



ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 30: Other issues to be considered by the Technical Commission

**NEED FOR AMENDMENT IN 5.2.4.5 AND 5.2.4.6 OF ANNEX 14 — AERODROMES,
VOLUME I — AERODROME DESIGN AND OPERATIONS – CHARACTERISTICS OF
RUNWAY THRESHOLD MARKINGS**

(Presented by India)

EXECUTIVE SUMMARY

Paragraphs 5.2.4.5 and 5.2.4.6 of Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations*, Eighth Edition, July, 2018 describes the Characteristics of Runway Threshold Markings. The number of threshold stripes are defined for different width of runways but width of threshold stripes and spacing mentioned as “Approximately 1.8 m” results in merging of threshold stripes with runway edge stripes. Else, airport operators have to manipulate width of threshold stripes and spacing. It is found that fixed width of threshold stripes and spacing of 1.6 m provides clear gap between the threshold stripe and runway edge stripe. This defined width will also ensure similar markings at all airports for different width of runways. In order to maintain similarity, Touchdown Zone Markings may also be defined as 1.6 m in place of 1.8 m (5.2.6.4 of Annex 14, Volume I) keeping other parameters same.

Action: The Assembly is invited to consider review of characteristics of Runway Threshold Markings, 5.2.4.5 and 5.2.4.5 of Annex 14, Volume I- *Aerodromes Design and Operations*.

<i>Strategic Objectives:</i>	This working paper relates to the Safety Strategic Objective. Visual Aids for Navigation
<i>Financial implications:</i>	Nil
<i>References:</i>	Annex 14 to the Convention on International Civil Aviation, Volume 1, July, 2018

1. INTRODUCTION

1.1 Paragraphs 5.2.4.5 and 5.2.4.6 of Annex 14, Aerodromes, Volume I, *Aerodrome Design and Operations*, Eighth Edition, July, 2018 describes the Characteristics of Runway Threshold Markings:

5.2.4.5 A runway threshold marking shall consist of a pattern of longitudinal stripes of uniform dimensions disposed symmetrically about the centre line of a runway shown in Figure 5-2 (A) and (B) for a runway width of 45 m. The number of stripes shall be in accordance with the runway width as follows:

Runway width	Number of stripes
18 m	4
23 m	6
30 m	8
45 m	12
60 m	16

5.2.4.6 The stripes shall extend laterally to within 3 m of the edge of a runway or to a distance of 27 m on either side of a runway centre line, whichever results in the smallest lateral distance. Where a runway designation marking is placed within a threshold marking there shall be a minimum of three stripes on each side of the centre line of the runway. Where a runway designation marking is placed above a threshold marking, the stripes shall be continued across the runway. The stripes shall be at least 30 m long and approximately 1.80 m wide with spacing of approximately 1.80 m between them except that, where the stripes are continued across a runway, a double spacing shall be used to separate the two stripes nearest the centre line of the runway, and in the case where the designation marking is included within the threshold marking this spacing shall be 22.5 m.

