Notice Number: **01/2019**
Version: **01**
Effective Date: **15/01/2019**

Subject: **AMENDMENT TO SEYCHELLES MANUAL OF AERODROME STANDARDS**

1. INTRODUCTION

1.1. The objective of this NOTAL is to provide aerodrome operators and applicants with the amended text of part of the Seychelles Manual of Aerodrome Standards (SMAS).

1.2. The contents of this NOTAL will be incorporated in the next revision of the SMAS.

2. RATIONALE

2.1. The International Civil Aviation Organization has recently adopted Amendment 14 to Annex 14 which took effect on 16th July 2018 and became applicable on 08th November 2018. As such, our National Regulations are being amended accordingly to reflect relevant parts of Amendment 14 to Annex 14.

2.2. Amendment 14 to Annex 14 has been effected to:

2.2.1. Eliminate excesses in safety buffers resulting from improved aeroplane capabilities and actual operating safety performances. It contributes to achieving a balance between the need for increased capacity and efficiency, and maintaining aviation safety at an acceptable level.

2.2.2. Update relevant parts of the Annex such that it is in line with ICAO Circulars 301 and 345 (yet to be published) and ICAO Doc 9981- Procedures for Air Navigation Services – Aerodromes (PANS-Aerodromes).

2.2.3. Reflect the restructuring of Annex 15 and the new ICAO Doc 10066- Procedures for Air Navigation Services – Aeronautical Information Management (PANS-AIM).

2.3. Additionally, scope of standards 13.2.4 of Chapter 13 is being amended to include *Wildlife* in general instead of *Birds* specifically. This change widens the scope of these standards significantly and establishes requirements for implementation of adequate systems to monitor, manage, and/or remove any potential wildlife hazard to aircraft operations. Compliance to these will result in an increased level of safety.

3. IMPACT ASSESSMENT

3.1. Generally, safety; financial; environmental; and efficiency impacts are expected to be positive. No impact is expected on security.

3.2. Refer to Attachment F to ICAO State letter AN4/1.2.27-18/23, included in pages 22 and 23 of this document, for detailed impact assessments.

4. NOTES ON THE PRESENTATION OF THE AMENDMENT

4.1 The text of the amendment is arranged to show deleted text with strikethrough and new text highlighted with grey shading, as shown below:

Example	Remarks
~~To be deleted is shown with strikethrough~~	Text to be deleted
New text to be inserted is highlighted with grey shading	New text to be inserted
~~Text to be deleted is shown with strikethrough~~ following by the replacement text which is highlighted with grey shading	New text to replace existing text

5. TEXT OF THE AMENDMENT

5.1. Abbreviations and symbols, Page xvi

Abbreviations

OFZ	Obstacle Free Zone
OMGWS	Outer main gear wheel span
PAPI	Precision Approach Path Indicator

5.2. Chapter 1 - Introduction, Definitions, Pages 1-9; 1-15; 1-20; and 1-23

Definition	Meaning
.....	
Data ~~A~~accurracy	A degree of conformance between the estimated or measured value and the true value. ~~Note – For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.~~
…..	
Data quality	A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution ~~and~~, integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

…..

Data ~~I~~integrity (~~aeronautical data~~ assurance level)	A degree of assurance that an aeronautical data and its value has not been lost or altered since the ~~data~~ origination or authorized amendment.

…..

Obstacle free zone	The airspace above the inner approach surface, inner transitional surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low- mass and frangibility mounted one required for air navigation purposes.
Outer main gear wheel span (OMGWS)	The distance between the outside edges of the main gear wheels.

…..

5.3. Chapter 1 – Introduction, Sub-Section 13.3.3 – Temporal reference system, Page 1-30

…..

1.3.3.2 When a different temporal reference system is used, this shall be indicated in GEN 2.1.2 of the Aeronautical Information Publication (AIP)~~; see Annex 15, Appendix 1~~.

Note – See PANS-AIM (Doc 10066), Appendix 2.

…..

5.4. Chapter 1 – Introduction, Section 1.4 – Certification of aerodromes, Page 1-30

Note.— The intent of these specifications is to ensure the establishment of a regulatory regime so that compliance with the specifications in this Manual can be effectively enforced. It is recognized that the methods of ownership, operation and surveillance of aerodromes differ among States. The most effective and transparent means of ensuring compliance with applicable specifications is the availability of a separate safety oversight entity and a well-defined safety oversight mechanism with support of appropriate legislation to be able to carry out the function of safety regulation of aerodromes. When an aerodrome is granted a certificate, it signifies to aircraft operators and other organizations operating on the aerodrome that, at the time of certification, the aerodrome meets the specifications regarding the facility and its operation, and that it has ,according to the certifying authority, the capability to maintain these specifications for the period of validity of the certificate .The certification process also establishes the baseline for continued monitoring of compliance with the specifications .Information on the status of certification of aerodromes would need to be provided to the appropriate aeronautical information services for promulgation in the Aeronautical Information Publication (AIP). See 6.2.13 and ~~ICAO Annex 15~~ PANS-AIM (Doc 10066), Appendix ~~1~~2, AD 1.5.

