

AVIATION IMPACT ASSESSMENT

**CROWS NEST OVERSTATION DEVELOPMENT
SITE B**

Prepared for Third.i Group



DOCUMENT CONTROL

Document Title: Crows Nest Over Station Development - Site B - Aviation Impact Assessment

Reference: 067001-01

Prepared by: L Wang

Reviewed by: P White

Released by: L Wang

REVISION HISTORY

<i>Version</i>	<i>Description</i>	<i>Transmitted</i>	<i>Reviewed by</i>	<i>Date</i>
0.1	First draft	21 September 2023	P White	21 September 2023
0.2	Draft Final	4 December 2023	P White	4 December 2023
0.3	Update draft final	5 December 2023	P White	5 December 2023
1.0	Final report	4 March 2024	P White	4 March 2024
1.1	Updated Final Report	9 July 2024	P White	9 July 2024
1.2	Updated Final Report	11 September 2024	P White	11 September 2024

COPYRIGHT AND DISCLAIMER NOTICE

This document and the information contained herein should be treated as commercial-in-confidence. No part of this work may be reproduced or copied in any form or by any means (graphic, electronic or mechanical, including photocopying, recording, taping or information retrieval system) or otherwise disclosed to any other party whatsoever, without the prior written consent of Aviation Projects Pty Ltd.

This report has been prepared for the benefit solely of the Client, and is not to be relied upon by any other person or entity without the prior written consent of Aviation Projects Pty Ltd.

© Aviation Projects Pty Ltd, 2024. All rights reserved

TABLE OF CONTENTS

EXECUTIVE SUMMARY	VIII
Introduction	viii
Aviation Impact Statement (AIS)	x
Summary of key recommendations	xi
1. INTRODUCTION	1
1.1. Situation	1
1.2. Purpose and Scope	1
1.3. Methodology	1
1.4. Aviation Impact Statement (AIS)	2
1.5. Material reviewed	2
2. BACKGROUND	3
2.1. Site overview	3
2.2. Project Description	3
2.3. Temporary crane operations	5
3. EXTERNAL CONTEXT	6
3.1. National Airports Safeguarding Framework	6
3.2. Airports (Protection of Airspace) Regulations 1996	8
3.3. Civil Aviation Safety Regulations 1998 Part 139—Aerodromes	9
3.4. Sydney Airport Master Plan	9
3.5. Sydney Airport Airspace protection	10
4. CONSULTATION	12
5. AVIATION IMPACT STATEMENT	16
5.1. Sydney Airport	16
5.2. Bankstown Airport	22
5.3. Camden Airport	25
5.4. Richmond Airport	27
5.5. Holsworthy Military Airport	29
5.6. Grid and Air routes LSALT	31
5.7. Airspace	32
5.8. Aviation facilities	34
5.9. Radar	34
6. HELICOPTER LANDING SITES	36
7. CONCLUSIONS	38
8. RECOMMENDATIONS	40

LIST OF FIGURES

Figure 1 Project site overview relative to Sydney Airport	3
Figure 2 Crows Nest OSD – Site B – Pacific Highway elevation	4
Figure 3 Crows Nest OSD – Site B – Clarke Lane elevation	4
Figure 4 Sydney Airport Obstacle Limitation Surfaces	11
Figure 5 Sydney Airport PANS-OPS Surfaces	11
Figure 6 Sydney Airport’s MSA	16
Figure 7 Sydney Airport MSA	17
Figure 8 Sydney Airport OLS contours and project site	19
Figure 9 Project location in relation to vertical intermediate approach of RNP-RWY 16L procedure	21
Figure 10 Project location in relation to the intermediate approach of RNP RWY 16L procedure.....	21
Figure 11 Bankstown Airport’s MSA	22
Figure 12 Bankstown Airport MSA	23
Figure 13 Camden Airport’s MSA	25
Figure 14 The Project location in relation to Camden Airport MSA	25
Figure 15 RAAF Richmond Airport’s MSA	27
Figure 16 Project location in relation to RAAF Richmond Airport MSA.....	27
Figure 17 Holsworthy Airport’s MSA.....	30
Figure 18 The Project location in relation to Holsworthy Airport MSA.....	30
Figure 19 Grid LSALT in proximity to the project site	32
Figure 20 Project site in relation to restricted area.	33
Figure 21 Restrictions of R405A.....	33
Figure 22 Restrictions of R405B.....	34
Figure 23 HLS Surfaces.....	36
Figure 24 HLS flight path in relation to development site	37

LIST OF TABLES

Table 1 Stakeholder consultation details	13
Table 2 MSA analysis.....	17
Table 3 Sydney Airport (YSSY) aerodrome and procedure charts	18
Table 4 Sydney Airport PANS-OPS Assessment.....	20
Table 5 Bankstown Airport MSA analysis	23
Table 6 Bankstown Airport (YSBK) aerodrome and procedure charts	24
Table 7 Bankstown Smith Airport PANS-OPS Assessment.....	24
Table 8 Camden Airport (YSCN) aerodrome and procedure charts.....	26
Table 9 Camden Airport PANS-OPS Assessment.....	26
Table 10 Richmond Airport (YSRI) aerodrome and procedure charts.....	28
Table 11 RAAF Richmond Airport PANS-OPS Assessment.....	29
Table 12 Holsworthy Airport (YSHW) aerodrome and procedure charts.....	30
Table 13 Holsworthy Airport PANS-OPS Assessment	31
Table 14 Grid LSALT impact analysis.....	32
Table 15 Surveillance System Clearance Plane.....	35

ACRONYMS

AC	Advisory Circular
AFAC	Australasian Fire and Emergency Services Council
AGL	above ground level
AHD	Australian Height Datum
AIP	Aeronautical Information Package
AIS	aviation impact statement
ALA	aircraft landing area
ALARP	as low as reasonably practicable
AMSL	above mean sea level
ARP	Aerodrome Reference Point
AS	Australian Standards
AsA	Airservices Australia
ATSB	Australian Transport Safety Bureau
BoM	Bureau of Meteorology
CAAP	Civil Aviation Advisory Publications
CAO	Civil Aviation Orders
CAR	Civil Aviation Regulation (1988)
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation (1998)
CFIT	controlled flight into terrain
CNS	communications, navigation and surveillance
CTAF	common traffic advisory frequency
DAH	Designated Airspace Handbook
EIS	environmental impact statement
ERC-H	en-route chart high
ERC-L	en-route chart low
ERSA	En Route Supplement Australia
GA	general aviation
ICAO	International Civil Aviation Organization
IFR	instrument flight rules

IMC	instrument meteorological conditions
LGA	local government area
LSALT	lowest safe altitude
MOC	minimum obstacle clearance
MOS	Manual of Standards
MSA	minimum sector altitude
NASAG	National Airports Safeguarding Advisory Group
NASF	National Airports Safeguarding Framework
NDB	non-directional (radio) beacon
OLS	obstacle limitation surface
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
PSR	primary surveillance radar
RAAF	Royal Australian Air Force
RFDS	Royal Flying Doctor Service
RPT	regular public transport
RSR	route surveillance radar
SSR	secondary surveillance radar
VFR	visual flight rules
VFRG	visual flight rules guide
VMC	visual meteorological conditions

UNITS OF MEASUREMENT

ft	feet	(1 ft = 0.3048 m)
km	kilometres	(1 km = 0.5399 nm)
m	metres	(1 m = 3.281 ft)
nm	nautical miles	(1 nm = 1.852 km)

EXECUTIVE SUMMARY

Introduction

Third.i Group is proposing an over station mixed use and residential development including a 17 storey building, known as Site B, with a maximum height of 158 m AHD to be located at 477, 479 and 491 - 495 Pacific Highway, Crows Nest NSW - approximately 13.4 km north of Sydney International Airport.

Third.i Group has engaged Aviation Projects to provide evidence and analysis to support an application via Sydney Airport Corporation Limited (SACL) for Commonwealth approval for any intrusions into Prescribed Airspace related to Sydney International Airport, including cranes approximately 15 m above the proposed building.

The Project requires an aviation impact assessment to be undertaken in accordance with:

- The Airports (Protection of Airspace) Regulations 1996
- Airservices Aeronautical Information Package (AIP)
- Civil Aviation Safety Authority (CASA) *Manual of Standards Part 139 – Aerodromes*
- Civil Aviation Safety Regulations (CASR) *Part 173 – Instrument Flight Procedure Design*
- National Airports Safeguarding Framework Guidelines, including:
 - Guideline F: Managing the Risk of Intrusions into the Protected Operational Airspace of Airports
 - Guideline H: Protecting Strategically Important Helicopter Landing Sites (HLS).

The following Aviation Impact Assessment (AIA) assesses the potential impacts, provides aviation safety advice in respect of relevant requirements of air safety regulations and procedures, and informs and documents consultation with relevant aviation agencies.

This report also includes an Aviation Impact Statement (AIS) and a qualitative risk assessment to determine the need for obstacle lighting.

Project description

This report refers to the development site known as Site B and includes the following:

- Maximum height of 158 m AHD (518.4 ft AMSL)
- Temporary crane(s) 65 m above installed building height, which will be up to 223 m AHD (731.6 ft AMSL).

Conclusions

Based on a comprehensive analysis and assessment detailed in this report, the following conclusions were made:

Certified airports

- The Project is within 30 nm of 3 certified airports and 2 military airports:

Sydney Airport (YSSY)

- Will not affect the MSA

- Will not infringe the IFR Circling areas
- Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures.

Bankstown Airport (YSBK)

- Will not affect the MSA
- Will not infringe the IFR Circling areas
- Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures.

Holsworthy Military Airport (YSHW)

- Will not infringe OLS surface
- Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures.

Camden Airport (YSCN)

- Will not affect the MSA
- Will not infringe the IFR Circling areas
- Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures.

