Intertek Airport Lighting Equipment Certification Program

IES Government Contacts Subcommittee – October 24, 2016

IESALC Fall Technology Meeting – San Diego, California

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Airport Lighting Equipment Certification

***Certification Program covers all equipment specified in the FAA AC 150/5345 series*:**

- Rotating Beacons
- Obstruction Lights
- Wind Cones
- Isolation Transformers
- Taxiway / Runway Inpavement Lights
- Retroreflective Markers
- Cable Connectors
- Underground Cable
- Runway & Taxiway Signs
- Portable Runway Lights
- Light Bases
- Constant Current Regulators
- Precision Approach Path Indicators (PAPI)
- Runway End Identification Lights (REIL)

FAA AC 150/5345-53D

- Third Party Certifier Acceptance Criteria
  - Section 5
- Third Party Certifier Application (every 4 years)
  - Section 6
  - Background as a certification body
  - Competency verification (accreditations)
  - Resumes of related staff
  - Copy of procedural guide and license agreement

FAA AC 150/5345-53D

GENERAL OUTLINE

- Manufacturer submits certification request via AL-2 application form
- Qualification testing
- Documentation submittal and engineering review
- Initial manufacturing facility audit
- License Agreement
- Certificate issued and product listed in 53D Addendum
- Manufacturer audited 2 times per year after certified
- Certification process covered under ANSI accreditation to ISO Guide 65

AL-2 Request for Certification (continued)

Required Product Documentation listed in section 6 of AL-2

- Section & part drawings
- Assembly drawings and schematics
- BOM with mfg name/catalogue numbers
- Statement of Warranty
- Instruction/installation/operating manual
- Product Description sheet (marketing)
- AL-2B Lamp Life form

AL-2 Request for Certification (continued)

Statement of Warranty

FAA AC 150/5345-53D, Appendix 2, section 5.a.iv

1 year from installation / 2 years from shipment

"…defects in design, materials, workmanship"

AL-2 Request for Certification (continued)

Statement of Warranty

FAA AC 150/5345-44K (runway and taxiway signs)

section 5.2

2 years from installation

“…defects in materials or workmanship”

FAA EB67D (all LED products except obstruction lighting)

section 4.0

4 years from installation

inclusive of all electronics

Qualification Testing

FAA AC 150/5345-53D, Appendix 2, section 5.c.i

Must be done IAW ISO 17025

At Intertek – covered under A2LA accreditation

Outside of Intertek – covered by audit and witness

- Test Plan Review and Acceptance
- Assignment to Intertek Representative
- Formal Report issued by Manufacturer

Semi-annual Inspections

- 1st visit each year
  - AL-7 Audit (follows basic ISO quality assurance requirements)
    - Management Commitment to quality system
    - Control of Procured Material
    - Manufacturing Quality Controls
    - Final Inspection and Testing
      - production tests from applicable FAA ACs
    - Equipment Calibration and Maintenance
    - Control of Non-conforming Material
    - Corrective Action Program
    - Handling, Packaging and Storage
    - Product Identification
    - Periodic Product Qualification
    - Collection and Analysis of Field Performance Data

Semi-annual Inspections

- 2nd visit each year

- Product Checklist(s)
  - Construction review using the applicable FAA ACs
  - Compare with units that were tested during qualification
  - Examine units directly from production

- Production Testing Requirements
  - As required in the applicable ACs

Current Program Status

62 Program Participants

76 Licensed Manufacturing Facilities

64 Certificates issued since the Spring meeting:

- 34 new qualification and 8 year re-qualification
- 30 revised

NEW SPECIFICATIONS

FAA AC 150/5345-43H – Specification for Obstruction Lighting Equipment

Posted – September 28, 2016

12 month effective date

NEW SPECIFICATIONS

BACKGROUND:

FAA AC 70/7460-1L – Obstruction Marking and Lighting

Issued on December 4, 2015

AJR-33 – Airspace and Rules Group (responsible)

AJV-15 – Obstructions Evaluation Group (Initiated by)

Principal changes:

Aircraft Detection Lighting Systems

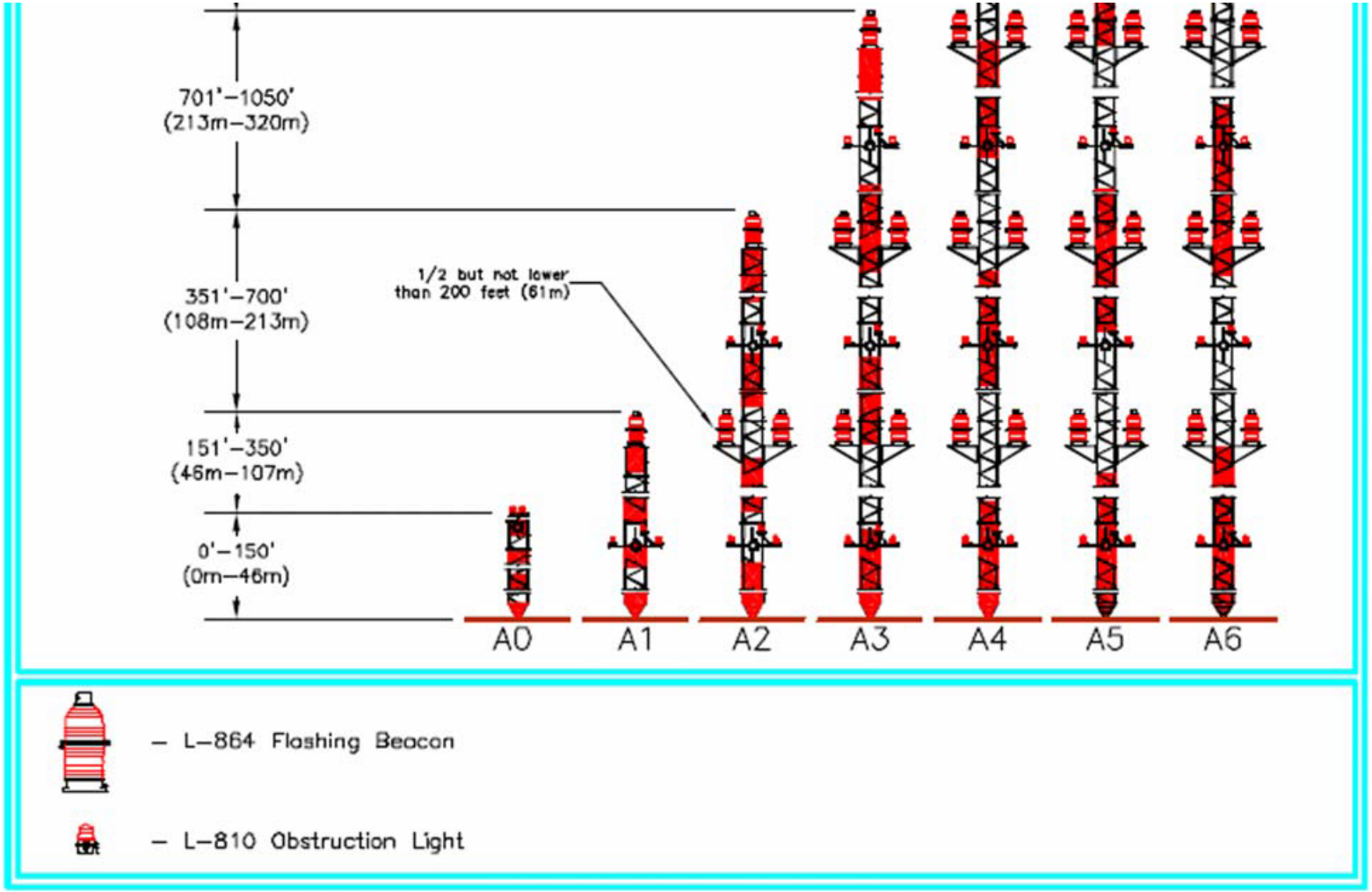
Flashing L-810 for some applications

Reduced number of steady L-810s

Medium Intensity white and dual obstruction lights are now authorized on towers up to and including 700ft.