…..

5.5. Chapter 2 – Application of Standards and Recommended Practices to Aerodrome, Section 2.2, Pages 2-7 to 2-9

2.2.1 Use of ICAO Aerodrome Reference Code to specify aerodrome standards and recommended practices

2.2.1.1 ICAO has devised a reference code to provide a simple method for inter-relating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for aeroplanes that are intended to operate at the aerodrome. The code is not intended to be used for determining runway length or pavement strength requirements. The code is composed of two elements which are related to the aeroplane performance characteristics and dimensions. Element 1 is a number based on the aeroplane reference field length and element 2 is a letter based on the aeroplane wing span ~~and outer main gear wheel span. A particular specification is related to the more appropriate of the two elements of the code or to an appropriate combination of the two code elements.~~ The code letter or number within an element selected for design purposes is related to the critical aeroplane characteristics for which the facility is provided.

2.2.1.2 This Manual of Aerodrome Standards adopts ICAO's method of applying the aerodrome reference code to determine the characteristics required of aerodromes and aerodrome facilities.

2.2.2 Aerodrome Reference Code and aeroplane characteristics

2.2.2.1 When applying the standards and recommended practices prescribed in this Manual, first identify the aeroplanes which the aerodrome is intended to serve ~~are first identified~~ and then determine the two elements of the code.

2.2.2.2 An aerodrome reference code – code number and letter – which is selected for aerodrome planning purposes shall be determined in accordance with the characteristics if the aeroplane for which an aerodrome facility is intended.

2.2.2.3 The aeroplane reference code numbers and letters shall have the meanings assigned to them in Table 2-1 of this Manual.

2.2.2.4 The code number for element 1 shall be determined from Table 2-1 of this Manual, column 1, selecting the code number corresponding to the highest value of the aeroplane reference field lengths of the aeroplanes for which the runway is intended.

Note 1 – The determination of the aeroplane reference field length is solely for the selection of a code number and is not intended to influence the actual runway length provided.

Note 2 – Guidance on determining the runway length is given in the Aerodrome Design Manual, (ICAO Doc 9157), Part 1 - Runways

2.2.2.5 The code letter for element 2 shall be determined from Table 2-1 of this Manual, ~~column 3~~, by selecting the code ~~number~~ letter which corresponds to the greatest wing span~~, or the greatest outer main gear wheel span, whichever gives the more demanding code number~~ of the aeroplanes for which the facility is intended.

Note – Guidance ~~to assist the aerodrome operator in~~ on determining the aerodrome reference code is given in the ICAO Aerodrome Design Manual (Doc 9157), Parts 1 and 2.

Table 2-1 – Aerodrome Reference Code

~~Code element 1~~		~~Code element 2~~		
~~Code number~~	~~Aeroplane reference field length~~	~~Code letter~~	~~Wing span~~	~~Outer main gear wheel span~~
~~(1)~~	~~(2)~~	~~(3)~~	~~(4)~~	~~(5)~~
~~1~~	~~Less than 800m~~	~~A~~	~~Up to but not including 15m~~	~~Up to but not including 4.5m~~
~~2~~	~~800m up to but not including 1200m~~	~~B~~	~~15m up to but not including 24m~~	~~4.5m up to but not including 6m~~
~~3~~	~~1200m up to but not including 1800m~~	~~C~~	~~24m up to but not including 36m~~	~~6m up to but not including 9m~~
~~4~~	~~1800m and over~~	~~D~~	~~36m up to but not including 52m~~	~~9m up to but not including 14m~~
		~~E~~	~~52m up to but not including 65m~~	~~9m up to but not including 14m~~
		~~F~~	~~65m up to but not including 80m~~	~~14m up to but not including 16m~~
~~a. Distance between the outer edges of the main gear wheels.~~				
~~Note – Guidance on planning for aeroplanes with wing spans greater than 80m is given in the ICAO Aerodrome Design Manual, Parts 1 and 2.~~				

Code element 1	
Code number	Aeroplane reference field length
1	Less than 800m
2	800m up to but not including 1200m
3	1200m up to but not including 1800 m
4	1800m and over

Code element 2	
Code letter	Wingspan
A	Up to but not including 15m
B	15m up to but not including 24m
C	24m up to but not including 36m
D	36m up to but not including 52m
E	52m up to but not including 65m
F	65m up to but not including 80m

Note – Guidance on planning for aeroplanes with wingspans greater than 80m is given in the Aerodrome Design Manual (ICAO Doc 9157), Parts 1 and 2.

5.6. Chapter 6 – Aerodrome Data, Pages 6-2 to 6-13

…..