RAAF Richmond Military Airport (YSRI)

- Will not affect the MSA
- Will not infringe IFR Circling areas
- Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures.

Obstacle Limitation Surfaces

- The Project will infringe the Outer Horizontal Surface of the obstacle limitation surface (OLS) of Sydney Airport.
- The Project does not infringe the OLS of Bankstown Airport, Camden Airport, RAAF Richmond Airport or Holsworthy Airport.

Air Routes and Lowest Safe Altitude (LSALT)

- The Project will not impact the grid LSALT
- The Project will not impact any air route LSALT.

Airspace

- The project site is located outside of controlled airspace but the building and cranes would infringe a Class C area with a lower limit of 500 ft AMSL adjacent to the Sydney Control Zone.
- The Project is located within Restricted Area R405B used by helicopters and seaplanes for operations. It is located adjacent to R405A but is on the eastern side of the Pacific Highway, wholly within R405B.

Aviation Navigation Facilities

- The Project will not infringe any protection areas associated with aviation navigation facilities.

Radar

- The Project site is located within the Area of Interest for assessment of potential impact from the development on surveillance radar. The Project will not impact the Sydney Primary Surveillance Radar (PSR) and Sydney Secondary Surveillance Radar (SSR).

Aviation Impact Statement (AIS)

- The project development:
 - a. Will be within 30 nm of 3 certified airports and 2 military airports:
 - i. Sydney Airport (YSSY)
 - ii. Bankstown Airport (YSBK)
 - iii. Holsworthy Military Airport (YSHW)
 - iv. Camden Airport (YSCN)
 - v. RAAF Richmond Military Airport (YSRI)
 - b. Sydney Airport:
 - i. Will not affect the MSA
 - ii. Will infringe the OLS – Outer Horizontal
 - iii. Will not infringe IFR Circling areas
 - iv. Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures
 - c. Bankstown Airport:
 - i. Will not affect the MSA
 - ii. Will not infringe the OLS
 - iii. Will not infringe the IFR Circling areas
 - iv. Will not infringe the PANS-OPS surface applicable to any of the instrument procedures
 - d. Camden Airport:
 - i. Will not affect the MSA
 - ii. Will not infringe the OLS
 - iii. Will not infringe the IFR Circling areas of Camden Airport
 - iv. Will not infringe the obstacle clearance heights applicable to any of the instrument procedures at Camden Airport
 - e. RAAF Richmond Airport:
 - i. Will not affect MSA
 - ii. Will not infringe OLS

- iii. Will not infringe the IFR Circling areas
- iv. Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures
- f. Holsworthy Airport:
 - i. Will not infringe OLS
 - ii. Will not infringe the PANS-OPS surfaces applicable to any of the instrument procedures
- Will not impact the Grid LSALT or the air routes LSALT.
- Is located outside of controlled airspace but the building and cranes would infringe a Class C controlled area with a lower limit of 500 ft AMSL adjacent to the Sydney Control Zone.
- Is located immediately east of the boundary between R405A and R405B but is situated within R405B which provides for helicopters transiting to HLS north of Sydney and for seaplanes transiting to/from landing sites on Sydney Harbour. Seaplanes must remain overwater during these operations. All flight operations in R405B must remain below 1000 ft AMSL and aircraft will comply with CASR 91.267.
- Will not impact any aviation navigation facilities.
- Will not impact PSR and SSR lines of sight.
- Will not impact Royal North Shore Hospital HLS's operation.

Summary of key recommendations

As a result of this assessment, the following recommendations are made:

- If approved, details of the Project should be reported to Airservices Australia via this email address: vod@airservicesaustralia.com, and published in En Route Supplement Australia (ERSA) and other relevant aeronautical chart products.
- Sydney Airport advises that approval to operate construction equipment (i.e. cranes) should be obtained prior to any commitment to construct. Information required by Sydney Airport prior to any approval is set out in attached crane application form.

1. INTRODUCTION

1.1. Situation

The developer is proposing to construct a 17 storey over station mixed use and residential development located at 477, 479 and 491 - 495 Pacific Highway, Crows Nest NSW, with a maximum elevation of RL 158.0 m AHD.

Third.i Group has engaged Aviation Projects to provide evidence and analysis to support an application to Sydney Airport Corporation Limited (SACL) for Commonwealth approval for any intrusions into Prescribed Airspace related to Sydney International Airport.

This Aeronautical Impact Assessment (AIA) assesses the potential aviation impacts, provides aviation safety advice in respect of relevant requirements of air safety regulations and procedures, and informs and documents consultation with relevant aviation agencies.

1.2. Purpose and Scope

The scope of work is to carry out an aviation impact assessment (AIA) to determine if the proposed building will affect aviation safety, and will:

- Assess the likely infringements into surrounding Prescribed Airspace, including OLS and PANS-OPS surfaces, against Airspace Protection Requirements stated in the “Concept Approval” condition A19 and B35 (SSD-9579) approved in December 2020.
- Include an Aeronautical Impact Study (AIS) for Airservices Australia that will form the basis for an application to the Department of Infrastructure, Transport, Regional Development and Cities (DITRDC) via SACL.
- Provide an application under the protection of airports regulations to SACL to commence the application process for a decision by DITRDC.

Assistance will be provided in support of stakeholder consultation and engagement in preparing the assessment and negotiating acceptable mitigation to identified impacts.

1.3. Methodology

The engagement will generally be delivered as outlined below:

1. Confirm the scope and deliverables.
2. Review client material.
3. Review relevant regulatory requirements and information sources.
4. Identify aviation assets and activities within the vicinity of the Project and identify any aviation constraints to Obstacle Limitation Surfaces (OLS), PAN-OPS surfaces and designated airspace.
5. Prepare a draft aviation impact assessment and supporting technical data that provides evidence and analysis for DITRDC to assess the Project. The draft aviation impact assessment report will include an Aviation Impact Statement (AIS) and a qualitative risk assessment to determine need for obstacle lighting and of applicable aspects for client review and acceptance before submission to external aviation regulators.

6. Consult with aviation regulators, consisting of Airservices Australia, SACL, CASA and DITRDCA as appropriate.
7. Consider the potential operational impacts on all surrounding airports and develop high-level mitigation options.
8. Consult/engage with stakeholders to negotiate acceptable outcomes (if required).
9. Finalise the aviation impact assessment report for client acceptance.
10. Assist with or prepare the Application to DITRDCA via SACL.

The aviation impact assessment and supporting technical data will provide evidence and analysis for the planning application to demonstrate that appropriate risk mitigation strategies have been identified.

1.4. Aviation Impact Statement (AIS)

The AIS included in this report (see Section 6) includes the following specific requirements as advised by Airservices Australia:

Aerodromes:

- Specify all certified aerodromes that are located within 30 nm (55.6 km) of the project site.
- Nominate all instrument approach and landing procedures at these aerodromes.
- Review the potential effect of project operations on the operational airspace of the aerodrome(s).

Air Routes:

- Nominate air routes published in ERC-L & ERC-H which are located near/over the project site and review potential impacts of project operations on aircraft using those air routes.

Airspace:

- Nominate the airspace classification – A, B, C, D, E, G etc where the project site is located.

Navigation/Radar:

- Nominate air traffic control radar with coverage overlapping the project site.
- Nominate aviation navigation systems in proximity to the project site.

1.5. Material reviewed

Material provided by the Proponent for preparation of this assessment include:

- Consolidated Consent - Concept Approval.pdf
- Elevations.pdf
- Concept Approval - Aviation Report.pdf

2. BACKGROUND

2.1. Site overview

The project site is located approximately 13.4 km north of Sydney Airport's Aerodrome Reference Point (ARP). An overview of the project site relative to Sydney Airport is provided in Figure 1 (source: Willowtree, Google Earth).

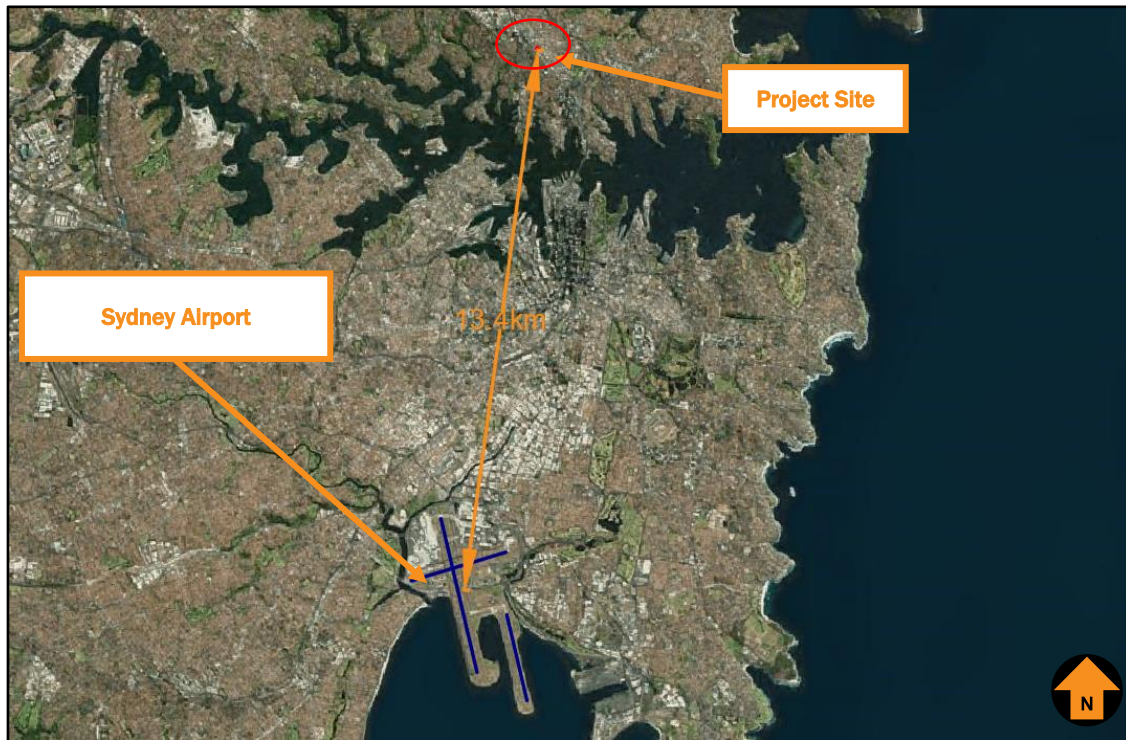


Figure 1 Project site overview relative to Sydney Airport

2.2. Project Description

The Project includes the development of a 17 storey building, known as Site B, located at 477, 479 and 491 - 495 Pacific Highway, Crows Nest NSW.

