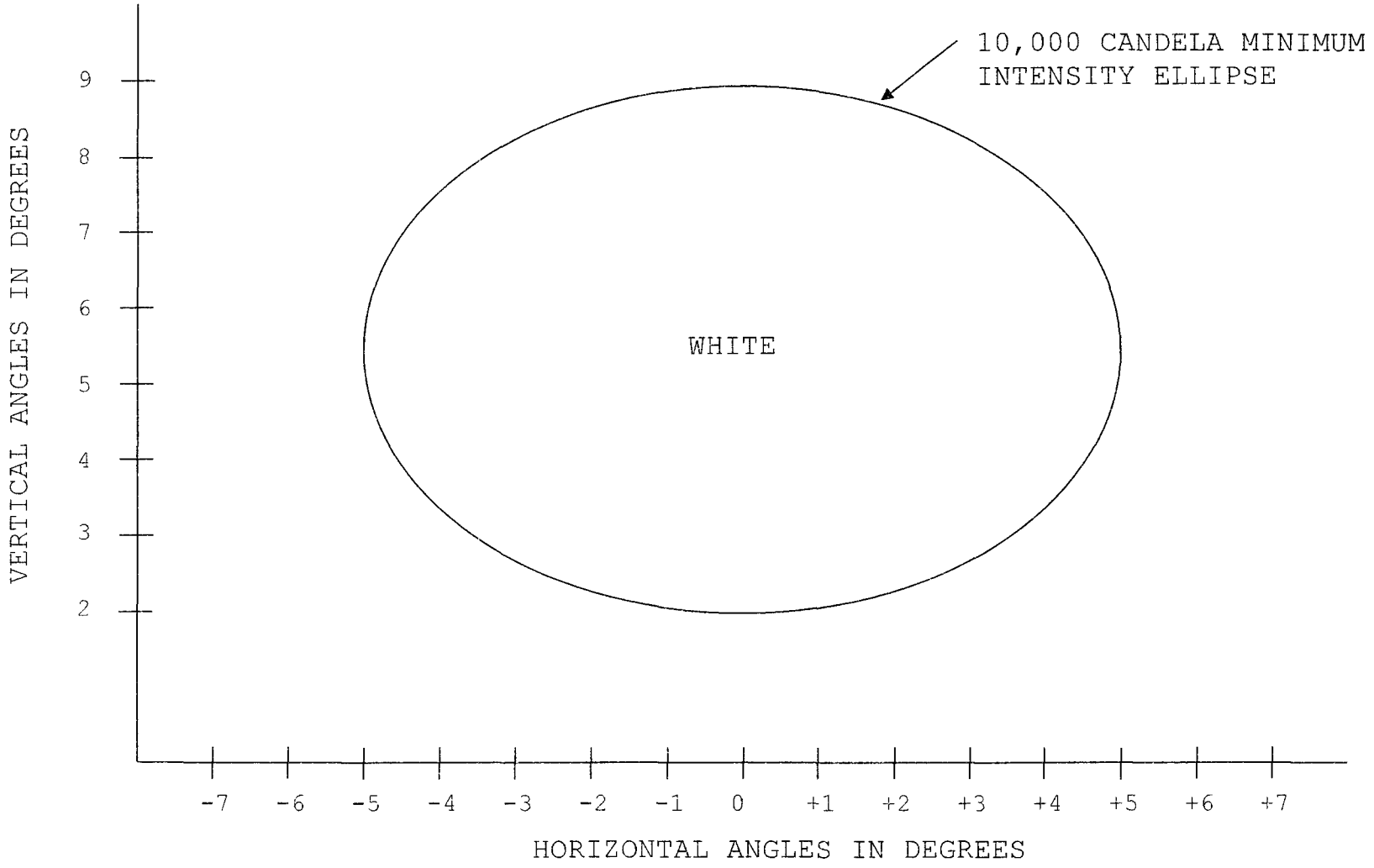

FIGURE 1.

