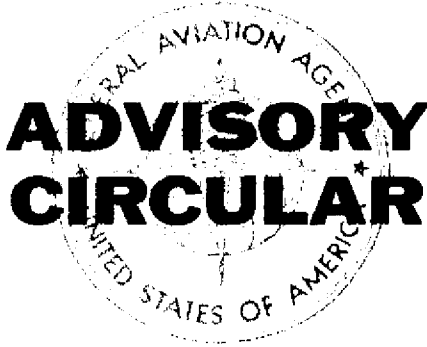


Federal Aviation Agency



CANCELLED

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AIRPORTS

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11/18/63

SUBJECT : CONFIGURATION DETAILS OF IN-RUNWAY LIGHTING: TOUCHDOWN ZONE, RUNWAY CENTERLINE, AND TAXIWAY TURNOFF LIGHTING SYSTEMS

1. PURPOSE. This advisory circular sets forth standards recommended by the Federal Aviation Agency for the guidance of the public relating to the configuration details of in-runway lighting: touchdown zone, runway centerline, and taxiway turnoff lighting systems. Installation details of these systems will be furnished in a separate circular. The uniform application of those standards will promote safety, regularity, and efficiency of air navigation; and they are required for project activity under the Federal-aid Airport Program.
2. APPLICATION. These standards apply whenever one or more of the subject lighting systems are installed. Touchdown zone lighting and runway centerline lighting are intended for installation on precision approach runways to facilitate landing under adverse visibility conditions (day and night). Considerations may indicate the installation of only a runway centerline system for assisting takeoff operations. The taxiway turnoff lighting system may be added to expedite the movement of aircraft from the runway in consideration of the severity and complexity of operations.
3. GENERAL DESCRIPTION.
 - a. Touchdown Zone Lighting. This system in the runway touchdown zone area presents, in plan view, two rows of transverse light bars disposed symmetrically about the runway centerline as shown on Figure 1. The basic system extends 3,000 feet along the runway. If operational needs dictate the requirements for touchdown zone lighting on a runway less than 6,000 feet in length, the length of this system may be reduced to not less than one-half the length of the runway.

- b. Runway Centerline Lighting. The runway centerline lighting system consists of single lights installed at uniform intervals along the runway centerline so as to provide a continuous lighting reference from threshold to threshold.
- c. Taxiway Turnoff Lighting. The taxiway turnoff lighting system consists of single lights installed at uniform intervals to define the path of aircraft travel from the runway centerline to a point on the taxiway, as shown in Figure 2.
- d. Brightness Control. Brightness control is a part of the systems and is provided for all segments.
- e. Color. All lights of the touchdown zone, runway centerline, and taxiway turnoff lighting systems should be aviation variable white.
- f. Intensity. The maximum intensities of the touchdown zone, runway centerline, and taxiway turnoff lighting systems should be such as to provide satisfactory guidance under the limiting meteorological conditions for which these systems are to be used. The brightness should be controlled to be compatible with the intensities of the approach lighting and runway edge lighting systems.

4. DETAILED DESCRIPTION.

- a. Touchdown Zone Lighting. The basic touchdown zone lighting system is arranged by designating thirty 100-foot intervals beginning at the landing threshold. The first pair of light bars is located 100 feet from the landing threshold at the precision approach end of the runway, except as provided for in paragraph (1) below.
 - (1) First Pair of Light Bars. In consideration of joint location design in concrete pavement, the first pair of light bars may be located within the interval of 75 to 125 feet from the landing threshold.
 - (2) Longitudinal Tolerance. The longitudinal installation tolerance in locating the symmetric pairs of transverse light bars should not exceed 2 feet.
 - (3) Width of Gauge. The rows of transverse light bars are spaced equidistant from the runway centerline. This spacing or gauge between the innermost light fixtures of the rows should be uniform throughout the length of the system. The uniform system gauge is 60 feet except that, where dictated by construction requirements, the gauge may be reduced to not less than 55 feet.