Figure 2 and Figure 3 show the elevation information of the project development (source: Willowtree).

The following details for the building are relevant to the assessment herein:

- Site B building height is 158 m AHD (518.4 ft AMSL).

2.3. Temporary crane operations

Project has advised that the temporary cranes' model will be Jaso 438. They will be 65 m above the installed building height, up to 223 m AHD (731.6 ft AMSL).

3. EXTERNAL CONTEXT

3.1. National Airports Safeguarding Framework

The National Airports Safeguarding Advisory Group (NASAG) was established by the Commonwealth Department of Infrastructure and Transport to develop a national land use planning framework called the National Airports Safeguarding Framework (NASF). The purpose of the NASF is to enhance the current and future safety, viability, and growth of aviation operations at Australian airports through:

- the implementation of best practice in relation to land use assessment and decision making in the vicinity of airports
- assurance of community safety and amenity near airports
- better understanding and recognition of aviation safety requirements and aircraft noise impacts in land use and related planning decisions
- the provision of greater certainty and clarity for developers and landowners
- improvements to regulatory certainty and efficiency
- the publication and dissemination of information on best practice in land use and related planning that supports the safe and efficient operation of airports.

3.1.1. NASF Guideline F: Managing the Risk of Intrusions into the Protected Operational Airspace of Airports

This guideline provides guidance to State/Territory and local government decision makers as well as airport operators to jointly address the issue of intrusions into the operational airspace of airports by tall structures, such as buildings, cranes and transmission lines, as well as trees in the vicinity of airports.

Key considerations for managing risk of intrusions into the protected operational airspace of airports

Protection of visual operations - Obstacle limitation surfaces

The first group of criteria are used to determine the obstacle limitation surfaces (OLS) for a runway. Criteria for determining these surfaces are established by the International Civil Aviation Organisation (ICAO). In Australia, CASA publishes these criteria in the Manual of Standards for Part 139 of the Civil Aviation Safety Regulations.

Structures, trees or other activities that intrude into the OLS could constitute obstacles to aircraft taking off or approaching to land. The OLS for an airport charts the volume and dimensions of operational airspace that should be kept free of obstacles to aircraft operations being conducted under VFR or during the visual stages of IFR operations.

It is important to note that the OLS does not prohibit all intrusions. The aim is to ensure that all objects that intrude into the OLS can be identified and assessed for their potential impact on aircraft operations. The assessment will enable a determination on whether the intrusion is permissible, and if so, a determination on whether any risk mitigation requirements should be imposed.

The requirements to protect operational airspace will be enforced most rigorously along the extended centrelines of runways in the approach and takeoff areas. This could extend up to 15 kilometres from the ends of runways at major airports. Other OLS surfaces that protect aircraft circling to land may also extend up to 15 kilometres from major airports.

The effects of individual obstacles may be relatively minor, but together a number of obstacles may seriously limit runway utilisation, cause airspace congestion and reduce the effective handling capacity of the airport. It is therefore important to understand that the pre-existence of a structure or other intrusion into operational airspace does not necessarily mean that a new proposal to penetrate operational airspace will be approved under Commonwealth legislation.

Land use planning authorities and state/territory governments should be aware that all intrusions into the OLS have the potential to create aviation safety risks and to limit the scope of aviation operations into and out of the airport.

Protection of instrument operations - Procedures for Air Navigation Services – Operations (PANS-OPS) surfaces

A second group of criteria is used to determine the volumes and dimensions of airspace required to protect the safety of IFR operations. Under IFR operations, pilots fly aircraft relying on instruments for navigation. Airspace protection for IFR operations cannot allow for any long-term penetrations.

ICAO established these criteria which are published in a document titled ‘Procedures for Air Navigation Services – Operations (PANS-OPS)’. The surfaces determined by using the criteria in the PANS-OPS publication are called PANS-OPS surfaces.

The PANS-OPS surfaces are used in the construction of take-off, landing and approach procedures based entirely on navigation with sole reference to aircraft instruments. They are designed to protect aircraft from colliding with obstacles when flying on instruments. Minimum safe altitudes are established for each segment of an instrument procedure.

If it is agreed by all stakeholders that a long-term penetration of the PANS-OPS surfaces is essential, the PANS-OPS surfaces must be raised so they are clear of the development causing the penetration. However, this may also have operational penalties for airport operations and could have community impacts, such as re-design of flight paths that increase the population exposed to high levels of aircraft noise.

3.1.2. NASF Guideline H: Protecting Strategically Important Helicopter Landing Sites (HLS)

The purpose of this guideline is to protect important Helicopter Landing Sites (HLS) from infringements. An HLS is a specific nominated area (not located on an aerodrome) wholly or partly used for the arrival or departure of helicopters for strategically important purposes.

Key Considerations:

It will be the responsibility of each jurisdiction to consult with the asset owner to identify those HLS that are considered to be of strategic importance or those that are to be protected in the interest of public safety.

SHLS to protect should include:

- a) a HLS associated with a hospital; or*
- b) an elevated HLS1, located within a populated area; or*
- c) a HLS subject to instrument flight procedures; or*
- d) any other facility identified as strategic by State/Territory or Commonwealth government/authorities.*

Where otherwise not required under state/territory provisions, a responsible planning authority or proponent is encouraged to consult with the relevant SHLS asset owner to establish protocols for the referral process within their jurisdiction including:

- a) *material to be provided as part of the referral;*
- b) *the timeframes in which advice is required to be provided; and*
- c) *the format of any advice provided and the wording of appropriate conditions that can be applied to mitigate any impacts. This should include standard conditions that can be applied in the event that the asset owner is unable to respond within the required assessment timeframes.*

3.2. Airports (Protection of Airspace) Regulations 1996

Part 12 of the **Airports Act 1996** and the **Airports (Protection of Airspace) Regulations 1996** establish a framework for the protection of airspace at and around airports. The following summary of these requirements is provided on the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications website.

The **Airports Act 1996** defines any activity resulting in an intrusion into an airport's protected airspace to be a "controlled activity", and requires that controlled activities cannot be carried out without approval.

The Regulations provide for the Department or the airport operator to approve applications to carry out controlled activities, and to impose conditions on an approval.

Any activity that infringes an airport's protected airspace is called a **controlled activity** and requires approval before it can be carried out. Controlled activities include the following:

- permanent structures, such as buildings, intruding into the protected airspace;
- temporary structures such as cranes intruding into the protected airspace; and
- any activities causing intrusions into the protected airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter.

The Regulations differentiate between **short-term** (less than 3 months) and **long-term** controlled activities. The Regulations provide for the airport operator to approve **short-term** controlled activities, excluding PANS-OPS infringements, and for the Department to approve long-term controlled activities, or **short-term** controlled activities referred to it by the airport operator, including short-term infringements of the PANS-OPS surface. However, long term intrusions of the PANS-OPS surface are prohibited.

Applications to carry out a controlled activity are to be made to the airport operator in writing. The information required in the application must include:

1. a description of the proposed controlled activity (building construction, crane operation etc);
2. its precise location (street directory grid references are suitable);
3. if the controlled activity consists of the erection of a building or structure:
 - a. the proposed maximum height of the structure above the Australian Height Datum (including any antennae or towers), and
 - b. the proposed maximum height of any temporary structure or equipment (e.g. cranes) intended to be used in the erection of the structure.
4. the purpose of the controlled activity.

The airport operator will conduct the initial assessment of the application in terms of:

- whether the activity results in an intrusion into the OLS or PANS-OPS surface;
- the extent of the intrusion; and
- the precise location of the development or activity.

The airport operator is required to invite the following organisations to assess or comment on an application:

- **the Civil Aviation Safety Authority (CASA)** for an assessment of the impact on aviation safety;
- **Airservices Australia** for assessments of proposals resulting in a penetration of the PANS-OPS surface or temporary redirection of flight paths;
- **the local council authority** responsible for building approvals; and
- **the Department of Defence** in the case of joint-user airports.

For short term controlled activities, comments are only required from CASA and Airservices.

The approval process varies depending on the type of controlled activity:

- **short-term controlled activities** which penetrate the OLS can be approved/refused by the airport operator after consultation with CASA and Airservices Australia or referred by the airport to the Department for a decision. However, if the short term controlled activity penetrates the PANS-OPS surfaces, airport operators are required to consult with CASA and Airservices and then refer applications to the Department for a decision. This referral is to include advice about whether the short-term penetration of the PANS-OPS has the support of the airport operator;
- **long-term controlled activities penetrating the OLS** are referred by the airport to the Department for a decision after consultation with CASA, Airservices and the relevant building authority; and
- **long-term controlled activities penetrating the PANS-OPS airspace** are not permitted, and the airport operator can notify the refusal of such controlled activities.

The Regulations require any decision by the airport operator to be made in the interests of the *safety, efficiency or regularity* of existing or future air transport operations into or out of the airport.

