



# Aeronautical Impact Assessment

Qantas Airways Ltd  
Flight Training & Simulation Centre  
297 King Street, Mascot, NSW

APP for Qantas Airways Ltd

LB00324

Final V1  
15 April 2019

Landrum & Brown Worldwide (Aust) Pty Ltd, 2019

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# 1 Introduction

Landrum and Brown Worldwide Australia Pty Ltd (L&B) has been commissioned by Qantas Airways Ltd (Qantas) to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the **SSD 10154** for the development of a new flight training centre (the project) at 297 King Street, Mascot (the Project).

New South Wales Roads and Maritime Services (RMS) have developed a proposal to widen Qantas Drive at the Airport to create a Gateway corridor, connecting the new Westconnex to the Airport precinct. The proposed widening of Qantas Drive will impact on existing Qantas Building 148, on the Airport Precinct, which houses the Simulator and Emergency Procedures training departments.

This facility is critical to the ongoing operation of Qantas Group. Apart from the physical impact of the roadway onto B148, the noise and vibration of the ongoing works is deemed likely to adversely affect the simulator training sessions which would cause stoppages in training and thus cause an unacceptable impact to the airline.

The timeframe for the Gateway project requires that Qantas must vacate B148 by June 2021. As this building is critical to the Airline's operations, a Project Programme has been developed to allow the transfer of the Simulator and Emergency Procedures training departments to a new facility by June 2021.

## 1.1 Description of Site and Locality

The site is located at 297 King Street, Mascot and comprises land known as Lots 2&4 DP 234489, Lot 1 DP 202747, Lot B DP 164829 and Lot 133 DP 659434.

The site is identified in Figures 1 and 2.

Key features of the site are as follows:

- The site is approximately 5.417ha and is an irregular shape. It is approximately 240m in length and maintains a variable width of between approximately 321m in the northern portion of the site and approximately 93m along the King Street frontage (refer to Figures 1 and 2).
- The site possesses a relatively level slope across the site. An open Sydney Water drainage channel bisects the northern portion of the site in an east-west direction. There are some isolated changes in level immediately adjacent to this channel. A Site Survey Plan accompanies the application which details the topographic characteristics of the site.
- Multiple mature Plane Trees are scattered throughout the site. A variety of native and exotic trees and vegetation also exist around the perimeter of the site which help screen the site from surrounding uses.
- Site improvements include at-grade car parking for Qantas staff, an industrial shed to store spare aviation parts, a substation, a disused gatehouse, a Sydney Water Asset with two driveways over it, the Qantas catering facility and Qantas tri-generation plant.
- The site forms part of a larger land holding under the ownership of Qantas that generally extends between Qantas Drive to the west, Ewan Street to the south, Coward Street to the north, with the Qantas "Corporate Campus" fronting Bourke Road.
- Vehicular access to the site from the local road network is available from King Street. The site has intra-campus connections along the northern boundary in the form of two connecting driveways in the north-eastern and north-western corner of the site along the northern boundary which link it to the broader Mascot Campus.
- The site is located within the Bayside LGA.

Key features of the locality are:

- **North:** The site is bounded to the north low scale industrial development, beyond which is Coward Street. Further north of the site is the Mascot Town Centre which is characterised by

transport-oriented development including high density mixed-use development focussed around the Mascot Railway Station.

- **East:** The site is bordered to the east by commercial development including a newly completed Travelodge hotel which includes a commercial car park. Additional commercial development to the east includes the Ibis Hotel and Pullman Sydney Kingsford Smith Airport (the Airport) fronting O’Riordan Street.
- **South:** The site is bounded to the south by King Street, beyond which is Qantas owned at-grade car parking and other industrial uses. Further south is the Botany Freight Rail Line and Qantas Drive beyond which is the Domestic Terminal at Sydney Kingsford Smith Airport (the Airport).
- **West:** The site is bordered to the west by the Botany Freight Rail Line and Qantas Drive, beyond which lies the Airport and the Qantas Jetbase (location of the current Flight Training Centre).

The site is located 2.1 km north-east from the Airport aerodrome reference point (ARP), 1 km north of the threshold for Runway 25, 2.5 km north of threshold for Runway 16L and 1.4 km east of the threshold for TWY 16R.

The development comprises buildings with a maximum height of 47.53 m AHD. Refer to Appendix A for site elevation details.

Figure 1 depicts the boundaries of the site. A detailed site layout is shown at Appendix A.

Figure 2 provides an overview of the site location in relation to the runway layout at the Airport.