ISOCANDELA CURVE FOR AVIATION GREEN APPROACH LIGHT

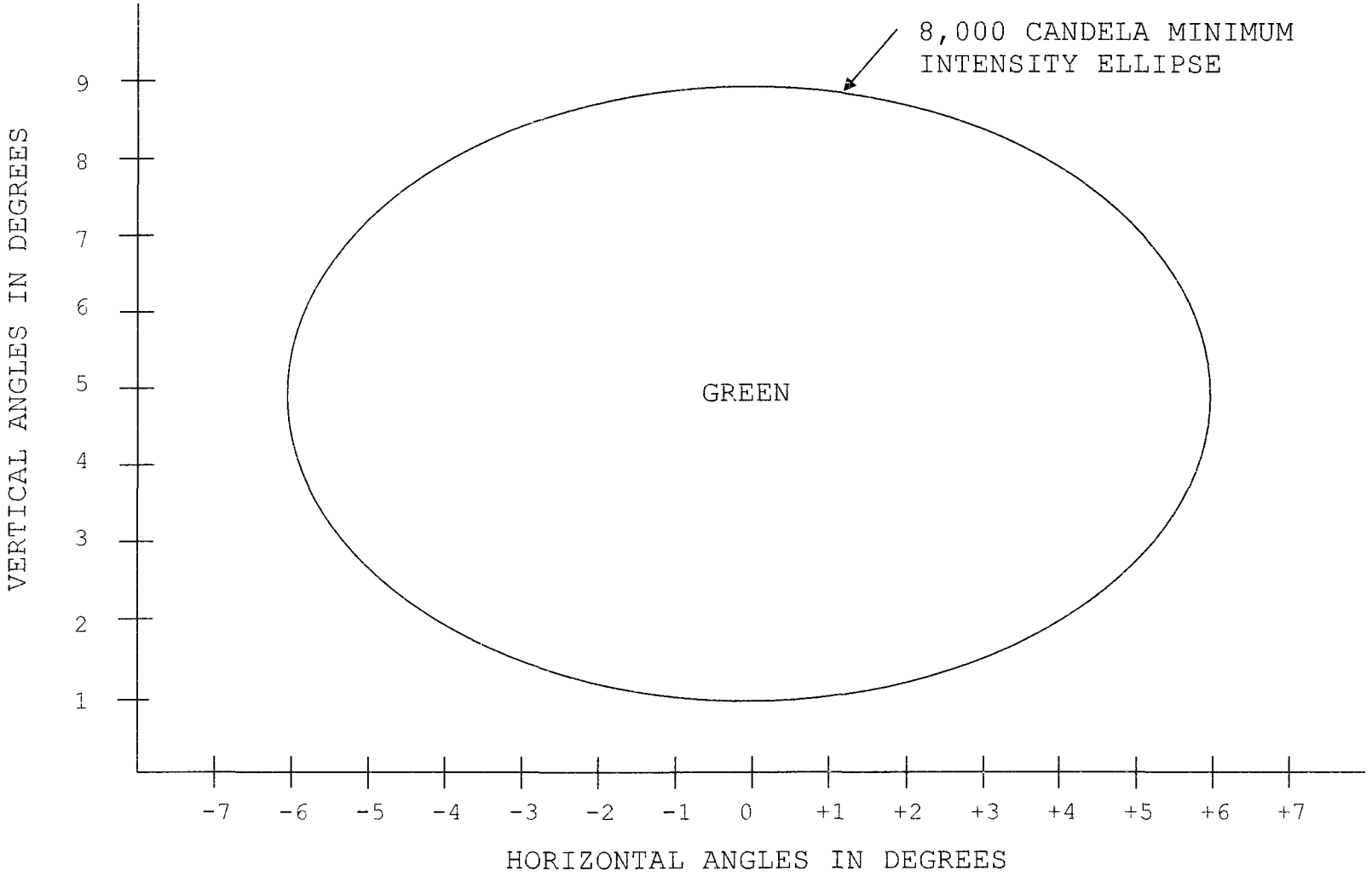

FIGURE 2.

3.5.6.1 Vibration.- The light unit shall withstand sinusoidal vibrations at frequencies ranging from 10 to 2,000 hertz (Hz) in the transverse, longitudinal and vertical directions.

3.5.6.2 Static load.- The light unit, including the adapter ring if required by design, shall withstand a static load (in pounds) of 500 times the top area (in square inches) distributed uniformly over the top surface of the light unit.

3.5.6.3 Dynamic load.- The light unit shall withstand the impact and vibration loads imposed by service vehicles with and without snow chains (snow plows, snow blowers and wire brush sweeping equipment) and aircraft during their operational phases (taxiing, taking off, landing, stopping and turning on the light unit).

3.5.6.4 Shear load.- The light unit shall withstand a shear load of 6,000 pounds applied to the top of the light unit in any direction parallel to the mounting surface.

3.5.6.5 Torque load.- The light unit shall withstand a torque load of 8,333 foot-pounds applied to the top surface of the light unit in any direction parallel to the mounting surface.

