Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

MEMORANDUM CIRCULAR NO.: 22-19

TO : ALL CONCERNED

FROM : DIRECTOR GENERAL

SUBJECT : AMENDMENT TO PHILIPPINE MANUAL OF STANDARDS FOR AERODROMES (MOS-AERODROMES) INCORPORATING AMENDMENT 14 TO ICAO ANNEX 14 VOLUME I

REFERENCE:

1. Philippine Manual of Standards for Aerodromes
2. ICAO Annex 14 Volume I, Aerodrome Design and Operations
3. ICAO State Letter AN 4/1.2.27-18/23
4. Regulations Amendment Procedure
5. Board Resolution No. 2012-054 dated 28 September 2012

Pursuant to the powers vested in me under the Republic Act No. 9497, otherwise known as the Civil Aviation Authority Act of 2008 and in accordance with the Board Resolution No.: 2012-054 dated 28 September 2012, I hereby approve the incorporation of ICAO Annex 14 Volume I Amendment No. 14 to the Philippine Manual of Standards for Aerodromes.

ORIGINAL REGULATIONS SUBJECT FOR REVIEW AND REVISION:

MANUAL OF STANDARDS FOR AERODROMES, 2ND EDITION

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CHAPTER 1. Introduction

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1.1.7 Related documents

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(z) ICAO Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes) (Doc 9981); ~~and~~

aa) ICAO Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM) (Doc 10066); and

~~(aa)~~ (bb) Federal Aviation Administration (FAA) Advisory Circular 150/ 5300-13.

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Section 1.2 Common reference systems

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1.2.3 Temporal reference system

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1.2.3.2 When a different temporal reference system is used, this shall be indicated in GEN 2.1.2 of the Aeronautical Information Publication (AIP)~~, see CAR-ANS-15, Appendix 15A Part I, GEN and CAR-ANS-15.4~~.

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

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Section 1.4 Definition of Terms

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Data ~~A~~accuracy. 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.*~~

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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.

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

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Outer main gear wheel span (OMGWS). The distance between the outside edges of the main gear wheels.

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Section 1.5 Certification of aerodromes

Note. — The intent of these specifications is to ensure that compliance with the specifications in the MOS can be effectively enforced. 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 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 need to be provided to CAAP-AIS for promulgation in the Aeronautical Information Publication (AIP). See MOS 5.2.6.1 *and PANS-AIM (Doc 10066), Appendix 2, AD 1.5.*

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2.1.6 ~~Using ICAO~~ Aerodrome Reference Code

Introductory Note. — The intent of the reference code is to provide a simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the 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 wingspan. 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.

When applying CAAP MOS for Aerodromes, Chapter 1-14, first identify the aeroplanes which the aerodrome is intended to serve and then determine the two elements of the code.

2.1.6.1 ~~CAAP has adopted the International Civil Aviation Organization (ICAO)methodology of using a code system, known as the Aerodrome Reference Code, to specify the standards for individual aerodrome facilities that are suitable for use by aeroplanes that have been grouped in a range of performances and sizes. The code is composed of two elements. Element 1 is a number related to the aeroplane reference field length, and element 2 is a letter related to the aeroplane wingspan 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 applicable code letter or number within an element selected is related to the critical aeroplane characteristics for which the facility is provided.~~ An aerodrome reference code — code number and letter — which is selected for aerodrome planning purposes shall be determined in accordance with the characteristics of the aeroplane for which an aerodrome facility is intended.

2.1.6.2 The aerodrome reference code numbers and letters shall have the meanings assigned to them in Table 2.1-1.

2.1.6.~~2~~3 The code number for element 1 shall be determined from column 1 of the Table below. The code number corresponding to the highest value of the aeroplane reference field length of the aeroplanes for which the runway is intended ~~is to be selected~~.

Note 1. — The determination of the aeroplane reference field length is solely for the selection of a code number ~~and must not be confused with operational runway length requirements as determined by aircraft operators, which are influenced by other factors~~ 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*, (Doc 9157), Part 1 —* Runway*s.*

2.1.6.~~3~~4 The code letter for element 2 shall be determined from ~~column 3 of the~~ Table 2.2-1 ~~below. The~~ by selecting the code letter ~~is selected according~~ which corresponds to the greatest wingspan~~, or the greatest outer main gear wheel span, whichever gives the more demanding code letter~~ of the aeroplane~~(s)~~ ~~using or intending to~~ for which the facility is intended.

Note. — Guidance on determining the aerodrome reference code is given in the Aerodrome Design Manual (Doc 9157, *Parts 1 and 2.*

2.1.6.~~4~~5 For certified aerodromes, information about the aerodrome reference code letter for each runway and taxiway shall be set out in the Aerodrome Manual.

2.1.6.~~5~~6 Unless otherwise agreed by CAAP, aerodrome operators ~~must~~ shall maintain the aerodrome facilities in accordance with the applicable standards set out in this MOS in relation to the aerodrome reference code for the facilities.

~~Aerodrome Reference Code~~				
~~Code element 1~~		~~Code element 2~~		
~~Code number~~	~~Aeroplane reference field length~~	~~Code letter~~	~~Wing span~~	~~Outer main gear wheel span[a]~~
~~1~~	~~Less than 800m~~	~~A~~	~~Up to but not including 15m~~	~~Up to but not including 4.5m~~
~~2~~	~~800 m up to but not including 1200 m~~	~~B~~	~~15 m up to but not including 24 m~~	~~4.5 m up to but not including 6 m~~
~~3~~	~~1200 m up to but not including 1800 m~~	~~C~~	~~24 m up to but not including 36 m~~	~~6 m up to but not including 9 m~~
~~4~~	~~1800 m and over~~	~~D~~	~~36 m up to but not including 52 m~~	~~9 m up to but not including 14 m~~
		~~E~~	~~52 m up to but not including 65 m~~	~~9 m up to but not including 14 m~~
		~~F~~	~~65 m up to but not including 80 m~~	~~14 m up to but not including 16 m~~
~~[a] Distance between the outside edges of the main gear wheels~~				

Code element 1	
Code number	**Aeroplane reference field length**
1	Less than 800m
2	800 m up to but not including 1 200 m
3	1200 m up to but not including 1 800 m
4	1800 m and over
Code element 2	
Code letter	**Wingspan**
A	Up to but not including 15m
B	15 m up to but not including 24 m
C	24 m up to but not including 36 m
D	36 m up to but not including 52 m
E	52 m up to but not including 65 m
F	65 m up to but not including 80 m