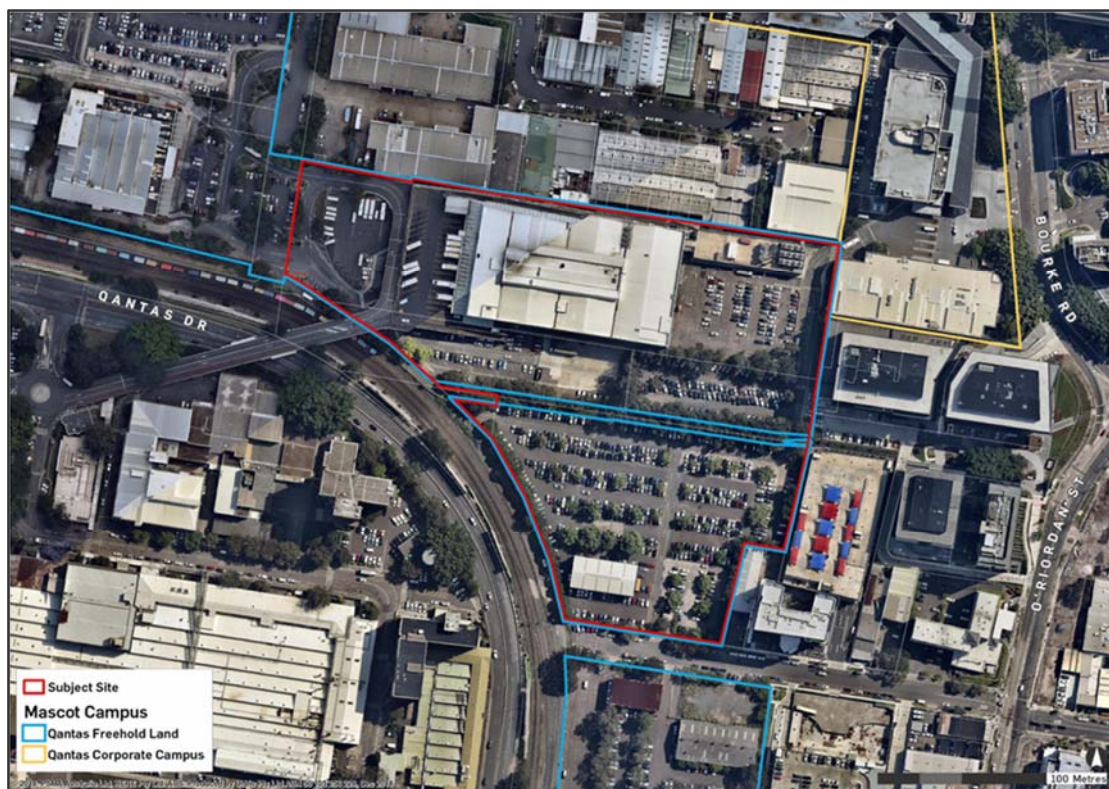


Figure 1: The Site (Source: Qantas Airways LTD)



**Figure 2: Development site in relation to Sydney Kingsford Smith Airport (the Airport) (Source: Google Earth and L&B)**

## 2 Project description

Safety is Qantas' first priority.

The flight training centre is a key pillar of this value. The facility enables pilots and flight crews to undertake periodic testing to meet regulatory requirements by simulating both aircraft and emergency procedural environments. The Project seeks consent for the construction and operation of a new flight training centre, and associated ancillary uses including a multi-deck car park.

The Project is comprised of the following uses:

### **Flight Training Centre**

The proposed flight training centre will occupy the southern portion of the site.

It is a building that comprises 4 core elements as follows:

- An emergency procedures hall that contains;
  - aircraft cabin evacuation emergency trainers,
  - an evacuation training pool,
  - door trainers,
  - fire trainers
  - slide descent towers,
  - security room,
  - aviation medicine training and equipment rooms.
- A flight training centre that contains:
  - a flight training hall with 14 bays that will house aircraft simulators,
  - integrated procedures training rooms, computer rooms, a maintenance workshop, storerooms, multiple de-briefing and briefing rooms, pilot's lounge and a shared lounge.
- Teaching Space that contains
  - training rooms,
  - classrooms and two computer based exam rooms.
- Office Space
  - Office space for staff and associated shared amenities including multiple small, medium and large meeting rooms, think tank rooms, informal meeting spaces, a video room and lunch/tea room.
- Ancillary spaces including the reception area at the ground floor, toilets, roof plant and vertical circulation. The external ground floor layout will include a loading dock, at-grade car parking for approximately 39 spaces and a bus drop-off zone at the northern site boundary.

### **Car Park**

The proposed multi-deck car park will be located to the north-east of the flight training centre and adjacent the existing Qantas catering facility and tri-generation plant. The car park is 13 levels and will provide 2059 spaces for Qantas staff. Vehicle access to the car park will be provided via King Street, Kent Road and from Qantas Drive via the existing catering bridge.

The top height will be 47.53 m AHD.

## **3 Prescribed Airspace**

### **3.1 Overview**

Prescribed Airspace for an airport is the airspace above any part of either an Obstacle Limitation Surface (OLS), a PANS OPS (Procedures for Air Navigation Services – Aircraft Operations) surface, or the Radar Terrain Clearance Chart (RTCC) protection surfaces.

The OLS are conceptual surfaces associated with an airport's runways that are designed to protect aircraft operations from unrestricted obstacle growth. The OLS comprises the following:

- outer horizontal surface (OHS);
- conical surface;
- inner horizontal surface (IHS);
- approach surface;

- inner approach surface;
- transitional surface;
- inner transitional surface;
- baulked landing surface; and
- take-off climb surface.

The outer segments of the OLS for airports with precision instrument approaches, such as Sydney Kingsford Smith Airport, extend to 15 km from the airport's aerodrome reference point (ARP).

PANS OPS surfaces are designed around instrument approach and departure flight paths with a prescribed minimum obstacle clearance from structures or terrain. They designate an obstacle-free flight path to enable safe and efficient aircraft operations in Instrument Meteorological Conditions (IMC).

The RTCC provides Air Traffic Control (ATC) with a minimum safe altitude above terrain and obstacles to which they can provide surveillance services to aircraft in the area around major airports.

Infringement by a building or crane through the OLS requires the support of Sydney Airport Corporation Limited (SACL), the Civil Aviation Safety Authority (CASA) and the approval of the Department of Infrastructure, Regional Development and Cities (DIRDC) where the airport is on federally leased land.

The aviation authorities do not support infringement of PANS OPS or RTCC protection surfaces.

## 3.2 OLS Assessment

The lowest segment of the Airport's OLS, overhead the project site, is the Inner Horizontal Surface, which at this location, is at a height of 51m.

The maximum height of the Project at 47.53 m does not infringe the Airport's OLS and does not require approval by SACL.

Figures 3 and 4 depict the location of the Project in relation to the Airport's OLS.