3.5.6.6 Hydraulic impact.- The light unit shall withstand hydraulic pressures created by aircraft tires moving at high speeds during operations in wet weather. The top of the light unit shall withstand a momentary hydraulic pressure of 250 psi.

3.5.6.7 Mechanical impact.- The light unit shall withstand the repeated impact of a steel ball with 30 pound-feet (40 J) of energy.

3.5.6.8 Light window load.- The light window shall support a load of 500 psi over the area of the opening when applied directly to the window surface.

3.5.7 Heat dissipation.- Temperature inside and outside of the light unit shall be held to the minimum by utilizing efficient heat dissipation techniques and materials with high coefficients of heat transfer. The maximum allowable external top surface temperature in still air is 302^{0}F (150 C). The maximum allowable external top surface temperature with the tire of a heavy ground vehicle resting on the light unit is 320^{0}F (160^{0}C).

3.5.8 Nameplate.- A nameplate conforming to FAA-G-2100, paragraph 3.3.3, shall be attached to the light unit with four type 18-8 stainless steel screws or rivets. Within the nameplate, the manufacturer's address shall be replaced with the FAA type number and the manufacturer's part number.

3.5.9 Certification documents.- Prior to testing the production model, certification shall be furnished to the Contracting Officer that the materials required, or allowed, by paragraphs 3.4.1.1, 3.4.1.2, 3.4.4, 3.4.5 and 3.4.6 meet the requirements of these paragraphs.

3.5.10 Documentation to be furnished.

3.5.10.1 Instruction book.- An instruction book shall be provided with each light unit in accordance with FAA-D-2494. A copy of the instruction book shall be supplied in software in a word processing language and media approved by the Contracting Officer.

3.5.10.2 Technical description.- A description of commercial parts (lamps, fittings, lenses, filters, gaskets, O-rings, etc.) shall be furnished to the Contracting Officer to permit procurement from sources independent of the contractor. The description shall contain all relevant technical details including, but not be limited to, electrical, mechanical, physical, photometric and chromatic characteristics.

3.5.10.3 Changes to transformer specification or Advisory Circular.- If external transformers are required to provide power to the light units, they shall comply with AC 150/5345-26 [SPECIFICATION FOR L-823 PLUG & RECEPTACLE, CABLE CONNECTORS] and specification FAA-E-2803 [POTENTIAL ISOLATION TRANSFORMERS FOR AIRPORT LIGHTING SYSTEMS]. Any changes to AC 150/5345-26 or FAA-E-2803 shall be provided to the FAA Contracting Officer for written approval.

4. QUALITY ASSURANCE AND QUALIFICATION PROVISIONS

4.1 General.- The production model light unit shall be energized and operated at maximum intensity level during the conduct of the tests described in paragraph 4.3. It may also be necessary to install the light unit in an L-868 light base during the conduct of the tests. Failure of the production model light unit to pass the tests described in paragraph 4.3 shall be cause for rejection.

The contractor shall provide and maintain a quality control program that fulfills the requirements of American National Standards ANSI/ASQC-Q9003. ISO certification is not required. Unless otherwise stated in this specification or in the contract, all tests and inspections to determine compliance with the requirements shall be made by the contractor and shall be subject to Government inspection. The term "Government inspection" as used in this specification, means that an FAA representative will witness the contractor's testing and inspection, and will carry out such visual and other inspection as deemed necessary to assure compliance with contract requirements. The Government reserves the right to waive Government inspection at the contractor's plant. When Government inspection is waived, the contractor shall furnish to the Contracting Officer two copies of test data, certified by an independent testing agency, describing the results obtained during the inspection and tests required by the contract and specifications. The test data must demonstrate that the equipment meets contract requirements, and shall include the statement: "This certifies that this equipment fully meets all technical requirements of the contract". The statement shall be dated and signed by a responsible official of the contractor or testing agency. Shipment shall not be made until the contractor receives written Government approval of the certified test data.

Inspecting and testing for the production model and production units shall be conducted using test procedures prepared by the contractor in accordance with ANSI/ASQC-Q9003 and approved in writing by the Government

4.2 Test classification.- Testing shall be accomplished in two categories, i.e. production *model* and production *units*.

4.2.1 Production *model*.- The first unit of production, referred to herein as the "production *model*", shall successfully complete all tests specified in paragraphs 4.3.1 through 4.3.18.

4.2.2 Production *units*.- Upon successful completion of all tests on the production *model*, the Government will witness testing on the production *units*. Production *units* shall undergo the tests specified in paragraphs

4.3.1 (Visual Inspection), 4.3.12 (Leakage Test) and 4.3.15.2 (Production Unit Photometric Tests).

