Engineering Brief No. 92A

Light Spacing Guidance for New Taxiway Fillet Geometry

(Per AC 150/5300-13A, Change 1, Airport Design)

I. PURPOSE.

The purpose of this Engineering Brief (EB) is to analyze and determine the impact of recent changes to AC 150/5300-13A, Airport Design, on taxiway edge lighting design/installation criteria. This EB is applicable to all edge lighting designs for taxiway fillets per AC 150/5300-13A.

II. BACKGROUND.

In earlier versions of AC 150/5300-13, Airport Design, taxiway design was primarily driven by the predominant Airplane Design Group (ADG) using the airport. Taxiway intersections were often designed to use judgmental over-steering that required the least amount of pavement surface. The use of judgmental over-steering designs for taxiway intersections increases the amount of complex maneuvering required and the risk of departure from full strength pavement surfaces.

In the revised AC 150/5300-13A, taxiways are now designed using newly formulated Taxiway Design Groups (TDG). The TDG is based upon the aircraft main landing gear width (MGW) and the distance from the cockpit to the main landing gear centroid (CMG). Coupled with the ADG, the addition of the TDG allows more precise taxiway design for aircraft cockpit over centerline steering which, in turn, provides the necessary taxiway edge safety margin.

Based on the new TDG design concept, fillets may consist of straight line and single straight line segments rather than the customary curves based on arcs or chords (see AC 150/5300-13A for additional details and taxiway design criteria).

Current taxiway lighting installation guidelines are in AC 150/5340-30, Design and Installation Details for Airport Visual Aids.

III. APPLICATION.

This EB is intended for use with taxiway edge lighting design requirements in AC 150/5340-30, Design and Installation Details for Airport Visual Aids.
IV. DESCRIPTION.

Existing taxiway edge lighting installation requirements are neither changed nor are they adversely impacted by the cockpit over centerline taxiway fillet design in AC 150/5300-13A. However, whenever the airport performs an upgrade of taxiways, the new design criteria must follow the requirements in AC 150/5300-13A.
V. EFFECTIVE DATE.

This Engineering Brief is effective after signature by the Manager of FAA Airport Engineering Division, AAS-100.

VI. APPLICABLE DOCUMENTS.

AC 150/5340-30, Design and Installation Details for Airport Aids (latest edition)

AC 150/5300-13A, Airport Design

This EB will present sample new taxiway fillet designs and associated taxiway edge lighting designs.

This EB will provide taxiway design examples for the layout of taxiway edge lights.

1.0 PLACING TAXIWAY EDGE LIGHTS FOR STANDARD TAXIWAY TURNS

See Figure 1 for an example of a taxiway edge lighting layout.

a. The spacing of the taxiway edge lights along the outer curve of taxiway turns and along curved fillets is identical to the current guidance in AC 150/5340-30, Figure 17.

b. Because L-1 is a gradual taper, light spacing along L-1 must align with the respective outer edge straight segments. The gradual taper is treated as part of the straight segment.

c. The spacing used along the straight section prior to the intersection of the taxiway must continue along the L-1 taper.

d. Install taxiway end indicator lights prior to intersections and curves per Figure 1 in this EB and AC 150/5340-30H, paragraph 2.1.4(b)(3).

e. A light must be placed at the intersection point (IP) of the L-1 and L-2 tapers, and on the opposite edge of the taxiway directly across from this point.

f. The IP indicates where the straight section light spacing requirement originates (see paragraphs b and c).

g. A light must be placed at the intersection of the L-2 taper and any curved fillets. Where there is no curved fillet (R-FILLET=0), a light must be installed at the intersection of the two “L-2” tapers.

h. The maximum spacing of the edge lights for L-2 tapers must not exceed 50 feet.

i. Per Figure 1, use single straight segment spacing requirements for straight sections that are opposite L-2 tapers. See AC 150/5340-30, Figure 16.

j. A minimum of three edge lights must be installed on a curved fillet where the angle of the intersection (delta) is more than 30 degrees. This is similar to the guidance in AC 150/5340-30 (See Figure 17, note 4).

k. See the Spacing Notes within Figure 1 for additional details.
90° TAXIWAY TURN

Notes:
1. L-1, L-2 AND L-3 DIMENSIONS ARE FOR TDG-4 AND ARE USED ONLY AS AN EXAMPLE.
2. SINGLE STRAIGHT REQUIRED, MAXIMUM 50' SPACING.
3. IP = INTERSECTION POINT.
4. PT = POINT OF TANGENCY.

Figure 1. Sample Layout for Taxiway Edge Lights
1.1 Taxiway Turns (180 degree)

a. Use the design rules in Section 1.0 to place the fillet taxiway edge lights.

b. W3, per the definition in AC 150/5300-13A, Change 1, Section 411, Figure 4-23 and Figure 4-24 represents the dimension of the narrowest paved segment for a crossover taxiway. The placement of lights on opposite side of the narrowest paved segment is recommended.

1.2 Placing Taxiway Edge Lights at Runway and Taxiway Intersections.

a. See Figure 2A and 2B for examples of taxiway edge lighting layouts at runway/taxiway intersections.

b. The taxiway lighting fillet segment length “L” must start at the taxiway fillet IP and continue to a point on a line parallel to and offset 3 feet outboard of the runway edge light line.

c. Taxiway lighting along the tapers is spaced based upon the length of the segment “L.” Refer to Table 1 for recommended spacing requirements.

d. Note that the TDG directly affects the pavement design, so these intersections can be unique. Therefore, the current guidance in AC 150/5340-30 must also be followed.

e. See the Spacing Notes in Figure 2 for additional details.
**TABLE 1**

<table>
<thead>
<tr>
<th>SECTION LENGTH (L)</th>
<th>NUMBER, EDGE LIGHTS (N) PER SIDE</th>
<th>MAXIMUM SPACING</th>
<th>SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>L &lt; 3'</td>
<td>1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3' ≤ L &lt; 10'</td>
<td>2</td>
<td>10'</td>
<td>L</td>
</tr>
<tr>
<td>10' ≤ L ≤ 40'</td>
<td>3</td>
<td>20'</td>
<td>L / 2</td>
</tr>
<tr>
<td>L &gt; 40'</td>
<td>((L_{MAX}) + 1)*</td>
<td>20'</td>
<td>L / (N-1)</td>
</tr>
</tbody>
</table>

* ROUND VALUE UP TO THE NEXT WHOLE NUMBER

**SPACING NOTES:**

1. THE LAST TAXIWAY EDGE LIGHT AT A RUNWAY/TAXIWAY INTERSECTION MUST BE PLACED AT AN ADDITIONAL 3 FEET FROM THE RUNWAY EDGE LIGHT OFFSET LINE. THE OFFSET IS NECESSARY TO MINIMIZE ANY POTENTIAL CONFLICT WITH RUNWAY EDGE LIGHTS.

2. SEE TABLE OPPOSITE FOR SPACING REQUIREMENTS.

3. INSTALL ONLY ONE LIGHT WHERE TAXIWAY AND TAPER INTERSECT WHEN L< 3 FEET.

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**Figure 2. Layout for Runway/Taxiway Intersection**