The Project site is also beneath both the Take-Off Surface and the Approach Surface for Runway 16L/34R of the Airport's OLS, which continues to increase in height above the IHS. The south east corner of the Project is coincident with where the Take-Off Surface and the IHS intersect at 51 m AHD.

Any long term construction crane activity or permanent rooftop exhaust plumes above the top of the Project are likely to infringe the OLS and therefore would require approval from SACL.

Such approval is unlikely due to the site being located so close beneath the Approach Surface of the OLS to Runway 16L and the Take-Off Surface to Runway 34R. These segments of the OLS are considered critical in protecting the regularity and safety of flight operations to/from these runways.

The building developer will need to consider the building's construction methodology to ensure that construction activity is compatible with regular and safe flight operations at the Airport.

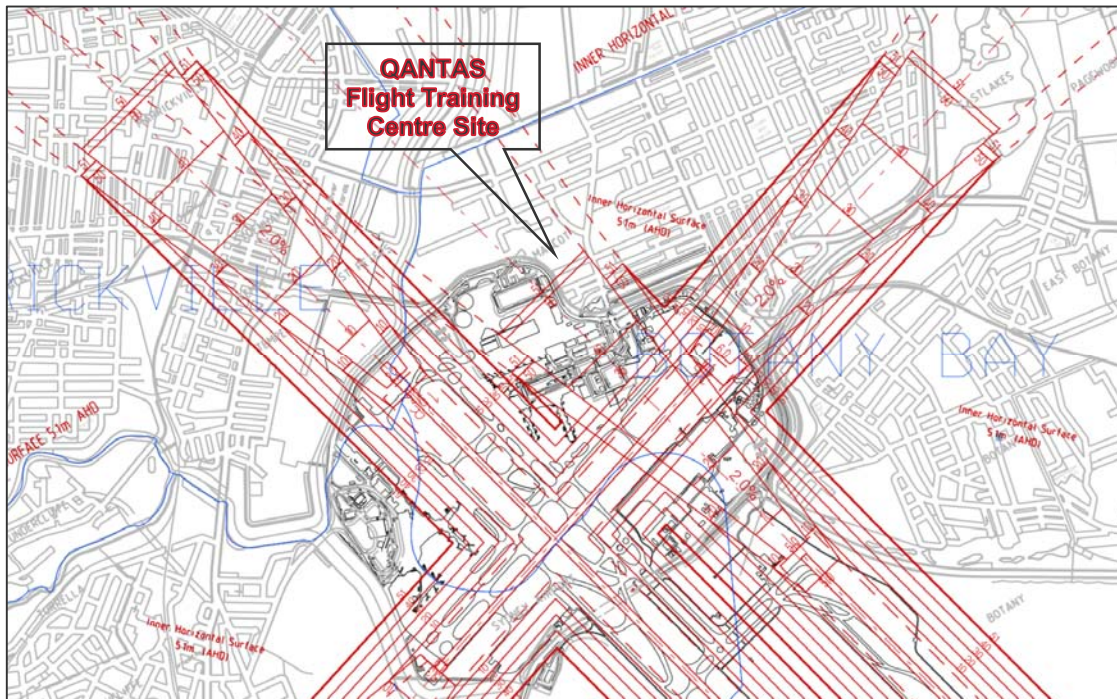


Figure 3: The Project location shown in relation to the Airport's OLS (SACL Masterplan 2015)

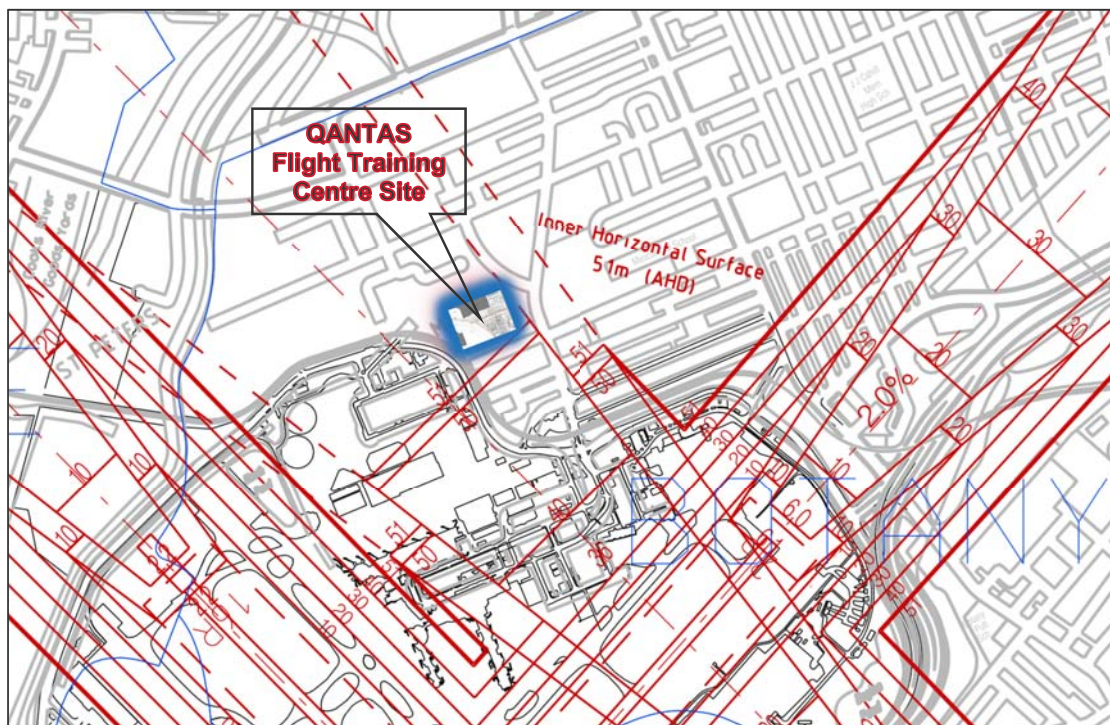


Figure 4: The Project Location in relation to OLS – Close Up. (SACL Masterplan 2015)

### 3.3 PANS OPS Assessment

The Airport's PANS OPS surfaces were assessed in detail for the Project by reference to the Aeronautical Information Publication – Australia (AIP) effective 23 May 2019.

