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Australian Government
Civil Aviation Safety Authority

**MULTI-PART
ADVISORY CIRCULAR
AC 139.E-01 AND AC 175.E-02 V2.0**

**Objects and structures that
affect aviation safety**

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April 2026

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Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

Advisory circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory circulars should always be read in conjunction with the relevant regulations.

Audience

This advisory circular (AC) applies to:

- a person who owns, controls or operates an object or structure, including buildings, telecommunications towers and wind turbines
- a person who owns, controls or operates any plant or equipment which may release emissions source that generates a gaseous efflux into airspace utilised by aircraft
- developers, proponents of new, or changes to, obstacles (including sources of gaseous efflux)
- Airservices Australia (AA)
- certified instrument flight procedure designers
- Department of Infrastructure, Transport, Regional Development, Communication, Sports and the Arts
- local government planning bodies
- Commonwealth, State, Territory or local government authorities
- aerodrome operators
- Department of Defence (Defence).

Purpose

The purpose of this AC is to provide guidance to aerodrome operators and persons involved in the planning, approval, erection, extension or dismantling of objects and structures or emission sources that generate a certain gaseous efflux so that they may understand the vital nature of the information they provide, in relation to the impact on safety of aircraft operations.

The AC demonstrates the range of variables that need to be considered with the management of assessment, risk mitigation and reporting intended to ensure the safe navigation of aircraft.

Information on objects and structures is managed by Airservices Australia (AA). Information is provided to pilots, aircraft operators and a range of aviation organisations so that objects and structures or sources of hazardous gaseous efflux can be identified in the Aeronautical Information Publication (AIP), on aeronautical charts, in NOTAM or included in aeronautical databases.

For further information

For further information or to provide feedback on this AC, visit CASA's [contact us](#) page.

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Status

This version of the AC is approved by the National Manager, Flight Standards Branch.

Note: Changes made in the current version are not annotated. The document should be read in full.

Table 1: Status

Version	Date	Details
v2.0	April 2026	This document: <ul style="list-style-type: none"> merges information from AC 139.E-01 v1.0 - <i>Reporting of tall structures</i> and AC 139.E-05 v1.1 - <i>Obstacles (including wind farms) outside the vicinity of a CASA certified aerodrome</i> is the first AC on reporting of tall objects and structures under Part 175 of CASR provides updated guidance on the collection and reporting of obstacle data on tall objects and structures.
v1.0	December 2021	This version of this document replaces AC 139-08 v2.0 - <i>Reporting of tall structures and hazardous plume sources</i> and has been renumbered to reflect the Part 139 advisory circular standard practices.
v2.0	March 2018	Revised to reflect requirements in Part 175 of CASR.
(0)	April 2005	Initial AC on this subject.

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1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Table 2: Acronyms

Acronym	Description
AA	Airservices Australia
AC	advisory circular
AGL	above ground level
AIP	Aeronautical Information Publication
AIP SUP	Aeronautical Information Publication Supplement
ALARP	as low as reasonably practicable
ALoS	acceptable level of safety
APAR	Airports (Protection of Airspace) Regulations 2026
CASA	Civil Aviation Safety Authority
CASR	<i>Civil Aviation Safety Regulations 1998</i>
CNS	Communications, navigation and surveillance
DAA	defence aviation area
DASA	Defence Aviation Safety Authority
The Department	Department of Infrastructure, Transport, Regional Development, Sports Communication and the Arts
ICAO	International Civil Aviation Organization
IFP	instrument flight procedures
IFPD	instrument flight procedure design
IFR	instrument flight rules
IMC	instrument meteorological conditions
LFA	leased Federal airports
MOS	Manual of Standards
NASF	National Aerodromes Safeguarding Framework
OLS	obstacle limitation surfaces
PANS-OPS	Procedures for air navigation - aircraft operations
RD	rotor diameter

Acronym	Description
TIFP	terminal instrument flight procedure
VOD	vertical obstruction data

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AC and the civil aviation legislation, the definition in the legislation prevails.

Table 3: Definitions

Term	Definition
controlled activities	<p>activities that result in intrusions into prescribed airspace, including:</p> <ol style="list-style-type: none"> a. constructing a building, or other structure, that intrudes into the prescribed airspace; b. altering a building or other structure so as to cause the building or structure to intrude into the prescribed airspace; c. any other activity that causes a thing attached to, or in physical contact with, the ground to intrude into the prescribed airspace; d. operating a source of artificial light, where: <ol style="list-style-type: none"> i the intensity of the light emitted exceeds the level ascertained in accordance with the regulations; and ii the light is capable of blinding or confusing pilots of aircraft operating in the prescribed airspace; e. operating prescribed plant, or a prescribed facility, that reflects sunlight, where: <ol style="list-style-type: none"> i the intensity of the reflected sunlight exceeds the level ascertained in accordance with the regulations; and ii the reflected sunlight is capable of blinding pilots of aircraft operating in the prescribed airspace; f. an activity that results in air turbulence, where: <ol style="list-style-type: none"> i the level of the turbulence exceeds the level ascertained in accordance with the regulations; and ii the turbulence is capable of affecting the normal flight of aircraft operating in the prescribed airspace; g. an activity that results in the emission of smoke, dust or other particulate matter, where: <ol style="list-style-type: none"> i the emission exceeds the level ascertained in accordance with the regulations; and ii the smoke, dust or particulate matter is capable of affecting the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules; h. an activity that results in the emission of steam or other gas, where: <ol style="list-style-type: none"> i the emission exceeds the level ascertained in accordance with the regulations; and ii the steam or gas is capable of affecting the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules.