Table 2.1-1: Aerodrome reference code
(see 2.1.6.1 to 2.1.6.4)

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

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2.1.11 Specific Procedures for Aerodrome Operations

Note. — This section introduces PANS-Aerodromes (Doc 9981) for the use of aerodromes undertaking an assessment of its compatibility for the type of traffic or operation the aerodrome is intending to accommodate. The material in the PANS-Aerodromes addresses operational issues faced by existing aerodromes and provides the necessary procedures to ensure the continued safety of operations. Where alternative measures, operational procedures and operating restrictions have been developed, these are detailed in the aerodrome manual and reviewed periodically to assess their continued validity. The PANS-Aerodromes does not substitute nor circumvent the provisions contained in ~~this Annex~~ the MOS. It is expected that infrastructure on an existing aerodrome or a new aerodrome will fully comply with the requirements in this Annex. See CAR-ANS Part ~~15.4.1.2~~ 15, 15.5.2.2.1 (c) on States' responsibilities on listing of differences with the related ICAO Procedures in the Aeronautical Information Publication.

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2.1.11.2 Information concerning alternative measures, operational procedures and operating restrictions implemented at an aerodrome arising from 2.1.11.1 shall be promulgated.

Note 1. — See ~~CAR-ANS Part 15, Appendix 15A~~ PANS-AIM (Doc 10066), Appendix 2, AD 2.20, on the provision of a detailed description of local traffic regulations.

Note 2. — See PANS-Aerodromes (Doc 9981), Chapter 3, section 3.6, on promulgation of safety information.

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5.1.2 Aeronautical Data ~~Accuracy and Integrity Requirements~~

5.1.2.1 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 MOS Appendix 5, Table 5.1-1 to Table 5.1-5, while taking into account the established quality system procedures. Accuracy requirements for aeronautical data are based upon a 95% 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 the known surveyed points of points in space, fixes) and declared points (e.g. flight information region boundary points)~~.

Note. — ~~Specifications governing the quality system are given in CAR-ANS Part 15, Chapter 3.~~ Specifications concerning the accuracy and integrity classification related to aerodrome-related aeronautical data are contained in PANS-AIM (Doc 10066), Appendix 1.

5.1.2.2 Aerodrome mapping data shall be made available to the aeronautical information services for aerodromes deemed relevant by CAAP where safety and/or performance-based operations suggest possible benefits.

Note 1. —Aerodrome mapping databases related provisions are contained in CAR-ANS Part 15, ~~Chapter 11~~ 15.5 and PANS-AIM (Doc 10066), Chapter 5.

Note 2. — Guidance material concerning the application of aerodrome mapping databases is provided in MOS Attachment A, Section 10.

5.1.2.3 Where made available in accordance with 5.1.2.2, the selection of the aerodrome mapping data features to be collected shall be made with consideration of the intended applications.

Note 1. — It is intended that the selection of the features to be collected match a defined operational need.

~~5.1.2.4 Where made available in accordance with 5.1.2.2, aerodrome mapping data shall comply with the accuracy and integrity requirements in MOS Appendix 5.~~

Note 2. — Aerodrome mapping databases can be provided at one of two levels of quality - fine or medium. These levels and the corresponding numerical requirements are defined in RTCA Document DO-272B and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-99B - User Requirements for Aerodrome Mapping Information.

5.1.2.4 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 (Doc 10066).

~~5.1.2.5 The integrity of aeronautical data shall be maintained throughout the data process from survey/origin to the next intended user. Based on the applicable integrity classification, the validation and verification procedures shall:~~

~~a) for routine data: avoid corruption throughout the processing of the data;~~

~~b) for essential data: assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and~~

~~c) for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.~~

~~*Note. Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76A* Standards for Processing Aeronautical Data.~~

~~5.1.2.6 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 5.1.2.5, a 32- or 24-bit CRC algorithm shall apply respectively.~~

~~5.1.2.7 To achieve protection of the integrity level of routine aeronautical data as classified in 5.1.2.5, a 16-bit CRC algorithm should apply.~~

~~*Note. — Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, protection and traceability) is contained in the* World Geodetic System — 1984 (WGS-84) Manual *(Doc 9674). Supporting material in respect of the provisions of 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* Standards for Aeronautical Information.~~

~~5.1.2.8 Geographical coordinates indicating latitude and longitude shall be determined and reported to the aeronautical information services authority 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 MOS Appendix 5, Table A5-1.~~

~~5.1.2.9 The order of accuracy of the field work shall be such that the resulting operational navigation 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 MOS Appendix 5.~~

~~5.1.2.10 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 MOS Appendix 5 shall be determined and reported to the aeronautical information services authority.~~

~~*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 CAR-ANS Part 4 —* Aeronautical Charts*, Chapter 2 and CAR-ANS Part 15, Chapter 1.*~~

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5.1.4 Standards for determining Aerodrome Information

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

Note 1. - See ~~CAR-ANS 15, Appendix 15G~~ PANS-AIM (Doc 10066) Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2 and 3.

Note 2. - ~~CAR-ANS 15 Appendix 15F/ MOS Appendix 5~~ PANS-AIM (Doc 10066), Appendix 1 and Appendix 8 provide requirements for obstacle data determination in Area 2 and 3.

~~*Note 3. - Implementation of CAR-ANS Part 15, provisions 15.10.1.4 and 15.10.1.8, concerning the availability, as of 12 November 2015, of obstacle data according to Area 2 and Area 3 specifications would be facilitated by appropriate planning for the collection and processing of such data.*~~

5.1.5 Condition of the movement area and related facilities

5.1.5.1 Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information services units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

Note. — The ~~N~~nature, format and conditions of the information to be provided are specified in ~~CAR-ANS Part 15,~~ the PANS-AIM (Doc 10066) and MOS-ATS.

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5.1.8 Runway friction level

5.1.8.1 Notification shall be given to aerodrome users when the friction level of a paved runway or portion thereof is less than that specified by the State in accordance with MOS 6.2.10.

Note ~~1~~. - Guidance on determining and expressing the minimum friction level is provided in the ICAO Circular 329 – Assessment, Measurement and Reporting of Runway Surface Conditions.