The lowest PANS OPS surface identified is related to the Basic ILS surfaces of the Runway 16L ILS approach at 55.1 m AHD.

At a maximum height of 47.53 m AHD, the Project will not infringe this surface.

Construction cranes or exhaust plumes up to a maximum height of 55 m AHD will not infringe the PANS OPS surfaces but will require approval from the aviation authorities for the infringement of the OLS above 51 m AHD. Such approval is unlikely due to the site being located so close beneath the Approach Surface of the OLS to Runway 16L and the Take-Off Surface to Runway 34R. These segments of the OLS are considered critical in protecting the regularity and safety of flight operations to/from these runways.

## 4 ATC Surveillance System Performance

This assessment identified two radars in relative proximity to the Project.

These are the Airport Terminal Area Radar (TAR), and the Cecil Park TAR.

Table 1 shows that the Project does not infringe the Clearance Planes for either ATC surveillance system and is therefore unlikely to have an impact on ATC surveillance services in the area.

Construction cranes are not considered to have an impact on the performance of the ATC surveillance system.

Surveillance System	Distance from development (m)	Antenna Elevation (m AHD)	Clearance Plane Elevation at The Project Distance x Tan 0.5° + TAR elevation (m)	Result for development height of 47.53 m AHD (m)
<b>Sydney Kingsford Smith Airport TAR</b>	2435	38.2	59.5	11.97
<b>Cecil Park TAR</b>	32645	200.5	485.4	437.87

Table 1: Impact of development on ATC Surveillance System Performance

## 5 Navigation Aid Performance

There are a number of navigation aids installed at the Airport, including ILS, GBAS and DME.

Airservices Australia's Building Restricted Areas (BRA) describes a sensitive zone that exists to a radius of 3,000 m from most of the navigation aid antenna sites.

The building development limitations within the BRA are specified in the Airservices Australia document Navigation Aid Building Restricted Areas and Siting Guidance AEI-7.1613 Issue 2.

The Project site is located further than 3,000 m from the GBAS Landing System (GLS) antenna, outside the protection zones for all of the ILS antenna and outside of the assessment radius of 1500 m for the Distance Measuring Equipment (DME) antenna.

The Project does not infringe any Building Restricted Area associated with aviation navigation aids located on the Airport and is therefore unlikely to have an impact upon aviation navigation aid performance or service in the area.

## 6 Roof Top Exhaust Plumes

Exhaust plumes in excess of 4.3 m/s that infringe the OLS or PANS OPS surfaces can create sufficient turbulence to upset the stability of aircraft during take-off and landing operations.

Roof top exhaust plume rises in excess of 4.3 m/s must be referred to CASA for their assessment of risk to aircraft operations.

## 7 Obstacle Lighting

As the Project does not infringe the OLS, obstacle lighting for the building is unlikely to be required by CASA. (Manual of Standards Part 139 – Aerodromes, Chapter 9.4 *Obstacle Lighting*.)

## 8 Cranes

An application to SACL is required at a later date for the construction cranes, once height requirements, construction methodology and duration of crane operations are known.

Construction crane activity above the top of the Project are likely to infringe the OLS and therefore would require approval from SACL. Such approval will be contingent upon understanding the construction methodology of the building once final designs are available. The site is located within the lateral limits of the Approach Surface of the OLS to Runway 16L and the Take-Off Surface to Runway 34R, almost immediately beneath these surfaces. These segments of the OLS are considered critical in protecting the regularity and safety of flight operations to/from these runways.

The building developer will need to consider the building's construction methodology to ensure that construction activity is compatible with regular and safe flight operations at the Airport. The curfew at The Airport may provide an opportunity for temporary crane operations for the latter stages of construction when Runway 16L/34R is not required.