Term	Definition
	<p>Note: This definition is from the Airports (Protection of Airspace) Regulations 2026 (APAR).</p>
gaseous efflux (plumes)	the continuous release of gas or aerosol from a finite source, such as industrial stacks, vents, flares, or cooling towers, forming an elongated cloud advected by wind or driven by momentum and buoyancy.
NOTAM	a notice issued by the NOTAM Office containing information or instructions 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.
obstacles	<p>Fixed (whether temporary or permanent) and mobile objects, structures, and parts of such objects and structures, that:</p> <ol style="list-style-type: none"> a. are located on an 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 the defined surfaces mentioned in paragraphs (a) and (b) and that have been assessed as being a hazard to air navigation. <p>Note: The defined surfaces in (b) include obstacle limitation surfaces (OLS) and PANS-OPS surfaces.</p>
obstacle limitation surfaces	A series of planes, associated with each runway at an aerodrome, that defines the desirable limits to which objects or structures may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely
objects and structures that affect aviation safety	<p>An object or structure:</p> <ol style="list-style-type: none"> a. that has a maximum height of at least 100 m above ground level; or b. that penetrates an obstacle limitation surface of an aerodrome; or c. that penetrates an obstacle data collection surface, as mentioned in Appendix 8 of Annex 15 to the Chicago Convention; or d. that is an obstacle that is required to be included on an Aerodrome Obstacle Chart—ICAO Type A, as mentioned in Annex 4 to the Chicago Convention; or e. that is an obstacle that is required to be included on an Aerodrome Obstacle Chart—ICAO Type B, as mentioned in Annex 4 to the Chicago Convention; or f. if Airservices Australia (AA) requires data about the object or structure in the interests of aviation safety.
prescribed airspace	airspace specified in, or ascertained in accordance with, the regulations, where it is in the interests of the safety, efficiency or regularity of existing or future air transport operations into or out of an airport for the airspace to be protected under the Airports Act 1996.
in the vicinity of a non-controlled aerodrome	<p>An aircraft is in the vicinity of a non-controlled aerodrome if it is:</p> <ol style="list-style-type: none"> a. in uncontrolled airspace; and b. within 10 nautical miles of the aerodrome (if an aerodrome reference point for the aerodrome is published in the authorised aeronautical information for the flight, the distance must be measured from that point); and c. at a height above the aerodrome that could result in conflict with

Term	Definition
	operations at the aerodrome.

1.3 References

Legislation

Legislation is available on the Federal Register of Legislation website <https://www.legislation.gov.au/>

Table 4: Legislation references

Document	Title
Part 91 of CASR	General operating and flight rules
Part 139 of CASR	Aerodromes
Part 173 of CASR	Standards Applicable to Instrument Flight Procedure Design
Part 175 of CASR	Aeronautical information management
Part 139 Manual of Standards	Aerodromes

Advisory material

CASA's advisory materials are available at <https://www.casa.gov.au/publications-and-resources/guidance-materials>

Table 5: Advisory material references

Document	Title
AC 1-01	Understanding the legislative framework
AC 139.E-02	Plume rise assessments
AC 139.E-03	Laser emissions which may endanger the safety of aircraft
AC 139.E-05	Obstacles (including wind farms) outside the vicinity of a CASA certified aerodrome

International Civil Aviation Organization documents

International Civil Aviation Organization (ICAO) documents are available for purchase from <http://store1.icao.int/>

Many ICAO documents are also available for reading, but not purchase or downloading, from the ICAO eLibrary (<https://elibrary.icao.int/home>).

Table 6: ICAO references

Document	Title
ICAO Annex 4	Aeronautical Charts
ICAO Annex 14	Aerodromes
ICAO Annex 15	Aeronautical Information Services

Document	Title
ICAO Doc 8168	PANS-Aircraft Operations (PANS-OPS) Volume II
ICAO Doc 10066	PANS-Aeronautical Information Management (PANS-AIM)

Other reference material

Table 7: Other reference material

Document	Title
Airports Act 1996	Airports Act 1996
Airports Act 2026	Airports Act 2026
Airports (Protection of Airspace) Regulations 2026	Airports (Protection of Airspace) Regulations 2026
Building Act 1993	Building Act 1993
Civil Aviation (Buildings Control) Regulations 1988	Civil Aviation (Buildings Control) Regulations 1988
Defence Regulation 2016	Defence Regulation 2016
Environmental Effects Act 1978	Environmental Effects Act 1978
Environmental Planning and Assessment Act 1979	Environmental Planning and Assessment Act 1979
Land Use Planning and Approvals Act 1993	Land Use Planning and Approvals Act 1993
The National Airports Safeguarding Framework - Guideline D	Managing the Risk of Wind Turbines Farms as Physical Obstacles to Air Navigation
The National Airports Safeguarding Framework - Guideline F	Managing the Risk of Intrusions into the Protected Airspace of Airports
The National Airports Safeguarding Framework - Guideline G	Protecting aviation facilities - Communication, Navigation and Surveillance (CNS)
Planning Act 2023	Northern Territory Planning Act 2023
Planning, Development and Infrastructure Act 2016	South Australian Planning, Development and Infrastructure (PDI) Act 2016

Document	Title
Planning and Development Act 2007	Australian Capital Territory Planning and Development Act 2007
Planning and Environment Act 1987	Victorian Planning and Environment Act 1987
AS 3891.1:2021	Air navigation - Cables and their supporting structures - Marking and safety requirements: Part 1: Marking of overhead cables and supporting structures
AS/NZS ISO 31000:2018	Risk Management and Guidelines