~~*Note 2. - Procedures on conducting a runway surface friction characteristics evaluation programme is provided in the PANS-Aerodromes (Doc 9981). See also MOS Attachment A Section 20.*~~

~~*Note 3. - Information to be promulgated in a NOTAM includes specifying which portion of the runway is below the minimum friction level and its location on the runway.*~~

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5.2.6 Coordination between aeronautical information services and aerodrome authorities

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5.2.6.3 Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as specified in CAR-ANS Part 15, 15.6 ~~and Appendix 15C.~~ The predetermined, internationally agreed AIRAC effective dates ~~in addition to 14 days postage time~~ shall be observed by the responsible aerodrome services when submitting the raw information/data to aeronautical information services.

Note. — Detailed specifications concerning the AIRAC system are contained in PANS-AIM (Doc 10066), Chapter 6.

5.2.6.4 The aerodrome services 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 necessary to meet the needs of the end-user of aeronautical data. ~~for aeronautical data as specified in CAR-ANS Part 15 Appendix 15F.~~

Note 1. - ~~Specifications for the issue of NOTAM are contained in CAR-ANS Part 15.5 and Appendix 15E.~~ Specifications concerning the accuracy and integrity classification of aerodrome-related aeronautical data are contained in PANS-AIM (Doc 10066), Appendix 1.

Note 2. - Specifications for the issue of NOTAM are contained in CAR-ANS Part 15, 15.6 and PANS-AIM (Doc 10066, Appendices 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 and guidance for the AIRAC use are contained in the CAR-ANS Part 15, 15.6 and AIP Gen 3.1-5.

CHAPTER 6. Aerodrome physical characteristics

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6.2.4 Runway Width

6.2.4.1 The width of a runway must not be less than that determined using Table 6.2-1.

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

Outer Main Gear Wheel Span (OMGWS)

Code number	**Up to but not including 4.5 m**	**4.5 m up to but not including 6 m**	**6 m up to but not including 9 m**	**9 m up to but not including 15 m**
1[a]	18 m	18 m	23 m	-
2[a]	23 m	23 m	30 m	-
3	30 m	30 m	30 m	45 m
4	-	-	45 m	45 m

1[a] Runway width may be reduced to 15 m or 10 m depending on the restrictions placed on small aeroplane operations. See MOS 13.

2[a] The width of a precision approach runway shall be not less than 30 m 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 Aerodrome Design Manual (Doc 9157), Part 1.

Note 3. - See MOS 6.2.12 concerning the provision of runway shoulders, in particular for Code F aeroplanes with four (or more) engines.

Table 6.2-1: Minimum runway width.

6.2.5 Runway Turn pads

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6.2.5.5. 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 taxi guidance marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the turn pad is not less than the distance determined using MOS Table 6.2-2.

~~Code letter~~	~~Minimum clearance distance~~
~~A~~	~~1.5 m~~
~~B~~	~~2.25 m~~
~~C~~	~~3.0* m~~
	~~4.5** m~~
~~D, E or F~~	~~4.5 m~~

~~* If the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.~~

~~** If the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.~~

~~*Note.- Wheel base means the distance from the nose gear to the geometric center of the main gear*~~

	OMGWS			
	Up to but not including 4.5 m	**4.5 m up to but not including 6 m**	**6 m up to but not including 9 m**	**9 m up to but not including 15 m**
Clearance	1.5 m	2.25 m	3m[a] or 4m[b]	4 m

[a] *If the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.*

[b] *If the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

Note. — Wheel base means the distance from the nose gear to the geometric center of the main gear.

Table 6.2-2: Minimum clearance distance between any undercarriage wheel and edge of runway turning area

~~6.2.5.6 Where severe weather conditions and resultant lowering of surface friction characteristics prevail, a larger wheel-to-edge clearance of 6 m shall be provided where the code letter is E or F.~~

6.2.5.~~7~~6 The longitudinal and transverse slopes on runway turn pads shall be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes shall be the same as those on the adjacent runway pavement surface.

6.2.5.~~8~~7 The strength of a runway turn pad shall be at least equal to that of the adjoining runway which it serves, due consideration being given to the fact that the turn pad will be subjected to slow-moving traffic making hard turns and consequent higher stresses on the pavement.

Note. - Where a runway turn pad is provided with flexible pavement, the surface will need to be capable of withstanding the horizontal shear forces exerted by the main landing gear tires during turning maneuvers.

6.2.5.~~9~~8 The surface of a runway turn pad shall not have surface irregularities that may cause damage to an aeroplane using the turn pad.

6.2.5.~~10~~9 The surface of a runway turn pad shall be so constructed or resurfaced as to provide surface friction characteristics at least equal to that of the adjoining runway.

6.2.5.~~11~~10 The runway turn pads shall be provided with shoulders of such width as is necessary to prevent surface erosion by the jet blast of the most demanding aeroplane for which the turn pad is intended, and any possible foreign object damage to the aeroplane engines.

Note. - As a minimum, the width of the shoulders will need to cover the outer engine of the most demanding aeroplane and thus must be wider than the associated runway shoulders.

6.2.5.~~12~~11 The strength of runway turn pad shoulders shall be capable of withstanding the occasional passage of the aeroplane it is designed to serve without inducing structural damage to the aeroplane and to the supporting ground vehicles that may operate on the shoulder.

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6.2.12 Runway shoulders

Note. - Guidance on characteristics and treatment of runway shoulders is given in MOS 6.2.17.2 to 6.2.17.5, and in the Aerodrome Design Manual (Doc 9157), Part 1.

~~6.2.12.1 Runway shoulders shall be provided for a runway where the code letter is F, the total width of the runway and shoulders must not be less than 75 m.~~

6.2.12.2 1 ~~If a runway code letter is D or E, shoulders must be provided and the total width of the runway and shoulders must not be less than 60 m.~~ Runway shoulders shall be provided for a runway where the code letter is D, E or F.

6.2.12.~~3~~2 If a runway is 30 m wide and is used by aeroplanes seating 100 passengers or more, shoulders must be provided and the total width of the runway and its shoulders must not be less than 36 m.