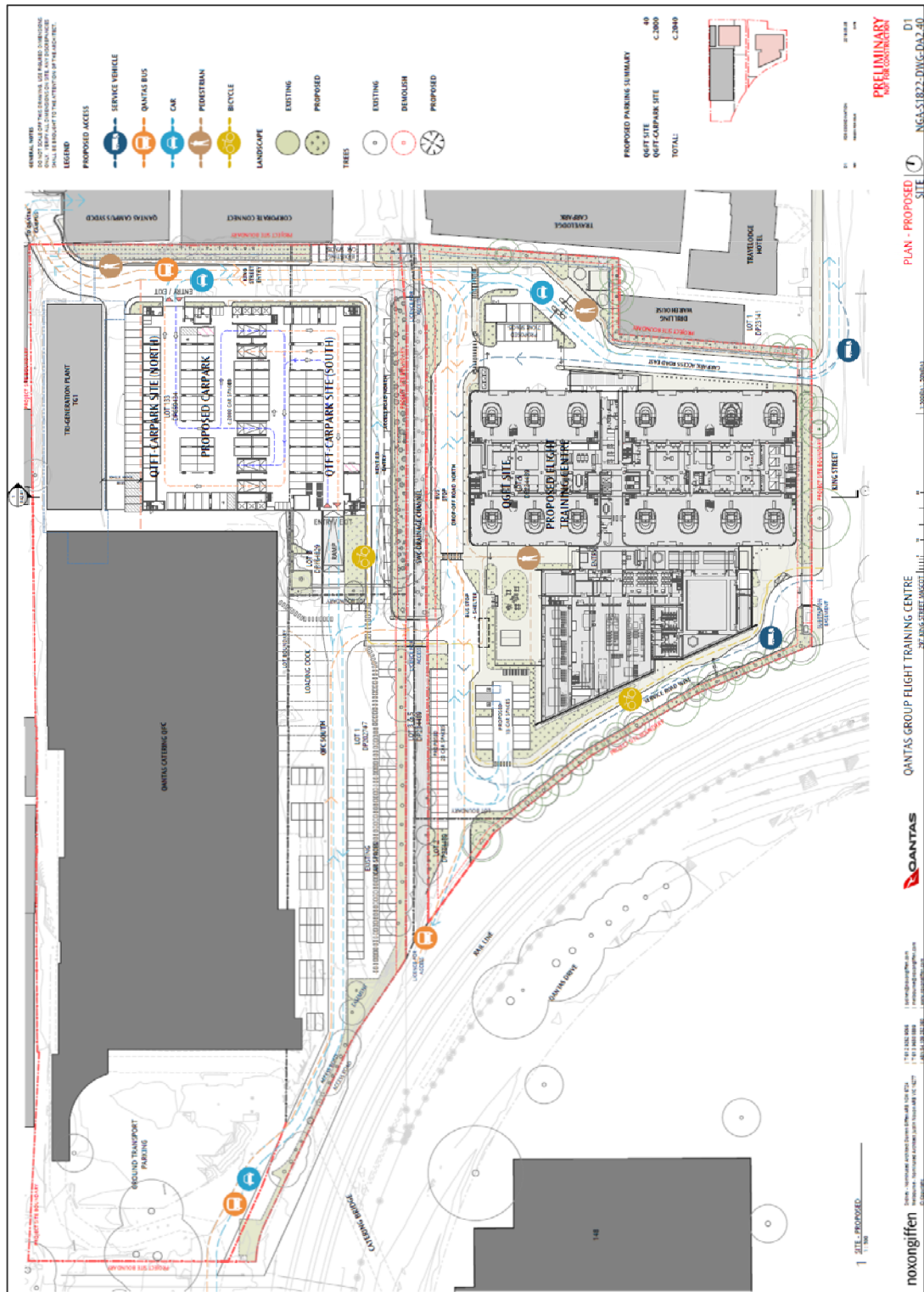
## 9 Conclusion

The proposed Project at 297 King Street, Mascot, to a maximum height of 47.53 m AHD:

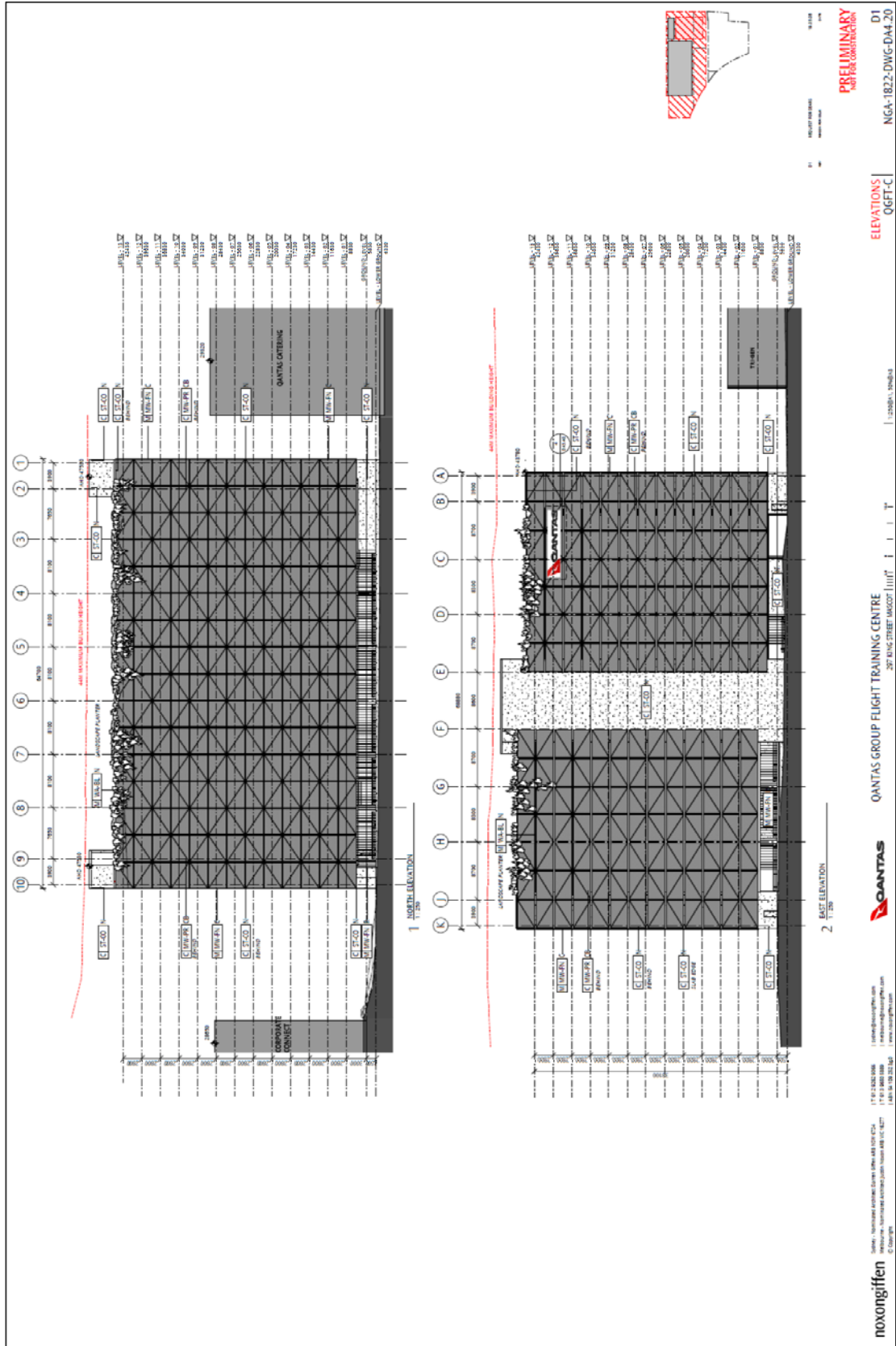
- will not infringe the OLS for Sydney Kingsford Smith Airport;
- will not infringe the PANS OPS surface for the Airport;
- will not infringe the BRA for navigation aids at the Airport; and
- will not infringe the ATC Radar clearance planes.