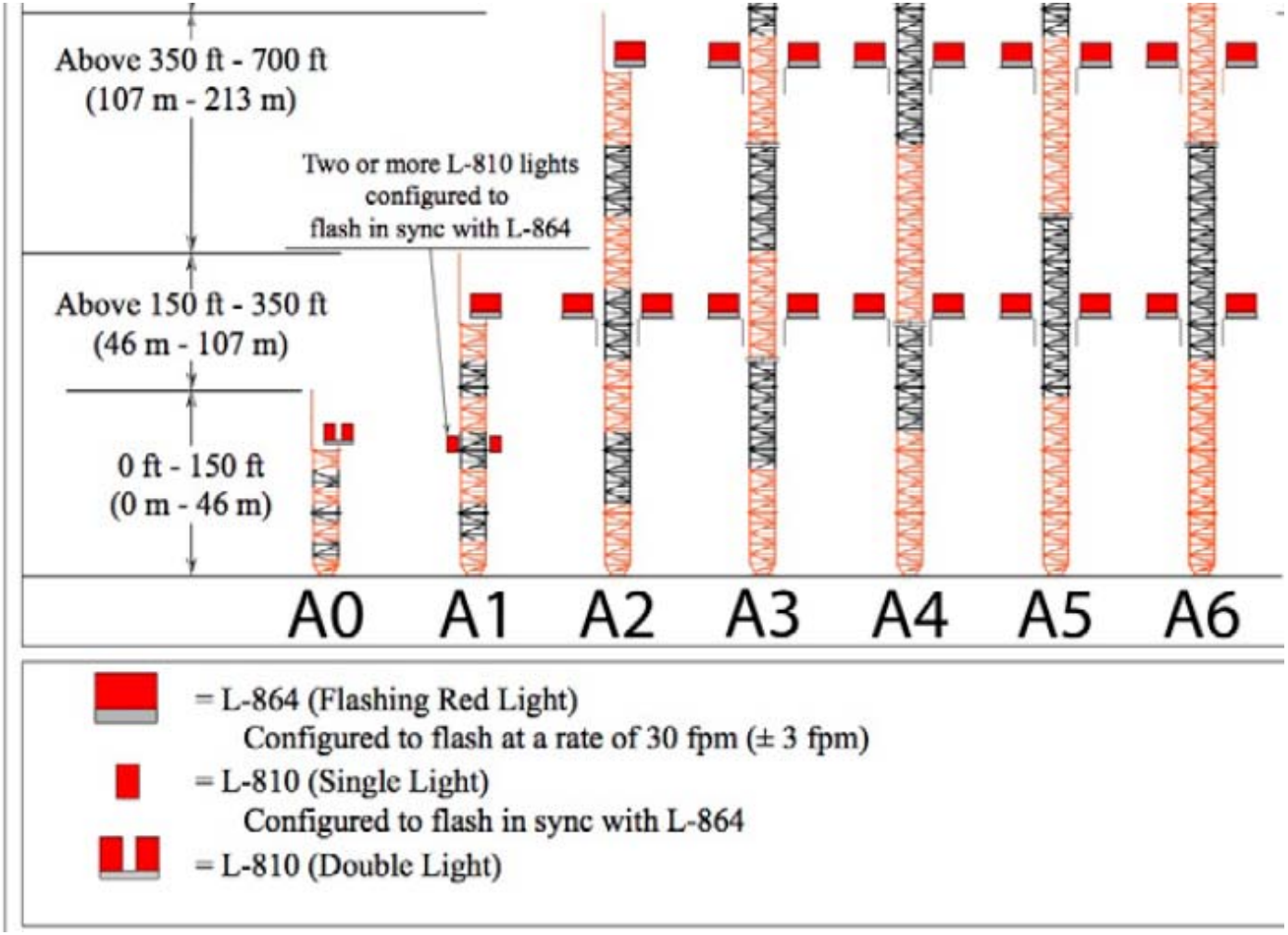
NEW SPECIFICATIONS

From FAA AC 70/7460-1K



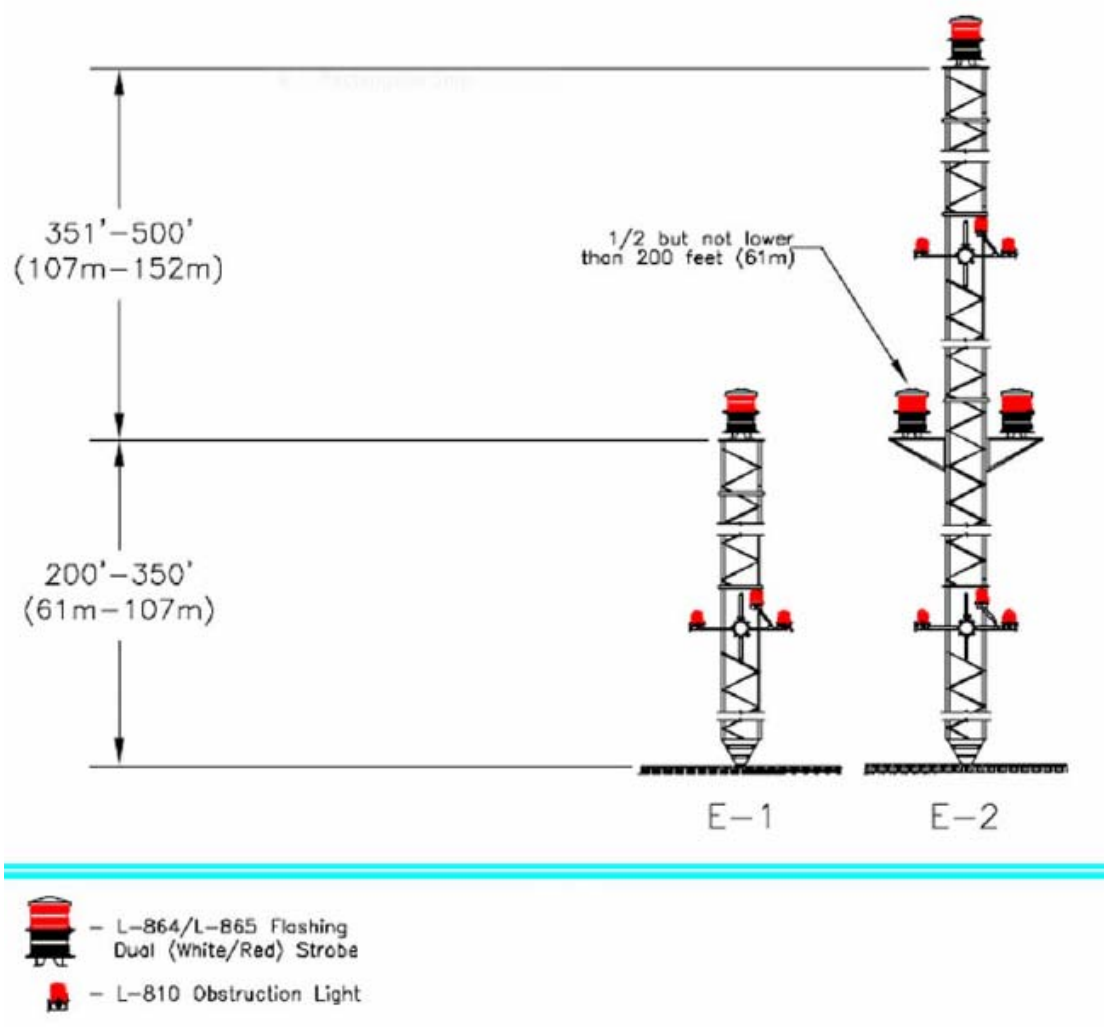
NEW SPECIFICATIONS

From FAA AC 70/7460-1L



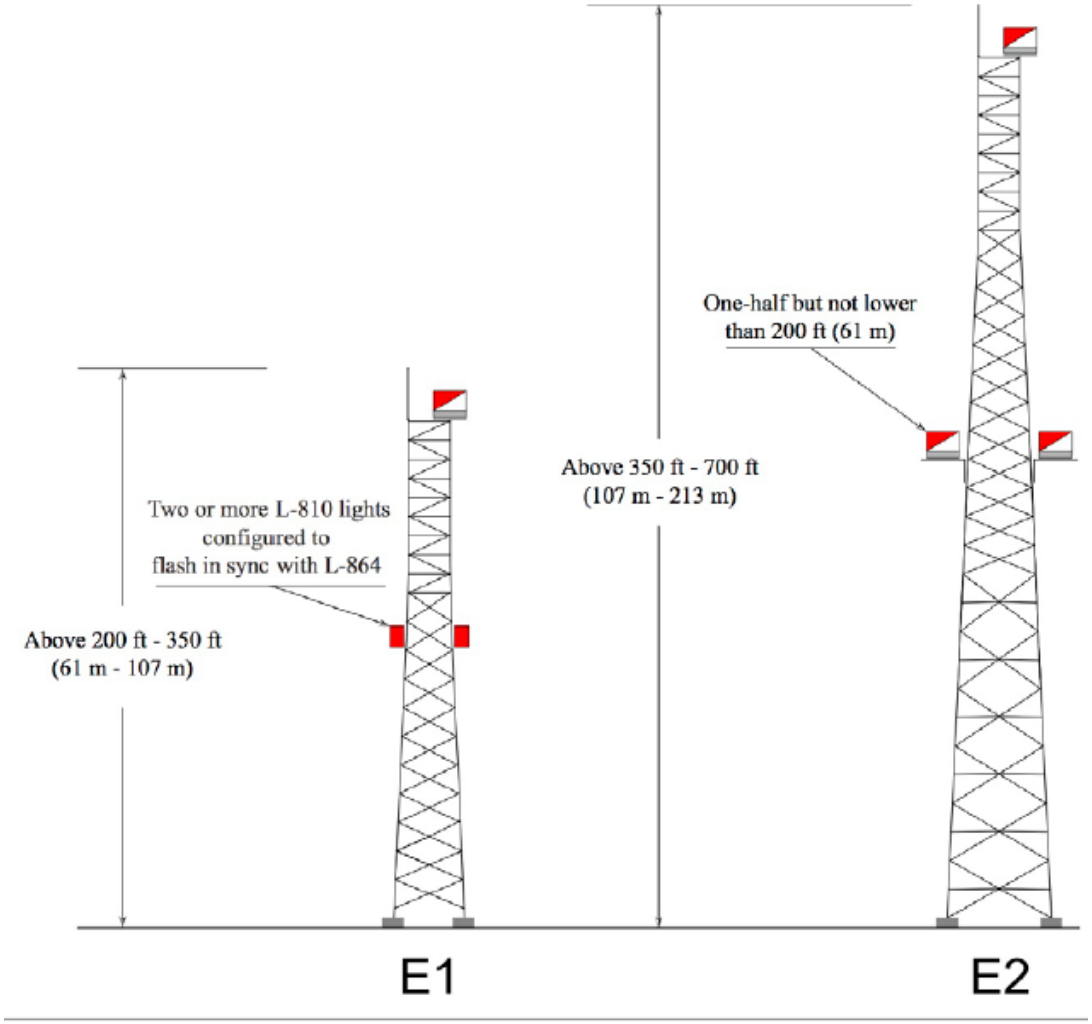
NEW SPECIFICATIONS

From FAA AC 70/7460-1K



NEW SPECIFICATIONS

From FAA AC 70/7460-1L



NEW SPECIFICATIONS

FAA AC 150/5345-43H:

Principal Changes:

- Addition of flashing L-810(F) configuration