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6.2.14 Surface of runway shoulders

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6.2.14.2 ~~At a runway intended to serve a wide body jet aeroplane, such as a Boeing 747 or any other aeroplane with engines which may overhang the shoulders, a further width of 7 m outside each shoulder must be prepared to resist engine blast erosion.~~ A runway shoulder shall be prepared or constructed so as to resist erosion and the ingestion of the surface material by aeroplane engines.

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

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

6.2.15 Width of runway shoulders

6.2.15.1 For aeroplanes with OMGWS from 9 m up to but not including 15 m, ~~T~~the runway shoulders shall extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than:

a) 60 m where the code letter is D or E; ~~and~~

b) 60 m where the code letter is F with two- or three-engined aeroplanes; and

~~b)~~ c) 75 m where the code letter is F with four (or more)-engined aeroplanes.

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6.2.17 Strength of runway shoulders

6.2.17.1 ~~A~~ The portion of a runway shoulder between the runway edge and a distance of 30 m from the runway centre line 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 Doc 9157 Aerodrome Design Manual, Part 1.

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6.3.3 Runway Strip Width

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~~6.3.3.2 In the case of a non-precision approach runway, the width of the runway strip, including the fly-over area, must not be less than that given in Table 6.3-6.~~

Aerodrome reference code	Overall runway strip width
1 or 2	90 m
3 (where the runway width is 30 m)	150 m [a]
3 or 4 (where the runway width is 45 m or more)	300 m [b]
a Where it is not practicable to provide the full 150 m width of runway strip, a minimum 90 m wide graded only strip may be provided where the runway is used by up to and including code 3C aeroplanes, subject to landing minima adjustment within the approach procedure design. b Where it is not practicable to provide the full runway strip width, a minimum 150 m wide graded only strip may be provided, subject to landing minima adjustment within the approach procedure design.	

Table 6.3-6: Runway strip width for non-precision approach runways

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

— 140 m where the code number is 3 or 4; and

— 70 m where the code number is 1 or 2;

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

6.3.3.3 In the case of a precision approach runway, the width of the runway strip, including the fly-over area, must not be less than that given in Table 6.3-7.

Aerodrome reference code	Overall runway strip width
1 or 2	150 m
3 or 4	300 m
Notes 1. - Where it is not practicable to provide the full runway strip width, a lesser strip width may be provided subject to landing minima adjustments. However, the standard width of the graded area must be provided. *Notes 2. - Where it is not practicable to provide the full runway strip width for precision approach runways code 3 and 4, it is recommended that an additional width of graded runway strip be provided. In this case, the graded width extends to a distance of 105 m from the runway centerline except that the width is gradually reduced (over a distance of 150 m) to 75 m from the runway centerline at both ends of the strip, for a length of 150 m from the runway ends as shown in Figure 6.3-3.*	

Table 6.3-7: Runway strip width for precision approach runways

6.3.3.3 A strip including a precision approach runway shall, wherever practicable, extend laterally to a distance of at least:

— 140 m where the code number is 3 or 4; and

— 70 m where the code number is 1 or 2;

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

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6.7 Taxiways

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6.7.1 Taxiway Width

6.7.1.1 The width of a straight section of a taxiway must not be less than the width determined using Table 6.7-1.

~~**Code letter**~~	~~**Minimum taxiway width (straight sections)**~~
~~**A**~~	~~7.5 m~~
~~**B**~~	~~10.5 m~~
~~**C**~~	~~15m~~
~~**D**~~	~~*18 m if the taxiway is intended to be used by aeroplanes with an outer main gear wheel span of less than*~~
	~~*23 m if the taxiway is intended to be used by aeroplanes with an outer main gear wheel span equal to or*~~
~~**E**~~	~~23 m~~
~~**F**~~	~~25 m~~

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

Table 6.7-1: Minimum width for straight section of taxiway

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

6.7.2 Taxiway Edge Clearance

6.7.2.1 The design of a taxiway shall be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centerline markings, the clearance

distance between the outer main wheel of the aeroplane and the edge of the taxiway shall be not less than the distance determined using Table 6.7-2.

~~Code letter~~	~~Minimum clearance~~
~~A~~	~~1.5 m~~
~~B~~	~~2.25 m~~
~~C~~	~~*3 m on straight portion;*~~
	~~*3 m on curved portions if the taxiway is intended to be used aeroplanes with a wheel base less than 18*~~
	~~*4.5 m on curved portions if the taxiway is intended to be used bay aeroplanes with a wheel base less than 18*~~
~~D, E or F~~	~~4.5 m~~

	OMGWS			
	Up to but not including 4.5 m	**4.5 m up to but not including 6 m**	**6 m up to but not including 9 m**	**9 m up to but not including 15 m**
Clearance	1.5 m	2.25 m	3m[a.b] or 4m[c]	4 m

Table 6.7-2: Minimum clearance between outer main gear wheels and edge of taxiway

[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 18 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

[c] *On curved portions if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

Note ~~1~~. - Wheel base means the distance from the nose gear to the geometric center 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.*~~

~~*Note 3. - This provision applies to taxiways first put into service on or after 20 November 2008.*~~

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6.7.10 Width of Taxiway Shoulders

6.7.10.1 Straight portions of a taxiway where the code letter is C, D, E or F shall 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:

(a) ~~60~~ 44 m if the taxiway's code letter is F;

(b) ~~44~~ 38 m if the taxiway's the code letter is E;

(c) ~~38~~ 34 m if the taxiway's the code letter is D; and

(d) 25 m if the taxiway's the code letter is C.

6.7.10.2 ~~On curved sections of taxiway, and on junctions or intersections with runways or other taxiways, where the width of the surface of the taxiway is increased, the width of the shoulders must not be reduced from their width along the adjacent straight sections of the taxiway~~. On taxiway curves and on junctions or intersections where increased pavement is provided, the shoulder width shall be not less than that on the adjacent straight portions of the taxiway.