6.2.1 Aeronautical data

6.2.1.1 Determination and reporting of aerodrome related aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end-users of aeronautical data ~~requirements set forth in Tables 1 to 5 contained in ICAO Annex 14 Vol. I Appendix 5 while taking into account the established quality system procedures. Accuracy requirements for aeronautical data are based on upon a 95 per cent confidence level and in that respect, three types of positional data shall be identified: surveyed points (e.g. runway threshold), calculated points (mathematical calculations from known surveyed points of points in space, fixed) and declared points (e.g. flight information region boundary points).~~

Note – ~~Specifications governing the quality system are given in ICAO Annex 5, Chapter 3.~~ Specifications concerning the accuracy and integrity classification related to aerodrome-relates aeronautical data are contained in PANS-AIM (ICAO Doc 10066), Appendix 1.

6.2.1.2 Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

Note – Detailed specifications concerning digital data error detection techniques are contained in PANS-AIM (ICAO Doc 10066).

~~6.2.1.2 An aerodrome operator shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classification and data integrity level shall apply:~~

~~a) *critical data, integrity level 1 x 10-8*: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;~~

~~b) *essential data, integrity level 1 x 10-5*: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;~~

c) ~~*routine data, integrity level 1 x 10-3*: there is a very low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.~~

~~6.2.1.3 Protection of electronic aeronautical data while stored or in transit shall be totally monitored by the cyclic redundancy check (CRC). To achieve protection of the integrity level of critical and essential aeronautical data as classified in paragraph 6.2.1.2 above, a 32 or 24 bit CRC algorithm shall apply respectively.~~

~~6.2.1.4 **Recommendation** – To achieve protection of the integrity level of routine aeronautical data as classified in paragraph 6.2.1.2 above, a 16 bit CRC algorithm should apply.~~

~~*Note – Guidance material on the aeronautical data integrity quality requirements (accuracy, resolution, integrity, protection and traceability) is contained in the ICAO World Geodetic System – 1984 (WGS-84) Manual (Doc 9674). Supporting material in respect of provisions of ICAO Annex 14 Vol. I, Appendix 5 related to accuracy and integrity of aeronautical data, is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77, entitled Industry Requirements for Aeronautical Information.*~~

~~6.2.1.5 Geographical coordinates including latitude and longitude shall be determined and reported to the Aeronautical Information Services in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum, identifying those geographical coordinates which have been transformed into WGS-84 coordinates by mathematical means and~~

~~whose accuracy of original field work does not meet the requirements in ICAO Annex 14 Vol. I Appendix 5, Table 1.~~

~~6.2.1.6 The order of accuracy of the field work shall be such that the resulting operational navigational data for the phases of flight will be within the maximum deviations, with respect to an appropriate reference frame, as indicated in the tables contained in ICAO Annex14 Vol. I Appendix 5.~~

~~6.2.1.7 In addition to the elevation (referenced to mean sea level) of the specific surveyed ground positions at aerodromes, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions as indicated in ICAO Annex 14 Vol. I Appendix 5 shall be determined and reported to the Aeronautical Information Services.~~

~~*Note 1 – An appropriate reference frame is that which enables WGS-84 to be realized on a given aerodrome and with respect to which all coordinate data are related.*~~
~~*Note 2 – Specifications governing the publication of WGS-84 coordinates are given in ICAO Annex 4, Chapter 2 and ICAO Annex 15, Chapter 3.*~~

….

6.2.5 Aerodrome dimensions and related information

….

6.2.5.5 The geographical coordinates of obstacles in Area 2 (the part within the aerodrome boundary) and in Area 3 shall be measured and reported to the AIS in degrees, minutes, seconds and tenths of seconds. In addition, the top elevation, type, marking and lighting (if any) of obstacles shall be reported to the aeronautical information services authority.

Note 1. – See Annex 15, Appendix ~~8~~1, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Areas 2 and 3.

Note 2. – ~~Appendix 5~~ PANS-AIM (ICAO Doc 10066), Appendix 1 and Appendix 8 provide~~s~~ requirements for obstacle data determination in Areas 2 and 3.

~~*Note 2. – Implementation of Annex 15 provision 10.6.1.2 concerning the availability, as of 18 November 2010, of obstacle data according to Area 2 and Area 3 specifications would be facilitated by appropriate advanced planning for the collection and processing of such data.*~~

…..

6.2.13 Coordination between the aerodrome operator and the Aeronautical Information Services

….

6.2.13.3 Of a particular importance are changes to aeronautical information that affects charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as specified in ICAO

Annex 15, Chapter 6 ~~and Appendix 4~~. The pre-determined internationally agreed AIRAC effective dates ~~in addition to 14 days postage time~~ shall be observed by the responsible aerodrome operator when submitting the raw information/data to the Aeronautical Information Services.

6.2.13.4 The aerodrome operator responsible for the provision of raw aeronautical information/data to the Aeronautical Information Services shall do that while taking into account accuracy and integrity requirements required to meet the needs of the end-user of aeronautical data ~~for aeronautical data as specified in ICAO Annex 14 Vol. I Appendix 5~~.

Note 1 – Specifications concerning the accuracy and integrity classification of aerodrome-related aeronautical data are contained in PANS-AIM) ICAO Doc 10066), Appendix 1.

Note ~~1~~2 – Specifications for the issue of a NOTAM are contained in ICAO Annex 15, Chapter ~~5~~6 and PANS_AIM (ICAO Doc 10066), Appendix ~~6~~3 and 4, respectively.