- (4) Light Bar Spacing. Each transverse light bar consists of a minimum of 3 unidirectional lights at intervals of 5 feet measured center to center to form a bar 10 feet long. The spacing of the lights in the transverse light bars are uniform throughout the system.
- b. Runway Centerline Lighting. The individual runway centerline lights should be spaced at uniform intervals not to exceed 25 feet.
- (1) Lateral Displacement. The entire centerline lighting system may be displaced laterally a maximum of 2 feet from the runway centerline, if necessary to meet runway construction requirements. Individual lights should not be displaced with respect to other units.
 - (2) Location of First Unit. The runway centerline lighting system commences 75 feet plus or minus $12\frac{1}{2}$ feet from the landing threshold and extends to a similar point at the opposite end of the runway.
 - (3) Longitudinal Tolerance. The longitudinal installation tolerance in locating individual lights should not exceed 2 feet.
 - (4) Light Beam. The runway centerline lights are bidirectional unless operational requirements dictate otherwise.
- c. Taxiway Turnoff Lighting. The taxiway turnoff lights, defining the path of aircraft travel from the runway centerline to a point on the taxiway, are spaced $12\frac{1}{2}$ feet.
- (1) Location of Lights. The taxiway turnoff lights should be offset, not in excess of 2 feet, from the curve defining the centerline of the taxiway turnoff. The taxiway turnoff centerline may be defined as beginning at the point of curvature of the "entrance curve" and ending at the point of tangency of the "central curve," as shown on Figure 2. If the turnoff is to the right from a runway as viewed from the landing threshold, the lights should be offset to the right. Conversely, if the turnoff is to the left the reverse applies.
 - (2) Starting Point on Runway. To provide advance indication of the position of the turnoff, the lights begin at a point 200 feet in advance of the point marking the beginning of the entrance curve. On this portion, the lights are located parallel to and displaced approximately 2 feet on the appropriate side of the runway centerline.
 - (3) Termination of Lights. From a point opposite the point of curvature the lights follow in a smooth curve and terminate at a point opposite the point of tangency. (See Figure 2).

- (4) Tolerance. A longitudinal installation tolerance in locating the lights should not exceed 2 feet. Individual lights should not be displaced laterally.
- (5) Light Beam. The taxiway turnoff lights are unidirectional unless operational requirements dictate otherwise.
- (6) Orientation of Light Beam. Each fixture on the curved portion is oriented to provide the optimum guidance by being aimed at a point 500 feet from the light fixture on the path of the approaching aircraft.