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6.7.14 Width of Graded Area of Taxiway Strip

6.7.14.1 The width of the graded area of a taxiway strip on each side of the centerline of the taxiway of ~~must~~ not be less than that given by the following tabulation:

(a) ~~30 m where the code letter is F; or~~ 10.25 m where the OMGWS is up to but not including 4.5 m;

(b) ~~22 m where the code letter is E; or~~ 11 m where the OMGWS is 4.5 m up to but not including 6 m;

(c) ~~19 m where the code letter is D; or~~12.50 m where the OMGWS is 6 m up to but not including 9 m;

(d) ~~12.5 m where the code letter is B or C; or~~ 18.50 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is D;

(e) ~~11 m where the code letter is A~~.19 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is E; or

(f) 22 m where the OMGWS is 9 m up to but not including 15 m, 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.*

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6.7.18 Taxiway minimum separation distances

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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 aircraft stand taxilane centre line (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)	(13)
A	~~82.5~~ 77.5	~~82.5~~ 77.5	–	–	37.5	47.5	–	–	23	15.5	19.5	12
B	~~87~~ 82	~~87~~ 82	152	–	42	52	87	–	32	20	28.5	16.5
C	88	88	~~168~~ 158	158	48	58	93	93	44	26	40.5	22.5
D	–	–	~~176~~ 166	~~176~~ 166	–	–	101	101	63	37	59.5	33.5
E	–	–	172.5	~~182.5~~ 172.5	–	–	107.5	107.5	76	43.5	72.5	40
F	–	–	180	~~190~~ 180	–	–	115	115	91	51	87.5	47.5

Note 1.— The separation distances shown in columns (2) to (9) represent ordinary combinations of runways and taxiways. The basis for development of these distances is given in the 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 the Aerodrome Design Manual *(Doc 9157), Part 2.*

Table 6.7-5: Taxiway minimum separation distances

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CHAPTER 7. Obstacle restriction and limitation

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7.1.4 Obstacle Limitation Requirements

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Table 7.1-1. ~~OLS Specification for Approach Runways~~ Dimensions and slopes of obstacle limitation surfaces — Approach runways

APPROACH RUNWAYS

Surface and dimensions[a] (1)	RUNWAY CLASSIFICATION: Non-instrument Code number 1 (2)	Non-instrument Code number 2 (3)	Non-instrument Code number 3 (4)	Non-instrument Code number 4 (5)	Non-precision approach Code number 1,2 (6)	Non-precision approach Code number 3 (7)	Non-precision approach Code number 4 (8)	Precision approach category I Code number 1,2 (9)	Precision approach category I Code number 3,4 (10)	Precision approach category II or III Code number 3,4 (11)
CONICAL										
Slope	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Height	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	100 m
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m
Radius	2 000 m	2 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 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	60 m	80 m	150 m	150 m	~~150 m~~ 140 m	~~300 m~~ 280 m	~~300 m~~ 280 m	~~150 m~~ 140 m	~~300 m~~ 280 m	~~300 m~~ 280 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10%	10%	10%	10%	15%	15%	15%	15%	15%	15%
First section										
Length	1 600 m	2 500 m	3 000 m	3 000 m	2 500 m	3 000 m	3 000 m	3 000 m	3 000 m	3 000 m
Slope	5%	4%	3.33%	2.5%	3.33%	2%	2%	2.5%	2%	2%
Second section										
Length	—	—	—	—	—	3 600 m[b]	3 600 m[b]	12 000 m	3 600 m[b]	3 600 m[b]
Slope	—	—	—	—	—	2.5%	2.5%	3%	2.5%	2.5%
Horizontal section										
Length	—	—	—	—	—	8 400 m[b]	8 400 m[b]	—	8 400 m[b]	8 400 m[b]
Total length	—	—	—	—	—	15 000 m	15 000 m	15 000 m	15 000 m	15 000 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	—	—	—	—	—	—	—	90 m	120 m[e]	120 m[e]
Distance from threshold	—	—	—	—	—	—	—	c	1 800 md	1 800 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 4.2.9 or 4.2.17).
c. Distance to the end of strip
d. Or end of runway whichever is less.
e. Where the code letter is F (Table 1-1), the width is increased to ~~155~~ 140 m~~. For information one~~except for those aerodromes that accommodate a code letter F aeroplane~~s~~ equipped with digital avionics that provide steering commands to maintain an established track during the go-around manoeuvre~~.~~.

Note.— ~~See~~See Circular~~s~~ 301, ~~— New Larger Aeroplanes — Infringement of the Obstacle Free Zone: Operational Measures and Aeronautical Study~~ 345 and Chapter 4 of the PANS-Aerodromes, Part I (Doc 9981) for further information.

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CHAPTER 10. Operating standards for certified aerodromes.

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10.5.2 General abbreviations and phrase contractions to minimize message length of aerodrome NOTAMs

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Aircraft classification number ACN

. . .

Obstacle limitation surface OLS

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Outer main gear wheel span OMGWS

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10.14.2 Wildlife strike hazard reduction

Note. — The presence of wildlife (birds and animals) on and in the aerodrome vicinity poses a serious threat to aircraft operational safety.

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

a) the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;

b) the collection of information from aircraft operators, aerodrome personnel and other sources on the presence of 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 CAR-ANS Part 15, 15.5 ~~15.8.1.2.1 (f) & (g).~~

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Section 10.20 Autonomous runway incursion warning system

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10.20.1.2. Where an ARIWS is installed at an aerodrome, information on its characteristics and status shall be provided to the appropriate aeronautical information services for promulgation in the AIP with the description of the aerodrome surface movement guidance and control system and markings as specified in ~~Annex 15~~ CAR-ANS Part 15~~, Appendix 1, AD 2.9~~.

Note. — Detailed specifications concerning the AIP are contained in PANS-AIM (Doc 10066).

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ATTACHMENT A: SUPPLEMENTARY GUIDANCE MATERIAL TO MOS

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8. Autonomous runway incursion warning system (ARIWS)

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8.5 Promulgation of information

8.5.1 Information on the characteristics and status of an ARIWS at an aerodrome are promulgated in the Philippine AIP, Section AD 2.9, in PANS-AIM (Doc 10066) and its status updated as necessary through NOTAM or ATIS in compliance with MOS 5.1.5.1.

--- END ---

AMENDED REGULATION AFTER REVISION:

MANUAL OF STANDARDS FOR AERODROMES, 2ND EDITION

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CHAPTER 1. Introduction

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1.1.7 Related documents

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(z) ICAO Procedures for Air Navigation Services — Aerodromes Information Management (PANS-Aerodromes) (Doc 9981);

(aa) ICAO Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM) (Doc 10066); and

(bb) Federal Aviation Administration (FAA) Advisory Circular 150/ 5300-13.