Note ~~2~~3 – AIRAC information is distributed by the AIS at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

Note ~~3~~4 – The schedule of the predetermined internationally agreed AIRAC common effective dates at intervals of 28 days, including 6 November 1997 and guidance for the AIRAC use are contained in the ICAO Aeronautical Information Services Manual (ICAO Doc 8126, Chapter 2 ~~3, 3.1.1 and Chapter 4, 4.4~~).

5.7. Chapter 7 – Physical Characteristics, Pages 7-3 to 7-25

……

7.2.1.9 Runways with stopways or clearways

….

Width of runways

7.2.1.10 The width of a runway shall not be less than the appropriate dimension specified in the following tabulation:

~~Code letter~~						
~~Code number~~	~~A~~	~~B~~	~~C~~	~~D~~	~~E~~	~~F~~
~~1a~~	~~18 m~~	~~18 m~~	~~23 m~~	~~-~~	~~-~~	~~-~~
~~2a~~	~~23 m~~	~~23 m~~	~~30 m~~	~~-~~	~~-~~	~~-~~
~~3~~	~~30 m~~	~~30 m~~	~~30 m~~	~~45 m~~	~~-~~	~~-~~
~~4~~	~~-~~	~~-~~	~~45 m~~	~~45 m~~	~~45 m~~	~~60 m~~

~~a. The width of a precision approach runway should be not less than 30 m where the code number is 1 or 2.~~

Outer Main Gear Wheel Span (OMGWS)				
Code number	Up to but not including 4.5	4.5m up to but not including 6m	6m up to but not including 9m	9m up to but not including 15m
1[a]	18m	18m	23m	-
2[a]	23m	23m	30m	-
3	30m	30m	30m	45m
4	-	-	45m	45m

a. The width of a precision approach runway should not be less than 30m where the code number is 1 or 2.

Note 1 — The combinations of code numbers and ~~letters~~ OMGWS for which widths are specified have been developed for typical aeroplane characteristics.

Note 2 — Factors affecting runway width are given in the ICAO Aerodrome Design Manual (Doc 9157), Part 1.

Note 3 – See 3.2 concerning the provision of runway shoulders, in particular for Code F aeroplanes with four (or more) engines.

….

7.2.2 Runway shoulders

General

Note — Guidance on characteristics and treatment of runway shoulders is given in ICAO Annex 14 Vol. I, Attachment A, Section ~~8~~9, and in the ICAO Aerodrome Design Manual (Doc 9157), Part 1.

7.2.2.1 Runway shoulders shall be provided for a runway where the code letter is D, ~~or~~ E, or F ~~and the runway width is less than 60 m~~.

~~7.2.2.2 Runway shoulders shall be provided for a runway where the code letter is F.~~

Width of runway shoulders

7.2.2.3 **Recommendation —** For aeroplanes with OMWGS from 9m up to but not including 15m ~~T~~the runway shoulders should extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than:

- 60 m where the code letter is D or E; ~~and~~
- 60m where the code letter is F with two or three-engined aeroplanes; and
- 75m where the code letter is F with four (or more)-engined aeroplanes.

Slopes on runway shoulders

7.2.2.4 The surface of the shoulder that abuts the runway shall be flush with the surface of the runway and its transverse slope shall not exceed 2.5 per cent.

Strength of runway shoulders

7.2.2.5 ~~A~~ The portion of a runway shoulder between the runway edge and a distance of 30m from the runway centreline shall be prepared or constructed so as to be capable, in the event of an aeroplane running off the runway, of supporting the aeroplane without inducing structural damage to the aeroplane and of supporting ground vehicles which may operate on the shoulder.

Note — Guidance on strength of runway shoulders is given in the ICAO Aerodrome Design Manual (Doc 9157), Part 1.

Surface of runway shoulders

7.2.2.6 A runway shoulder shall be prepared or constructed so as to resist erosion and the ingestion of the surface material by aeroplane engines.

7.2.2.7 Runway shoulders for code letter F aeroplanes should be paved to a minimum overall width of runway and shoulder of not less than 60m.

Note – Guidance on surface of runway shoulders is given in the Aerodrome Design Manual, (Doc 9157), Part 1.

7.2.3 Runway turn pads

…..

7.2.3.5 **Recommendation.** – The nose wheel steering angle to be used in the design of the runway turn pad should not exceed 45 degrees.

7.2.3.6 The design of a runway turn pad shall be such that, when the cockpit of the aeroplane for which the turn pad is intended remains over the turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the turn pad shall be not less than that given by the following tabulations:

~~Code letter~~	~~Clearance~~
~~A~~	~~1.5m~~
~~B~~	~~2.25m~~
~~C~~	~~3m if the turn pad is intended to be used by aeroplanes with a wheel base of less than 18m~~ ~~4.5m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18m~~
~~D~~	~~4.5m~~
~~E~~	~~4.5m~~
~~F~~	~~4.5m~~

OMGWS				
	Up to but not including 4.5m	4.5m up to but not including 6m	6m up to but not including 9m	9m up to but not including 15m
Clearance	1.50m	2.25m	3m[a] or 4m[b]	4m
[a] If the turn pad is intended to be used by aeroplanes with a wheel base less than 18m.				
[b] If the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18m.				

