Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

Advisory Circular

OBSTACLE CONTROL

AC AGA-OC–01–2025

(First Issue)

Aerodrome & Air Navigation Safety Oversight Office (AANSOO)
Office of the Director General
Civil Aviation Authority of the Philippines
Old MIA Road, Pasay City, 1300

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Advisory Circulars (AC) are intended to provide recommendations and guidance, illustrate a means-but not necessarily the only means of complying with regulatory requirements, or to explain certain regulatory requirements by providing interpretative and explanatory materials.

CAAP will generally accept that when the provisions of an Advisory Circular have been met, compliance with the relevant regulatory obligations has been satisfied.

Where an AC is referred to in a "Note" within regulatory documentation, the AC remains as a guidance material.

ACs should always be read in conjunction with the referenced regulations.

I. PURPOSE

This Advisory Circular (AC AGA-OC-01-2025) is issued to provide supplementary guidance to aerodrome operators to demonstrate compliance with, and information related to the handling of obstructions such as the limitation, control of obstacles, and making arrangements for the removal or lowering of obstacles to ensure the safe operation of aircraft at the aerodrome. It provides guidance on what is acceptable to the Aerodrome and Air Navigation Safety Oversight Office (AANSOO) of Civil Aviation Authority of the Philippines (CAAP) to demonstrate compliance with regulatory requirements stipulated under Chapter 7 – Obstacle Restriction and Limitation of the Manual of Standards for Aerodromes (MOS-Aerodromes).

II. APPLICATION

AC AGA-OC-01-2025 is applicable to all airport operators in the Republic of the Philippines.

III. RELATED RULES

This AC relates specifically to the requirements of Manual of Standards for Aerodromes Chapter 7 – Obstacle Restriction and Limitation.

IV. ACKNOWLEDGEMENT

Aerodrome and Air Navigation Safety Oversight Office (AANSOO) of the Civil Aviation Authority of the Philippines (CAAP) acknowledges the valuable information provided by ICAO through its published Guidance Materials for all Contracting States and through other related best practices developed by international organizations.

V. COPIES OF THIS AC

AC AGA-OC-01-2025 is available and can be downloaded at the official website of CAAP at www.caap.gov.ph. A printed copy of this AC can be requested from the Regulatory Safety Standards Division (RSSD) of the Aerodrome and Air Navigation Safety Oversight Office (AANSOO), Civil Aviation Authority of the Philippines, located at MIA Road corner, Ninoy Aquino Avenue, Pasay City, Metro Manila, 1300 with Tel. No.: (02) 8246 4988 local 2040.

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FOREWORD

Pursuant to the overarching mandate to uphold safety and efficiency within the realm of aviation operations and in adherence to the regulatory edicts as prescribed by the Civil Aviation Authority of the Philippines (CAAP) and of the International Civil Aviation Organization (ICAO), this Advisory Circular (hereinafter referred to as the "AC AGA-OC-01-2025") is hereby promulgated. This AC is imbued with the objective of providing Aerodrome Operators with comprehensive guidance to prevent the aerodromes from becoming unusable by the growth of obstacles around the aerodromes. This is achieved by establishing a series of obstacle limitation surfaces that define the limits to which objects may project into the airspace. It provides guidance on what is acceptable to the Aerodrome and Air Navigation Safety Oversight Office (AANSOO) of Civil Aviation Authority of the Philippines (CAAP) to demonstrate compliance with regulatory requirements in Chapter 7 – Obstacle Restriction and Limitation of the MOS-Aerodromes.

Furthermore, it is imperative to underscore that this advisory circular is not be construed as a substitute for, nor does it supersede any existing laws, regulations or mandates. Rather, it should be interpreted as a supplementary instrument designed to enhance the understanding and implementation of the aforesaid statutory requirements.

Lastly, AC AGA-OC-01-2025 is dynamic in nature, reflective of the fluidity of the aviation domain. It is subject to periodic revisions and updates, which will be duly effected to encapsulate advancements in the aviation industry, shifts in operational paradigms, and the evolution of regulatory landscapes.

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DEFINITIONS

Critical obstacle. The obstacle within the take-off climb area and/or the approach area, which subtends the greatest vertical angle when measured from the inner edge of the take-off climb surface and/or the approach surface.