- Change of L-864 flash rate and duration limits
- New L-865 and L-864/865 cable lengths to be considered for 700’ towers (must be tested)

NEW SPECIFICATIONS

FAA AC 150/5345-43H:

Flashing L-810(F):

Photometry done in the steady burn mode – 3.4.1.2.1 (3)

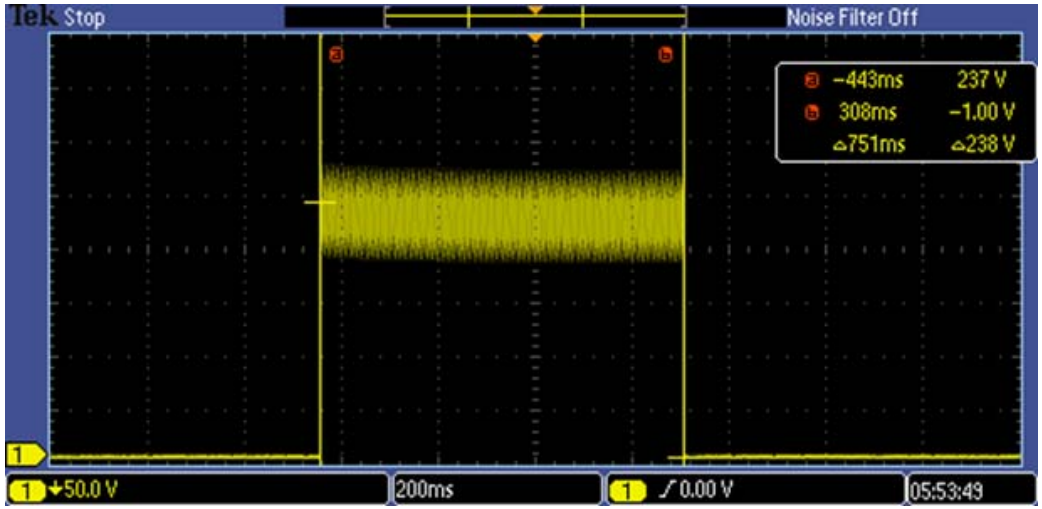
3.4.1.2.1 (3) also states: “The minimum effective intensity will be half of this value, but is not calculated for this application.”