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Section 1.2 Common reference systems

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1.2.3 Temporal reference system

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1.2.3.2 When a different temporal reference system is used, this shall be indicated in GEN 2.1.2 of the Aeronautical Information Publication (AIP).

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

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Section 1.4 Definition of Terms

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Data accuracy. A degree of conformance between the estimated or measured value and the true value.

. . .

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

. . .

Outer main gear wheel span (OMGWS). The distance between the outside edges of the main gear wheels.

. . .

Section 1.5 Certification of aerodromes

Note. — The intent of these specifications is to ensure that compliance with the specifications in the MOS can be effectively enforced. 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 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 need to be provided to CAAP-AIS for promulgation in the Aeronautical Information Publication (AIP). See MOS 5.2.6.1 and PANS-AIM (Doc 10066), Appendix 2, AD 1.5.

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2.1.6 Aerodrome Reference Code

Introductory Note. — The intent of the reference code is to provide a simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the 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 wingspan. 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. When applying CAAP MOS for Aerodromes, Chapter 1-14, first identify the aeroplanes which the aerodrome is intended to serve and then determine the two elements of the code.

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

2.1.6.2 The aerodrome reference code numbers and letters shall have the meanings assigned to them in Table 2.1-1.

2.1.6.3 The code number for element 1 shall be determined from column 1 of the Table below. The code number corresponding to the highest value of the aeroplane reference field length 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*, (Doc 9157), Part 1 —* Runways.

2.1.6.4 The code letter for element 2 shall be determined from Table 2.2-1 by selecting the code letter which corresponds to the greatest wingspan of the aeroplanes for which the facility is intended.

Note. — Guidance on determining the aerodrome reference code is given in the Aerodrome Design Manual *(Doc 9157*, *Parts 1 and 2.*

2.1.6.5 For certified aerodromes, information about the aerodrome reference code letter for each runway and taxiway shall be set out in the Aerodrome Manual.

2.1.6.6 Unless otherwise agreed by CAAP, aerodrome operators shall maintain the aerodrome facilities in accordance with the applicable standards set out in this MOS in relation to the aerodrome reference code for the facilities.

Code element 1	
Code number	**Aeroplane reference field length**
1	Less than 800m
2	800 m up to but not including 1 200 m
3	1200 m up to but not including 1 800 m

4	1800 m and over
Code element 2	
Code letter	**Wingspan**
A	Up to but not including 15m
B	15 m up to but not including 24 m
C	24 m up to but not including 36 m
D	36 m up to but not including 52 m
E	52 m up to but not including 65 m
F	65 m up to but not including 80 m

Table 2.1-1: Aerodrome reference code
(see 2.1.6.1 to 2.1.6.4)

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

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2.1.11 Specific Procedures for Aerodrome Operations

Note. — This section introduces PANS-Aerodromes (Doc 9981) for the use of aerodromes undertaking an assessment of its compatibility for the type of traffic or operation the aerodrome is intending to accommodate. The material in the PANS-Aerodromes addresses operational issues faced by existing aerodromes and provides the necessary procedures to ensure the continued safety of operations. Where alternative measures, operational procedures and operating restrictions have been developed, these are detailed in the aerodrome manual and reviewed periodically to assess their continued validity. The PANS-Aerodromes does not substitute nor circumvent the provisions contained in the MOS. It is expected that infrastructure on an existing aerodrome or a new aerodrome will fully comply with the requirements in this Annex. See CAR-ANS Part 15, 15.5.2.2.1 (c) on States' responsibilities on listing of differences with the related ICAO Procedures in the Aeronautical Information Publication.

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2.1.11.2 Information concerning alternative measures, operational procedures and operating restrictions implemented at an aerodrome arising from 2.1.11.1 shall be promulgated.

Note 1. — See PANS-AIM (Doc 10066), Appendix 2, AD 2.20, on the provision of a detailed description of local traffic regulations.

Note 2. — See PANS-Aerodromes (Doc 9981), Chapter 3, section 3.6, on promulgation of safety information.

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5.1.2 Aeronautical Data

5.1.2.1 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.

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

5.1.2.2 Aerodrome mapping data shall be made available to the aeronautical information services for aerodromes deemed relevant by CAAP where safety and/or performance-based operations suggest possible benefits.

Note 1. — Aerodrome mapping databases related provisions are contained in CAR-ANS Part 15, 15.5 and PANS-AIM (Doc 10066), Chapter 5.

Note 2. — Guidance material concerning the application of aerodrome mapping databases is provided in MOS Attachment A, Section 10.

5.1.2.3 Where made available in accordance with 5.1.2.2, the selection of the aerodrome mapping data features to be collected shall be made with consideration of the intended applications.

Note 1. — It is intended that the selection of the features to be collected match a defined operational need.

Note 2. — Aerodrome mapping databases can be provided at one of two levels of quality - fine or medium. These levels and the corresponding numerical requirements are defined in RTCA Document DO-272B and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-99B - User Requirements for Aerodrome Mapping Information.

5.1.2.4 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 (Doc 10066).

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5.1.4 Standards for determining Aerodrome Information

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

Note 1. — See PANS-AIM (Doc 10066) Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2 and 3.

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

5.1.5 Condition of the movement area and related facilities

5.1.5.1 Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information services units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

Note. — The nature, format and conditions of the information to be provided are specified in the PANS-AIM (Doc 10066) and MOS-ATS.

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5.1.8 Runway friction level

5.1.8.1 Notification shall be given to aerodrome users when the friction level of a paved runway or portion thereof is less than that specified by the State in accordance with MOS 6.2.10.

Note. — Guidance on conducting a runway surface friction characteristics evaluation programme that includes determining and expressing the minimum friction level is provided in MOS Attachment A, Section 20.

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5.2.6 Coordination between aeronautical information services and aerodrome authorities

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5.2.6.3 Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as specified in CAR-ANS Part 15, 15.6. The predetermined, internationally agreed AIRAC effective dates shall be observed by the responsible aerodrome services when submitting the raw information/data to aeronautical information services.

Note. — Detailed specifications concerning the AIRAC system are contained in PANS-AIM (Doc 10066), Chapter 6.

5.2.6.4 The aerodrome services 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 necessary to meet the needs of the end-user of aeronautical data.