3.3. Civil Aviation Safety Regulations 1998 Part 139—Aerodromes

The Civil Aviation Safety Authority (CASA) regulates aviation activities in Australia. Applicable requirements include the Civil Aviation Safety Regulations 1998 Part 139—*Aerodromes* (CASR 139), the associated Manuals of Standards Part 139—*Aerodromes* (MOS 139) and other guidance and advisory material.

3.4. Sydney Airport Master Plan

The Sydney Airport 2039 Master Plan establishes a clear vision of aviation and non-aviation activities at the Airport.

The Sydney Airport Master Plan 2039, and in particular Chapter 16, addresses current and future requirements for airport safeguarding. In particular:

16.4 Airport Safeguarding

The capacity of an airport to operate and its ability to respond to growing demand for aviation services can be directly impacted by what occurs on the land surrounding it. For example, the construction of buildings or other structures that physically intrude into the airspace around existing flight paths can clearly limit or prevent use of a particular runway at the airport.

Impacts on the airport can also occur as a result of other off-airport development activities that are less obvious. These include:

- *Residential developments in inappropriate areas adjacent to airports or under flight paths, which are likely to result in future complaints about aircraft noise and calls to further restrict airport operations (e.g. through curfews or other noise management strategies)*
- *Large structures/buildings and industrial activities, chimneys and ventilation outlets that generate wind turbulence or wind shear, smoke or intrusions, which may constitute a hazard to aircraft in flight or further constrain airport operations*
- *Land uses or activities that may attract wildlife (e.g. birds, bats or flying foxes) which may constitute a hazard to aircraft in flight*

The long term and effective safeguarding of Sydney Airport is critical to maintaining existing and future aviation operations and the social and economic benefits the Airport contributes to the wider community.

While Sydney Airport can control development and activities on the airport, off-airport development involves external agencies and authorities, and needs to be managed cooperatively.

Sydney Airport has been actively working with the NSW Government and local councils to ensure planning decisions made in areas outside the boundary of Sydney Airport have regard to and, where applicable, comply with the existing National Airport Safeguarding Framework (NASF) Guidelines.

3.5. Sydney Airport Airspace protection

To ensure sustainable future growth and the safety of aircraft and airline passengers, airspace surrounding an airport must be protected from inappropriate development.

For this reason, Australian Government regulations have long recognised the need to restrict the height of buildings and other structures (such as cranes) near airports or under flight paths. This protected airspace is formally known as “prescribed airspace”.

These regulations aim to ensure that:

- The airspace aircraft fly in is obstacle-free;
- Radar and other air navigation equipment can operate free from interference and;
- Airport safety lights are not obscured.

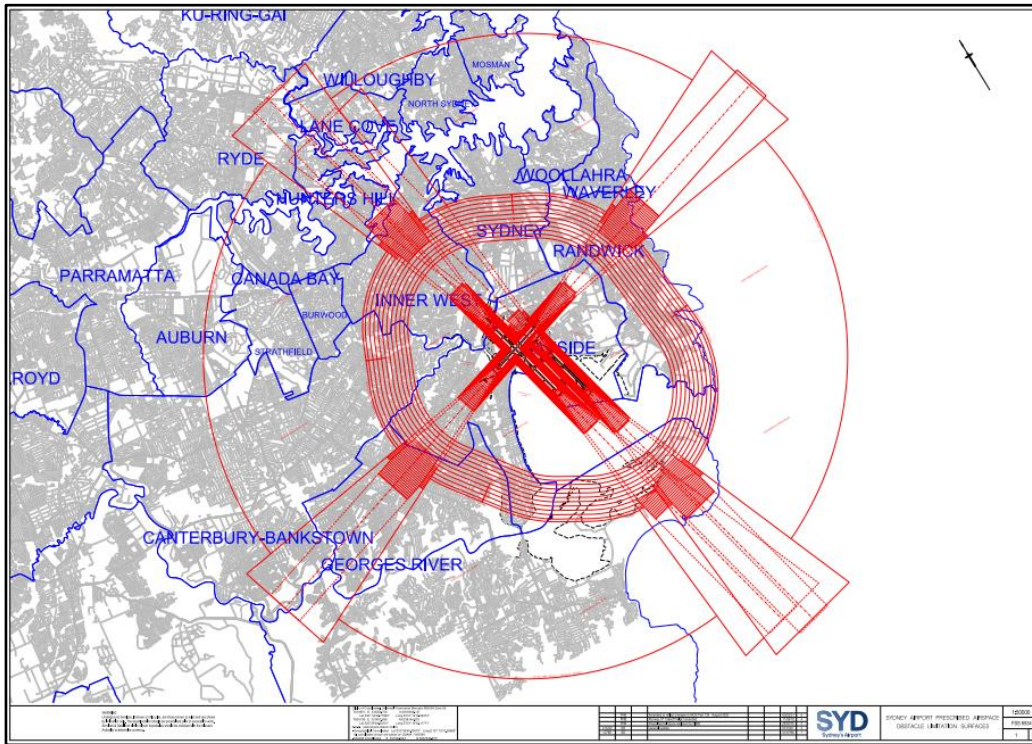


Figure 4 Sydney Airport Obstacle Limitation Surfaces

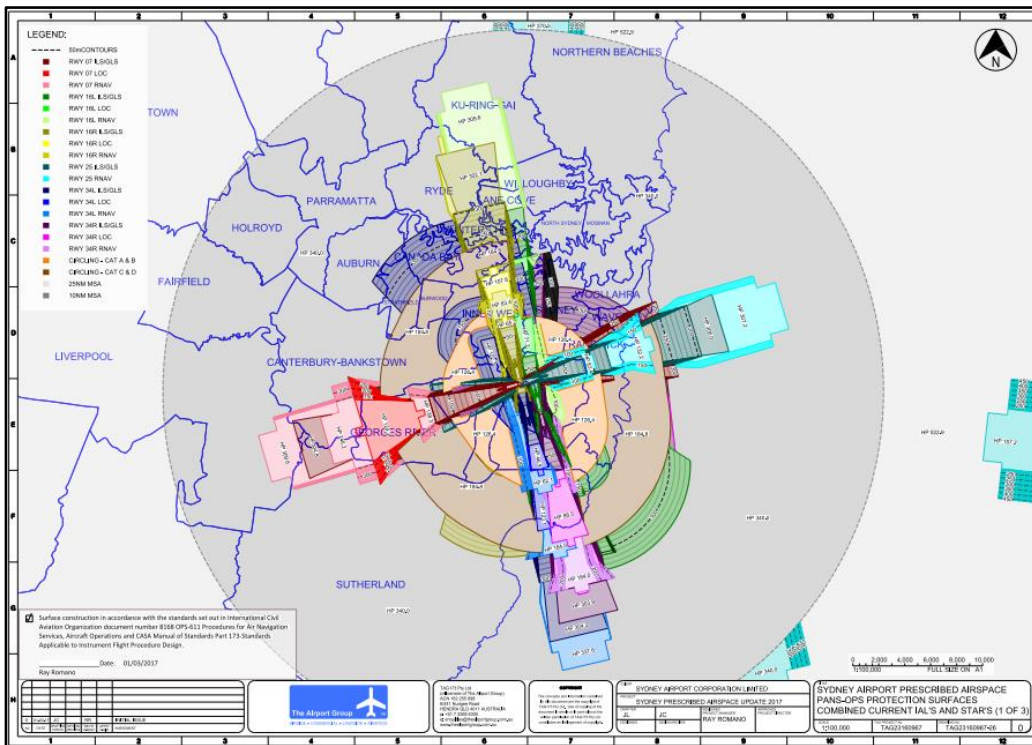


Figure 5 Sydney Airport PANS-OPS Surfaces

4. CONSULTATION

The following list of stakeholders were identified as requiring consultation:

1. Airservices Australia
2. Department of Defence
3. Bankstown Airport
4. Sydney Airport

Details and results of the consultation activities are provided in Table 1.

Table 1 Stakeholder consultation details

<i>Agency/Contact</i>	<i>Activity/Date</i>	<i>Response/ Date</i>	<i>Issues Raised During Consultation</i>	<i>Action Proposed</i>
Airservices	6 December 2023 Email to Airport Development	15 December 2023 Email from Alex Blight (Airspace Development & Protection Coordinator)	Based on the location of the Crows Nest development, approx. 13.4km from Sydney Aerodrome, it is likely that it will need Department of Infrastructure approval. Please contact Sydney Airport so they may conduct the initial assessment.	Contact Sydney Airport to conduct the initial assessment
Department of Defence	6 December 2023 Email to Department of Defence	1 March 2024 Email from Matthew Williams (Acting Estate Strategic Planner)	Thank you for referring the abovementioned proposal to the Department of Defence (Defence) for comment. Defence understands that the application is for an over station mixed use including a 158 metre Australin Height Datum (AHD) residential development at 477, 479 and 491-495 Pacific Highway, Crows Nest, NSW. The site is located approximately 47 kilometres east of RAAF Base Richmond. Defence is duly concerned with ensuring the long-term viability of the Base is not compromised by incompatible development on surrounding land. Defence has assessed the proposal and has determined that the proposed development will not impact on operations and capability at RAAF Base Richmond. Therefore, based on the information provided, Defence has no objection to the proposal provided that the following is advice is adhered to.	Defence has no objection to the proposal provided. Defence requests that the applicant is to provide Air Services Australia (ASA) “as constructed” details. The details can be emailed to ASA at vod@airservicesaustralia.com