4.3 Tests.

4.3.1 Visual inspection.- The light unit shall be visually inspected for workmanship, fabrication and finish.

4.3.2 High and low temperature tests.- The light unit shall be subjected to the temperature extremes required in paragraph 3.3.1 in accordance with MIL-STD-810, Method 501.4, Procedure II (High Temperature), and Method 502.4, Procedure II (Low Temperature). Any evidence of malfunction or damage shall be cause for rejection. The light unit shall continue to operate without degradation of performance.

4.3.3 Low pressure (altitude).- A low pressure (altitude) test shall be conducted in accordance with Method 500.4, Procedure II of MIL-STD-810 at atmospheric pressures corresponding to sea level and 10,000 feet altitude at both -67°F (-55°C) and +131°F (+55°C) to demonstrate compliance with paragraph 3.3.2. The light unit shall be operated for 2 hours at maximum intensity level before the test and shall be operational at the maximum intensity level during the test.

4.3.4 Sand and dust.- A sand and dust test shall be conducted in accordance with Method 510.4, Procedure I and Procedure II of MIL-STD-810 to demonstrate compliance with paragraph 3.3.3. The air velocities used in the sand and dust test shall be 5,700 ft/min and 1,750 ft/min., respectively. The test duration shall be 6 hours, and the equipment shall be rotated twice during the conduct of the test. Deterioration of any part or infiltration of sand or dust shall be cause for rejection. This test is not required to be imposed on the light window/lens, and therefore appropriate masking may be applied to the window/lens surface during the test.

4.3.5 Corrosive fog tests.- To demonstrate compliance with paragraph 3.3.4, tests shall be conducted on scratched samples. Each sample light unit shall have at least three scratches. Each scratch shall be at least one inch long and at least 0.001 inch wide and 0.001 inch deep.

4.3.5.1 Salt fog test.- A salt fog test shall be conducted in accordance with Method 509.4, Procedure I of MIL-STD-810. The scratched light unit shall be exposed to salt spray for period of at least 72 hours, followed by a drying period of at least 48 hours. This sequence shall be repeated three times. At the conclusion of the test, salt build-up may be removed with tap water. Deterioration (rust, pitting, or corrosion, etc.) of any part which prevents the light unit from meeting structural, photometric and leakage requirements shall be cause for rejection.

4.3.5.2 Potassium acetate fog tests.- A potassium acetate fog test shall be conducted in accordance with Method 509.4, Procedure I of MIL-STD-810. The potassium acetate solution shall be either 25 percent potassium acetate and 75 percent water, or a solution with proportions recommended by the potassium acetate manufacturer, if different from the 25/75 solution. The scratched light unit shall be exposed to potassium acetate spray for period of at least 72 hours, followed by a drying period of at least 48 hours. This sequence shall be repeated three times. At the conclusion of the test, potassium acetate build-up may be removed with tap water. Deterioration (rust, pitting, or corrosion, etc.) of any part which prevents the light unit from

meeting structural, photometric and leakage requirements shall be cause for rejection.

4.3.6 Humidity test.- A humidity test shall be conducted in accordance with Method 507.4, Procedure I of MIL-STD-810 to demonstrate compliance with paragraph 3.3.5, except that a total of three complete 24 hour cycles (72 hours) shall be required (Table 507.2-I (cycle 5)). The maximum temperature shall be 131°F (+55°C) and the highest relative humidity shall be 95 percent instead of 75 percent.

4.3.7 Thermal shock test.- To demonstrate compliance with paragraph 3.3.6, the light unit shall be mounted on an L-868 light base and subjected to a cycling test by operating the unit at maximum intensity level at room temperature (dry) for a period of not less than 4 hours. At the expiration of the "on" part of the cycle, the test unit shall be de-energized and immediately submerged under at least 1 foot of water. The temperature of the water before submersion shall be 41°F (5°C) or lower. The test unit shall remain under water for at least 4 hours. At the expiration of the "off" part of the cycle, the test unit shall be subjected to repetition of the above tests until a total of three "on-off" cycles have been completed. The test unit shall be immediately inspected at the completion of the third cycle. Evidence of glass breakage or lens damage, leakage of water into the unit, damage to any part of the unit or equipment failure during the tests shall be cause for rejection.