This is only true for an flash duration of 200ms.

NEW SPECIFICATIONS

FAA AC 150/5345-43H:

Flashing L-810(F):



$$I_e = \left(\int_{t_1}^{t_2} I dt \right) / \left(0.2 + (t_2 - t_1) \right)$$

NEW SPECIFICATIONS

FAA AC 150/5345-43H:

Flashing L-810(F)

on-time (s)	peak instantaneous intensity (cd)	Blondel-Rey effective intensity (cd) assuming square wave flash
0.1	32.5	10.8
0.2	32.5	16.3
0.5	32.5	23.2
1	32.5	27.1
1.333	32.5	28.3

NEW SPECIFICATIONS

FAA AC 150/5345-43H:

Flashing L-810(F)

Operational requirements:

Flash characteristics (Table 3-4)

30fpm flash rate

100ms to 1333ms flash duration

Control (3.3.5.2)

Monitoring (3.3.5.2.2)

“Simultaneous” Flashing within 1/60 second of the L-864 (3.4.1.2.1 and 3.4.3.1)

NEW SPECIFICATIONS

FAA AC 150/5345-43H:

Certification of a flashing L-810(F):

Certification is tied to a specific controller

Existing certified L-810 would not need to repeat optical testing.

Operational testing will be required in most cases.

NEW (-ISH) SPECIFICATIONS

FAA AC 150/5345-46E -- Specification for Runway and Taxiway Light Fixtures

Issued – March 2, 2016

FAA AC 150/5345-42H—Specification for Airport Light Bases, Transformer Housings, Junction Boxes and Accessories

Issued – November 6, 2015

NEW SPECIFICATIONS

Background:

Previously, elevated light baseplates were certified as part of the light since the requirements were found in FAA AC 150/5345-46D.

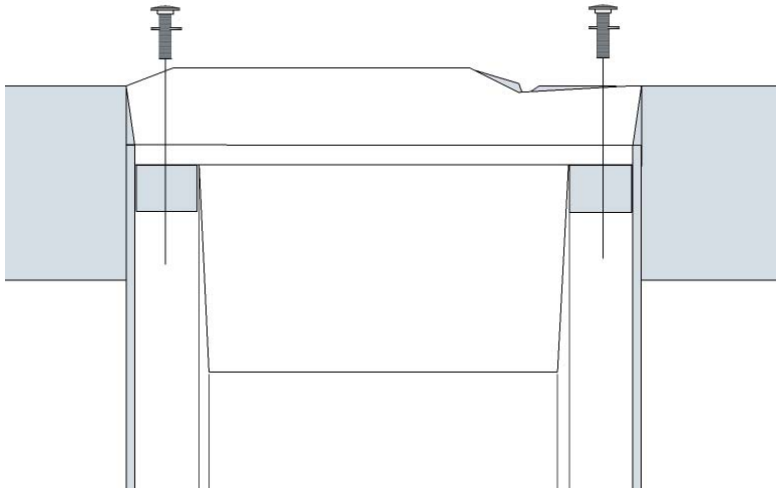
Baseplates did not have their own “L” designation like other similar equipment found in FAA AC 150/5345-42G.

When elevated lights were certified, they were done so with a particular baseplate.

NEW SPECIFICATIONS

FAA AC 150/5345-46E:

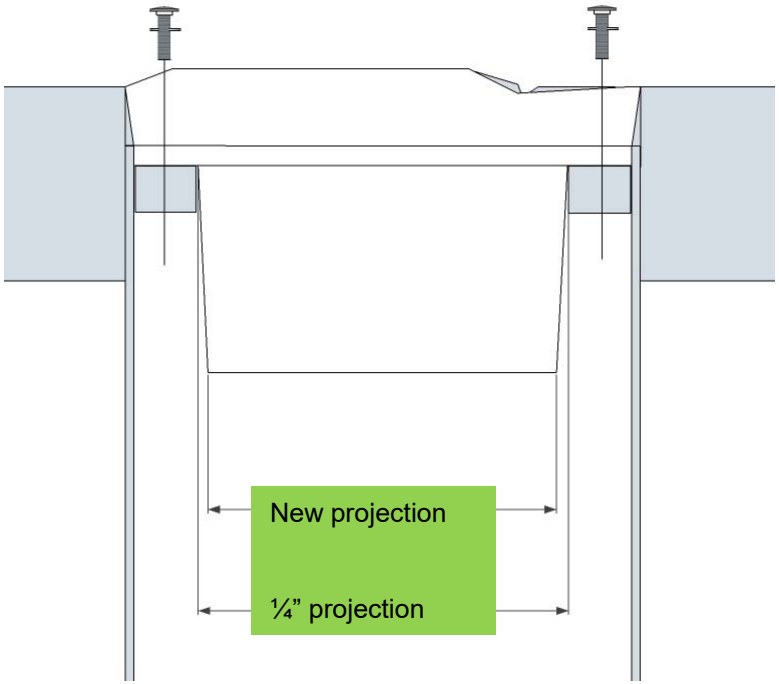
- 3.4.1.2.d – The diameter tolerance of the ¼ inch projection was removed.
  - Was 0.050” to 0.060” less than the base flange nominal ID
  - 9.94”-9.95” for 12 fixtures.