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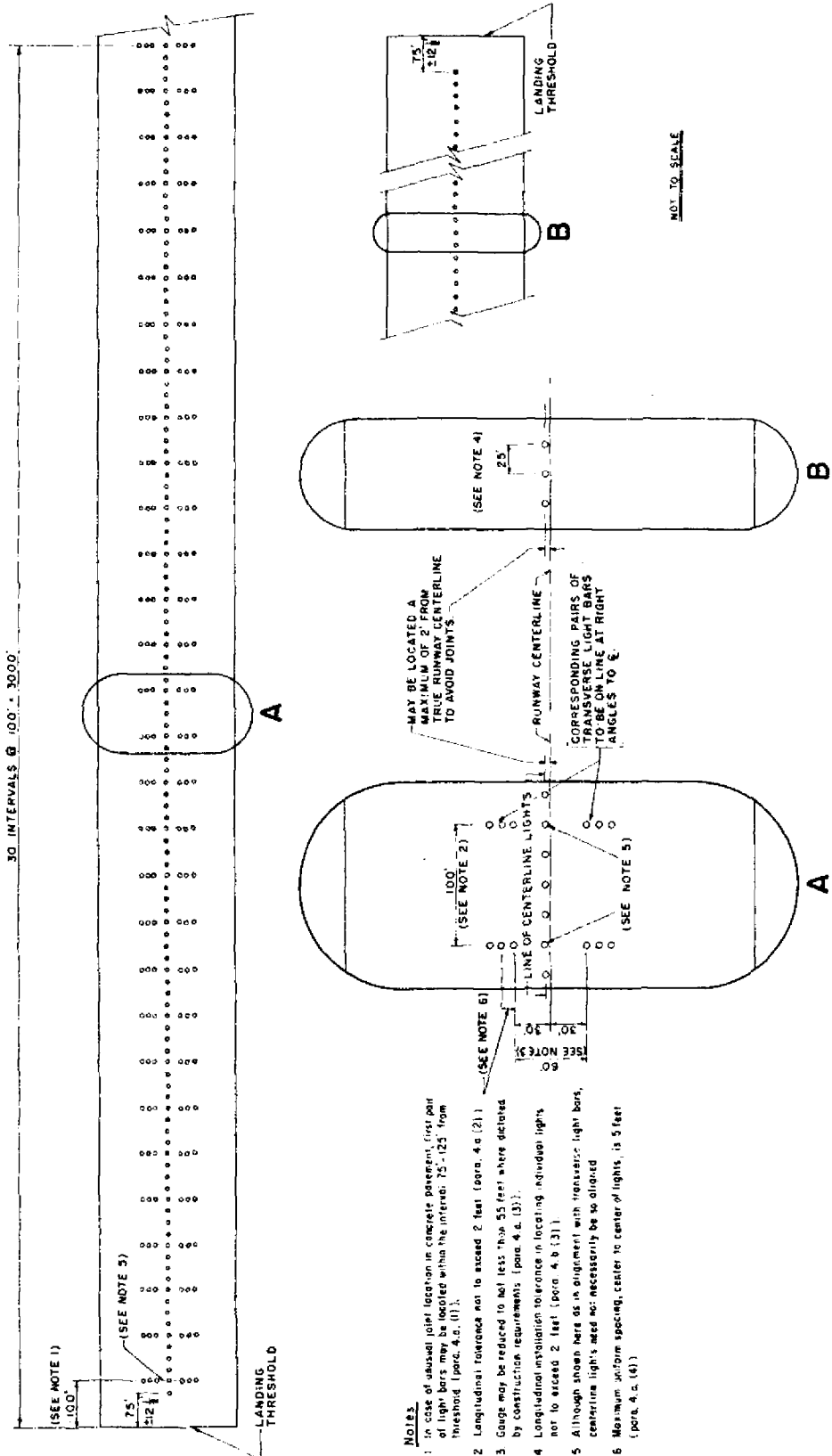
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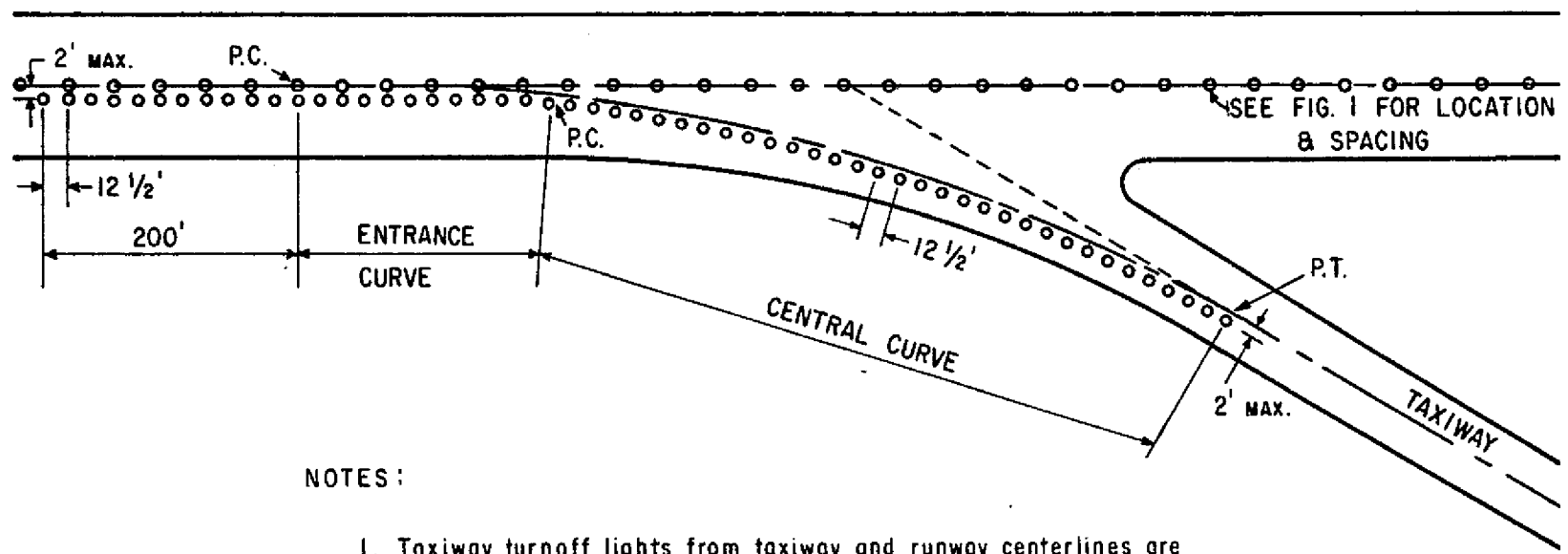
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Cole Morrow, Director
Airports Service



- Notes:**
1. In case of unusual joint location in concrete pavement, first pair of light bars may be located within the interval 75'-125' from threshold. (para. 4. a. (1)).
 2. Longitudinal tolerance not to exceed 2 feet (para. 4. a. (2)).
 3. Gauge may be reduced to not less than 55 feet where dictated by construction requirements. (para. 4. a. (3)).
 4. Longitudinal installation tolerance in locating individual lights not to exceed 2 feet. (para. 4. b. (3)).
 5. Although shown here as in alignment with transverse light bars, centerline lights need not necessarily be so aligned.
 6. Maximum uniform spacing, center to center of lights, is 5 feet (para. 4. a. (4)).

FIGURE 1. RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING LAYOUT



NOTES:

1. Taxiway turnoff lights from taxiway and runway centerlines are offset a distance not in excess of 2 feet.
2. A longitudinal tolerance of $\pm 2'$ may be necessary to avoid rigid pavement joints.
3. Standard "entrance" and "central" curve design information per FAA Manual "Airport Design"

FIGURE 2. TAXIWAY TURNOFF LIGHTING LAYOUT