2 Background

2.1 Risk to aviation operations

- 2.1.1 Objects, structures, certain emissions sources, turbulent air, glint and glare may be hazardous and pose a risk to aviation operations. Those proposing to erect or construct certain objects or structures, or undertake activities that generate a gaseous efflux with a velocity exceeding 4.3 m/s, must notify CASA of their intent. See section 3.1 of this AC for further information on reporting and notifications to CASA. Additionally, operators of certified aerodromes monitor the obstacle limitation services (OLS) for their aerodrome and any infringement, potential infringement or proposed infringement of the OLS to CASA.
- 2.1.2 Existing objects or structures, or proposed objects or structures that are 100 m or more AGL, or gaseous effluxes that exceed 6.1 m/s, may be a hazard to aircraft operations. CASA, upon assessment, may determine the matter is a hazard to aircraft operations and provide notice of any determination. In relation to gaseous effluxes, an efflux exceeding 4.3 m/s must still be reported to CASA, refer to [AC 139.E-02 - Plume rise assessments](#) for more detailed information.
- 2.1.3 Specific to Leased Federal Airports (LFA), the *Airports (Protection of Airspace) Regulations 2026* (APAR) apply. The Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts (the Department) is responsible for the APAR. Controlled activities that penetrate prescribed airspace of an LFA are subject to approval by the Department or their delegate.
- 2.1.4 Typically, pilots must fly at a minimum height of 1,000 ft over cities or populous areas. Outside populous areas they can fly as low as 500 ft above terrain or obstacles. In other areas, pilots must consider objects and maintain a specific height above known obstacles. At night, an aircraft must not be flown at a height less than the lowest height specified in regulation 91.277 of CASR.
- 2.1.5 However, pilots may descend below these altitudes during take-off and landing manoeuvres to/from an aerodrome. Also, some pilots are able to operate at low levels. Such operations occur throughout Australia and include but are not limited to:
- specialist flying activities, such as crop-dusting, cattle mustering, pipeline or powerline inspection or firefighting
 - search and rescue operations
 - military low-level flying operations.
- 2.1.6 Take-off and landing manoeuvres to an aerodrome may include instrument approach and departure operations at certified and military aerodromes. Flight operations conducted under instrument flight rules (IFR) can be conducted at any time during instrument meteorological conditions (IMC) when visibility may be reduced.
- 2.1.7 When developing instrument flight procedures (IFP), designers take into account terrain elevation and known obstacles when determining safe operating altitudes when aircraft are operated under IFR.
- 2.1.8 Under Subpart 139.E of the CASR, all objects 100 m or more above ground level (AGL) are required to be reported to CASA and may need to be published. For further information on obstacles outside the vicinity of an aerodrome, refer to [AC 139.E-05 - Obstacles \(including wind farms\) outside the vicinity of a CASA certified aerodrome](#).
- 2.1.9 Objects and structures below 100 m AGL, such as power transmission lines, can create a hazard to low-level civil and military aircraft operations because they are very thin and difficult to observe with the naked eye. It is recommended that these objects and structures are reported to CASA as well.

- 2.1.10 Introduced turbulence is also a risk to aircraft operations. The level of turbulence and the potential impact on aircraft and aerodrome operations is uncertain. Wind farms can also affect the performance of communications, navigation and surveillance (CNS) equipment operated by AA or Defence. For further information on obstacles outside the vicinity of an aerodrome, refer to [AC 139.E-05 - Obstacles \(including wind farms\) outside the vicinity of a CASA certified aerodrome](#).
- 2.1.11 Gaseous efflux¹ can pose a risk to aircraft operations when vertical and lateral air movements (buoyancy-driven 'plume rise') may exceed an aircraft's ability to maintain normal flight, particularly during critical phases such as take-off, approach or low-level operations. For further information on gaseous efflux, refer to section 3.1 of this AC and [AC 139.E-02 -Plume rise assessments](#).
- 2.1.12 Lasers and high-intensity lights, like sky trackers, pose a serious risk to pilots as the hazardous lights can impair their vision. Visual effects can range in severity from glare, such as oncoming headlights or inability to see outside the aircraft while illuminated, to temporary flash blindness. The increased use of lasers for light displays for entertainment and other commercial purposes requires protection of flight crews from accidental illumination. For further information on risks and hazards created by lasers and lights, refer to [AC 139.E-03 - Laser emissions which may endanger the safety of aircraft](#).

2.2 Regulatory framework

- 2.2.1 Understanding Australia's aviation safety framework and how independent government agencies and the international safety framework under the International Civil Aviation Organisation (ICAO) ensure the safe operation of aircraft is advantageous. For further information on the regulatory framework, refer to [AC 1-01 - Understanding the legislative framework](#).
- 2.2.2 Certified aerodromes need to comply with the requirements of the CASR, and they fall within the oversight of CASA. Part of an aerodrome operator's certification requirement is the need to have a monitoring and reporting process documented in the aerodrome manual.
- 2.2.3 Uncertified aerodromes are not subject to the CASR, and therefore there is no provision for CASA to engage with those aerodromes. CASA does not regulate or oversee the safety of uncertified aerodromes, including obstacle monitoring or management. Operators of certain LFA need to also comply with the APAR. The Department has overall responsibility of matters under the *Airports Act 1996*, including the APAR. Operators of LFA continue to need to comply with the requirements of the CASR.
- 2.2.4 Except for joint-user aerodromes, military aerodromes fall within the responsibility of Defence and are oversighted by the Defence Aviation Safety Authority (DASA). Joint-user aerodromes such as Darwin and Townsville fall within the jurisdiction of CASA, the Department and DASA.
- 2.2.5 In exceptional circumstances, CASA may issue NOTAMs for significant obstacles such as cranes near runways, or for uncertified aerodromes after a safety/risk analysis. However, in cases where obstacles are a risk to aircraft using runways at uncertified aerodromes, the operator should first consider closing or limiting the use of the runway.
- 2.2.6 For any object, structure, activity and thing that does or intends to exceed 100 m or more above ground, CASA may publish a temporary or permanent NOTAM but only when the owner or operator of the matter cannot take responsibility as the aeronautical data originator.
- 2.2.7 Relevant planning authorities may refer objects, structures, activities and things, including sources of emissions that may extend above 100 m AGL or extend above the OLS of an uncertified aerodrome, to CASA. CASA may determine the matter to be a hazard to the safe navigation of aircraft and recommend risk mitigation where appropriate.