Note. – Wheel base means the distance from the nose gear to the geometric centre of the main gear.

~~7.2.3.6.1 **Recommendation**. – Where severe weather conditions and resultant lowering of the surface friction characteristics prevail, a larger wheel-to- edge clearance of 6m should be provided where the code letter is E or F.~~

…..

7.2.4 Runway strips

…..

Width of runway strips

7.2.4.3 A strip including a precision approach runway shall extend laterally to a distance of at least:

- ~~150 m~~ 140m where the code number is 3 or 4; and
- ~~75 m~~ 70m where the code number is 1 or 2;

on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

7.2.4.4 A strip including a non-precision approach runway shall extend laterally to a distance of at least:

- ~~150 m~~ 140m where the code number is 3 or 4; and
- ~~75 m~~ 70m where the code number is 1 or 2;

on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

……

7.2.9 Taxiways

…..

7.2.9.3 **Recommendation -** The design of the taxiway should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway should be not less than that given by the following tabulation:

~~Code letter~~	~~Clearance~~
~~A~~	~~1.5m~~
~~B~~	~~2.25m~~
~~C~~	~~3m if the taxiway is intended to be used by aeroplanes with a wheel base less than 18m;~~ ~~4.5m if the taxiways is intended to be used by aeroplanes with a wheel base equal to or greater than 18m~~
~~D~~	~~4.5m~~
~~E~~	~~4.5m~~
~~F~~	~~4.5m~~

OMGWS				
	Up to but not including 4.5m	4.5m up to but not including 6m	6m up to but not including 9m	9m up to but not including 15m
Clearance	1.50m	2.25m	3m[a, b] or 4m[c]	4m
[a] On straight portions;				
[b] On curved portions if the taxiway is intended to be used by aeroplanes with a wheel base of less than 18m				
[c] On curved portions if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18m.				

Note ~~1~~ — Wheel base means the distance from the nose gear to the geometric centre of the main gear.

~~*Note 2 — Where the code letter is F and the traffic density is high, a wheel-to-edge clearance greater than 4.5 m may be provided to permit higher taxiing speeds.*~~

~~7.2.9.4 As of 20 November 2008, the design of a taxiway should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway should be not less than that given by the following tabulation:~~

~~Code letter~~	~~Clearance~~
~~A~~	~~1.5m~~
~~B~~	~~2.25m~~
~~C~~	~~3m if the taxiway is intended to be used by aeroplanes with a wheel base less than 18m;~~ ~~4.5m if the taxiways is intended to be used by aeroplanes with a wheel base equal to or greater than 18m~~
~~D~~	~~4.5m~~
~~E~~	~~4.5m~~
~~F~~	~~4.5m~~

~~*Note 1 — Wheel base means the distance from the nose gear to the geometric centre of the main gear.*~~
~~*Note 2 — Where the code letter is F and the traffic density is high, a wheel-to-edge clearance greater than 4.5 m may be provided to permit higher taxiing speeds.*~~

Width of taxiways

7.2.9.5 A straight portion of a taxi-way shall have a width of not less than that given by the following tabulation:

~~Code letter~~	~~Taxiway width~~
~~A~~	~~7.5m~~
~~B~~	~~10.5m~~
~~C~~	~~15m if the taxiway is intended to be used by aeroplanes with a wheel base less than 18m;~~ ~~18m if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18m~~
~~D~~	~~18m if the taxiway is intended to be used by aeroplanes with an outermain gear wheel span of less than 9m;~~ ~~23m if the taxiway is intended to be used by aeroplanes with an outer main gear wheel span equal to or greater than 9m~~
~~E~~	~~23m~~
~~F~~	~~23m~~

OMGWS				
	Up to but not including 4.5m	4.5m up to but not including 6m	6m up to but not including 9m	9m up to but not including 15m
Taxiway width	7.5m	10.5m	15m	23m

Note — Guidance on width of taxiways is given in the ICAO Aerodrome Design Manual (Doc 9157), Part 2.

….

Table 7-1 – Taxiway minimum separation distances

Code letter	Distance between taxiway centre line and runway centre line (metres)								Taxiway centre line to taxiway centre line (metres)	Taxiway, other than aircraft stand taxilane, centre line to object (metres)	Aircraft stand taxilane centre line to object (metres)
	Instrument runways Code number				Non-instrument runways Code number						
	1	2	3	4	1	2	3	4			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	~~82.5~~ 77.5	~~82.5~~ 77.5	-	-	37.5	47.5	-	-	23	15.5	12
B	~~87~~ 82	~~87~~ 82	152	-	42	52	87	-	32	20	16.5
C	88	88	~~168~~ 158	158	48	58	93	93	44	26	22.5
D	-	-	~~176~~ 166	~~176~~ 166	-	-	101	101	63	37	33.5
E	-	-	172.5	~~182.5~~ 172.5	-	-	107.5	107.5	76	43.5	40
F	-	-	180	~~190~~ 180	-	-	115	115	91	51	47.5
Note 1 – The separation distance shown in columns (2) to (9) represent ordinary combinations of runways and taxiways. The basis for development of these distances is given in the ICAO Aerodrome Design Manual, (Doc 9157) Part 2.											
Note 2 - The distances in columns (2) to (9) do not guarantee sufficient clearance behind a holding aeroplane to permit the passing of another aeroplane on a parallel taxiway. See ICAO Aerodrome Design Manual, (Doc 9157) Part 2.											

