



Advisory Circular

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NIGERIAN CIVIL AVIATION AUTHORITY (NCAA)

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CALCULATIONS OF DECLARED DISTANCES

1.0 GENERAL

Nigerian Civil Aviation Authority Advisory Circulars from Aerodrome Standards Department contain information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated Regulations.

An AMC is not intended to be the only means of compliance with a regulation, and consideration will be given to other methods of compliance that may be presented to the Authority.

2.0 PURPOSE

This Advisory Circular provides methods, acceptable to the Authority, for showing compliance with the calculation of declared distances requirements of Nig.CARs Part 12 as well as explanatory and interpretative material to assist in showing compliance. The calculation of declared distances is to allow pilots to determine aircraft loading and performance requirements.

3.0 REFERENCE

The Advisory Circular relates specifically to Nig.CARs 12.4.2 & Aerodrome Standards Manual section 6.2.8

4.0 STATUS OF THIS AC

This is a re-issue of the AC on the subject and it cancels the previous edition



Table of Contents

CALCULATIONS OF DECLARED DISTANCES.....	3
FORWARD	3
DEFINITIONS.....	4
CALCULATION OF RUNWAY DECLARED DISTANCES	5
Figure 1	5
Figure 2.	6
Figure 3	7



FORWARD

This document provides guidance to aerodrome operators on the calculation of runway declared distances. Aerodrome Operators are to note that it is the responsibility of an aerodrome operator who operates a certificated aerodrome to calculate and publish accurate declared distances for a runway intended for use by international commercial air transport

Declared distances should be measured for each runway direction. The distances are measured along the centre line of the runway and of any associated stopway and clearway, and should be declared by publication in the Nigeria AIP or in a NOTAM.

The following declared distances shall be calculated to the nearest metre for a runway intended for use by international commercial air transport:

- (1) Take-off run available (TORA) - This is the length of runway available and suitable for the ground run of an aircraft Taking Off;
- (2) Take-off distance available (TODA) - The length of the take-off run available plus the length of the clearway, if provided.
- (3) Accelerate-stop distance available (ASDA) - The length of the take-off run available plus the length of the stop way, if provided.
- (4) Landing distance available (LDA) - This is the length of the runway available and suitable for the ground run of an aeroplane landing.



Definitions	
Clearway (CWY)	A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height
Declared distances:	
a) Take-off run available (TORA)	The length of runway declared available and suitable for the ground run of an aeroplane taking off
b) Take-off distance available (TODA)	The length of the take-off run available plus the length of the clearway, if provided
c) Accelerate-stop distance available (ASDA)	The length of the take-off run available plus the length of the stopway, if provided.
d) Landing distance available (LDA)	The length of runway which is declared available and suitable for the ground run of an aeroplane landing
Stopway (SWY)	A defined rectangular area on the ground at the end of take-off run available (TORA) prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take off



CALCULATION OF RUNWAY DECLARED DISTANCES

Where a runway is not provided with a stopway or clearway and the threshold is located at the extremity of the runway, the four declared distances should normally be equal to the length of the runway, as shown in Diagram (A) in Figure 4. The threshold is the start of that part of a runway that is declared as available for landing. In such a case the runway extremity, illustrated as position 1 in Figure 1 below is the end of TORA, ASDA and LDA. It would be the start of TORA, ASDA and TODA in the reciprocal direction, and also the LDA subject to the availability of an acceptable obstacle free approach surface.