¹ Colloquially known as *plumes*.

2.3 Subpart 139.E of the CASR

- 2.3.1 The operator of a certified aerodrome must monitor airspace in the vicinity of the aerodrome, including:
- any proposed, or existing unassessed object or structure that extends obstacle limitation surfaces of an aerodrome
 - any activity that generates a gaseous efflux with a velocity exceeding 4.3m/s
 - other surfaces and obstacles associated with the airspace around an aerodrome associated with instrument flight procedures.
- 2.3.2 The operator of a certified aerodrome must monitor airspace in the vicinity of the aerodrome and report infringements to CASA and AA.
- 2.3.3 In addition to 2.3.1 aerodrome operators should also report:
- penetrations of an obstacle data collection surface, as mentioned in Appendix 8 of Annex 15, Aeronautical Information Services to the Convention on International Civil Aviation (Chicago Convention)
 - any obstacle that is required to be included on an Aerodrome Obstacle Chart—ICAO Type A, as mentioned in Annex 4 to the Chicago Convention
 - any obstacle that is required to be included on an Aerodrome Obstacle Chart—ICAO Type B, as mentioned in Annex 4 to the Chicago Convention.
- 2.3.4 Objects, structures, certain emissions sources that exceed 100 m AGL or more outside the vicinity of an aerodrome, or an OLS, must be reported to AA².

2.4 Airports (Protection of Airspace) Regulations

- 2.4.1 The *Airports (Protection of Airspace) Regulations 2026* apply to all LFA, except for Tennant Creek and Mt Isa. Activities that could penetrate the protected airspace of LFAs must be approved before the proposed penetration is permitted to occur.
- 2.4.2 The *Airports Act 2026* defines any activity resulting in an intrusion into an airport's prescribed airspace to be a 'controlled activity', and requires that controlled activities cannot be carried out without approval. In some instances, the aerodrome operator is delegated to approve certain controlled activities. For further information on [LFA operator responsibilities](#) and *Airports (Protection of Airspace) Regulation 2026*, refer to the Department's website.

2.5 Civil Aviation (Buildings Control) Regulations

- 2.5.1 The *Civil Aviation (Buildings Control) Regulations 1988* regulate construction heights near designated Australian airports to protect airspace, requiring approval for structures that may create hazards. Sydney/Kingsford Smith, Bankstown, Melbourne Tullamarine, Moorabbin, Essendon Fields and Adelaide are subject to the *Civil Aviation (Buildings Control) Regulations 1988*.
- 2.5.2 These regulations are administered by the Department and require prior approval for a building or structure to be constructed in specified areas where a building, structure or object constitutes or may constitute an obstruction, hazard or potential hazard to aircraft flying in the vicinity of the nominated aerodromes.

² Refer to Subpart 175.D of CASR - Aeronautical information management— aeronautical data originators and Subpart 175.E of CASR - Aeronautical information management—objects and structures that affect aviation safety.

2.6 Defence Regulations

- 2.6.1 Airspace may also be regulated by Defence aviation areas (DAAs) declared through *Defence Regulation 2016*. DAAs are established to control activities, structures and objects that may be dangerous to Defence aviation.
- 2.6.2 If the height of a planned structure exceeds the DAA height restriction, or a hazardous object is to be brought into a DAA, an application for approval must be made to Defence prior to the activity taking place. Further information about current DAAs is available at: [Defence aviation areas regulation](#). DAAs are established for all permanent air bases and for Defence exercises.

2.7 The National Airports Safeguarding Framework

- 2.7.1 Each state and territory jurisdiction is responsible for implementing National Airports Safeguarding Framework (NASF) into their respective planning systems. In May 2012, the NASF was agreed to by Commonwealth, state and territory transport ministers at the meeting of the then Standing Council on Transport and Infrastructure.
- 2.7.2 The National Airports Safeguarding Advisory Group (NASAG), comprising of Commonwealth, State and Territory Government planning and transport officials, Department of Defence, the Civil Aviation Safety Authority (CASA), AA and the Australian Local Government Association (ALGA), has developed the National Airports Safeguarding Framework (the Framework).
- 2.7.3 The Framework has implications for anyone working in town planning, residential or commercial development, building construction or related industries. It consists of a set of guiding principles with 9 guidelines relating to aircraft noise, windshear and turbulence, wildlife strikes, wind turbines, lighting distractions, protected airspace, communication equipment, helicopter landing sites and public safety areas at the end of runways.
- 2.7.4 Australia lacks uniform state and territory legislation solely dedicated to aerodrome airspace protection. States and territories may incorporate aviation safeguards into broader planning, building, and environment acts. These require local planning schemes to protect OLS and PANS-OPS via overlays, height restrictions, and consultations with airport operators and CASA. The following demonstrates differences between states and territories regarding obstacle control and monitoring in Australia.

2.7.5 Victoria

- 2.7.5.1 Key laws include the *Planning and Environment Act 1987*, the *Building Act 1993*, and the *Environmental Effects Act 1978*, which mandate airport environs overlays in planning schemes to prevent intrusions into protected airspace.

2.7.6 Queensland

- 2.7.6.1 The State Planning Policy 1/02: Development in the Vicinity of Non-Federal Airports protects operational airspace around state airports by restricting developments penetrating OLS or PANS-OPS, with referrals to airport operators.

2.7.7 New South Wales

- 2.7.7.1 Planning policies under the *Environmental Planning and Assessment Act 1979* implement NASF guidelines via State Environmental Planning Policies (SEPPs), managing obstacles, noise, and windshear near airports.

2.7.8 Western Australia

- 2.7.8.1 State Planning Policy 5.1: Land Use Planning in the Vicinity of Perth Airport limits incompatible development, for example, tall structures, within noise contours and protected airspace.