…..

7.2.10 Taxiway shoulders

Note — Guidance on characteristics of taxiway shoulders and on shoulder treatment is given in the ICAO Aerodrome Design Manual, Part 2.

7.2.10.1 **Recommendation —** Straight portions of a taxiway where the code letter is C, D, E or F should be provided with shoulders which extend symmetrically on each side of the taxiway so that the overall width of the taxiway and its shoulders on straight portions is not less than:

- ~~60 m~~ 44m where the code letter is F;
- ~~44 m~~ 38m where the code letter is E;
- ~~38 m~~ 34m where the code letter is D; and
- 25 m where the code letter is C.

On taxiway curves and on junctions or intersections where increased pavement is provided, the shoulder width should be not less than that on the adjacent straight portions of the taxiway.

7.2.10.2 When a taxiway is intended to be used by turbine-engined aeroplanes, the surface of the taxiway shoulder shall be so prepared as to resist erosion and the ingestion of the surface material by aeroplane engines.

7.2.11 Taxiway strips

…..

Grading of taxiway strips

7.2.11.4 The centre portion of a taxiway strip shall provide a graded area to a distance from the centre line of the taxiway of at least:

- ~~11 m where the code letter is A;~~
- ~~12.5 m where the code letter is B or C;~~
- ~~19 m where the code letter is D;~~
- ~~22 m where the code letter is E; and~~
- ~~30 m where the code letter is F.~~
- 10.25m where the OMGWS is up to but not including 4.5m
- 11m where the OMGWS is 4.5m up to but not including 6m
- 12.50m where the OMGWS is 6m up to but not including 9m
- 18.50m where the OMGWS is 9m up to but not including 15m, where the code letter is D
- 19m where the OMGWS is 9m up to but not including 15m, where the code letter is E
- 22m where the OMGWS is 9m up to but not indlucing 15m, where the code letter is F

Note - Guidance on width of the graded portion of a taxiway is given in the Aerodrome Design Manual (Doc 9157), Part 2.

5.8. Chapter 8 – Obstacle restriction and removal, Pages 8-7 to 8-8

…...

Surface and dimensions[a]	RUNWAY CLASSIFICATION									
	Non-instrument				Non-precision approach			Precision approach category		
								I		II or III
	Code number				Code number			Code number		Code number
	1	2	3	4	1, 2	3	4	1, 2	3, 4	3, 4
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
CONICAL										
Slope	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Height	35m	55m	75m	100m	60m	75m	100m	60m	100m	100m
INNER HORIZONTAL										
Height	45m	45m	45m	45m	45m	45m	45m	45m	45m	45m
Radius	2000 m	2500 m	4000 m	4000 m	3500 m	4000 m	4000 m	3500 m	4000 m	4000 m
INNER APPROACH										
Width	-	-	-	-	-	-	-	90 m	120 m[e]	120 m[e]
Distance from threshold	-	-	-	-	-	-	-	60 m	60 m	60 m
Length	-	-	-	-	-	-	-	900 m	900 m	900 m
Slope	-	-	-	-	-	-	-	2.5%	2%	2%
APPROACH										
Length of inner edge	60m	80m	150m	150m	~~150m~~ 140m	~~300m~~ 280m	~~300m~~ 280m	~~150m~~ 140m	~~300m~~ 280m	~~300m~~ 280m
Distance from threshold	30m	60m	60m	60m	60m	60m	60m	60m	60m	60m
Divergence (each side)	10%	10%	10%	10%	15%	15%	15%	15%	15%	15%

First section										
Length	1600 m	2500 m	3000 m	3000 m	2500 m	3000 m	3000 m	3000 m	3000 m	3000 m
Slope	5%	4%	3.33 %	2.5%	3.33 %	2%	2%	2.5%	2%	2%
APPROACH										
Second section										
Length	-	-	-	-	-	3600 m[b]	3600 m[b]	12000 m	3600 m[b]	3600 m[b]
Slope	-	-	-	-	-	2.5%	2.5%	3%	2.5%	2.5%
Horizontal section										
Length	-	-	-	-	-	8400 m[b]	8400 m[b]	-	8400 m[b]	8400 m[b]
Total length	-	-	-	-	-	15000 m	15000 m	15000 m	15000 m	15000 m
TRANSITIONAL										
Slope	20 %	20%	14.3 %	14.3 %	20%	14.3%	14.3%	14.3%	14.3%	14.3%
INNER TRANSITIONAL										
Slope	-	-	-	-	-	-	-	40%	33.3%	33.3%
BALKED LANDING SURFACE										
Length of inner edge	-	-	-	-	-	-	-	90m	120m[e]	120m[e]
Distance from threshold	-	-	-	-	-	-	-	c	1800 md	1800 md
Divergence (each side)	-	-	-	-	-	-	-	10%	10%	10%
Slope	-	-	-	-	-	-	-	4%	3.33%	3.33%