Notices to airmen (NOTAM). A notice issued by the relevant authority containing information or instruction concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to persons concerned with flight operations.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

a) are located on the area intended for the surface movement of aircraft; or

b) extend above a defined surface intended to protect aircraft in flight; or

c) stand outside those defined surfaces and have been assessed as being a hazard to air navigation

Obstacle free zone (OFZ). The airspace above the inner approach surface, inner transitional surfaces, balked landing surfaces, and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low mass and frangible mounted one that is required for air navigation purposes.

Obstacle limitation surfaces (OLS). A series of planes associated with each runway at an aerodrome that defines the intended limits to which objects may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely.

Operator. The aerodrome operator.

Protected Surfaces. Not limited to the OLS but including the ATS and ANS on basis in determining obstacles.

ACRONYMS AND ABBREVIATIONS

AANSOO	Aerodrome and Air Navigation Safety Oversight Office
AC	Advisory Circular
ADMS	Aerodrome Development and Management Service
AGA	Aerodrome and Ground Aids
AIP	Aeronautical Information Publication
AISG	Aeronautical Information Service Group
ANS	Air Navigation Service
ATS	Air Traffic Service
CAAP	Civil Aviation Authority of the Philippines
GNSS	Global Navigation Satellite System
CNS	Communication, Navigation, Surveillance
ICAO	International Civil Aviation Organization
MOS - Aerodromes	Manual of Standards for Aerodromes
NOTAM	Notices to Airmen
OC	Obstacle Control
OFZ	Obstacle free zone
OLS	Obstacle limitation surfaces
RSSD	Regulatory Safety Standards Division
WGS	World Geodetic System

CHAPTER 1. CONTROL OF OBSTACLES

1.1 The effective utilization of an aerodrome may be considerably influenced by man-made activities and natural growths (e.g. trees) within the aerodrome and its vicinity. These may result in:

a) Limitations on the distances available for take-off and landing operations;

b) The range of meteorological conditions in which take-off and landing operations can be undertaken;

c) A reduction in the payload of some aircraft types; or

d) Any of the combinations above.

1.1.1 Such man-made activities and natural growths can pose as a hazard to aircraft operations at the aerodrome.

1.2 Obstacle limitation surfaces (OLS) is defined in the MOS-Aerodromes as:

"A series of planes associated with each runway at an aerodrome that defines the intended limits to which objects may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely".

1.3 The operator is responsible for the limitation and control of obstacles and making arrangements for the removal or lowering of obstacles at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D. For obstacles located within the OLS dimensions specified under Appendix B Appendix C and Appendix D, the operator should formalize an arrangement with CAAP and other relevant authorities to deal with the timely removal or lowering of these obstacles. Procedures and arrangements to remove or lower such obstacles should be developed in consultation with relevant stakeholders and captured in the aerodrome manual/operations manual as standard operating procedures, which should be updated as and when there are changes.

1.4 Effective obstacle control processes require the collective efforts of various parties including the operator, relevant authorities, property / construction site owners and the general public. These efforts would provide a safe environment for efficient and safe operation of aircraft at and near the aerodrome. In this regard, the operator should regularly engage the relevant parties involved to ensure that the established processes are robust and effective.

1.5 The operator should minimally consider the following for its obstacle control:

a) Frequency and timing of obstacle surveys;

b) Marking and lighting of obstacles other than natural growths;

c) Staff competency and training;

d) Calibration of equipment required for obstacle surveys;

e) Conduct of day obstacle surveys;

f) Conduct of night obstacle surveys;

g) Documentation and follow-ups;

h) Promulgation of information on obstacles;

i) Obstacle data analysis and continuous improvement; and

j) Engagement with relevant authorities and stakeholders in removal of obstacles.

1.6 The operator should contact CAAP (ADMS, ATS, and ANS) concerning obstacle-related matters (e.g. data of approved HCP).

1.7 The operator shall comply the requirements of the National Building Code of the Philippines prior to any proposed construction within the aerodrome that may infringe the protected surfaces (OLS including flight procedures and CNS facilities) established by CAAP and aerodrome operator.