<i>Agency/Contact</i>	<i>Activity/Date</i>	<i>Response/ Date</i>	<i>Issues Raised During Consultation</i>	<i>Action Proposed</i>
			<p>Marking tall structures on aeronautical charts assists pilot navigation and enhances flight safety. Air Services Australia (ASA) is responsible for recording the location and height of tall structures.</p> <p>The information is held in a central database managed by ASA and relates to the erection, extension or dismantling of tall structures, RAAF requirements are:</p> <ul style="list-style-type: none"> a. 30 metres AGL, that are within 30 kilometres of an aerodrome, and b. 45 metres AGL elsewhere. <p>As the proposed Telecommunication facility meets the requirement for reporting tall structures, Defence requests that the applicant is to provide Air Services Australia (ASA) “as constructed” details.</p> <p>The details can be emailed to ASA at vod@airservicesaustralia.com</p> <p>Should you wish to discuss the content of this advice further, my point of contact is Matt Williams at land.planning@defence.gov.au</p>	
Bankstown Airport	6 December 2023 Email to Aeria Management Group	7 December 2023 Email from Alan Collins (Aviation Compliance Manager)	This proposed development and associated crane will have no impact on Bankstown or Camden Airports airspace.	No further actions required

<i>Agency/Contact</i>	<i>Activity/Date</i>	<i>Response/ Date</i>	<i>Issues Raised During Consultation</i>	<i>Action Proposed</i>
Sydney Airport	6 December 2023 Email to Sydney Airport Planning Manager	12 December 2023 Email from Peter Bleasdale (Airfield Technical Planning Manager)	The height of Sydney Airport's Obstacle Limitation Surface (OLS) over the site has a height of 156m AHD. As the proposed development will have a maximum height of 158m AHD, when built, would be considered a controlled activity & be subject to the Federal Airports (Protection of Airspace) Regulations 1996. Construction cranes may be required to operate at a height significantly higher than that of the proposed development and consequently, may not be approved under the Airports (Protection of Airspace) Regulations.	Sydney Airport advises that approval to operate construction equipment (i.e. cranes) should be obtained prior to any commitment to construct. Information required by Sydney Airport prior to any approval is set out in attached crane application form.

5. AVIATION IMPACT STATEMENT

The proposed project site is located within 30 nm of 3 certificated airports and 2 military airports:

- Sydney Airport (YSSY)
- Bankstown Airport (YSBK)
- Holsworthy Military Airport (YSHW)
- Camden Airport (YSCN)
- RAAF Richmond Military Airport (YSRI)

5.1. Sydney Airport

Sydney Airport (YSSY) is the closest certified aerodrome to the project site. It is operated by Sydney Airport Corporation Limited (SACL).

A check of Airservices Australia’s Aeronautical Information Package (AIP), dated 05 September 2024, shows that airspace procedures are measured from the aerodrome reference point (ARP). The coordinates published in Airservices Australia’s Designated Airspace Handbook (DAH) dated 13 June 2024, are as follows:

- ARP coordinates: Latitude 33°56'46"S and Longitude 151°10'38"E

According to En Route Supplementary Australia (ERSA) facilities information chart (FAC) for YSSY, Sydney Airport has an aerodrome elevation of 6.4 m AHD (21 ft AMSL).

Sydney Airport has 3 runways:

- Runway 07/25 is a Code 4, asphalt runway 2530 m x 45 m (runway strip: 280m)
- Runway 16L/34R is a Code 4, asphalt runway 2438 m x 45 m (runway strip: 280m)
- Runway 16R/34L is a Code 4, asphalt runway 3962 m x 45 m (runway strip: 280m)

5.1.1. Minimum Sector Altitudes

The minimum sector altitude (MSA) is applicable for the instrument approach procedures from the applicable reference point. A copy of the MSA published for the airport in AIP DAP is shown in Figure 6 (Source: Airservices Australia).

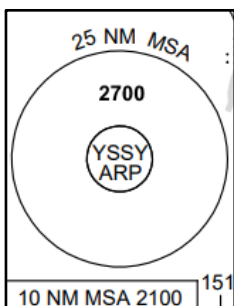


Figure 6 Sydney Airport’s MSA

The CASR Part 173 Manual of Standards requires a minimum obstacle clearance (MOC) of 984 ft to be applied above the highest terrain or obstacle within the applicable segment.

The 25 nm MSA minimum altitude is based on a 30 nm radius (25 nm MSA + 5 nm buffer) circle from the applicable reference point.

The 10 nm MSA minimum altitude is based on a 15 nm radius (10 nm MSA + 5 nm buffer) circle from the applicable reference point.



Figure 7 Sydney Airport MSA

The project site is located within the 10 nm MSA and 25 nm MSA. The orange circle represents a distance of 15 nm from the ARP, Figure 7 (Source: Willowtree).

The 10 nm MSA is 640 m AHD (2100 ft AMSL), with a PANS-OPS surface elevation of 340 m AHD (1116 ft AMSL). The 25 nm MSA is 823 m AHD (2700 ft AMSL), with a PANS-OPS surface elevation of 523 m AHD (1716 ft AMSL).

Table 2 summarises an impact analysis of the MSA based on the overall height of the Project. The Project's building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), it will not affect MSA.

Table 2 MSA analysis

<i>MSA Segments</i>	<i>Minimum altitude (ft AMSL)</i>	<i>PANS OPS Surface (ft AMSL)</i>	<i>Impact</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
10 nm MSA	2100	1116	Nil – below surface	N/A	N/A
25 nm MSA	2700	1716	Nil – below surface	N/A	N/A

5.1.2. Instrument procedures

A check of the Aeronautical Information Package (AIP) via the Airservices Australia website showed that Sydney Airport is served by precision and non-precision flight procedures (source: AsA, effective 30 November 2023).

Table 3 identifies the aerodrome and procedure charts for Sydney Airport designed by Airservices Australia.

Table 3 Sydney Airport (YSSY) aerodrome and procedure charts

<i>Chart name (Procedure Designer)</i>	<i>Effective date</i>
AERODROME CHART PAGE 1 (AsA)	15 June 2023 (Am 175)
AERODROME CHART PAGE 2 (AsA)	1 December 2022 (Am 173)
SID SYDNEY TWO DEPARTURE (RADAR) (AsA)	30-November-2023 (Am 177)
ILS OR LOC RWY 07 (AsA)	30-November-2023 (Am 177)
ILS OR LOC RWY 16L PAGE 1 (AsA)	9 September 2021 (Am 168)
ILS RWY 16L PAGE 2 (AsA)	9 September 2021 (Am 168)
ILS OR LOC RWY 16R PAGE 1 (AsA)	23 March 2023 (Am 174)
ILS RWY 16R PAGE 2 (AsA)	23 March 2023 (Am 174)
ILS OR LOC RWY 25 (AsA)	17 June 2021 (AM 167)
ILS OR LOC RWY 34L PAGE 1 (AsA)	9 September 2021 (Am 168)
ILS RWY 34L PAGE 2 (AsA)	9 September 2021 (Am 168)
ILS OR LOC RWY 34R PAGE 1 (AsA)	30-November-2023 (Am 177)
ILS RWY 34R PAGE 2 (AsA)	30-November-2023 (Am 177)
RNP RWY 07 (AsA)	30-November-2023 (Am 177)
RNP RWY 16L (AsA)	1 December 2022 (Am 173)
RNP RWY 16R (AsA)	8 September 2022 (Am 172)
RNP RWY 25 (AsA)	30-November-2023 (Am 177)
RNP RWY 34L (AsA)	8 September 2022 (Am 172)
RNP RWY 34R (AsA)	30-November-2023 (Am 177)
GLS RWY 07 (AsA)	30-November-2023 (Am 177)
GLS RWY 16L (AsA)	23 March 2023 (Am 174)
GLS RWY 16R (AsA)	9 September 2021 (Am 168)
GLS RWY 25 (AsA)	17 June 2021 (AM 167)
GLS RWY 34L (AsA)	7 September 2023 (Am 176)
GLS RWY 34R (AsA)	30-November-2023 (Am 177)

5.1.3. IFR Circling areas

An IFR circling approach is an extension of an instrument approach to the specified circling minima (lowest altitude permitted without visual reference to the ground) at which point the pilot will visually manoeuvre the aircraft to align with the runway for landing. Typically, a circling approach is only conducted where there is no

runway-aligned instrument procedure, or if the runway used for the approach procedure is not suitable for landing.

Circling areas are established by the instrument flight procedure designer based on ICAO specifications, related to the performance category of the design aircraft. The circling area is determined by drawing an arc centred on the threshold of each usable runway and joining these arcs by tangents. The most demanding aircraft category provided for in Sydney Airport's instrument flight procedure's is Category D.

The radii for each relevant category of aircraft are provided below:

- Category A – 1.63 nm / 3.03 km
- Category B – 2.59 nm / 4.80 km
- Category C – 4.11 nm / 7.62 km
- Category D – 4.39 nm / 8.13 km

The Project is located 13.4 km away from Sydney Airport and is outside the airport's Circling surfaces.

5.1.4. Obstacle Limitation Surface (OLS)

Sydney Airport provides a map which shows the contours of the different OLS surfaces of Sydney Airport. The OLS surfaces of Sydney Airport are designed to accommodate future upgrade needs.

The maximum horizontal distance that an OLS may extend for an aerodrome in Australia is 15 km (8.1 nm) from the edge of a runway strip. The Project is located approximately 13.4 km north of the airport's ARP and is therefore constrained by the outer horizontal surface as shown in Figure 8 (source: Google Earth, Sydney Airport).



Figure 8 Sydney Airport OLS contours and project site

The proposed development site is constrained by the outer horizontal surface, which is at a height of 156 m AHD (511.8 ft AMSL). The proposed building height is 158 m AHD (518.4 ft AMSL) with the temporary crane

height being 65 m above the building. The overall project height is 223 m AHD (731.6 ft AMSL), which infringes on the outer horizontal Surface by 67 m (219.8 ft).

5.1.5. PANS-OPS Surfaces

A detailed assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken.

Table 4 details the assessment for each instrument approach procedure.