4.3.8 Rain test.- A rain test shall be conducted to demonstrate compliance with paragraph 3.3.7. The rain test shall be in accordance with Procedure I, Method 506.4 of MIL-STD-810. The wind velocity shall be 40 miles per hour (mph), and the rainfall rate shall be 4 inches per hour. The light unit temperature shall be at least 18°F (10°C) higher than the rain temperature at the beginning of each 30 minute exposure period.

4.3.9 Chemical immersion tests.- The top of the production model light unit shall be covered with deicing fluid at 194°F (90°C) temperature and a pressure of 250 pounds per square inch shall be applied to the top of the unit for a period of (72) seventy two hours. The light unit shall be operated at 2 hours at maximum rated current before the test and shall be operational at the maximum rated current during the test. After the immersion period, the unit shall be removed from the chemical bath and disassembled for inspection. There shall be no evidence of corrosion, electrical degradation, or leakage into the light unit. The deicing fluid shall be of the potassium acetate type - Cyrotech E36® LRD (Liquid Runway Deicer), Safeway® KA Runway Deicing Fluid, or equal. Concentration of the test fluid shall conform to the industry practice for application of deicing fluids and shall therefore be 50 percent potassium acetate and 50 percent water, by weight.

4.3.10 Insulation resistance check.- To demonstrate compliance with paragraph 3.4.3, the light unit shall be subjected to a 600-volt insulation resistance test (lead-to-case). The initial resistance shall be at least 50 megohms. The light unit shall then be operated for 1 hour at maximum intensity level and shall be immediately submerged in a saturated salt water solution except for the ends of the leads. The resistance test shall be repeated. Resistance shall be at least 50 megohms.

4.3.11 Lamp replacement test.- To demonstrate compliance with paragraph 3.5.1, a lamp failure shall be simulated in a light unit which is mounted in an L-868 light base which has been installed in a manner similar to an actual

installation in an airport runway. Using the tools and processes described in the contractor-provided instruction book, a contractor-provided technician will remove the light unit which is at ambient temperature, replace the lamp(s) and return the light to service. The times to accomplish this task shall not exceed the times stated in paragraph 3.5.1.

4.3.12 Leakage test.- This test shall be performed to demonstrate compliance with paragraph 3.5.3 after the production *model* has successfully passed the load tests of paragraph 4.3.16 and sub-paragraphs. Prior to performing this test, the wire leads shall be subjected to a tension equal to the weight of the light unit (44 pound maximum) for 5 minutes to test the integrity of the seal where the leads enter the light unit. The entire assembly shall then be submerged in water at least 3 inches below the surface, subjected to an internal air pressure of 20 psi and maintained for a period of 10 minutes. Any leakage shall be cause for rejection. Leakage tests on production *units* may use this method, a gas leak detector, or other approved method to ensure that the light unit is watertight.

4.3.13 Accelerated life test.- To demonstrate compliance with paragraph 3.5.4.1, the light unit shall be set in an L-868 light base installed in sand, simulating its installation in airport pavement, at a stabilized temperature of at least 131°F (+55°C). The sand shall be at least 5 inches thick around the sides and bottom of the light base. The unit shall be operated for at least one-half the rated lamp life at the maximum intensity level. After this, the photometric performance of the unit shall be measured as described in paragraph 3.5.5.1 or 3.5.5.2, as appropriate. Intensities shall not be less than 80 percent of the intensities specified. After this test, the light unit shall be taken apart and thoroughly examined. Any deforming, blistering, heat damage or corrosion shall be cause for rejection.

4.3.14 Chromaticity tests.- To demonstrate compliance with paragraph 3.5.5, the chromaticity tests shall be conducted after the production *model* has successfully passed the load tests of paragraph 4.3.16 and sub-paragraphs. The light unit shall meet the chromaticity requirements of SAE-AS25050 when tested at maximum intensity at the center of the main beam and the extremes of the horizontal and vertical beam distribution. Chromaticity readings shall be recorded for the record at all three intensity levels. Chromaticity outside of distribution boundaries may be verified visually.

4.3.15 Photometric testing.- Photometric tests shall be conducted at maximum intensity level with filters in place to demonstrate compliance with paragraphs 3.5.5, 3.5.5.1 and 3.5.5.2. Before testing, photometric test equipment shall be calibrated in accordance with paragraph 6 of IES LM-35. The photometric axes are established in relation to the runway. The horizontal axis passes through the center of the light unit at grade and is parallel to the runway centerline, and the vertical axis runs through the center of the light unit and is perpendicular to the ground plane. The light unit shall be operated for at least 15 minutes before taking measurements. Photometric measurements shall be taken with at least five random production-run lamps. The method of measurement required to demonstrate compliance with the specification is given below.