1.8 The operator is responsible for notifying CAAP through the Aeronautical Information Service Group (AISG) the data involving the presence of all obstacles, including shielded obstacles as described in Appendix A, and their detailed characteristics. The updated portion of the Aerodrome Manual/Operations Manual containing the said data should be submitted to CAAP.

CHAPTER 2. MARKING AND LIGHTING OF OBSTACLES

2.1 The operator should make every effort to have the obstacles removed or reduced in height so that they no longer pose danger to aircraft operations.

2.2 Where it is impractical to remove an obstacle or to have an obstacle reduced in height, it should be appropriately marked and / or lit so as to be clearly visible to pilots in all weather and visibility conditions. MOS-Aerodromes Chapter 8 Aerodrome visual aids: markers, markings, signals and signs and

Chapter 9 Aerodrome visual aids: aerodrome lighting for Denoting Obstacles, contain the requirements concerning marking and/or lighting of obstacles.

2.3 It should be noted that the marking and lighting of obstacles is intended to reduce hazards to aircraft by indicating their presence. It does not necessarily reduce operating limitations which may be imposed by the obstacle.

2.4 Vehicles and other mobile objects, excluding aircraft, on movement area of an aerodrome are obstacles and must be marked and if the vehicles are used at night or in conditions of low visibility, it must be lit in accordance with the requirements under MOS-Aerodromes.

2.5 The operator should monitor all obstacle lights and markings at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D and take necessary actions to have unserviceable lights repaired or replaced, and faded markings painted or replaced.

CHAPTER 3. OBSTACLE SURVEYS

3.1 The objective of obstacle control is for the operator to ensure that man-made structures, natural growths (e.g. trees) or aerial activities likely to infringe the OLS including flight procedures and CNS facilities are identified before they pose a danger to aircraft operations. Hence, the operator should put in place a process of systematic and frequent obstacle surveys within the OLS dimensions specified under Appendix B, Appendix C and Appendix D.

Also, the obstacle surveys should include checks to detect any unauthorized presence of construction equipment and hazardous aerial activities that may pose a danger to aircraft operations. The operator is to take necessary corrective actions to address the infringement of the protected surfaces, non-compliances and /unauthorized presence of construction equipment.

3.2 The operator should conduct obstacle surveys at day and night, within the OLS dimensions specified under Appendix B, Appendix C and Appendix D. The operator should consider the following when planning the frequency and scheduling of such surveys:

a) Locations and types of activities e.g. construction works, operating or flying a kite or model aircraft;

b) Frequency/Duration of activities;

c) Timing at which the activities are being carried out;

d) Area of coverage and scope of each survey;

e) For tree surveys, depending upon the species thereof;

f) Records on previous infringement of the protected surfaces, non-compliances and/or unauthorized presence of construction equipment as well as aerial activities; and

g) Periodic review of flight procedure design.

CHAPTER 4. COMPETENCY AND TRAINING

4.1 The operator should ensure that the personnel (e.g. aerodrome staff or contractor) conducting the obstacle surveys are properly trained and are able to perform the obstacle surveys.

Note: In case that the operator is not capable of conducting and performing obstacle surveys, a third-party service provider/contractor may be engaged.

4.2 The operator should put in place a formal and structured training program for the personnel. The training program should include recurrent training so as to maintain the proficiency of personnel and keep them updated on new developments and technology which may enhance their work.

4.3 The operator should also be conversant with the following:

a) Correct use of equipment as required for the obstacle surveys;

b The survey data required under the World Geodetic System-1984 (WGS-84) (ICAO Document 9674).

c) Familiar with the aerodrome layout and at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D;

d) Identify different types of tall construction equipment used at sites;

e) Identify different species of trees found at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D and their characteristics;

f) Read obstacle charts and be able to accurately relate obstacles in the chart to their actual ground locations;

g) Calculate and measure the range and bearing of an obstacle from the aerodrome reference point;

h) Identify the different types of markings & lights to be used on obstacles; and

i) Details to be provided to AISG for the promulgation of a Notice to Airmen (NOTAM) / AIP for the information of air traffic services units and pilots of an obstacle and its location.