Table 4 Sydney Airport PANS-OPS Assessment

<i>Instrument Approach Title</i>	<i>Minimum Altitude over Project (ft AMSL)</i>	<i>PANS- OPS Surface (ft AMSL)</i>	<i>Impact</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
SID SYDNEY TWO DEPARTURE (RADAR)	1265.5	971.5	Nil – beneath departure surface	N/A	N/A
ILS OR LOC RWY 07	2750 (MSA)	1716	Nil – outside	N/A	N/A
ILS OR LOC RWY 16L	2750 (MSA)	1716	Nil – outside	N/A	N/A
ILS OR LOC RWY 16R	2750 (MSA)	1716	Nil – outside	N/A	N/A
ILS OR LOC RWY 25	2750 (MSA)	1716	Nil – outside	N/A	N/A
ILS OR LOC RWY 34L	2750 (MSA)	1716	Nil – outside	N/A	N/A
ILS OR LOC RWY 34R	2750 (MSA)	1716	Nil – outside	N/A	N/A
RNP RWY 07	2750 (MSA)	1716	Nil – outside	N/A	N/A
RNP RWY 16L	1800	1308	Nil – beneath intermediate approach surface	N/A	N/A
RNP RWY 16R	2750 (MSA)	1716	Nil – outside	N/A	N/A
RNP RWY 25	2750 (MSA)	1716	Nil – outside	N/A	N/A
RNP RWY 34L	2750 (MSA)	1716	Nil – outside	N/A	N/A
RNP RWY 34R	2750 (MSA)	1716	Nil – outside	N/A	N/A
GLS RWY 07	2750 (MSA)	1716	Nil – outside	N/A	N/A
GLS RWY 16L	2750 (MSA)	1716	Nil – outside	N/A	N/A
GLS RWY 16R	2750 (MSA)	1716	Nil – outside	N/A	N/A
GLS RWY 25	2750 (MSA)	1716	Nil – outside	N/A	N/A
GLS RWY 34L	2750 (MSA)	1716	Nil – outside	N/A	N/A
GLS RWY 34R	2750 (MSA)	1716	Nil – outside	N/A	N/A

Standard Instrument Departure (SID) TWO DEPARTURE (RADAR)

The SID procedures have PANS-OPS surfaces determined by the Procedure Design Gradient (PDG) that is the minimum climb gradient that aircraft are required to achieve in order to ensure obstacle clearance during the initial climb after take-off.

The lowest SID PANS OPS surface above the development site is 296 m AHD (971.5 ft AMSL), based on runway 34 L with turn height of 600 ft AMSL and PDG of 3.3%. The proposed site will not affect SID procedures.

RNP-RWY 16L

The development site would be located within the intermediate approach track of this procedure. Figure 9 and Figure 10 show the site location in relation to the intermediate approach segment of the RNP RWY 16L procedure (Source, Google Earth, Airservices).

The development site is within the intermediate segment, with a minimum altitude of 1800 ft AMSL. The PANS-OPS surface height is 1308 ft AMSL. Based on the proposed location, the site will be below the protection surface elevation of 1308 ft AMSL, therefore there is no impact anticipated to the intermediate area.

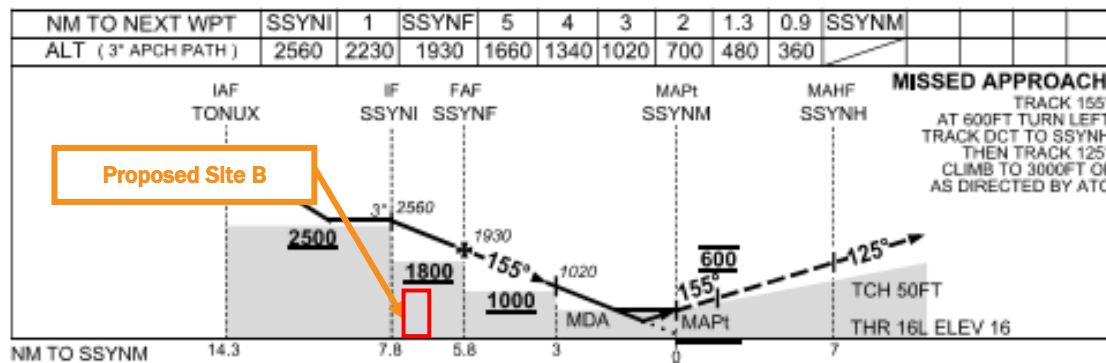


Figure 9 Project location in relation to vertical intermediate approach of RNP-RWY 16L procedure

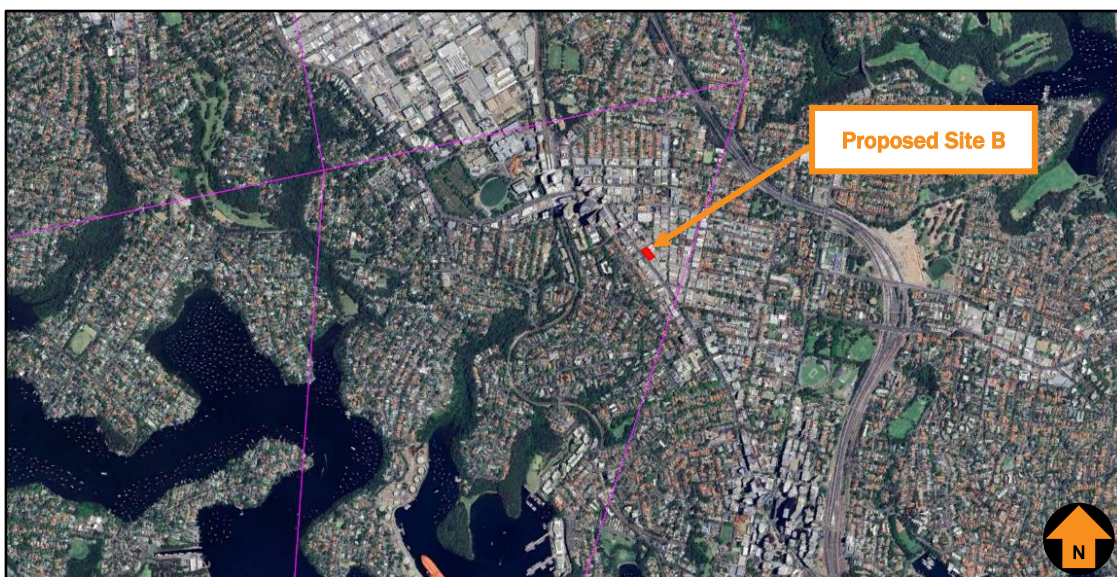


Figure 10 Project location in relation to the intermediate approach of RNP RWY 16L procedure

5.2. Bankstown Airport

Bankstown Airport (YSBK) is operated by Bankstown Airport Limited.

A check of Airservices Australia’s Aeronautical Information Package (AIP), dated 05 September 2024, shows that airspace procedures are measured from the aerodrome reference point (ARP). The coordinates published in Airservices Australia’s Designated Airspace Handbook (DAH) dated 13 June 2024, are as follows:

- ARP coordinates: Latitude 33° 55'28"S and Longitude 150° 59'18"E

According to En Route Supplementary Australia (ERSA) facilities information chart (FAC) for Bankstown Airport, the airport has an aerodrome elevation of 10.4 m AHD (34 ft AMSL).

Bankstown Airport has 3 runways:

- Runway 11R/29L is a Code 2 runway 1038 m x 23 m (runway strip: 90m)
- Runway 11C/29C is a Code 3 runway 1416 m x 30 m (runway strip: 90m)
- Runway 11L/29R is a Code 2 runway 1100 m x 30 m (runway strip: 90m)

5.2.1. Minimum Sector Altitudes

The minimum sector altitude (MSA) is applicable for the instrument approach procedures from the applicable reference point. A copy of the MSA published for the airport in AIP DAP is shown in Figure 11 (Source: Airservices Australia).

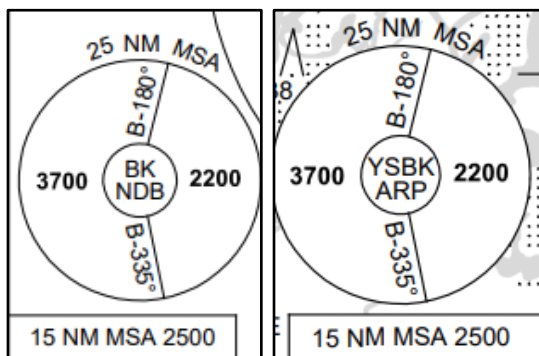


Figure 11 Bankstown Airport’s MSA

The project site is located within the 10 nm MSA and 25 nm MSA. The orange circle represents a distance of 15 nm from the ARP. The green circle represents a distance of 15 nm from the NDB Figure 12 (Source: Willowtree).

The 10 nm MSA is 762 m AHD (2500 ft AMSL), with a PANS-OPS surface elevation of 462 m AHD (1516 ft AMSL). The 25 nm MSA sector is 670.6 m AHD (2200 ft AMSL), with a PANS-OPS surface elevation of 370.6 m AHD (1216 ft AMSL).