2.7.9 South Australia

- 2.7.9.1 The *Planning, Development and Infrastructure (PDI) Act 2016*, uses overlays, such as Airport Building Heights, Aircraft Noise Exposure Forecasts, in the state-wide Planning and Design Code to protect airspace around sites like Adelaide Airport.

2.7.10 Tasmania

- 2.7.10.1 The *Land Use Planning and Approvals Act 1993*, where local planning schemes apply airport overlays and height restrictions, aligned with NASF guidelines; council approvals require airport consultation for the introduction of potential obstacles.

2.7.11 Northern Territory

- 2.7.11.1 The *Planning Act 2023*, with NT Planning Scheme Part 4.6.9 (Land in Proximity to Airports) mandates buffers, height limits, and referrals to operators like Darwin Airport; Defence regulations also apply to military-adjacent sites.

2.7.12 Australian Capital Territory

- 2.7.12.1 The *Planning and Development Act 2007* through the Territory Plan, enforces NASF via strategic overlays that restrict developments impacting OLS or PANS-OPS at Canberra Airport, with mandatory assessments by the airport lessee.
- 2.7.12.2 Further information regarding the Framework is available on the Department's website.

2.8 Obstacle Limitation Surfaces

- 2.8.1 Every aerodrome certified under Part 139 of CASR is required to establish obstacle limitation surfaces (OLS). The purpose of these surfaces is to define the volume of airspace that should be kept free from obstacles to minimise the hazards presented by obstacles to an aircraft, either during an entirely visual approach or during the visual segment of an instrument approach.
- 2.8.2 The OLS is a series of imaginary surfaces, associated with the aerodrome and each runway at an aerodrome, that define the limits to which objects, structures, activities and things may project into the airspace around the aerodrome. The OLS will be specific to the aerodrome, its runways and intended aircraft operation. The importance of protecting the OLS is to ensure that aircraft operations at the aerodrome can be conducted safely.
- 2.8.3 Aerodrome operators are required to monitor their OLS both within the aerodrome boundary and outside the boundary. Aerodrome operators can control the development of objects and structures (obstacles) within the aerodrome boundary. Aerodrome operators should engage with relevant planning authorities and the community to ensure when third parties propose to erect objects, structures and things or undertake activities that are likely to infringe the OLS outside the aerodrome boundary they are not likely to be a hazard to aircraft.
- 2.8.4 To ensure ongoing and future aircraft operations to and from the aerodrome are not negatively impacted by obstacles, it is in the best interest of the aerodrome operator to liaise with the proponents and the relevant planning authorities as early as possible.
- 2.8.5 Figure 1 depicts the OLS surfaces surrounding an aerodrome with an instrument precision approach runway. For these aerodromes, the outer horizontal surface extends to 15 km from the aerodrome reference point (ARP) which is effectively the geographical centre of the aerodrome.

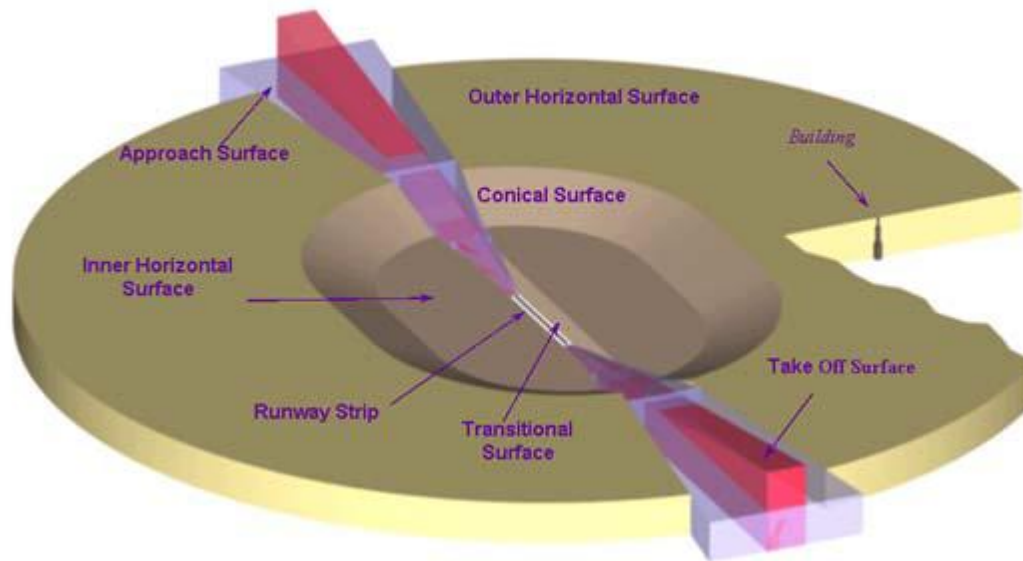


Figure 1: Example of an Obstacle limitation surfaces for an instrument precision approach runway

2.9 Procedures for Air Navigation Services – Aircraft Operations

- 2.9.1 Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS) defines protective surfaces in Australian airspace to ensure obstacle clearance for instrument flight rules (IFR) operations, particularly at airports, where pilots rely on instruments during low visibility. These surfaces normally sit above the Obstacle Limitation Surface (OLS) and safeguard aircraft during approaches, departures, and manoeuvre around navigation aids.
- 2.9.2 The PANS-OPS are used by Part 173 of CASR instrument flight procedure designers primarily in the construction of instrument flight procedures which are designed to safeguard an aeroplane from collision with obstacles and terrain when flying under the IFR.
- 2.9.3 The PANS-OPS surfaces of leased federal airports are also protected under the *Airports (Protection of Airspace) Regulations 2026*.
- 2.9.4 The PANS-OPS surfaces of Defence aerodromes are protected by the DAAs declared through *Defence Regulation 2016*.