CHAPTER 5. CALIBRATION OF EQUIPMENT FOR OBSTACLE SURVEYS

5.1 The equipment required for obstacle surveys such as height measuring equipment and Global Navigation Satellite System (GNSS) device should be calibrated to ensure its accuracy and integrity before using. The equipment for calibration should be sent to the appropriate government agency as recommended before its due date.

5.2 The operator should ensure that the calibration records of the equipment are retained.

Note: In case a third-party service provider/contractor conducts the obstacle survey, the calibration certificate must be submitted to CAAP.

5.3 The operator should also ensure that there is spare equipment available to be used for obstacle surveys when the main equipment is found to be unserviceable.

CHAPTER 6. CONDUCT OF OBSTACLE SURVEYS

6.1 Obstacle surveys at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D are conducted at day and night, to detect unauthorized obstacles and inform CAAP if detected. These will include checking the following:

a) Obstacles that are within the maximum allowable height approved by CAAP and are appropriately marked and/or lit;

b) Erected objects (e.g. construction equipment) that have been approved by CAAP;

c) Markings, markers, and lights on vehicles and other objects (e.g. construction equipment and buildings) that are in proper working condition and properly maintained;

d) Natural growths (e.g. trees) that are within its allowable height;

e) Aerial activities, if any, that are approved by CAAP; and

f) Follow-up actions that have been taken arising from previous OLS infringements, non-compliances and/or unauthorized presence of construction equipment as well as aerial activities, if any.

6.2 The operator should be aware of the developments at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D. The operator should also be aware of the outcomes of the previous surveys conducted, i.e. any infringement of OLS, non-compliances and/or unauthorized operations of construction equipment as well as aerial activities noted, to effectively plan the survey route. As the route may change from time to time, the operator should record the changes and their reasons in the checklists used. The operator should be familiar with the area to be surveyed and the locations of sites to be checked.

6.3 The operator should carry the following items for the obstacle survey:

a) Up-to-date checklists for day obstacle survey (to be completed by staff during the survey);

b) Information on the activities at and within the OLS dimensions specified under Appendix B, Appendix C and Appendix D (e.g. construction sites);

c) Information on outcomes of previous surveys conducted;

d) Up-to-date obstacle charts / aerodrome maps;

e) Binoculars;

f) Digital camera;

g) Calibrated survey equipment;

h) Calibrated height measuring instrument;

i) Documentation to facilitate his/her access to areas for the purposes of the survey;

j) Torchlight and other night-light survey equipment and accessories; and

k) Other obstacle-related requirements that may be imposed by CAAP.

6.4 The operator should make use of observation points to assist in the survey. In the event that access to certain sites are required for the survey, the operator should seek necessary permissions from the land or property owner and make arrangements for access to the site.

Survey of construction activities

6.5 The operator, when conducting a survey on a construction site, should:

a) be in the appropriate personal protective equipment;

b) check that numbers, types and heights of construction equipment used at the site do not pose as unauthorized obstacles. If the height measurements of the construction equipment could not be easily taken, the heights of the surrounding structures could be referred to as reference;

c) if there are no works at night, check that all equipment are retracted/lowered and lit in accordance with the relevant requirements; and,

d) inform and provide supporting documentation (e.g. photographs) to CAAP and the person-in-charge of the construction site if obstacles have been detected.

6.6 When an obstacle is detected, the operator should advise the person-in-charge to cease operations, retract / lower equipment and refer them to CAAP to apply and seek approval for the obstacle to be authorized. The operator should also report immediately the detection to CAAP, the air traffic service~~s~~ provider and appropriate authorities, and promulgate a NOTAM to notify on the detected obstacle.

6.7 The operator should also highlight the following issues, to the land or property owner, if encountered:

a) Flags should not increase the hazard presented by the object they mark. The operator could use binoculars to inspect the flags. Flags in poor conditions (e.g. faded, torn) should be replaced.

b) Markings painted on buildings and structures located within the aerodrome that are of poor conditions (e.g. faded) should be repainted.

c) When checking the obstacle lights at night, an obstacle light that is unlit or significantly dimmer than the other obstacle lights should be replaced.

6.8 The operator should refer to the relevant requirements and standards of the MOS-Aerodromes for the specifications of flags used for marking different objects and markings used for marking buildings and structures.