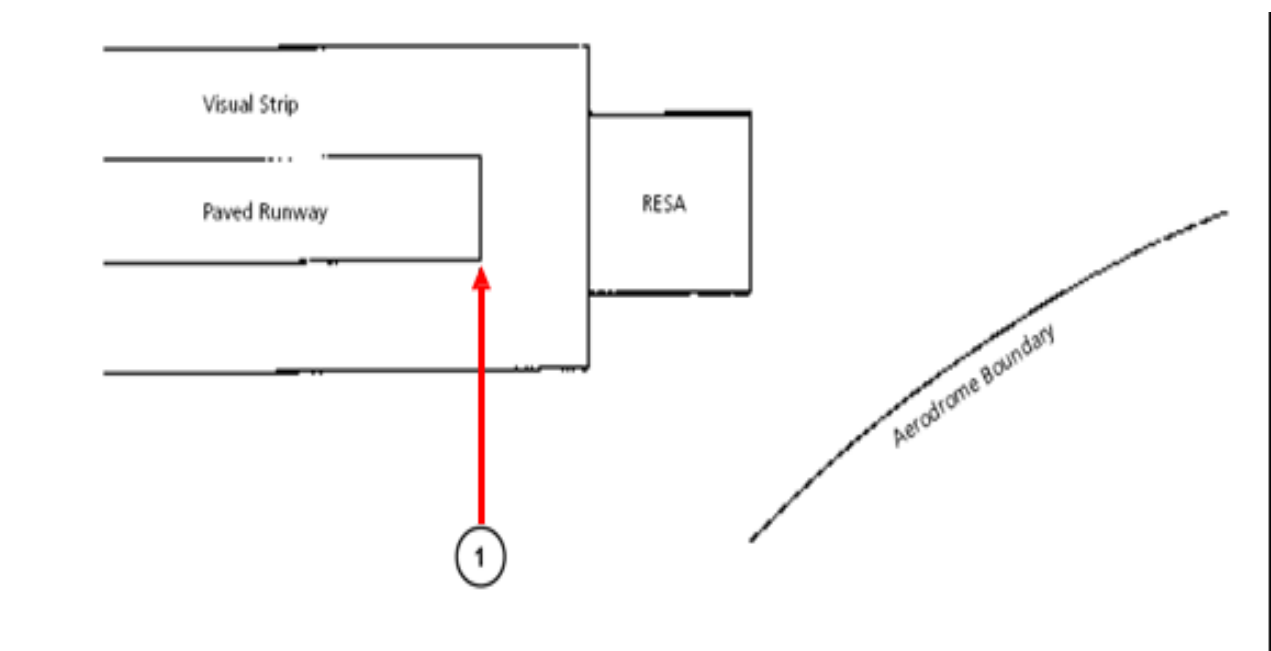


Figure 1

Where it is necessary to account for an obstacle that cannot be removed and which extends above the approach surface and the threshold has to be displaced from the runway extremity then the LDA will be reduced by the distance the threshold is displaced. The TODA, TORA and ASDA and the LDA in the reciprocal direction are not affected. The LDA in the reciprocal direction is affected by displacement of the opposite threshold.