2.10 Objects, structures, activities and things that are not a hazard to aviation

- 2.10.1 CASA has determined that objects, structures, activities and things that extend to less than 30 m AGL are not a hazard to aircraft operations, except when:
- the matter penetrates, or is likely to penetrate, the approach, take-off or transitional surface of a runway (including final and take-off area (FATO) of a helicopter landing site)
 - the matter interferes, or is likely to interfere with the protection surface for a CNS surface, or an air traffic management (ATM) including line of sight protection surfaces
 - any instrument flight procedure surface that is lower than the OLS of an aerodrome.

- 2.10.2 Unless the matter penetrates one or more of the above surfaces, CASA does not require obstacles marking, lighting or publication of the matter. However, nothing prohibits the marking, lighting or publication of the matter if determined appropriate by CASA, the owner or operator.

3 Reporting of objects, structures and hazardous plume sources

3.1 What do I need to report?

- 3.1.1 If you are the person who owns, controls, operates or is proposing an object, structure or source of a gaseous emission (i.e., plume) that exceeds or will exceed 4.3 m/s and is either present, planned or has been approved for erection/construction, details need to be provided to CASA about:
- the construction, extension or dismantling (including construction equipment) of objects and structures if the overall elevation is:
 - 100 m or more AGL
 - or
 - exceeds the obstacle limitation surface of an aerodrome as defined in Part 139 of CASR
 - or
 - any gaseous effluxes (plume rises) with a velocity of more than 4.3 m/s (see [AC 139.E-02 - Plume rise assessments](#) for more detailed information on plume rise notifications and interactions between the CASR and the APAR on this specific topic).
- 3.1.2 Information to be provided to CASA should include:
- a. details of the proposal
 - b. the proposed height and location of the object or structure
 - c. if the object or structure includes an emissions source—the details of the velocity and location of the emissions
 - d. the proposed timeframe for constructing or erecting the object or structure
 - e. any other information about the proposal that is prescribed by the Part 139 MOS for the purposes of this paragraph.
- 3.1.3 For information other than gaseous effluxes (plume rises), information should be submitted to CASA at airspace.protection@casa.gov.au. For information relating to plume rises, this should be reported using [Form 1247](#) to anaa.corro@casa.gov.au (see [AC 139.E-02 - Plume rise assessments](#) for more detailed information).
- 3.1.4 CASA may require information from AA, Defence or other service providers to make informed determinations. Where possible, to avoid delays, the information provided to CASA should include this information.
- 3.1.5 In addition, objects and structures may pose a specific hazard for the operation of low-flying civil and Defence aircraft or to the flight paths of arriving/departing aircraft (refer paragraph 2.1.5 and 2.1.6).

Note: Reporting information on permanent obstacles and structures from 30 m AGL or higher within 30 km of a certified or military aerodrome, and 45 m AGL or higher outside 30 km of certified or military aerodromes is recommended so that obstacle databases used for charts can be updated, and to support flight planning.

Unless otherwise required, the reporting of permanent obstacles and structures up to 30 m and 45 m AGL outside the radius mentioned above is for charting purposes only. Unless otherwise required, these items are not subject to an obstacle assessment process.

- 3.1.6 Objects and structures around aerodromes can impact on flight paths to/from the aerodrome, therefore if you are proposing a building, crane operation, wind farm or other structure in the vicinity of an airport or aerodrome:
- for civil certified aerodromes, AA can review your application and provide advice to ensure your proposal does not compromise the operations at the aerodrome. This service is available from AA. Refer to the [Developments at and around airports - on the AA website](#).
 - for Defence aerodromes, you should review the relevant DAA and, if the proposal will exceed the height restriction, currently make an application to Defence (land.planning@defence.gov.au). Further information about DAAs is available at: [Defence aviation areas regulation web page](#).
- 3.1.7 Under Part 173 of the CASR, there are multiple certified instrument flight procedure design (IFPD) organisations other than AA. The relevant IFPD organisation for a particular aerodrome will include their company logo at the bottom of the instrument approach chart as published in the AIP Departure and Approach Procedures (DAP). Their details can also be found on the CASA's website: [Certified instrument flight procedure designers | Civil Aviation Safety Authority](#).
- 3.1.8 The Vertical Obstruction Data (VOD) is a database where airlines and aircraft operators can seek information on obstacles. Information provided for the database should be accurate and readily interpreted. The VOD reporting form has been designed to help owners and/or developers in this respect. The VOD form is available on the AA website (including a spreadsheet for reporting multiple structures) at: [Civil Aviation Safety Regulation Part 175 — Aircservices and You - Aircservices](#), linked under the obstacle owners section.
- 3.1.9 Information about other obstacles or objects that might affect aviation safety, such as power transmission lines and wind monitoring masts, should also be reported to AA in the methods mentioned above, even if these objects and structures are less than 100 m AGL.

3.2 Why do I need to report?

- 3.2.1 If, following the assessment by CASA, the building, structure or wind turbine, etc is determined as posing a hazard to aircraft operations, a recommendation will be made as to whether the risk to aircraft could be mitigated by marking or lighting of the building, structure or wind turbine etc.
- 3.2.2 In addition to the risk to aircraft operations, a collision with an object or structure poses several other risks, such as:
- business continuity if the services provided from the tall structure are unavailable e.g., communications services
 - costs associated with repair/erection of a new structure, or
 - liability issues.
- 3.2.3 The risk an object or structure poses to aircraft safety can be minimised if information about the tall structure is conveyed to pilots, so they can fly at a safe height above the structure. This information can be made available to pilots if an obstacle, including wind turbines, is published on aeronautical charts or included in an obstacle database.