Photometric tests shall follow the shock and hydraulic impact tests to determine if the lamp filament has sustained any damage. If the light unit is designed so that any portion of the exterior lens or prism is below pavement level, that portion shall be obscured by opaque tape, but no more than half the lens area shall be blocked. The resulting intensity

distribution, in the applicable color, shall be no less than 50 percent of that required in Figures 1 and 2. The center of the light beam may be shifted ±0.5 degree vertically, and ±1.0 degree horizontally, to meet the photometric curve.

4.3.15.1 Production *model* photometric tests.- Photometric tests shall be conducted after the production *model* has successfully passed the load tests of paragraph 4.3.16 and sub-paragraphs, to determine if the lamp filament has sustained any damage.

The Style I (white) light units shall be tested at 17 positions as follows:

(a) On beam vertical axis at 2^0, 3.75^0, 5.5^0, 7.25^0 and 9^0 above grade.

(b) At +/- 2.5^0 horizontally from the beam vertical axis, at 2.5^0, 3.75^0, 5.5^0, 7.25^0 and 8.5^0 above grade.

(c) At +/- 5^0 horizontally from the beam vertical axis, at 5.5^0 above grade.

The Style II (green) light units shall be tested at 17 positions as follows:

(a) On beam vertical axis at 1^0, 3^0, 5^0, 7^0 and 9 above grade.

(b) At +/- 3^0 horizontally from the beam vertical axis, at 1.5^0, 3^0, 5^0, 7^0 and 8.5^0 above grade.

(c) At +/- 6^0 horizontally from the beam vertical axis, at 5^0 above grade.

4.3.15.2 Production *unit* photometric tests.- The Style 1 (white) light units shall be tested at 5 positions as follows:

(a) On beam vertical axis at 2^0, 5.5^0 and 9^0 above grade.

(b) At +/- 5 horizontally from the beam vertical axis, at 5.5 above grade.

The Style II (green) light units shall be tested at 5 positions as follows:

(a) On beam vertical axis at 1^0, 5^0 and 9^0 above grade.

(b) At +/- 6^0 horizontally from the beam vertical axis, at 5 above grade.

4.3.16 Vibration test. To demonstrate compliance with paragraph 3.5.6.1, the light unit, complete with all parts and lamp(s), shall be mounted securely on the test machine in a manner to simulate installed conditions.

(a) Vibration planes.- The light unit shall be vibrated in three planes, or directions, as follows:

(1) In a direction perpendicular to the test table (vertically).

(2) Horizontally, parallel to the light beam axis.

(3) Horizontally, at right angles to the light beam axis.

(b) Frequencies.- The test assembly shall be vibrated through a frequency range of 10 to 2,000 Hz, in each plane, until the accelerations shown in Table 1 are reached.

Duration of each sweep shall be ten minutes. Electrical continuity through the lamp(s) shall be continuously monitored. If the filament and/or lamp envelope fails at any point in the range of frequencies, the test shall be continued and completed on the light unit alone. Then a new lamp shall be installed and the light unit shall again be vibrated in three planes through the frequencies of 55 to 2,000 cycles at 3 G. Failure to meet these requirements shall be a cause for rejection of the light unit and/or of the lamp mounting method.

TABLE I

Acceleration in G	Frequency in Hz
0.020 inch D.A. (double amplitude)	10-70
5	70-200
10	200-500
15	500-2,000

After the vibration test, the light unit shall be examined for failure of any component, loosening of any part, cracked or broken seals, continuity of electrical circuits, damage to the lamp filament, lenses, mirrors, filters, supports, etc.

4.3.17 Load tests.- The light unit shall survive load tests of paragraphs 4.3.17.1 through 4.3.17.7 without damage. There shall be no evidence of failure of the lens or its seal, of cracking or breaking of any component which would cause leaks and there shall be no permanent distortion to cause shifting of the light output. Mounting and support of the light unit during all load tests shall be consistent with the conditions of field installation. The load tests may be conducted on more than one light unit to accelerate the overall test program.

4.3.17.1 Static load test.- To demonstrate compliance with paragraph 3.5.6.2, the static load shall be applied vertically in a manner to distribute the load uniformly over the light unit spanning the light base. The load shall be applied upon the upper surface and within the inner edge of the light base flange. The load shall be applied to the surface of the light unit through a rubber pad having a Shore A hardness of 55 to 70, of 1 inch thickness and 1 inch less than the diameter of the unit. The load shall be applied uniformly over the rubber at a rate not greater than 10,000 pounds per minute. The full load shall be applied for at least 1 minute. The full load shall be applied for 10 repetitions at the stated rate.