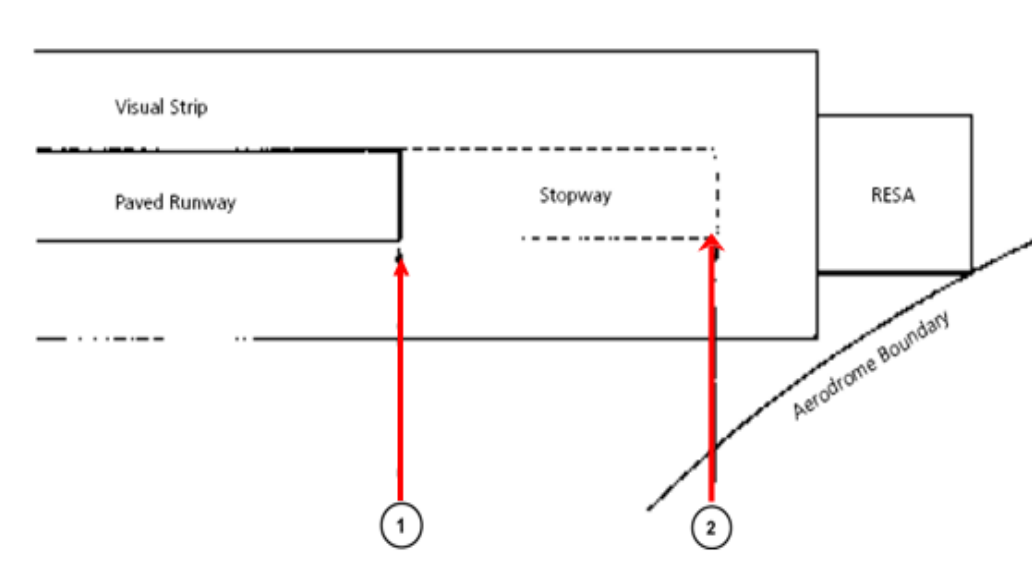


Figure 2.

Where a runway is provided with a stopway (SWY), (as in figure 2, above) then the ASDA will include the length of stopway. A stopway is located at the end of the TORA, hence the ASDA is calculated by adding the length of the stopway to the TORA. Position 2 therefore is the end of the ASDA. It is to be noted that in this example the RESA is the limiting feature as it is constrained by the aerodrome boundary. Aerodrome Operators are to note that in compliance with Nig.CARs Part 12/Aerodrome Standards Manual, the requirements of a RESA as appropriate for runway code number 3 or 4 and code number 1 or 2 where the runway is an instrument one must be met.

Where a runway is provided with a clearway (CWY), then the TODA will include the length of clearway. The origin of a clearway is at the end of the TORA, hence TODA is calculated by adding length of clearway to TORA.