Survey of trees

6.9 In the case of natural growths (e.g. trees), the operator should make arrangements with the property owner to remove such obstacles (e.g. by trimming the trees).

6.10 It is important to understand the species of trees which could pose a problem, assess the growth rate of these trees and trim them low enough so that the ensuing growth will be below the height limits until the next survey. In this regard, the operator should identify trees that are near to their height limits for closer monitoring and/or possible proactive actions (e.g. trimming) to prevent them from exceeding their height limits.

6.11 If a tree was found to have exceeded its height limit, the operator should immediately inform and provide supporting documentation (e.g. photographs) to CAAP and the property owner.

Night survey of vehicles and mobile objects within the airside

6.12 As part of the obstacle survey within the airside, the operator should check that the use and serviceability of lights on follow-me vehicles and mobile objects, are as specified in MOS-Aerodromes.

6.13 Besides checking for the presence of the physical light fixture and whether it is properly lit, i.e. the particular light has similar intensity / brightness as the other lights found on the same vehicle / mobile object or other similar vehicles and mobile objects located around the same area, the operator should also check if the specifications of the light are as specified in MOS-Aerodromes.

6.14 In the event that a vehicle or mobile object is not appropriately lit, the operator should immediately inform and provide supporting documentation (e.g. photographs) to CAAP and the person-in-charge of the vehicle or mobile object.

CHAPTER 7. DOCUMENTATION AND FOLLOW-UPS

7.1 The operator should take photographs of the trees, aerial activities, buildings, vehicles and mobile objects sighted during the survey for record purposes. These photographs should be printed and filed with the completed checklists.

7.2 In all cases, it is important that the operator records down all the survey information and outcomes in the checklists as they may be used for subsequent surveys or obstacle data analysis. For the purposes of NOTAM promulgation, geographical coordinates of the location of the infringement / unauthorized aerial activity should be determined in terms of World Geodetic System – 1984 (WGS-84) format using a calibrated GNSS. The operator should annotate in the up-to-date aerodrome obstacle charts, locations of the on-going activities near the aerodrome as well as the infringement, non-

compliances and unauthorized aerial activities noted during the surveys. For the latter, the operator should arrange to conduct follow-ups including revisiting the site the next day or two and keep CAAP updated.

7.3 It is a good practice for the personnel to share the survey conducted and its outcomes with the other personnel who may be conducting subsequent surveys. This sharing may be incorporated into the daily handing / taking over sessions between personnel.

CHAPTER 8. PROMULGATION OF INFORMATION ON OBSTACLES

8.1 The geographical coordinates, top elevation, type, marking and lighting, if any of the obstacles within the aerodrome and its vicinity should be measured and reported by the operator to the AISG.

8.2 Whenever an infringement, either temporary or permanent in nature, is identified, the operator is to inform CAAP and other appropriate authorities (including air traffic service provider). The operator is responsible to ensure that information on all obstacles is promptly transmitted to the AISG (e.g. issuance of NOTAM). The operator has the most direct interest in seeing that information is properly disseminated, and through the periodic surveys, the operator is most likely to be aware of the presence of new obstacles. The operator should report all data on obstacles, including marking and lighting, if any, to the AISG for promulgation. Such data should be amended at regular intervals as may be necessary to keep it up-to-date.

CHAPTER 9. OBSTACLE DATA ANALYSIS AND CONTINUOUS IMPROVEMENT

9.1 The operator should make use of the obstacle data collected and conduct periodic data analysis. This should allow the operator to review the overall effectiveness of the obstacle control process. Through such analysis, the operator should also be able to identify potential risks and hotspots, and develop mitigating measures to address them.

9.2 The operator should seek continuous improvement in the obstacle control process. The operator should review the process and ensure that it is in compliance with the relevant CAAP requirements at all times.

APPENDIX A – SHIELDED OBSTACLES

1.1 New obstacle located in the vicinity of an existing permanent obstacle and assessed as not posing any additional hazard to aircraft is deemed to be shielded by the existing obstacle.

1.2 Unless specifically directed by CAAP, a shielded obstacle does not require removal, lowering, marking or lighting and should not impose any additional restrictions to aircraft operations.