A stress analysis shall be prepared, using a Finite Element Model Report on not less than 1,425,636 points or elements. Also, a stress strain curve for the metal of which the load carrying parts of the optical assembly are to be made - with the maximum allowable stress at the elastic limit identified and one half that maximum calculated and identified as the maximum allowable working stress. The light unit shall be designed so that the stress analysis indicates that no element of the optical assembly is stressed above the maximum allowable working stress when the unit is subjected to the full load.

4.3.17.2 Dynamic load test.- To demonstrate compliance with paragraph 3.5.6.3, the light unit shall be mounted in a light base installed in pavement and traversed at 35 mph, using an Oshkosh P Series or H Series plow vehicle, or equivalent, equipped with a Wausau BMP 2250 (HW) steel edged blade, or equivalent, with its blade set to a clearance of not more than 1/4 inch above the pavement. The vehicle shall be equipped with snow chains. During this test the blade shall pass over the light unit five (5) times, i.e. from 0 (towards center of light windows), 45 , 90°, 135° and 180 . In three (3) of these passes, the tires and snow chains shall also pass over the light unit. There shall be no damage which would render the light unit unfit for service.

4.3.17.3 Shear load test.- To demonstrate compliance with paragraph 3.5.6.4, the shear load test shall be conducted in a manner to distribute a load of 6,000 pounds uniformly over an area bounded horizontally by the diameter of the light unit and vertically by the portion of the light unit projecting

above the top elevation of the light base flange. The load shall be applied at a rate not greater than 10,000 pounds per minute. The full load shall be applied for at least 1 minute. The full load shall be applied for 10 repetitions at the stated rate.

4.3.17.4 Torque load test.- To demonstrate compliance with paragraph 3.5.6.5, the torque load test shall be conducted by application of a vertical load of 250 psi simultaneously with application of a torque load of 8,333 foot-pounds. The torque shall be applied in the horizontal plane (i.e. the plane of the runway). The vertical load shall be held at the specified value during torque loading and unloading. The loads shall be applied in a manner to distribute the loads uniformly over the light unit. The load shall be applied at a rate not greater than 10,000 pounds per minute. The full load shall be applied for at least 1 minute. The full load shall be applied for 10 repetitions at the stated rate.

4.3.17.5 Hydraulic impact test.- To demonstrate compliance with paragraph 3.5.6.6, the hydraulic impact test shall require the light unit to be submerged in water to a depth of approximately 1/2 inch. The upper surfaces of the light unit around the light windows shall be encased in a leak-proof metal housing with a 1-3/4 inch diameter steel piston. The housing shall be filled with water and purged of all air. A 5 pound steel ball shall be dropped 6 feet onto the piston. The light unit must not have any mechanical failure, optical damage or water penetration after this test has been repeated five times.

4.3.17.6 Mechanical impact test.- To demonstrate compliance with paragraph 3.5.6.7, the light 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 or concrete base shall be at least 3x3 feet. The light unit shall be operational at maximum intensity level for at least 2 hours prior to starting the test. With the light still operational at maximum intensity level, a case hardened steel ball weighing 5 pounds shall be dropped 10 times at various locations around the top of the light unit from a height of 6 feet with a 5-minute interval between each drop. Upon conclusion, the light unit shall be opened to determine if the light unit has been damaged or any component displaced. Any evidence of damage, including lamp envelope and filament, shall be cause for rejection.

4.3.17.7 Light window load test.- To demonstrate compliance with paragraph 3.5.6.8, the light window shall be subjected to a load applied uniformly over the area of the exposed window opening. The static load shall be a uniformly distributed load of 500 psi over the area of the exposed window opening applied through a one-inch thick rubber pad having a Shore A hardness of 55 to 65. The contour of the rubber block shall be similar to, but not larger than, the exposed light window. The test load shall be applied to the rubber pad and light window through a steel plate one-inch thick with a shape similar to but not larger than the rubber pad. The load shall be applied perpendicular to the exposed window face at the rate of 1,000 pounds per minute and the total load maintained for not less than two minutes. The window shall not crack or be permanently displaced or damaged by the test.