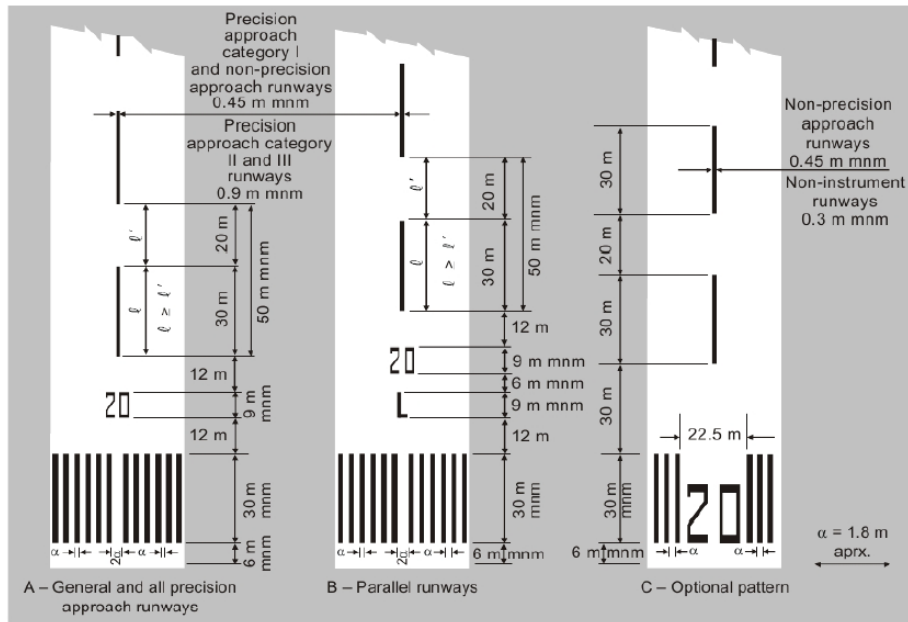
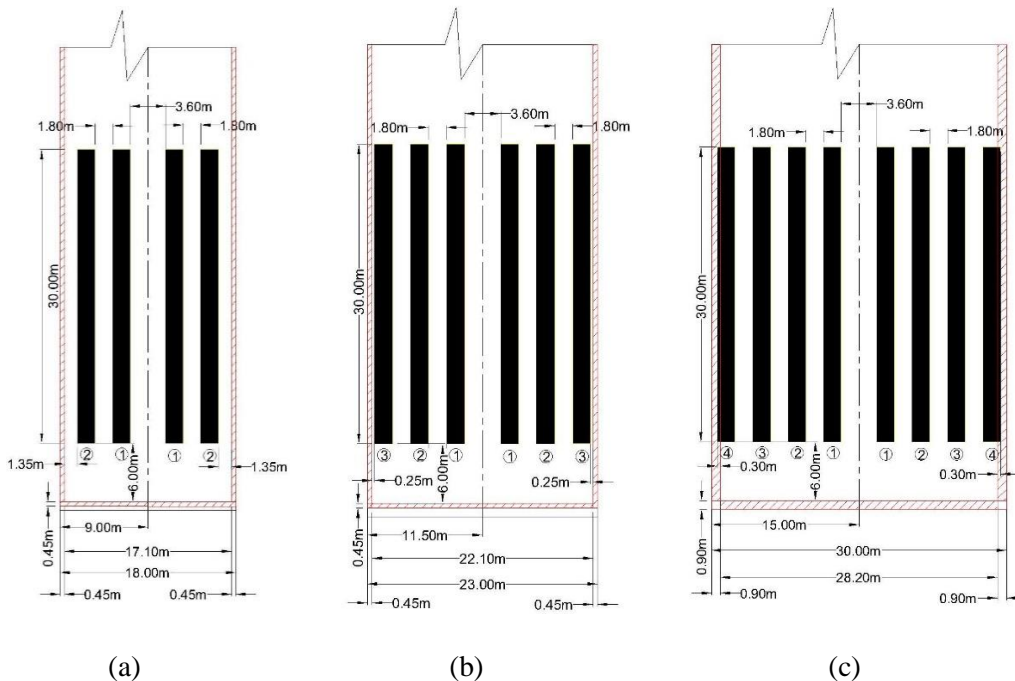


Figure 5-2. Runway design, centre line and threshold markings

2. DISCUSSION

2.1 Threshold markings in accordance with 5.2.4.5 and 5.2.4.6 are marked in Figure 1 (a, b, c, d and e) for runway width 18 m, 23 m, 30 m, 45 m and 60 m respectively for pattern “A” and “B”. While maintaining width α as 1.8 m, the spacing and/or number of strips cannot be achieved.