4 Assessment of hazards

4.1 Review by development proponent

- 4.1.1 In the early stages of planning for an object or structure, it is recommended that the proponent engages an aviation consultant to conduct an aeronautical study to determine if the proposed development location will create a risk to the safe navigation of aircraft. It is critical that the proponent consult with those who may operate aircraft nearby to proposed structures and wind farms to prevent adverse impacts to aviation and to ensure the viability of the project.
- 4.1.2 An aeronautical study will identify any aviation safety risks, and the need for mitigation of those risks. The study should provide a detailed assessment of the potential impacts of the proposed development on aviation activities and demonstrate how an acceptable level of aviation safety can be maintained. The aeronautical study should:
- assess the impact of the object or structure on any aviation activity
 - conduct a risk analysis using AS/NZS ISO 31000:2018 *Risk Management and Guidelines*
 - consult with nearby aerodrome (certified and un-certified) operators and aircraft operators known to fly in the area (low flying activities that may include fire spotting and control)
 - consult with AA and Defence to determine whether any nearby aeronautical communications, navigation or surveillance equipment may be affected, or potential impacts to instrument flight procedures, or Australian Defence Force low flying areas
 - provide details of proposed mitigation to ensure an acceptable the level of safety analysis of the effectiveness of each risk control measure
 - recommend operating procedures/restrictions or other means to mitigate risks.
- 4.1.3 All proposed mitigation measures should be assessed to demonstrate they are adequate to reduce risks to an acceptable level.

4.2 Planning authority process

- 4.2.1 A proponent of an object or structure may be required to submit a development application to the relevant planning authority for approval. The planning authority will assess the proposal and relevant supporting documentation that should be provided as part of the development application.
- 4.2.2 The planning authority may seek advice from CASA on the risk to aviation created by the development and/or the proposed mitigation plan if a risk has been identified.
- 4.2.3 CASA will review the development application and aeronautical study and provide advice to the planning authority.
- 4.2.4 The planning authority will usually specify that the proponent will need to ensure that any aviation hazard lighting implemented is in accordance with any CASA recommendations. In relation to an object, structure, activity or thing, for matters outside the vicinity of a certified aerodrome, CASA will inform the planning authority in regard to any decisions or conditions on any approval the planning authority might place on a development.
- 4.2.5 Regardless of CASA advice, planning authorities make the final determination via conditions of consent as to whether an object or structure not in the vicinity of a CASA regulated aerodrome will require lighting or marking. If there is a dispute about the number of, or need for, aviation hazard lighting to be implemented, the matter should be referred to the responsible authority who issues the consent.

4.3 Independent accredited audit

- 4.3.1 Typically, aviation safety assessments are reliant on consultants engaged by proponents preparing reports and other information for the proponent to submit for consideration by the relevant planning authority and CASA.
- 4.3.2 Where an aviation safety assessment supplied by the proponent and a CASA assessment differ in recommendation, it may be appropriate for the responsible authority to consider appointing an independent auditor to review and assess the consultant's aeronautical study and the associated documents to assist the responsible authority to draft conditions.
- 4.3.3 In addition, and if prescribed by the planning authority, once a structure has been approved and constructed, a further audit should be undertaken of the aviation safety requirements to ensure such measures have been properly implemented.

4.4 Interaction between CASR and APAR - LFA only

- 4.4.1 As mentioned in this AC, when objects, structures, activities and things are likely to penetrate the OLS of an aerodrome, the owner or operator of such matters needs to notify the relevant LFA in the first instance. Under the APAR, the operator of LFA needs to manage obstacle matters.
- 4.4.2 The APAR provide the Department, or the airport-operator company (through delegation) authority to approve applications to carry out controlled activities, and to impose conditions on an approval.
- 4.4.3 The delegation to specified airport-operator company officers (airport-operator delegates) relates only to certain short-term (no longer than three months) controlled activities.
- 4.4.4 The APAR and the associated delegations (as amended from time-to-time) provide for approvals for certain categories of controlled activities:
1. short-term controlled activities, OLS intrusions - the airport-operator company (or the Department if referred by the airport-operator company)
 2. long-term controlled activities, including OLS intrusions or intrusions into declared future airspace, but excluding PANS-OPS intrusions - the Department
 3. short-term controlled activities, PANS-OPS intrusions - the Department
 4. long-term controlled activities, PANS-OPS intrusions - these are prohibited.
- All on-airport applications for which the airport-operator company is the proponent (excluding for item 2 above) should be forwarded to the Department for consideration.
- 4.4.5 Nothing in paragraph 4.4.4 obviates the need by a proponent or, by delegation, an aerodrome operator, from their responsibilities under Subpart 139.E of CASR and the need to inform CASA of matters.
- 4.4.6 Where an aerodrome operator coordinates obstacle assessment referrals, any determination provided by CASA, and validation of mitigations provided through the determination, should be conveyed and confirmed by the aerodrome operator.

5 Aviation hazard mitigation

- 5.1 Following CASA or instrument flight procedure designer assessment of any resulting hazard from an infringement, it is the responsibility of the aerodrome operator to advise the relevant planning authority of the result of the assessment and liaise with that authority to ensure hazardous obstacles that are an unacceptable risk to aviation are not approved; or that hazardous objects or structures are appropriately mitigated, e.g. through marking, lighting or charting.

5.2 Obstacle lighting

- 5.2.1 When a determination has been made that an object, structure, activity or thing can penetrate the OLS of a certified aerodrome, lighting should be provided in accordance with section 9.27 of the Part 139 MOS. CASA can also determine that although an object or structure within the OLS of an aerodrome is a hazard to aircraft operations, obstacle lighting is not required.
- 5.2.2 Obstacles outside the OLS of a certified aerodrome that are 150 m or more AGL would normally automatically be considered an obstacle that impacts aviation safety as they intrude into navigable airspace and should be lit.
- 5.2.3 Owners of tall buildings or structures whose apex is below the OLS, or that are less than 100 m AGL, may, of their own volition, provide obstacle lighting to indicate the presence of such buildings or structures at night. To ensure consistency, avoid confusion to pilots, and further the interests of safety both in the air and on the ground, such obstacle lighting should conform with the standards specified in the Part 139 MOS.
- 5.2.4 Powerlines can be a hazard to low-level aircraft operations. AS 3891.1 provides specific air navigation guidance on the standards for the marking and safety requirements (including lighting) of overhead cables and their supporting structures. This guidance includes the OLS, proximity to a certified or non-certified aerodrome and Defence aerodromes. The requirements include colour and location of aircraft warning markers and lights.