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

Note 2. — Specifications for the issue of NOTAM are contained in CAR-ANS Part 15, 15.6 and PANS-AIM (Doc 10066, Appendices 3 and 4 respectively.

Note 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 4. — The schedule of the predetermined internationally agreed AIRAC common effective dates at intervals of 28 days and guidance for the AIRAC use are contained in the CAR-ANS Part 15, 15.6 and AIP Gen 3.1-5.

CHAPTER 6. Aerodrome physical characteristics

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6.2.4 Runway Width

6.2.4.1 The width of a runway must not be less than that determined using Table 6.2-1.

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

1[a] Runway width may be reduced to 15 m or 10 m depending on the restrictions placed on small aeroplane operations. See MOS 13.

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

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

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

Note 3. - See MOS 6.2.12 concerning the provision of runway shoulders, in particular for Code F aeroplanes with four (or more) engines.

Table 6.2-1: Minimum runway width.

6.2.5 Runway Turn pads

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6.2.5.5. 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 taxi guidance marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the turn pad is not less than the distance determined using MOS Table 6.2-2.

	OMGWS			
	Up to but not including 4.5 m	**4.5 m up to but not including 6 m**	**6 m up to but not including 9 m**	**9 m up to but not including 15 m**
Clearance	1.5 m	2.25 m	3m[a] or 4m[b]	4 m

a If the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.

b If the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.

Note. — Wheel base means the distance from the nose gear to the geometric center of the main gear.

Table 6.2-2: Minimum clearance distance between any undercarriage wheel and edge of runway turning area

6.2.5.6 The longitudinal and transverse slopes on runway turn pads shall be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes shall be the same as those on the adjacent runway pavement surface.

6.2.5.7 The strength of a runway turn pad shall be at least equal to that of the adjoining runway which it serves, due consideration being given to the fact that the turn pad will be subjected to slow-moving traffic making hard turns and consequent higher stresses on the pavement.

Note. — Where a runway turn pad is provided with flexible pavement, the surface will need to be capable of withstanding the horizontal shear forces exerted by the main landing gear tires during turning maneuvers.

6.2.5.8 The surface of a runway turn pad shall not have surface irregularities that may cause damage to an aeroplane using the turn pad.

6.2.5.9 The surface of a runway turn pad shall be so constructed or resurfaced as to provide surface friction characteristics at least equal to that of the adjoining runway.

6.2.5.10 The runway turn pads shall be provided with shoulders of such width as is necessary to prevent surface erosion by the jet blast of the most demanding aeroplane for which the turn pad is intended, and any possible foreign object damage to the aeroplane engines.

Note. — As a minimum, the width of the shoulders will need to cover the outer engine of the most demanding aeroplane and thus must be wider than the associated runway shoulders.

6.2.5.11 The strength of runway turn pad shoulders shall be capable of withstanding the occasional passage of the aeroplane it is designed to serve without inducing structural damage to the aeroplane and to the supporting ground vehicles that may operate on the shoulder.

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6.2.12 Runway shoulders

Note. — Guidance on characteristics and treatment of runway shoulders is given in MOS 6.2.17.2 to 6.2.17.5, and in the Aerodrome Design Manual (Doc 9157), Part 1.

6.2.12.1 Runway shoulders shall be provided for a runway where the code letter is D, E or F.

6.2.12.2 If a runway is 30 m wide and is used by aeroplanes seating 100 passengers or more, shoulders must be provided and the total width of the runway and its shoulders must not be less than 36 m.

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6.2.14 Surface of runway shoulders

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

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

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

6.2.15 Width of runway shoulders

6.2.15.1 For aeroplanes with OMGWS from 9 m up to but not including 15 m, the runway shoulders shall extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than:

a) 60 m where the code letter is D or E;

b) 60 m where the code letter is F with two-or three-engined aeroplanes; and

c) 75 m where the code letter is F with four (or more)-engined aeroplanes.

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6.2.17 Strength of runway shoulders

6.2.17.1 The portion of a runway shoulder between the runway edge and a distance of 30 m from the runway centre line 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 Doc 9157 Aerodrome Design Manual, Part 1.

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6.3.3 Runway Strip Width

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

— 140 m where the code number is 3 or 4; and

— 70 m 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.

6.3.3.3 A strip including a precision approach runway shall, wherever practicable, extend laterally to a distance of at least:

— 140 m where the code number is 3 or 4; and

— 70 m where the code number is 1 or 2;

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

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6.7 Taxiways

6.7.1 Taxiway Width

6.7.1.1 The width of a straight section of a taxiway must not be less than the width determined using Table 6.7-1.

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

Table 6.7-1: Minimum width for straight section of taxiway

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

6.7.2 Taxiway Edge Clearance

6.7.2.1 The design of a taxiway shall be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centerline markings, the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway shall be not less than the distance determined using Table 6.7-2.

	OMGWS			
	Up to but not including 4.5 m	**4.5 m up to but not including 6 m**	**6 m up to but not including 9 m**	**9 m up to but not including 15 m**
Clearance	1.5 m	2.25 m	3m[a.b] or 4m[c]	4 m

Table 6.7-2: Minimum clearance between outer main gear wheels and edge of taxiway

[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 18 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

[c] *On curved portions if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

Note. — Wheel base means the distance from the nose gear to the geometric center of the main gear.

. . .

6.7.10 Width of Taxiway Shoulders

6.7.10.1 Straight portions of a taxiway where the code letter is C, D, E or F shall 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:

(a) 44 m if the taxiway's code letter is F;

(b) 38 m if the taxiway's the code letter is E;

(c) 34 m if the taxiway's the code letter is D; and

(d) 25 m if the taxiway's the code letter is C.