NEW SPECIFICATIONS

FAA AC 150/5345-46E:

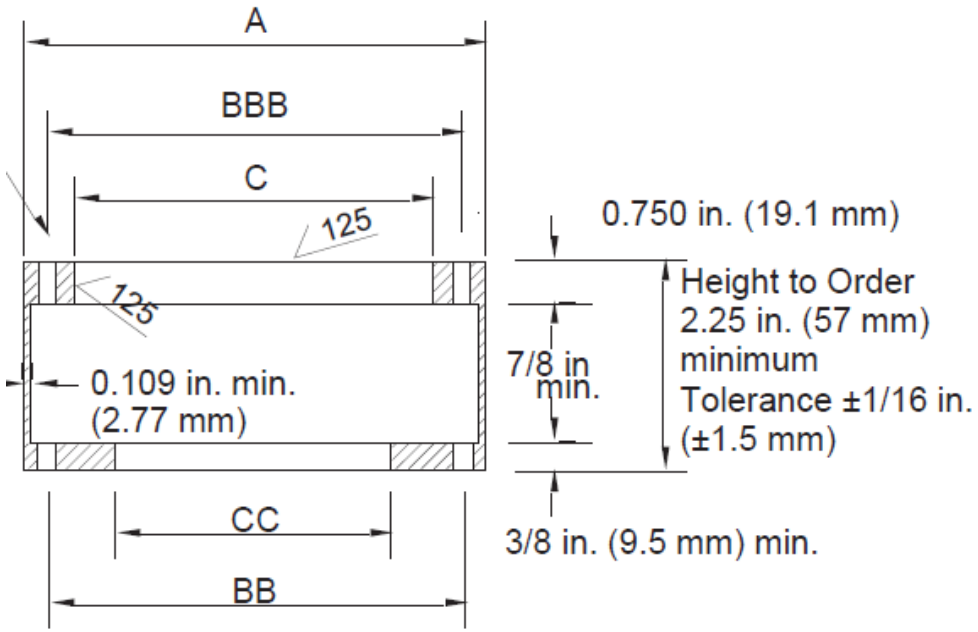
- 3.4.1.2.e – New diameter requirement is added for the projection that is below the ¼ inch projection.



NEW SPECIFICATIONS

FAA AC 150/5345-46E:

- Class 2 fixtures must be sized to fit multiple section base or extension.
- 0.060” less than the flange IDs



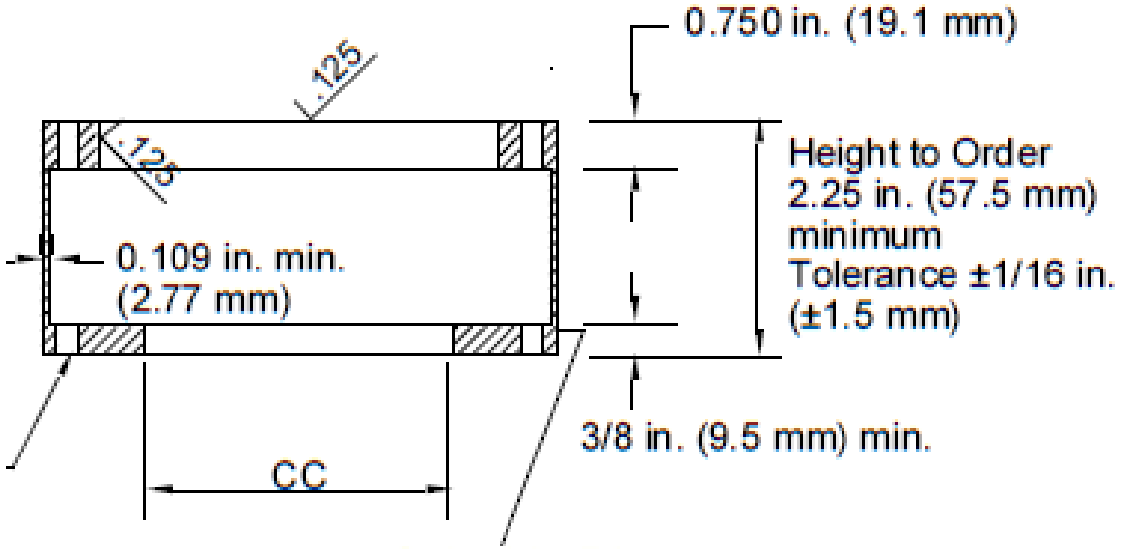
Top Section

CC	5.250	9.250
Tolerances, CC	±0.015	±0.015

NEW SPECIFICATIONS

FAA AC 150/5345-46E:

– Extension Dimensions



C, Inside Dia Tolerances, C	6.500 +0.015 -0.000	10.000 +0.015 -0.000
CC, Inside Dia Tolerances, CC	6.500 ±0.015	10.00 ±0.015

NEW SPECIFICATIONS

FAA AC 150/5345-46E:

- Worse case is the 2.25” top section

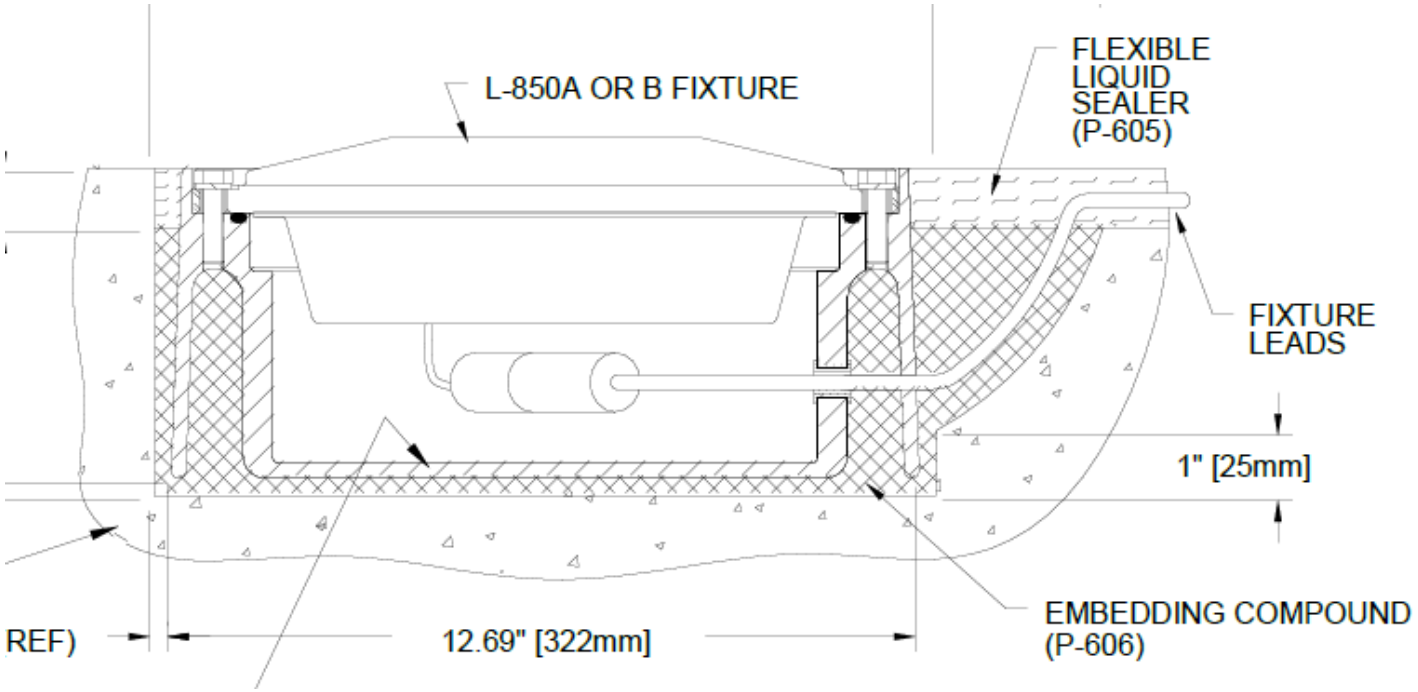
NEW SPECIFICATIONS

FAA AC 150/5345-46E:

If the fixture doesn't fit:

Option 1 - Design Modification

Option 2 – Limit certification to Class 1:



NEW SPECIFICATIONS

FAA AC 150/5345-46E:

- 3.9i – All elevated and inpavement lights must include the proper lug or connector for grounding.

FAA AC 150/5340-30H:

12.7 – Light Fixture Bonding:

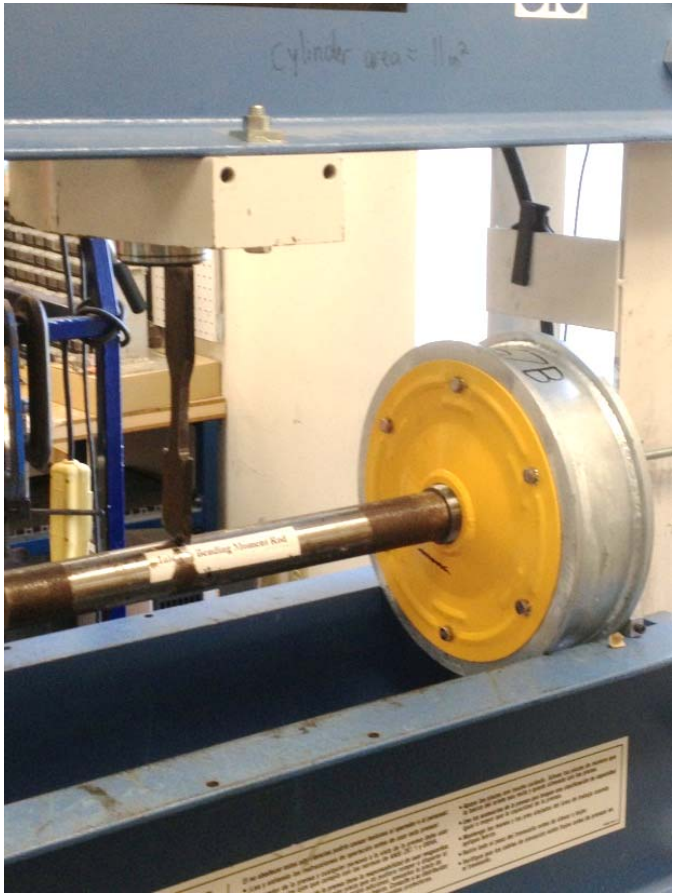
"Fixture must be bonded to the light base ground lug via a #6 AWG stranded copper wire rated for 600V with green XHHW insulation or a braided ground strap of equivalent current rating."