1.3 An existing obstacle within the approach and take-off climb area is called the critical obstacle. Where a number of obstacles exist closely together, the critical obstacle is the one which subtends the greatest vertical angle measured from the appropriate inner edge.

1.4 As illustrated in Figure 1, a new obstacle may be assessed as not imposing additional restrictions if:

a) when located between the inner edge end and the critical obstacle, the new obstacle is below a plane sloping downwards at 10% from the top of the critical obstacle toward the inner edge;

b) when located beyond the critical obstacle from the inner edge end, the new obstacle is not higher than the height of the permanent obstacle; and,

c) where there is more than one critical obstacle within the approach and take-off climb area, and the new obstacle is located between two critical obstacles, the height of the new obstacle is not above a plane sloping downwards at 10% from the top of the next critical obstacle.

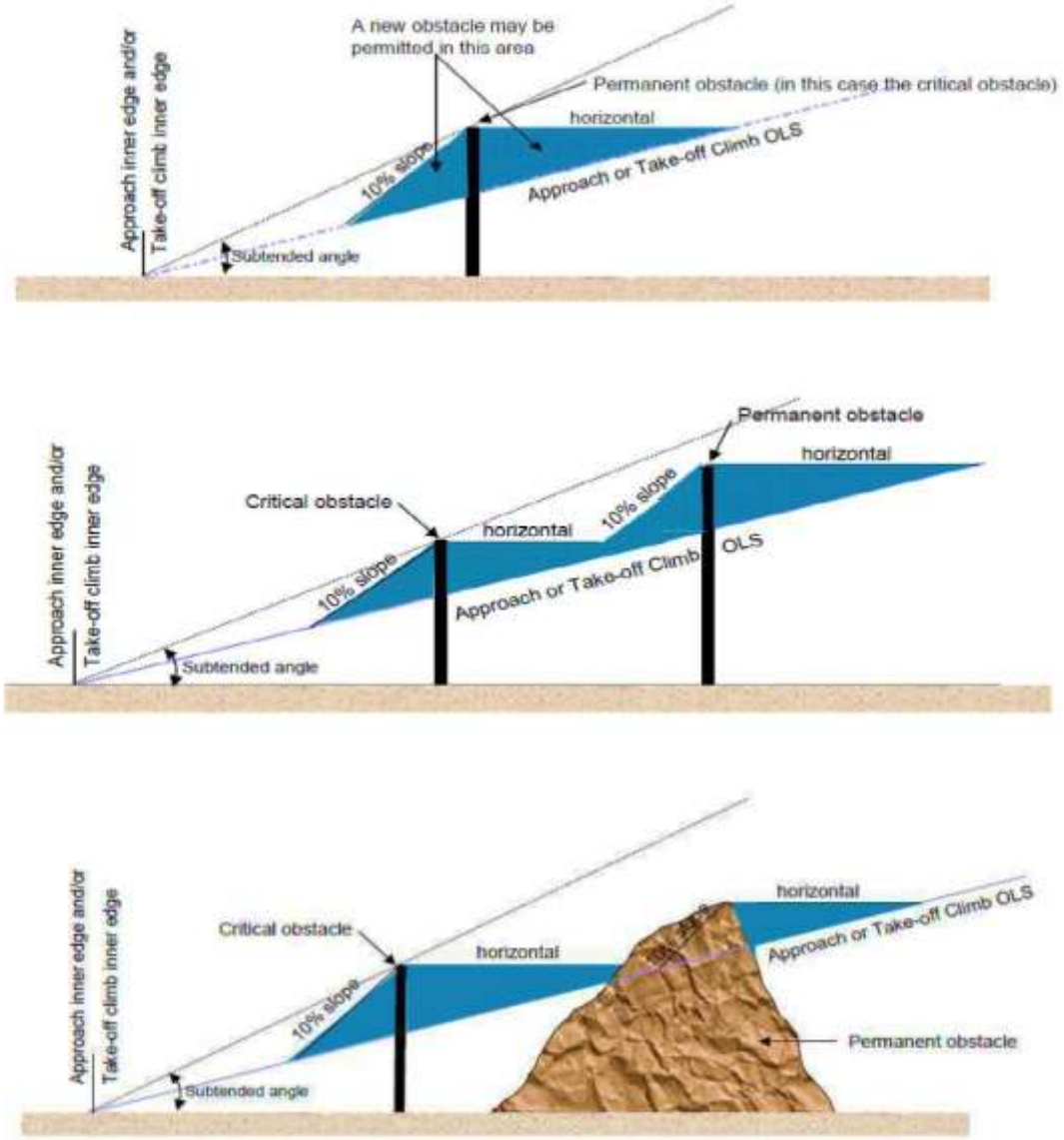

Figure 1 – Shielding of obstacles penetrating the approach and take-off climb surfaces
Obstacle penetrating the inner and outer horizontal and conical surfaces