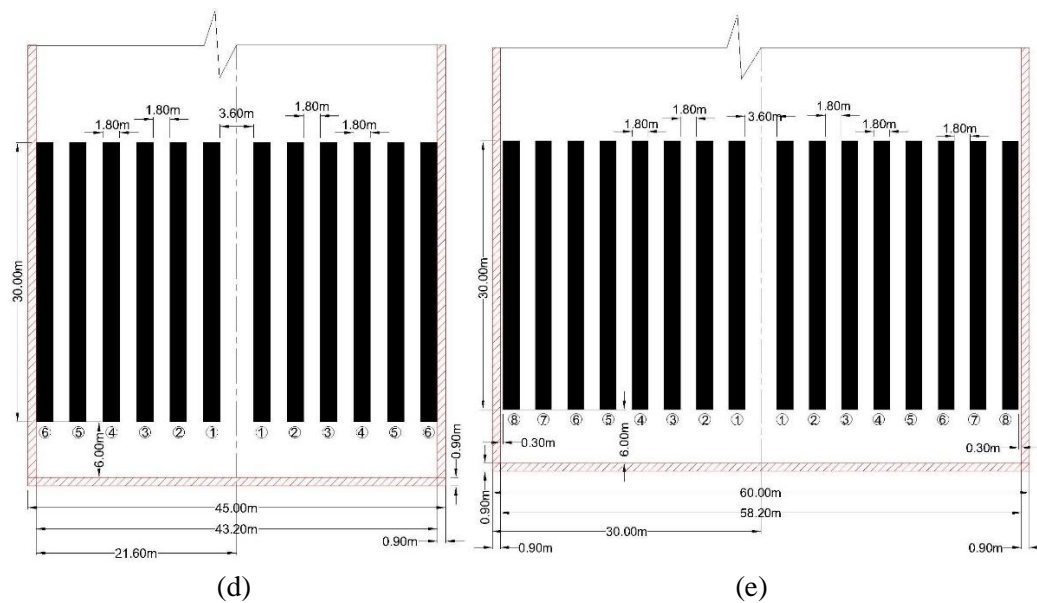


Figure-1

2.2 It can be seen that the distance of extreme outside threshold stripe from runway side stripe is either too small or both stripes are merging for all runway width except 18 m wide runway where a clear gap of 1.35 m is achieved. The gap between outermost threshold stripe and inner edge of the runway side stripe are given in Table-1.

Runway width	Side stripe width	Width of threshold marking/ spacing	Gap between side strip and last threshold line	Remarks
18 m	0.45 m	1.8 m	1.35 m	Clear gap
23 m	0.45 m	1.8 m	0.25 m	Clear gap
30 m	0.90 m	1.8 m	-0.30 m	overlapping
45 m	0.90 m	1.8 m	0.00 m	Merging
60 m	0.90 m	1.8 m	0.30 m	Clear gap

Table-1

2.3 For runway width 23 m, clear gap between threshold stripe and side stripe is 0.25 m and for width 60m, it is 0.30 m. For 30 m wide runway, the threshold stripe is overlapping side stripe by 0.30 m whereas for 45 m wide runway, both stripes are merging. Width of runway and side stripe are defined but as per 5.2.4.6, width of threshold stripe and gap between stripes is to be **approximately** 1.8 m. Similarly, the stripes shall extend laterally to within 3m of the edge of a runway or to a distance of 27 m on either side of a runway centre line, whichever results in the smallest lateral distance. Condition of the stripe within 3 m of the edge of runway is satisfied but the side stripe is so close to the Edge stripe that the gap appears non-existent. For 30 m wide runway, both stripes are overlapping

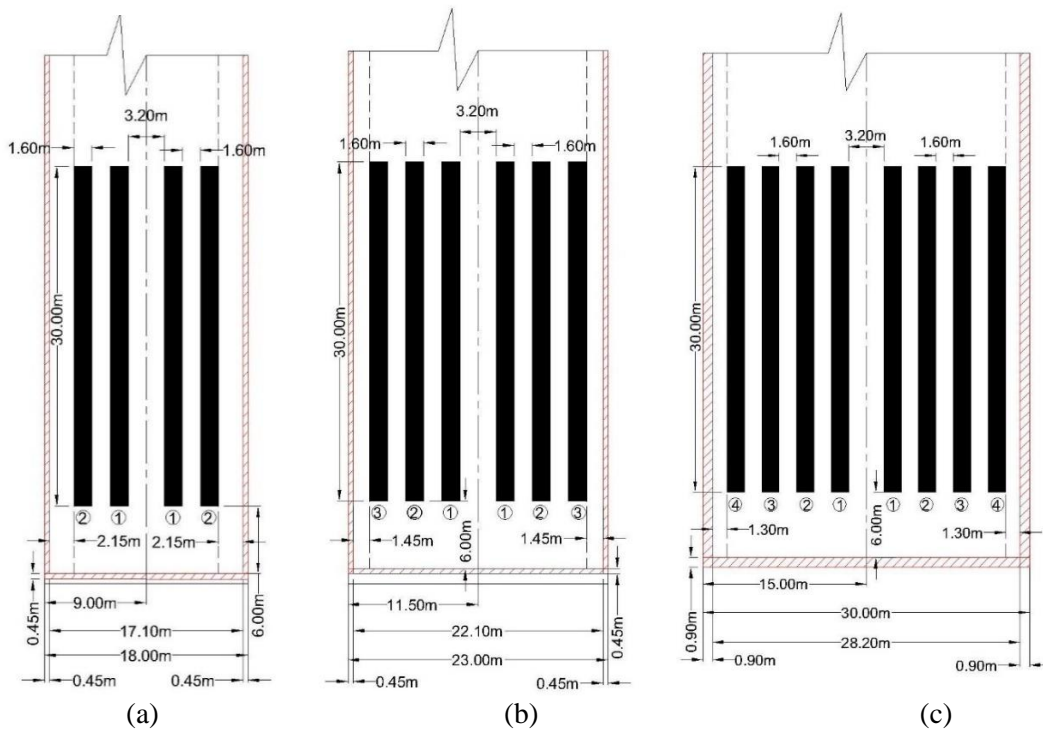
2.4 It has been observed that airport operators are manipulating “approximately 1.8 m” provision and providing threshold stripes in different width for different runways. When Runway width is defined, threshold stripes’ dimensions should also be clearly defined so as to maintain uniformity for all width of runways at all airports. Clear spacing of threshold stripe from Edge Stripe should also be defined to distinguish between the side stripe and outermost threshold marking.