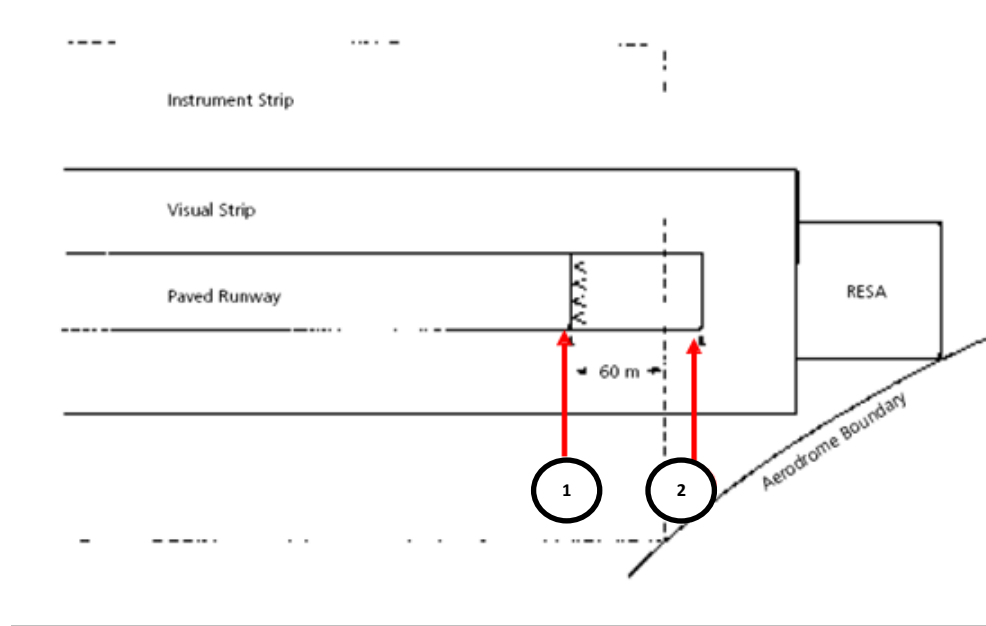


Figure 3

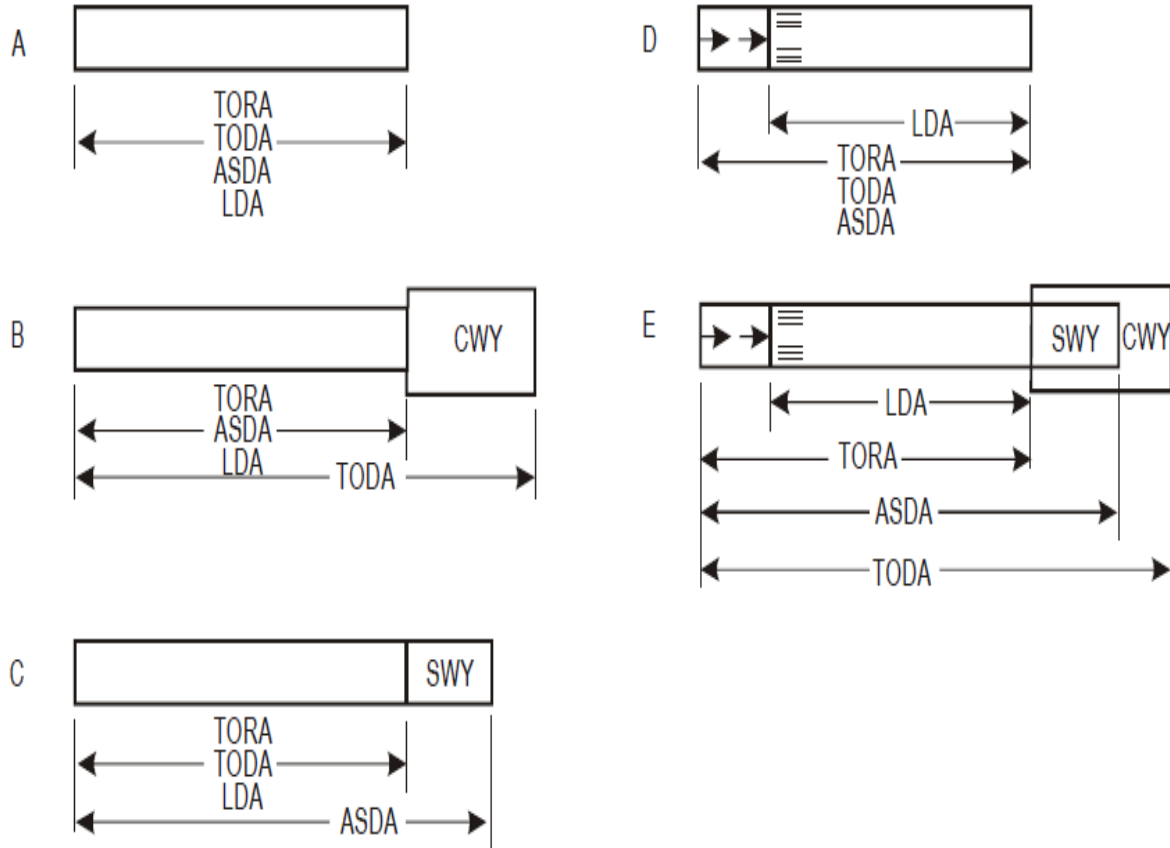
Position 1, (Figure 3) would be the end of TORA and LDA for a visual runway. It would be the start of TORA, ASDA and TODA in the reciprocal direction, also LDA unless the threshold was displaced because of obstacles in the approach area.

Position 2, (in Figure 3 above) would be the end of LDA for an instrument runway, the provision of the required instrument strip becoming the limiting factor, and the start of LDA in the reciprocal direction, subject to the availability of an acceptable obstacle free approach surface.

The general principles for calculating declared distances are illustrated in figure 4.




Under Attachment A, Section 3.0 of the Aerodrome Standards Manual, the declared distances shall be calculated and reported by the aerodrome operator to Aeronautical Information Services (AIS). Such information should be subsequently made available to pilots via the Aeronautical Information Publication (AIP).



Note.— All declared distances are illustrated for operations from left to right.

Figure 4


Capt. Muhtar Usman
Director General