a. All dimensions are measured horizontally unless specified otherwise.
b. Variable length (see paragraph 8.2.2.9 or 8.2.2.17 of this Manual).
c. Distance to then end of strip.
d. Or end of runway whichever is less.
e. ~~Where the code letter id F (Column (3) of Table 2-1 of this Manual), the width is increased to 155m. See ICAO Circular 301-AN/174 New Larger Aeroplanes – Infringement of the Obstacles Free Zone: Operational Measures and Aeronautical Study for information on code~~

~~letter F aeroplanes equipped with digital avionics that provide steering commands to maintain an established track during the go-around manoeuvre~~.
Where the code letter is F (Table 2-1 of this Manual), the width is increased to 140m except for those aerodromes that accommodate a code letter F aeroplane equipped with digital avionics that provide steering commands to maintain an established rack during the go-aroun manoeuvre.

Note – See ICAO Circulars 301, 345 and Chapter 4 of the PANS-Aerodromes, Part I (Doc 9981) for further information.

……

5.9. Chapter 13 – Aerodrome Operational Services, Equipment and Planning, Pages 13-12 to 13-13

……..

13.2.4 ~~Bird~~ Wildlife strike hazard reduction

13.2.4.1 The ~~bird~~ wildlife strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:

a) the establishment of a procedure by the aerodrome operator for recording and reporting ~~bird~~ wildlife strikes to aircraft; and

b) the collection of information from aircraft operators, airport personnel, etc. on the presence of ~~birds~~ wildlife on or around the aerodrome constituting a potential hazard to aircraft operations~~.~~; and

c) an ongoing evaluation of the wildlife hazard by competent personnel.

Note – See ICAO Annex 15, Chapter ~~8, Section 8.3~~ 5

13.2.4.2 ~~Bird~~ Wildlife strike reports shall ~~be collected and forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database. The report shall also be copied to the Aerodrome Safety And Standards Inspectorate.~~ sent to the Aerodrome Safety & Standards Inspectorate as soon as practicable after the strike has occurred. The report will be forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database.

Note — The ICAO Bird Strike Information System (IBIS) is designed to collect and disseminate information on ~~bird~~ wildlife strikes to aircraft. Information on the system is included in the Manual on the ICAO Bird Strike Information System (IBIS) (Doc 9332).

13.2.4.3 When a ~~bird~~ wildlife strike hazard is identified at or within the vicinity of an aerodrome, the aerodrome operator shall take action to decrease the ~~number of birds constituting a potential hazard~~ risk to aircraft operations by adopting measures to ~~for~~

~~discouraging their presence on, or in the vicinity of, an aerodrome~~ minimize the likelihood of collisions between wildlife and aircraft.

Note — Guidance on effective measures for establishing whether or not ~~birds~~ wildlife, on or near an aerodrome, constitute a potential hazard to aircraft operations, and on methods for discouraging their presence, is given in the ICAO Airport Services Manual (Doc 9137), Part 3.

13.2.4.4 The aerodrome operator shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any such other source ~~attracting bird activity~~ which may attract wildlife on, or in the vicinity of, an aerodrome, unless an appropriate aeronautical study indicates that they are unlikely to create conditions conducive to a ~~bird~~ wildlife hazard problem.

Note — Due consideration needs to be given to aerodrome operators' concerns related to land developments close to the aerodrome boundary that may attract birds/wildlife.

6. Queries

6.1. Please address any queries relating to this NOTAL to Head of Aerodrome Safety & Standards Inspectorate at

- seyaga@scaa.sc;

Or

- Aerodrome Safety & Standards Inspectorate, Safety Regulation Division
  Seychelles Civil Aviation Authority
  P.O. Box 181
  Mahé
  Seychelles

Aerodrome Safety & Standards Inspectorate
Seychelles Civil Aviation Authority
January 2019

ATTACHMENT F to State letter AN 4/1.2.27-18/23
IMPACT ASSESSMENT IN RELATION TO AMENDMENT 14 TO ANNEX 14, VOLUME I

1. INTRODUCTION

1.1 Amendment 14 to Annex 14, Volume I addresses a) modifications of aerodrome design specifications in Chapters 3 and 4; b) an amendment to update footnote e. in Table 4-1; and c) a consequential amendment, resulting from the restructuring of Annex 15 and the proposed new PANS-AIM, relating to change of references, data quality requirements and performance-based data error detection requirements.