5.3 Obstacle marking

- 5.3.1 Any fixed object or structure, whether temporary or permanent in nature, extending above the OLS should be marked in accordance with Chapter 8 Division 10 of the Part 139 MOS.
- 5.3.2 CASA may determine, following an assessment, that an object or structure on, or within the immediate vicinity of the aerodrome is a hazardous obstacle and markings are required.
- 5.3.3 CASA may determine, following an assessment, that an object or structure on, or within the immediate vicinity of the aerodrome is a hazardous obstacle but may remain unmarked because it is:
- sufficiently conspicuous in shape, size or colour; or
 - shielded by another obstacle that is already marked.
- 5.3.4 In accordance with Chapter 9 of the Part 139 MOS, obstacle lighting may be used during the day instead of obstacle marking.

5.4 Obstacle publication - charting

- 5.4.1 Publishing the presence of obstacles through aeronautical information publications such as aeronautical charts is critical. Charting obstacles allows pilots to take them into consideration in pre-planning their flights and determining whether a place is safe for their intended operation. Publication on aeronautical charts is required for objects and structures that are 100 m or more AGL.

6 Reporting of objects and structures

6.1 Obstacle database

- 6.1.1 The aviation community has identified a need to have information on objects, structures, activities and things that may affect an aircraft in flight available for publication on aeronautical charts and, more importantly, available in an obstacle database.
- 6.1.2 The information about obstacles is held in a central database that is managed by AA and any requests for data are available on the AA website: [Data, Airservices portal - Airservices Australia](#).
- 6.1.3 CASA recommends that the owners and operators of permanent objects, structures and things report when the obstacle is:
- 30 m AGL or higher within 30 km of a certified or military aerodrome
 - 45 m AGL or higher outside 30 km of certified or military aerodromes.
- 6.1.4 Reports should be made to the vod@airservicesaustralia.com using either the [Vertical obstruction data \(VOD\) form](#) or [Multiple vertical obstruction data spreadsheet](#).

6.2 Aeronautical Information Publication (AIP)

- 6.2.1 Aerodrome obstacle data is published in the [AIP](#) (available on the AA website) in the En Route Supplement Australia (ERSA).

6.3 Aeronautical charts

- 6.3.1 Aerodrome obstacle data is published on the visual charts and those associated with an aerodrome:
- [World Aeronautical Chart \(WAC\)](#) - 1:1,000,000 series
 - [Visual Navigation Chart \(VNC\)](#) - 1:500,000 series
 - [Visual Terminal Chart \(VTC\)](#) - 1:250,000 series
 - [Aerodrome Obstacle Chart – ICAO Type A and B](#) (from the aerodrome operator when provided)
 - Aerodrome Terrain and Obstacle Chart – ICAO (Electronic) - when available
 - [Aerodrome and Terminal Instrument Flight Procedure \(TIFP\) Charts](#) (included in Departure and Approach Procedures (DAP))

6.4 NOTAMs

- 6.4.1 The primary purpose of a NOTAM is to alert pilots and other airspace users to temporary changes or potential hazards that could affect the safety of flight operations. They can also be issued permanently if the information is to be incorporated in the AIP, aeronautical charts and obstacle databases.
- 6.4.2 The operators of a certified aerodrome are required to issue a NOTAM when a new obstacle is identified that penetrates the OLS. NOTAMs are also required when there is an obstacle light outage to inform pilots of the hazard.
- 6.4.3 The person or organisation who owns, or is in occupation, or control of an object or structure is responsible for requesting the issuing of NOTAMs for any obstacle light outages.

- 6.4.4 Instrument flight procedure designers publish NOTAMs when their TIFPs require adjustment in relation to an obstacle that penetrates the PANS-OPS surface.
- 6.4.5 AA is responsible for issuing NOTAMs for new or updated obstacles 92 m (300 ft) or more AGL.
- 6.4.6 AA provides guidance for those NOTAM authorised persons responsible for raising NOTAM:
- for certified aerodromes, a NOTAM should be raised in accordance with the [Airservices Australia NOTAM data quality requirements for aerodrome operators](#)
 - for defence aerodromes, a NOTAM should be raised in accordance with [NOTAM Data Quality Requirements for Australian Defence Force](#)
 - for certified instrument procedure design organisations, a NOTAM should be raised in accordance with [NOTAM Data Quality Requirements for CASR Part 173 Certified Instrument Procedure Design Organisations](#)
 - for Airservices Australia, a NOTAM should be raised in accordance with [NOTAM Data Quality Requirements for Airservices](#)
- 6.4.7 A temporary NOTAM should not be active for more than 3 months. A NOTAM with an estimated end time that unexpectedly exceeds the maximum 3-month period may be extended for a further period of up to 3 months. Any further extension of time should be via the issuing of an AIP Supplement (AIP SUP).
- 6.4.8 At any given time, there is the potential for a large volume of NOTAMs around some aerodromes in populated areas, where there are many tall objects, structures, activities and things. To ensure the NOTAM system is not saturated by too many obstacle NOTAMs, an AIP Supplement (AIP SUP) should be issued instead.
- 6.4.9 Additionally, any temporary changes of long duration (exceeding 3 months) will be published as an AIP SUP. When required, a temporary NOTAM may be issued to bridge the period between required notification and AIP SUP publication.
- 6.4.10 NOTAMs regarding crane operations are exempt from the above requirements and may be continually reviewed in 3-month increments. However, aerodromes with a published AIP SUP for non-permanent NOTAMs should consider including long term crane information in their AIP SUP.