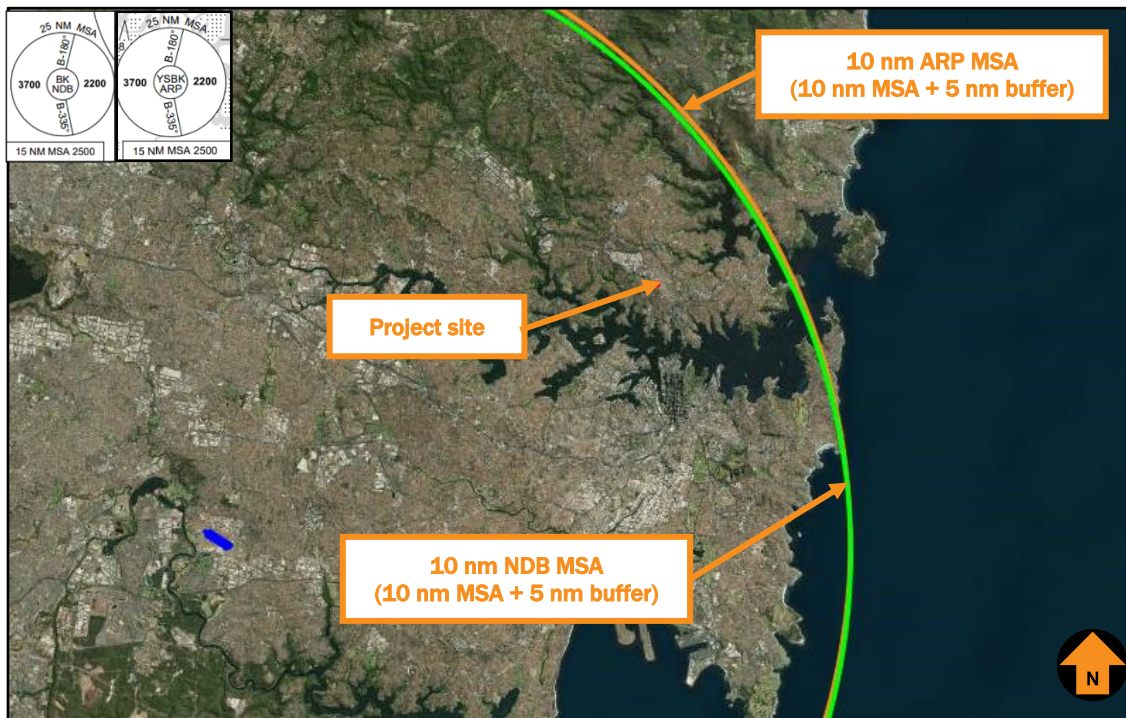


Figure 12 Bankstown Airport MSA

Table 5 summarizes an impact analysis of the MSA based on the overall height of the Project. The Project’s building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which will not affect MSA.

Table 5 Bankstown Airport MSA analysis

<i>MSA Segments</i>	<i>Minimum altitude (ft AMSL)</i>	<i>PANS OPS Surface (ft AMSL)</i>	<i>Impact</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
10 nm MSA	2500	1516	Nil – below surface	N/A	N/A
25 nm MSA - Sector	2200	1216	Nil – below surface	N/A	N/A

5.2.2. Instrument procedures

A check of the Aeronautical Information Package (AIP) via the Airservices Australia website showed that Bankstown Airport is served by non-precision flight procedures (source: AsA, effective 05 September 2024).

Table 6 identifies the aerodrome and procedure charts designed by Airservices Australia.

Table 6 Bankstown Airport (YSBK) aerodrome and procedure charts

<i>Chart name (Procedure Designer)</i>	<i>Effective date</i>
AERODROME CHART PAGE 1 (AsA)	1 December 2022 (Am 173)
AERODROME CHART PAGE 2 (AsA)	1 December 2022 (Am 173)
SID BANKSTOWN EIGHT DEP – RWY 11C/29C (AsA)	30-November-2023 (Am 177)
NDB RWY 11C (AsA)	23 March 2023 (AM 174)
NDB A (AsA)	23 March 2023 (AM 174)
RNP RWY 11C (AsA)	23 March 2023 (AM 174)

5.2.3. IFR Circling areas

The most demanding aircraft category provided for instrument flight procedure's is Category C. The radii for Category C is 7.62 km (4.11 nm).

The Project is located 22.35 km from Bankstown Airport and is outside airport's Circling surfaces.

5.2.4. Obstacle Limitation Surface (OLS)

The maximum horizontal distance that an OLS may extend for an aerodrome in Australia is 15 km (8.1 nm) from the edge of a runway strip. The Project is located approximately 22.35 km northeast of the airport's ARP and will outside the OLS.

5.2.5. PANS-OPS Surfaces

A detailed assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken.

Table 7 details the assessment for each instrument approach procedure.

Table 7 Bankstown Smith Airport PANS-OPS Assessment

<i>Airport Instrument Approach Title</i>	<i>Minimum Altitude over Project (ft AMSL)</i>	<i>PANS- OPS Surface (ft AMSL)</i>	<i>Impact</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
SID BANKSTOWN EIGHT DEP – RWY 11C/29C	Nil	Nil	Nil – outside	N/A	N/A
NDB RWY 11C	2200 (MSA)	1216	Nil – outside	N/A	N/A
NDB A	2200 (MSA)	1216	Nil – outside	N/A	N/A
RNP RWY 11C	2200 (MSA)	1216	Nil – outside	N/A	N/A

5.3. Camden Airport

Camden Airport (YSCN) is operated by Camden Airport Limited.

A check of Airservices Australia’s Aeronautical Information Package (AIP), dated 05 September 2024, shows that airspace procedures are measured from the aerodrome reference point (ARP). The coordinates published in Airservices Australia’s Designated Airspace Handbook (DAH) dated 13 June 2024 are as follows:

- ARP coordinates: Latitude 34° 02'25"S and Longitude 150° 41'12"E

According to En Route Supplementary Australia (ERSA) facilities information chart (FAC), the airport has an aerodrome elevation of 70 m AHD (230 ft AMSL).

Camden Airport has 2 runways:

- Runway 10/28 is a Code 1 runway 723 m x 30 m (runway strip: 90m)
- Runway 06/24 is a Code 2 runway 1464 m x 30 m (runway strip: 90m)

5.3.1. Minimum Sector Altitudes

The minimum sector altitude (MSA) is applicable for the instrument approach procedures from the applicable reference point. A copy of the MSA published for the airport in AIP DAP is shown in Figure 13 (Source: Airservices Australia).

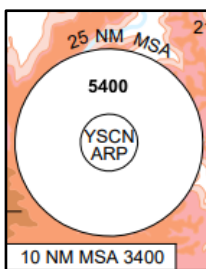


Figure 13 Camden Airport's MSA

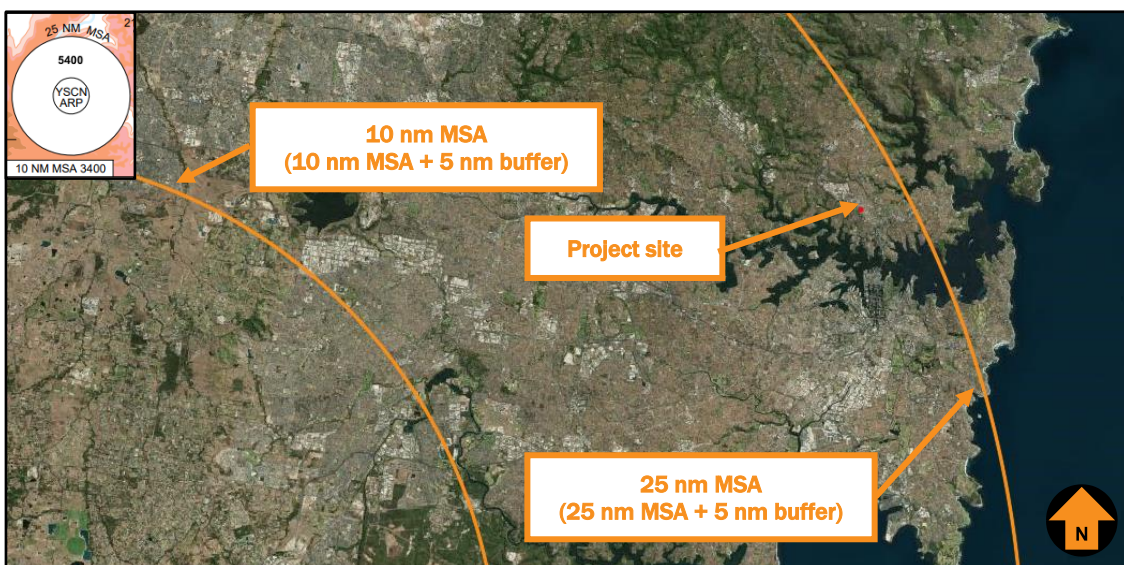


Figure 14 The Project location in relation to Camden Airport MSA

The project site is located within the 25 nm MSA. The orange circle represents a distance of 30 nm from the ARP of Camden Airport. Figure 14 (Source: Willowtree).

The 25 nm MSA is 1646 m AHD (5400 ft AMSL), with a PANS-OPS elevation of 1346 m AHD (4416 ft AMSL). The Project's building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which will not affect the MSA of Camden Airport.

5.3.2. Instrument procedure

A check of the Aeronautical Information Package (AIP) via the Airservices Australia website showed that Camden Airport is served by non-precision flight procedures (source: AsA, effective 30 November 2023).

Table 8 identifies the aerodrome and procedure charts for Camden Airport designed by Airservices Australia.

Table 8 Camden Airport (YSCN) aerodrome and procedure charts

<i>Chart name (Procedure Designer)</i>	<i>Effective date</i>
AERODROME CHART PAGE 1 (AsA)	5 November 2020 (Am 165)
AERODROME CHART PAGE 2 (AsA)	8 September 2022 (Am 172)
RNP W (AsA)	1 December 2022 (AM 173)

5.3.3. IFR Circling areas

The most demanding aircraft category provided for in Camden Airport's instrument flight procedure's is Category C. The radii for Category C is 7.62 km (4.11 nm).

The Project is located 53 km from Camden Airport and is outside the airport's Circling surfaces.

5.3.4. Obstacle Limitation Surface (OLS)

Obstacle Limitation Surface (OLS) is established for each certified aerodrome runway. For the Code 2 non-precision runway, the maximum lateral extent of the OLS is up to 4.7 km for the conical surface and 2.5 km for the take-off and approach surfaces.

The closest point of Site B is 53 km away from Camden Airport, outside the OLS.

5.3.5. PANS-OPS Surfaces

A detailed assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken.

Table 9 details the assessment for the instrument approach procedure.