NEW SPECIFICATIONS

FAA AC 150/5345-42H:

L-894 – Elevated Light Cover

L-895 – Elevated Light Stake Mounting



NEW SPECIFICATIONS

FAA AC 150/5345-42H:

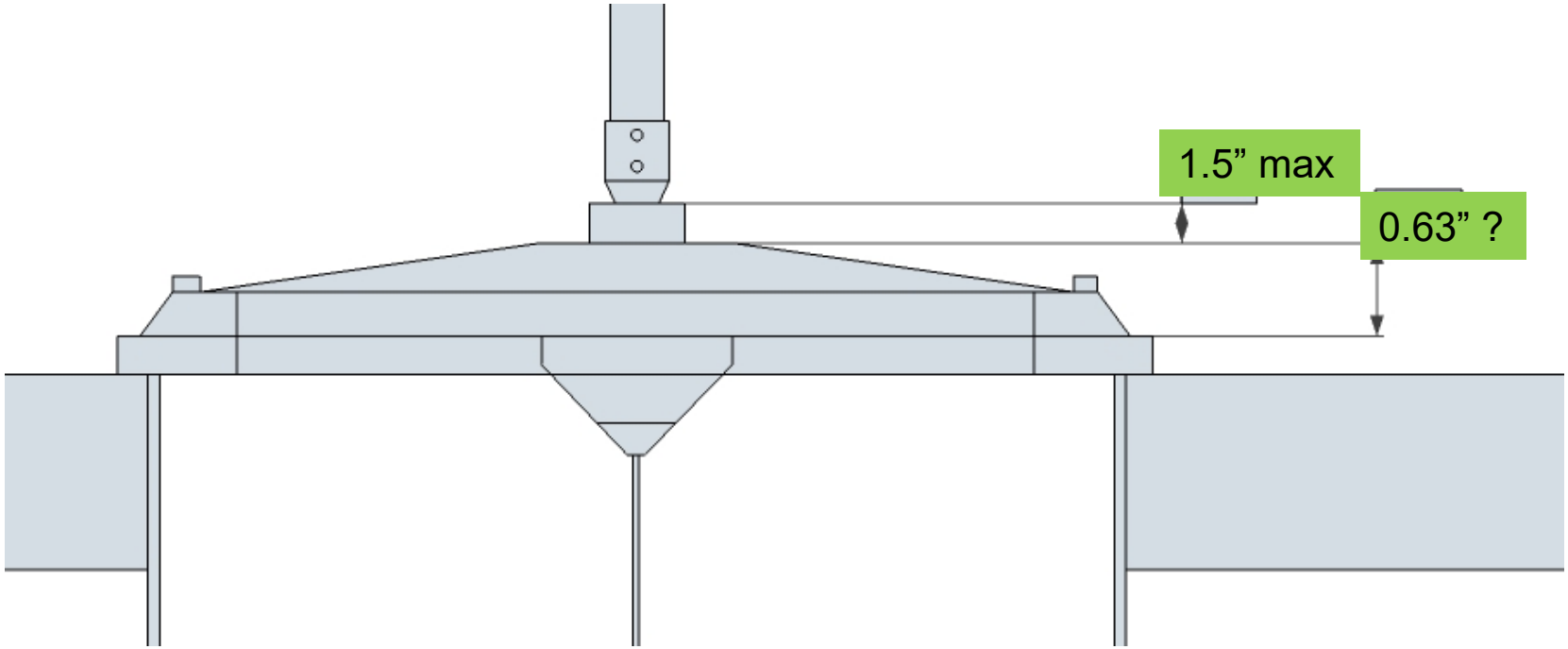
- L-894 – Elevated Light Cover

requirement	paragraph	notes
General - must be metal	3.1.3.5.2	
L-867 interface	3.2.3.1	
max height of 0.63	3.2.3.1	from top of the light base plate bolt circle ??
frangible threads	3.2.3.1.1	1.5"-12UNF or 2" NPT/NPS
thread depth max of 0.88"	3.2.3.1.1	
1/8" Gasket	3.2.3.1.2	
transformer receptacle mounting	3.2.3.1.3	
drainage through mounting	3.2.3.1.3	
compressive load	3.2.3.1.4	2500 pounds
bending moment - L-804 (2500ftlbs)	3.2.3.1.4	
bending moment - L-861/862 (700ftlbs)	3.2.3.1.4	use must be restricted
Ground connections	3.2.3.1.5	for #6AWG or ground braid
Color and finish	3.2.3.1.6	FED-STD-595 Yellow color number 13538

NEW SPECIFICATIONS

FAA AC 150/5345-42H:

- L-894 – Elevated Light Cover



NEW SPECIFICATIONS

FAA AC 150/5345-42H:

- L-894 – Elevated Light Cover

- FAA References that require the frangible point to be no more than 3” above grade.

  – FAA AC 150/5340-30H, Figure 23
  – FAA AC 150/5300-13A, Change 1, paragraph 307b(4)
  – FAA AC 150/5220-23, 3.2.c(1)(c)

NEW SPECIFICATIONS

FAA AC 150/5345-46E:

- 3.4.2.1.a(1) – The yield point height was clarified.
  - Now 1.5” above the threaded interface instead of 1.5” above grade.

NEW SPECIFICATIONS

FAA AC 150/5345-42H:

- L-895 – Elevated Light Stake Mounting

requirement	paragraph	notes
2X2X3/16" angle stock	3.2.3.2	
must receive frangible	3.2.3.2.1	1.5"-12UNF or 2" NPT/NPS
transformer receptacle mounting	3.2.3.2.2	
drainage through mounting	3.2.3.2.2	
standard length of 30"	3.2.3.2.3	
Grounding clamp	3.2.3.2.4	for #6AWG
protective coating per 3.2.8	3.2.3.2.5	galvanizing

Intertek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ILLUMINATING ENGINEERING SOCIETY
AVIATION LIGHTING COMMITTEE