1.5 A new obstacle may be accepted if it is in the vicinity of an existing obstacle, and does not penetrate a 10% downward sloping conical-shaped surface from the top of the existing obstacle, i.e. the new obstacle is shielded radially by the existing obstacle.

Obstacle penetrating the transitional surfaces

1.6 A new obstacle may be assessed as not imposing additional restrictions if it does not exceed the height of an existing obstacle which is closer to the runway strip and the new obstacle is located perpendicularly behind the existing obstacle relative to the runway center line.

APPENDIX B – DIMENSIONS AND SLOPES OF OBSTACLE LIMITATION SURFACES – APPROACH RUNWAYS

	RUNWAY CLASSIFICATION									
								Precision approach category		
	Non-instrument				Non-precision approach			I		II or III
	Code number				Code number			Code number		Code number
Surface and dimensions[a]	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 **110 m	150 m	140 m	280 m	280 m	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%

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 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 manoeuvre.

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

* 150 m (*Applicable until 26 November 2025)*
**110 m (*Applicable on 27 November 2025 until 21 November 2030)*

APPENDIX C – DIMENSIONS AND SLOPES OF OBSTACLE LIMITATION SURFACES – TAKE-OFF RUNWAYS

Take-off climb surface dimensions (in meters and percentages)	**Take-off Runways Code number**		
	1*	**2**	**3 or 4**
Length of inner edge	60	80	180 [b]
Minimum distance of inner edge from runway end [c]	30	60	60
Rate of divergence (each side)	10%	10%	12.5%
Final width	380	580	1200
			1800 [d]
Overall length	1600	2500	15000
Slope	5%	4%	2% [e]

* 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 otherwise specified.

b The length of the inner edge may be reduced to 90 m if the runway is intended to be used by aeroplanes having a mass less than 22,700 kg and operating in VMC by day. In this case the final width may be 600 m, unless the flight path may involve a change of heading in excess of 15°.

c The take-off climb surface starts from the end of clearway if a clearway is provided.

d 1 800 m when the intended track includes changes of heading greater than 15° for operations conducted in IMC or VMC by night.

e See MOS-Aerodromes 7.1.4.14 & 7.1.4.15.

APPENDIX D – STANDARDS FOR PHYSICAL DIMENSIONS AND OBSTACLE LIMITATION SURFACES

Aerodrome characteristics and obstacle limitation surfaces	**Aeroplanes not exceeding 5,700 kg – by night**	**Aeroplanes exceeding 2,000 kg but not exceeding 5,700 kg by day**	**Aeroplanes not exceeding 2,000 kg by day with cross- wind less than 5 knots**
Runway and runway strip			
Runway width	18 m	15 m	10 m**
Runway strip width - graded - total (graded and ungraded)	45 m, 80 m if practicable* 80m * 80 m required for flying training activity	45 m,60 m if practicable # 60 m # 60 m required for flying training activity	30 m** 60 m** ** not permitted for flying training activity
Runway longitudinal slope	2%	2%	2%
Runway transverse slope	2.5%	2.5%	2.5%
Runway strip transverse slope	2.5%	2.5%	2.5%
Approach and take-off climb surfaces			
Length of inner edge	80 m	60 m	30 m
Distance of inner edge before threshold	60 m	30 m	30 m
Divergence, each side	10%	10%	10%
Length of surface	2500 m	1600 m	900 m
Slope	4%	5%	5%
Transitional surface			
Slope (to 45 m height)	20%	20%	20%
Inner horizontal surface			
Height	45 m	45 m	45 m
Radius from runway strip	2,500 m	2,000 m	2,000 m