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

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6.7.14 Width of Graded Area of Taxiway Strip

6.7.14.1 The width of the graded area of a taxiway strip on each side of the centerline of the taxiway of not be less than that given by the following tabulation:

(a) 10.25 m where the OMGWS is up to but not including 4.5 m;

(b) 11 m where the OMGWS is 4.5 m up to but not including 6 m;

(c) 12.50 m where the OMGWS is 6 m up to but not including 9 m;

(d) 18.50 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is D;

(e) 19 m where the OMGWS is 9 m up to but not including 15 m, where the code letter is E; or

(f) 22 m where the OMGWS is 9 m up to but not including 15 m, 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.*

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6.7.18 Taxiway minimum separation distances

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Code letter	Distance between taxiway center line and runway center line (meters)								Taxiway center line to taxiway center line (meters)	Taxiway other than aircraft stand taxilane, center line to object (meters)	Aircraft stand taxilane center line to aircraft stand taxilane center line (meters)	Aircraft stand taxilane center line to object (meters)
	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)	(13)
A	77.5	77.5	-	-	37.5	47.5	-	-	23	15.5	19.5	12
B	82	82	152	-	42	52	87	-	32	20	28.5	16.5
C	88	88	158	-	48	58	93	-	44	26	40.5	22.5
D	-	-	166	166	-	-	101	101	63	37	59.5	33.5
E	-	-	172.5	172.5	-	-	107.5	107.5	76	43.5	72.5	40
F	-	-	180	180	-	-	115	115	91	51	87.5	47.5

Note 1.- The separation distances shown in columns (2) to (9) represent ordinary combinations of runways and taxiways. The basis for development of these distances is given in the 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 the Aerodrome Design Manual (Doc 9157), Part 2.

Table 6.7-5: Taxiway minimum separation distances

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CHAPTER 7. Obstacle restriction and limitation

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7.1.4 Obstacle Limitation Requirements

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Table 7.1-1. Dimensions and slopes of obstacle limitation surfaces — Approach runways

APPROACH RUNWAYS

Surface and dimensions[a]	RUNWAY CLASSIFICATION									
	Non-instrument Code number				Non-precision approach Code number			I Code number		II or III 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	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	100 m
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m
Radius	2 000 m	2 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 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	60 m	80 m	150 m[f]	150 m	140 m[f]	280m	280 m[g]	140 m	280 m	280 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10%	10%	10%	10%	15%	15%	15%	15%	15%	15%
First section										
Length	1 600 m	2 500 m	3 000 m	3 000 m	2 500 m	3 000 m	3 000 m	3 000 m	3 000 m	3 000 m
Slope	5%	4%	3.33%	2.5%	3.33%	2%	2%	2.5%	2%	2%
Second section										
Length	—	—	—	—	—	3 600 m[b]	3 600 m[b]	12 000 m	3 600 m[b]	3 600 m[b]
Slope	—	—	—	—	—	2.5%	2.5%	3%	2.5%	2.5%
Horizontal section										
Length	—	—	—	—	—	8 400 m[b]	8 400 m[b]	—	8 400 m[b]	8 400 m[b]
Total length	—	—	—	—	—	15 000 m	15 000 m	15 000 m	15 000 m	15 000 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	—	—	—	—	—	—	—	90 m	120 m[e]	120 m[e]
Distance from threshold	—	—	—	—	—	—	—	c	1 800 m[d]	1 800 m[d]
Divergence (each side)	—	—	—	—	—	—	—	10%	10%	10%
Slope	—	—	—	—	—	—	—	4%	3.33%	3.33%

* Runways used for air transport operations at night by aircraft with maximum take-off mass not exceeding 5,700 kg are required to meet code 2 standards.

a All dimensions are measured horizontally unless specified otherwise.

b Variable length (see MOS 7.1.4.6 or MOS 7.1.4.8).

c Distance to the end of strip.

d Or end of runway whichever is less.

e Where the code letter is F [Column (3) of Table 2.1-1], the width is increased to 140 m except for those aerodromes that accommodate a code letter F aeroplane equipped with digital avionics that provide steering commands to maintain an established track during the go-around maneuver.

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

f 90 m where width of runway is 30 m.

g 150 m if only used by aeroplanes requiring 30 m wide runway.

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CHAPTER 10 Operating standards for certified aerodromes.

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10.5.2 General abbreviations and phrase contractions to minimize message length of aerodrome NOTAMs

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Aircraft classification number ACN

. . .
Obstacle limitation surface OLS
. . .
Outer main gear wheel span OMGWS
. . .
10.14.2 Wildlife strike hazard reduction

Note. — The presence of wildlife (birds and animals) on and in the aerodrome vicinity poses a serious threat to aircraft operational safety.

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

a) the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;

b) the collection of information from aircraft operators, aerodrome personnel and other sources on the presence of 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 CAR-ANS Part 15, 15.5.
. . .
Section 10.20 Autonomous runway incursion warning system
. . .
10.20.1.2 Where an ARIWS is installed at an aerodrome, information on its characteristics and status shall be provided to the appropriate aeronautical information services for promulgation in the AIP with the description of the aerodrome surface movement guidance and control system and markings as specified in CAR-ANS Part 15.

Note. — Detailed specifications concerning the AIP are contained in PANS-AIM (Doc 10066).
. . .
ATTACHMENT A: SUPPLEMENTARY GUIDANCE MATERIAL TO MOS
. . .
8. Autonomous runway incursion warning system (ARIWS)
. . .
8.5 Promulgation of information

8.5.1 Information on the characteristics and status of an ARIWS at an aerodrome are promulgated in the Philippine AIP, Section AD 2.9, in PANS-AIM (Doc 10066) and its status updated as necessary through NOTAM or ATIS in compliance with MOS 5.1.5.1.
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--- END ---

i. ***Separability Clause.*** **-** If, for any reason, any provision of this Memorandum Circular is declared invalid or unconstitutional, the other part or parts thereof which are not affected thereby shall continue to be in full force and effect.

ii. ***Repealing Clause.*** **-** All orders, rules, regulations and issuances, or parts thereof which are inconsistent with this Memorandum Circular are hereby repealed, superseded or modified accordingly.

iii. ***Determination of changes***. – To highlight the amendments and/or revisions in the Memorandum Circular, the deleted text shall be shown with strikethrough and the new inserted text shall be highlighted with grey shading, as illustrated below:

1. Text deleted: ~~Text to be deleted is shown with a line through it.~~
2. New text inserted: New text is highlighted with grey shading.
3. New text replacing existing text: ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.

iv. ***Effectivity Clause***. - This Memorandum Circular shall take effect fifteen (15) days after publication in a requisite single newspaper of general circulation or the Official Gazette and a copy filed with the U.P. Law Center - Office of the National Administrative Register.

So Ordered. Signed this 30th day of July 2019, at the Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Metro Manila, 1301.

CAPTAIN JIM C. SYDIONGCO