4.3.18 Heat dissipation test.- To demonstrate compliance with paragraph 3.5.7, the light unit shall be operated at maximum intensity level for at least 4 hours in still air whose ambient temperature is at least 77°F (25°C). Temperature readings shall be taken to assure that the maximum surface temperature does not exceed 302°F (150°C). The light shall then be covered with the tire of a heavy ground vehicle of at least 6,000 pounds GVW rating

for a period of 10 minutes. A thermocouple shall be located between the hottest point of the light unit and the tire to register the test temperature. Temperature readings shall then be taken to assure the maximum surface temperature does not exceed 320°F (160°C).

4.4 Alternative load test procedures.- For paragraph 4.3.17 and sub-paragraphs above, the contractor is free to devise and submit, for Government review and written approval, fully engineered and acceptable alternative load test procedures to demonstrate the light unit's capability to endure without damage the repetitions of load as described. Any alternative load test procedures submitted will be disapproved by the Government unless such procedures provide all pertinent technical documentation relevant to the determination of sufficiency for dealing with the fatigue characteristics of the involved load bearing materials. Furthermore, such alternative load test procedures shall take into account the fatigue characteristics of the weakest of the particular alloys used in the load bearing parts of the light unit.

5.PREPARATION FOR DELIVERY.

5.1 General.- Unless otherwise specified in the contract, each light unit shall be prepared for domestic shipment and extended storage in accordance with paragraphs 5.2 through 5.4.

5.2 Packaging.- Packaging shall be in accordance with ASTM D 3951 and testing shall be in accordance with ASTM D 4169, Assurance Level II, Distribution Cycle 18. Each light unit shall be packaged in an individual unit container. Packaging and shipping containers shall be capable of multiple handlings and storage cycles under favorable conditions, such as enclosed facilities, for a minimum of one year.

5.3 Palletized shipments.- All palletized shipments shall be made on disposable pallets with maximum outside dimensions of 47-1/2 inches by 40 inches. Overall height of the pallet and contents shall not exceed 47 inches. Fork entry of the pallet shall be on the long sides of the pallet. No portion of the load shall overhang or extend beyond the pallet edge. Shrink wrapping to secure intermediate containers is encouraged.

5.4 Marking.- Unit and intermediate packages and exterior shipping containers shall be marked in accordance with FED-STD-123. Each package and/or shipping container shall be marked with bar codes in accordance with FED-STD-123. Each intermediate package and each shipping container shall be durably and legibly marked with the following information: (examples in parentheses)

National Stock Number:

FAA Type Number:

Item Description: (Approach Light, Semi Flush)

Style/Color: (Style II/Green)

Specification Number:

Serial Number:

Quantity and Unit of Issue:

Contract Number:

Date Packed:

Contractor's Name and Trade Mark:

Contractor's Part Number:

6. NOTES.- The contents of the subparagraphs below are only for the information of the Contracting Officer. They are not contract requirements, and are not binding on either the Government or the contractor except to the extent that they may be specified elsewhere in the contract as such. Any reliance placed by the contractor on the information is wholly at the contractor's own risk.

6.1 Deliverable items.- The following items are to be called out in the contract documents as deliverable items under this specification:

a.) Style I Medium intensity approach lights, White.

b.) Style II Medium intensity approach lights (threshold), Green.

c.) Instruction Books.

d.) Technical description of commercial parts.

e.) Technical changes to specification FAA-E-2803 [POTENTIAL ISOLATION TRANSFOPMERS FOR AIRPORT LIGHTING SYSTEMS] or Advisory Circular AC 150/5345-26 [SPECIFICATION FOR L-823 PLUG & RECEPTACLE, CABLE CONNECTORS]

f.) Transformers will be required with each light unit if not already available in accordance with (IAW) specification FAA-E-2803 [POTENTIAL ISOLATION TRANSFORMERS FOR AIRPORT LIGHTING SYSTEMS].

g.) If transformers are not already available IAW specification FAA-E-2803 [POTENTIAL ISOLATION TRANSFORMERS FOR AIRPORT LIGHTING SYSTEMS], a quantity of transformers shall be delivered to the FAA for use as spare parts peculiar.

6.2 Certification.- Certification, if called for in the contract, shall be accomplished in accordance with AC 150/5345-53B, [AIRPORT LIGHTING EQUIPMENT CERTIFICATION].

a.) Certification of the light units shall be accomplished using this specification, FAA-E-2968, as the testing standard.

b.) Certification of the transformer(s) developed for use with light units purchased IAW this specification, FAA-E-2968, shall be accomplished using specification FAA-E-2803 [POTENTIAL ISOLATION TRANSFORMERS FOR AIRPORT LIGHTING SYSTEMS] as the testing standard.

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