2.5 After lot of permutation and combination, it was observed that 1.6 m wide threshold stripe can provide suitable clear gap from runway edge stripe. Keeping all other parameters the same as per 5.2.4.5 and 5.2.4.6 except the requirement of 27 m distance from runway centre line, which is, otherwise also, applicable only for 60 m wide runway, the dimensions can be freezed for all runway widths. Threshold stripes layout with 1.6 m wide stripes is depicted in Figure 2 (a, b, c, d and e). The gap between last threshold stripe and inner edge of the runway side stripe, in such case, are given in Table-2.

Runway width	Side stripe width	Width of threshold marking/ spacing	Gap between side strip and last threshold line	Remarks
18 m	0.45 m	1.6 m	2.15 m	Clear gap
23 m	0.45 m	1.6 m	1.45 m	Clear gap
30 m	0.90 m	1.6 m	1.30 m	Clear gap
45 m	0.90 m	1.6 m	2.40 m	Clear gap
60 m	0.90 m	1.6 m	3.50 m	Clear gap

Table 2

2.6 In order to maintain similarity, width of Touchdown stripes should also be defined as 1.6 m in place of 1.8 m (5.2.6.4 of Annex 14, Volume I) keeping other parameters same.



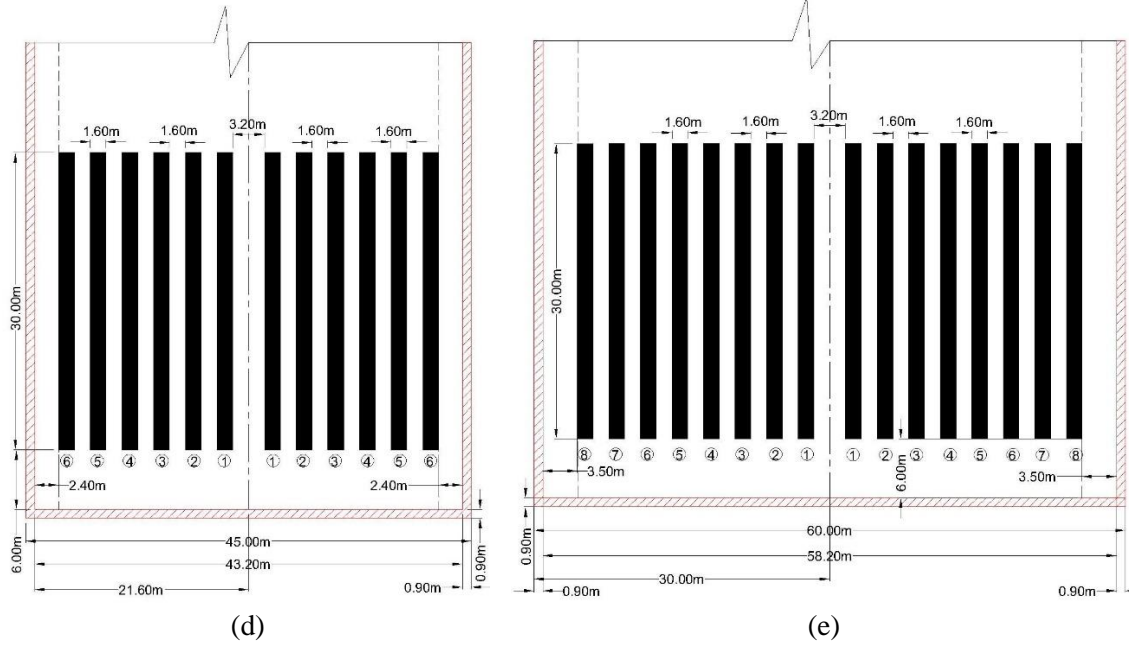


Figure-2

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