Construction crane activity and methodology will need consideration prior to gaining approval from SACL and DIRDC, so that it can be shown that the Project will not cause disruption to the safety and regularity of flight operations at Sydney Kingsford Smith Airport.

## Site Layout and Elevation



**Plan View (Source: Noxon Griffin P/L)**



South and West Elevations showing maximum building height 47.530 m AHD (Source: Noxon Griffen P/L)

## Appendix B

### Assessment Methodology

In preparing aeronautical impact assessments associated with airport safeguarding and protection, it is necessary to observe the requirements of the relevant aviation authorities including:

- The Department of Infrastructure, Regional Development and Cities (DIRDC);
- The Civil Aviation Safety Authority of Australia (CASA);
- Airservices Australia (ASA);
- Airport Operators; and
- Department of Defence where appropriate.

The *Airports Act 1996* and *Airports (Protection of Airspace) Regulations 1996* prescribes the volumes of airspace surrounding Federally Leased Airports that protect aircraft operations into those airports, in order to ensure the safety and regularity of airline and other flight operations.

Sydney Kingsford Smith Airport (the Airport)'s Prescribed Airspace comprises:

- Obstacle Limitation Surfaces (OLS) that restrict obstacle growth in the vicinity of takeoff and landing paths; and
- PANS OPS surfaces that provide a buffer between flight paths and terrain or obstacles.

Relevant Acts and Regulations applicable to developments near airports and air traffic routes were referenced during this assessment.

The major relevant documents include:

- The Airports Act 1996, Airports (Protection of Airspace) Regulations 1996;
- Civil Aviation Safety Regulation (CASR) Part 139 Manual of Standards – Aerodromes;
- Aeronautical Information Publication (AIP);
- Airservices Australia's Airways Engineering Instruction – Navigation Aid Building Restricted Areas and Siting Guidance (BRA);
- International Civil Aviation Organization (ICAO) DOC 8168 Procedures for Air Navigation – Aircraft Operations (PANS OPS).

A Glossary of Aeronautical Terms and Abbreviations is shown at Appendix C.

## Appendix C

### Glossary of Aeronautical Terms and Abbreviations

To facilitate the understanding of aviation terminology used in this report, the following is a glossary of terms and acronyms that are commonly used in aeronautical impact assessments and similar aeronautical studies.

**Advisory Circulars (AC)** are issued by CASA and are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means, of complying with the *Regulations*.

**Aeronautical Information Publication (AIP)** is a publication promulgated to provide operators with aeronautical information of a lasting character essential to air navigation. It contains details of regulations, procedures and other information pertinent to flying and operation of aircraft within the applicable country. AIP Australia is produced by Airservices Australia under contract to CASA.

**Aeronautical study** is a tool used to review aerodrome and airspace processes and procedures to ensure that safety criteria are appropriate.

**Air routes** exist between navigation aids or waypoints to facilitate the regular and safe flow of aircraft operating under the IFR.

**Airservices Australia (ASA)** is the Australian government-owned corporation Air Navigation Service Provider (ANSP) providing safe, secure, efficient and environmentally sound air traffic management and related airside services including telecommunications, aeronautical data, navigation services and aviation rescue and firefighting services to the aviation industry within the Australian flight information region.

**Air Traffic Control (ATC)** service is a service provided in controlled airspace for the purpose of preventing collisions between aircraft and between aircraft and obstructions on the manoeuvring area of controlled aerodromes whilst maintaining an expeditious and orderly flow of air traffic.

**Altitude** is the vertical distance of a level, a point or an object, considered as a point, measured from mean sea level.

**Area navigation (RNAV)** A method of navigation which permits aircraft operation on any desired flight path within the coverage of the station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

**Circling approach** An extension of an instrument approach procedure which provides for visual circling of the aerodrome prior to landing.

**Civil Aviation Safety Authority (CASA)** is the Australian government authority responsible under the *Civil Aviation Act 1988* for developing and promulgating appropriate, clear and concise aviation safety standards. As Australia is a signatory to the ICAO *Chicago Convention*, CASA adopts the standards and recommended practices established by ICAO, except where a difference has been notified.

**Civil Aviation Safety Regulations (CASR)** are promulgated by CASA and establish the regulatory framework (*Regulations*) within which all service providers must operate.

**Civil Aviation Act 1988** (the Act) establishes the CASA with functions relating to civil aviation, in particular the safety of civil aviation and for related purposes.

**Decision altitude (DA) or decision height (DH)** A specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. *Note— Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.*

**Elevation** The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

**Height** The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

**Instrument Flight Rules (IFR)** are rules applicable to the conduct of flight under IMC. IFR are established to govern flight under conditions in which flight by outside visual reference is not available due to cloud cover or restricted visibility. IFR flight depends upon a qualified instrument rated pilot flying by reference to instruments located in the flight deck. Navigation is accomplished by reference to electronic signals. It is also referred to as, “a term used by pilots and controllers to indicate the type of flight plan an aircraft is flying,” such as an IFR or VFR flight plan. IFR flights can and do regularly operate in VMC but remain an IFR flight for rule and ATC requirements. Regular Public Transport flights are required to file an IFR flight plan, irrespective of the weather conditions.