2. IMPACT ASSESSMENT

2.1 Modification of aerodrome design specifications in Chapters 3 and 4

2.1.1 *Safety impact:* Neutral. The de-linking of the outer main gear wheel span (OMGWS) from current aerodrome reference code methodology and the application of this parameter in the relevant design provisions will not affect safety. Industry research provided convincing evidence that current separation distances can be reduced without any reduction in the level of safety. The reduction in runway width is based on actual landing deviation studies of code F aeroplanes which have demonstrated that the standard deviation from the centreline of a 45 m wide runway is less than what was assumed previously. On taxiways, the risk level for veer-off is much less than on runways due to the lower speed involved. Harmonized taxiway values improve the accuracy of aeroplane trajectory while maintaining the overall area coverage to sustain occasional excursions which are supported by shoulders and graded strip.

2.1.2 *Financial impact*: Positive. For States, the certification of existing aerodromes from code E to code F will be easier due to reduction in costs and fewer studies required. For aerodrome operators, acceptance of the proposed changes will significantly improve efficiency and reduce construction and maintenance costs for many aerodromes in different parts of the world. Aerodromes can also accept code F operations within existing infrastructure, thus increasing capacity, particularly at congested aerodromes where slots are at a premium. In terms of the costs, a 60 m wide runway costs approximately 20 per cent more to build than one measuring 45 m wide including 15 m wide paved shoulders. For taxiways, a 2 m reduction in taxiway width for large aerodromes, some of which having as much as 50 km or more of taxiways, results in enormous savings. Furthermore, annual maintenance costs, incurring – as a rule of thumb – one per cent of the construction costs, are also expected to be reduced with these improved specifications.

2.1.3 *Security impact*: Nil

2.1.4 *Environmental impact*: Positive. Updated and improved specifications will preclude overdesign/overprovisions; avoid unnecessary expansion/relocation; constitute a more environmentally-efficient use of land surface; be less dependent on natural resources and result in less use of toxic materials for operations and maintenance.

2.1.5 *Efficiency impact*: Positive. More efficient use of land surface, particularly at aerodromes where real estate is at a premium. Aerodromes will be able to accept code F operations within existing infrastructure, thus increasing capacity and efficiency, particularly at congested aerodromes where slots are at a premium. Airlines unable to operate code F aeroplanes on routes currently unavailable

due to States' restrictions will have greater opportunities to deploy their fleet without any complicated network planning.

2.1.6 *Expected implementation time*: Between two to five years from the applicability date.

2.2 Amendment concerning update to footnote e. in Table 4-1

2.2.1 *Safety impact*: Positive. The amendment ensures alignment among requirements, as contained in Annex 14, Volume I, PANS-Aerodromes (Doc 9981) and Circulars 301 and 345 and avoids their misinterpretation. Therefore, there is an indirect benefit in terms of safety.

2.2.2 *Financial impact*: Negligible.

2.2.3 *Security impact*: Nil.

2.2.4 *Environmental impact*: Negligible.

2.2.5 *Efficiency impact*: Positive. The amendment ensures alignment among requirements, as contained in Annex 14, Volume I, Circulars 301, 345 and the PANS-Aerodromes (Doc 9981). Requirements are retrieved in a more efficient way as they are cross-referenced. Therefore, the change is considered beneficial.

2.2.6 *Expected implementation time*: Up to one year from the applicability date.

2.3 Consequential amendment resulting from the review and proposed restructuring of Annex 15 and the proposed new PANS-AIM, concerning change of references, data quality requirement and performance-based data error detection requirements

2.3.1 *Safety impact*: Positive. The amendment ensures alignment among requirements, as contained in Annex 14, Volume I, Annex 15 and the PANS-AIM (Doc 10066) and avoids misinterpretation. Additionally, the introduction of performance-based requirements for data error detection allows for greater flexibility in terms of implementation techniques, leading to more efficient processes and allowing an enhanced output in terms of quality. This results in a reduced risk of providing erroneous data and increases safety.

2.3.2 *Financial impact*: Minimal financial impact to both States and Industry.

2.3.3 *Security impact*: Nil.

2.3.4 *Environmental impact*: Negligible.

2.3.5 *Efficiency impact*: Positive. The amendment to Annex 14, Volume I relocates the quality requirements for aeronautical data into a single reference (the Aeronautical Data Catalogue), which will facilitate compliance by Contracting States, and allow future changes in aeronautical data specificity to be updated with greater ease. Requirements are cross-referenced and therefore retrieved in a more efficient way.

2.3.6 *Expected implementation time*: States will require no more than one year to modify their regulatory framework to take into account the new references to Annex 15 and the PANS-AIM.

— END —

LIST OF EFFECTIVE NOTAL

NOTAL No.	SUBJECT
01/2008	Procedures for the issue of a Notice to Aerodrome License Holders
02/2008	Requirement for Aerodrome Operators to assess the impact of bird strikes at the aerodrome and implement measures to control the hazard including the control of development of facilities on or in the vicinity of the aerodromes that are likely to attract birds
01/2009	The requirement to periodically determine and report information regarding runway friction characteristics
01/2010	The requirement for airports to measure and report the pavement strength (Pavement Classification Number (PCN))
01/2019	Amendment to Seychelles Manual of Aerodrome Standards