**Instrument Meteorological Conditions (IMC)** are meteorological conditions that are less than the minimum specified for visual meteorological conditions.

**International Civil Aviation Organization (ICAO)** is an agency of the United Nations which codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. The ICAO Council adopts standards and recommended practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation. In addition, the ICAO defines the protocols for air accident investigation followed by transport safety authorities in countries signatory to the Convention on International Civil Aviation, commonly known as the *Chicago Convention*. Australia is a signatory to the *Chicago Convention*.

**Jetbase** Qantas leased land within the boundaries of Sydney Kingsford Smith Airport.

**Lowest Safe Altitude (LSALT)** are published for each low level air route segment. Their purpose is to allow pilots of aircraft that suffer a system failure to descend to the LSALT to ensure terrain or obstacle clearance in IMC where the pilot cannot see the terrain or obstacles due to cloud or poor visibility conditions. It is an altitude that is at least 1,000 feet above any obstacle or terrain within a defined safety buffer region around a particular route that a pilot might fly.

**Manual of Standards (MOS)** comprises specifications (Standards) prescribed by CASA, of uniform application, determined to be necessary for the safety of air navigation in relation to a particular segment of the aviation regulations. For example, MOS 139 relates to CASR Part 139 – Aerodromes.

**Mascot Campus** Over 19ha of Qantas Airways Limited controlled land in Mascot to the north of Sydney Kingsford Smith Airport consisting of freehold and leased land.

The following lots are owned by Qantas: Lot 133 DP 659434; Lots 4 & 5 DP 38594 Lot 23 DP 883548; Lots 1 & 2 DP 738342; Lot 3 DP 230355; Lot 4 DP 537339; Lots 2 & 4 DP 234489; Lot 4 234489; Lot 1 DP 81210; Lot 1 DP 202093; Lot 1 DP 721562; Lot 2 DP 510447; Lot 1 DP 445957; Lot B DP 164829 and Lot 1 DP 202747 and equates to 16.5ha of land.

The following lots are leased by Qantas: Lot 14 DP 1199594 and Lot 2 DP 792885 and equates to 2.7ha of land.

**Minimum descent altitude (MDA) or minimum descent height (MDH)** A specified altitude or height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference. Note: Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.

**Minimum Obstacle Clearance (MOC)** is the minimum distance above an obstacle or terrain that aircraft conducting instrument approach or departure procedures are not allowed to fly below in IMC. The MOC varies depending on the distance from the runway or in mountainous areas.

**Notices to Airmen (NOTAMs)** are notices issued by the NOTAM office 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.

**Obstacles** All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

**Obstacle assessment surface (OAS)** is a defined surface intended for the purpose of determining those obstacles to be considered in the calculation of obstacle clearance altitude/height for a specific APV or precision approach procedure.

**Obstacle Limitation Surfaces (OLS)** are a series of planes associated with each runway at an aerodrome that defines the desirable limits to which objects may project into the airspace around the aerodrome so that aircraft operations may be conducted safely.

**Prescribed airspace** is an 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. The prescribed airspace for an airport is the airspace above any part of either an OLS or a PANS OPS surface for the airport and airspace declared in a declaration relating to the airport.

**Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS)** is an ICAO term denominating rules for designing instrument approach and departure procedures. Such procedures are used to allow aircraft to land and take off under Instrument Meteorological Conditions (IMC) using the Instrument Flight Rules (IFR). ICAO document 8168-OPS/611 (volumes 1 and 2) outlines the principles for airspace protection and procedure design which all ICAO signatory states must adhere to.

**PANS OPS Surfaces** Similar to an Obstacle Limitation Surface, the PANS-OPS protection surfaces are defined surfaces in space, below the nominal flight path of the aircraft, which guarantee a certain minimum obstacle clearance above the ground or man-made obstacles. These surfaces may be used as a tool for local governments in assessing building developments. Where buildings may (under certain circumstances) be permitted to penetrate the OLS, they cannot be permitted to penetrate any PANS OPS surface, because the purpose of these surfaces is to guarantee pilots operating in IMC an obstacle free descent or climb path for a given approach, holding procedure or departure. Some PANS OPS surfaces may be adjusted to accommodate critical infrastructure.

## **Regulations** Civil Aviation Safety Regulations

**Sydney Gateway Project** A RMS Project including a road and rail component that is intended to increase capacity and improve connections to the ports to assist with growth in passenger, freight and commuter movements across the region, by expanding and improving the existing road and freight rail networks.

**Threshold (THR)** The beginning of that portion of the runway usable for landing.

**The Project** The construction of a new Flight Training Centre and ancillary uses to replace the existing facility on the Qantas Jetbase that will be impacted by RMS' Sydney Gateway Project.

**The Site** Qantas Airways Limited owned land in Mascot to the north of Sydney Kingsford Smith Airport consisting of Lots 2&4 DP 234489, Lot 1 DP 202747, Lot B DP 164829 and Lot 133 DP 659434. Current site improvements include including at-grade car parking for Qantas staff, an industrial shed to store spare aviation parts, a substation, a disused gatehouse, a Sydney Water Asset with two driveways over it, the Qantas catering facility and Qantas tri-generation plant.

**Visual Flight Rules (VFR)** are rules applicable to the conduct of flights that are only permitted in VMC due to aircraft equipment and pilot qualifications. The visual flight rules allow a pilot to operate an aircraft in weather conditions that allow the pilot to navigate by visual reference to the ground or water by maintaining visual contact with the terrain and obstacle environment in order to be able to see and avoid other aircraft, terrain, obstacles or other hazards. Specifically, the weather must be equal to or better than basic VFR weather minima. If the weather is worse than VFR minima, IFR qualified pilots operating an IFR qualified aircraft are able to operate under the IFR.

**Visual Meteorological Conditions (VMC)** are meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, equal or better than specified minima.

**Visual Segment Surface (VSS)** A PANS-OPS design segment of a straight-in instrument approach procedure, which needs to be monitored and kept clear of any penetrations by obstacles.

## Abbreviations

Abbreviations used in this report, and the meanings assigned to them for the purposes of this report are detailed in the following table.

Abbreviation	Meaning
AC	Advisory Circular (document support CAR 1998)
ACFT	Aircraft
AD	Aerodrome
ADS-B	Automatic Dependent Surveillance - Broadcast
AHD	Australian Height Datum
AIP	Aeronautical Information Publication
Airports Act	Airports Act 1996, as amended
AIS	Aeronautical Information Service
ALT	Altitude
AMSL	Above Mean Sea Level
APARs	Airports (Protection of Airspace) Regulations, 1996 as amended
ARP	Aerodrome Reference Point
ARTC	Australian Rail Track Corporation
AsA	Airservices Australia
ATC	Air Traffic Control(ler)
ATM	Air Traffic Management
BARO-VNAV	Barometric Vertical Navigation
BBLC	Botany Bay Local Environment Plan 2013
BRA	Building Restricted Area
CAO	Civil Aviation Order
CAR	Civil Aviation Regulation
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation
Cat	Category
DAP	Departure and Approach Procedures (charts published by AsA)
DER	Departure End of (the) Runway
DME	Distance Measuring Equipment
Doc nn	ICAO Document Number nn
DIRDC	Department of Infrastructure, Regional Development and Cities. (Formerly Dept. of Infrastructure, Transport, Regional Development and Local Government and Department of Transport and Regional Services (DoTARS))
DOTARS	See DIRD above
ELEV	Elevation (above mean sea level)
ENE	East North East

Abbreviation	Meaning
ERSA	Enroute Supplement Australia
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
FAF	Final Approach Fix
FAP	Final Approach Point
FAS	Final Approach Surface of a BARO-VNAV approach
FTE	Full-time Equivalent
ft	feet
GBAS	Ground Based Augmentation System (satellite precision landing system)
Gateway	Sydney Gateway Project
GNSS	Global Navigation Satellite System
GP	Glide Path
IAS	Indicated Airspeed
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
Ha	Hectares
ICAO	International Civil Aviation Organization
IHS	Inner Horizontal Surface, an Obstacle Limitation Surface
ILS	Instrument Landing System
ISA	International Standard Atmosphere
km	kilometres
kt	Knot (one nautical mile per hour)
LAT	Latitude
LEP	Local Environmental Plan
LGA	Local Government Area
LLZ	Localizer
LONG	Longitude
LNAV	Lateral Navigation criteria
m	metres
MAPt	Missed Approach Point
MDA	Minimum Descent Altitude
MGA94	Map Grid Australia 1994
MOC	Minimum Obstacle Clearance
MOS	Manual of Standards, published by CASA
MSA	Minimum Sector Altitude
MVA	Minimum Vector Altitude
NASAG	National Airports Safeguarding Advisory Group
NDB	Non Directional Beacon

Abbreviation	Meaning
NE	North East
NM	Nautical Mile (= 1.852 km)
nnDME	Distance from the DME (in nautical miles)
NNE	North North East
NOTAM	NOtice to AirMen
NSW	New South Wales
OAS	Obstacle Assessment Surface
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OHS	Outer Horizontal Surface
OIS	Obstacle Identification Surface
OLS	Obstacle Limitation Surface
PANS OPS	Procedures for Air Navigation Services – Aircraft Operations, ICAO Doc 8168
PBN	Performance Based Navigation
PRM	Precision Runway Monitor
Qantas	Qantas Airways Limited
QNH	An altimeter setting relative to height above mean sea level
REF	Reference
RL	Relative Level
RMS	NSW Roads and Maritime Services
RNAV	aRea NAVigation
RNP	Required Navigation Performance
RPA	Rules and Practices for Aerodromes — replaced by the MOS Part 139 — Aerodromes
RPT	Regular Public Transport
RTCC	Radar Terrain Clearance Chart
RWY	Runway
SACL	Sydney Airport Corporation Limited
SEPP	State Environment Planning Policy
SEPP 55	State Environment Planning Policy No 55 – Remediation of Land
SEPP SRD	State Environment Planning Policy (State and Regional Development 2011)
SFC	Surface
SID	Standard Instrument Departure
Simulators	Full Motion Flight Simulators
SOC	Start Of Climb
Sqm	Square Metres
STAR	STandard ARival
SGHAT	Solar Glare Hazard Analysis Tool

Abbreviation	Meaning
TAR	Terminal Approach Radar
TAS	True Air Speed
THR	Threshold (Runway)
The Airport	Sydney Kingsford Smith Airport
The Department	Department of Planning and Environment
The District Plan	Eastern City District Plan (2018)
The Minister	the Minister of Planning and Development
The Region Plan	A Metropolis of Three Cities - The Greater Sydney Region Plan (2018)
The Strategy	The Future Transport Strategy 20156 (2018)
TNA	Turn Altitude
TODA	Take-Off Distance Available
VNAV	Vertical Navigation criteria
V <sub>n</sub>	aircraft critical Velocity reference
VOR	Very high frequency Omni directional Range
WAC	World Aeronautical Chart