Table 9 Camden Airport PANS-OPS Assessment

<i>Airport Instrument Approach Title</i>	<i>Minimum Altitude over Project (ft AMSL)</i>	<i>PANS- OPS Surface (ft AMSL)</i>	<i>Impact</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
RNP W	5400 (MSA)	4416	Nil – outside	N/A	N/A

5.4. Richmond Airport

Richmond Airport (YSRI) is operated by the Royal Australian Air Force (RAAF).

A check of Airservices Australia’s Aeronautical Information Package (AIP), dated 05 September 2024, shows that airspace procedures are measured from the aerodrome reference point (ARP). The coordinates published in Airservices Australia’s Designated Airspace Handbook (DAH) dated 13 June 2024 are as follows:

- ARP coordinates: Latitude 33° 36'02"S and Longitude 150° 46'51"E

According to En Route Supplementary Australia (ERSA) facilities information chart (FAC), the airport has an aerodrome elevation of 20.4 m AHD (67 ft AMSL).

RAAF Richmond Airport has one runway:

- Runway 10/28 is 2134 m x 45 m (runway strip: 154m)

5.4.1. Minimum Sector Altitudes

The minimum sector altitude (MSA) is applicable for the instrument approach procedures from the applicable reference point. A copy of the MSA published for the airport in AIP DAP is shown in Figure 15 (Source: Airservices Australia).

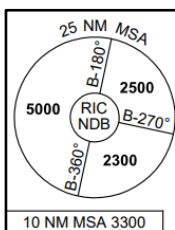


Figure 15 RAAF Richmond Airport’s MSA

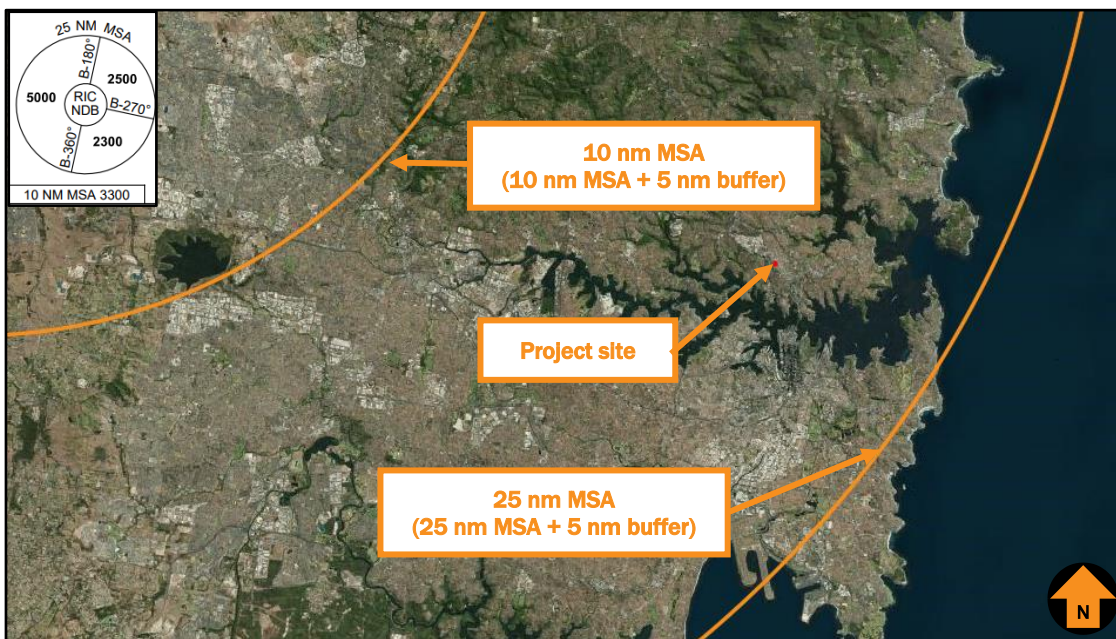


Figure 16 Project location in relation to RAAF Richmond Airport MSA

The project site is located within the 25 nm MSA. The orange circle represents a distance of 15 nm and 30 nm from the ARP. Figure 16 (Source: Willowtree).

The 25 nm MSA Sector is 701 m AHD (2300 ft AMSL), with a PANS-OPS surface elevation of 401 m AHD (1316 ft AMSL). The Project's building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which will not affect MSA.

5.4.2. Instrument procedures

A check of the Aeronautical Information Package (AIP) via the Airservices Australia website showed that RAAF Richmond Airport is served by precision and non-precision flight procedures (source: AsA, effective 05 September 2024).

Table 10 identifies the aerodrome and procedure charts for Richmond Airport designed by Airservices Australia.

Table 10 Richmond Airport (YSRI) aerodrome and procedure charts

<i>Chart name (Procedure Designer)</i>	<i>Effective date</i>
AERODROME CHART PAGE 1 (AsA)	25 March 2021 (Am 166)
AERODROME CHART PAGE 2 (AsA)	7 September 2023 (Am 176)
SID RICHMOND THREE DEPARTURE (RADAR) (AsA)	30-November-2023 (Am 177)
ILS Z or LOC Z RWY 28 (AsA)	30-November-2023 (Am 177)
NDB B or NDB RWY 28 (AsA)	30-November-2023 (Am 177)
ILS Y or LOC Y RWY 28 (RAAF)	23 March 2023
ILS X or LOC X RWY 28 (RAAF)	21 May 2020
ARA RWY 10 (RAAF)	24 March 2022
ARA RWY 28 (RAAF)	15 June 2023
TACAN RWY 10 (RAAF)	21 September 2021
TACAN RWY 28 (RAAF)	15 June 2023
NDB – A or NDB/DME A (RAAF)	5 November 2020
RNP RWY 10 (RAAF)	9 September 2021
RNP RWY 28 (RAAF)	15 June 2023
COMPOSITE	15 June 2023

5.4.3. IFR Circling areas

The most demanding aircraft category provided for the instrument flight procedure's is Category D. The radii for Category D is 8.13 km (4.39 nm).

The Project is located 46 km from Richmond Airport and is located outside the Circling area.

5.4.4. Obstacle Limitation Surface (OLS)

Obstacle Limitation Surface (OLS) is established for each certified aerodrome runway. The maximum lateral extent of the OLS is up to 6 km for the conical surface and 15 km for the take-off and approach surfaces.

The closest point of the building is 46 km away from Richmond Airport, outside Richmond Airport OLS.

5.4.5. PANS-OPS Surfaces

A detailed assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken.

Table 11 details the assessment for the instrument approach procedure.

Table 11 RAAF Richmond Airport PANS-OPS Assessment

<i>Instrument Approach Title</i>	<i>Minimum Altitude over Project (ft AMSL)</i>	<i>PANS- OPS Surface (ft AMSL)</i>	<i>Impact on procedure</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
SID RICHMOND THREE DEPARTURE (RADAR)	Nil	Nil	Nil – outside	N/A	N/A
ILS Z or LOC Z RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
NDB B or NDB RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
ILS Y or LOC Y RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
ILS X or LOC X RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
ARA RWY 10	2300 (MSA)	1316	Nil – outside	N/A	N/A
ARA RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
TACAN RWY 10	2300 (MSA)	1316	Nil – outside	N/A	N/A
TACAN RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
NDB A or NDB/DME A	2300 (MSA)	1316	Nil – outside	N/A	N/A
RNP RWY 10	2300 (MSA)	1316	Nil – outside	N/A	N/A
RNP RWY 28	2300 (MSA)	1316	Nil – outside	N/A	N/A
COMPOSITE	2300 (MSA)	1316	Nil – outside	N/A	N/A

5.5. Holsworthy Military Airport

Holsworthy Airport (YSHW) is an airport operated by the Australian Department of Defence. It has a published aerodrome elevation of 76.2 m AHD (250 ft AMSL) (Source: Airservices Australia (AsA), FAC 30 November 2023). The Aerodrome Reference Point (ARP) coordinates published in Airservices Australia's Designated Airspace Handbook (DAH) are Latitude 33° 59'42"S and Longitude 150° 57'09"E.

5.5.1. Minimum Sector Altitudes

The minimum sector altitude (MSA) is applicable for the instrument approach procedures from the applicable reference point. A copy of the MSA published for the airport in RAAF is shown in Figure 17 (Source: Australian Defence Force).

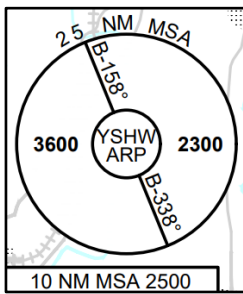


Figure 17 Holsworthy Airport's MSA

The project site is located within the 25 nm MSA. The orange circle represents a distance of 15 nm and 30 nm from the ARP.

The 25 nm MSA Sector is 701 m AHD (2300 ft AMSL) The PANS-OPS surface elevation is 401 m AHD (1316 ft AMSL). The Project's building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which will not affect MSA.



Figure 18 The Project location in relation to Holsworthy Airport MSA

5.5.2. Instrument procedures

A check of the Aeronautical Information Package (AIP) via the Australian Defence Force website showed that Holsworthy Airport is served by non-precision flight procedures (source: Australian Defence Force, effective 15 June 2023).

Table 12 identifies the aerodrome and procedure charts for Holsworthy Airport designed by the Australian Defence Force.

Table 12 Holsworthy Airport (YSHW) aerodrome and procedure charts

<i>Chart name (Procedure Designer)</i>	<i>Effective date</i>
AERODROME CHART PAGE (RAAF)	24 March 2022
SID HW2SI ONE DEPARTURE (HELICOPTER, RNAV) (RAAF)	15 June 2023
RNP 021	15 June 2023

5.5.3. Obstacle Limitation Surface (OLS)

Holsworthy Airport has OLS extending to a maximum distance of 2.7 km from the aerodrome. The closest point of the building is 29.6 km and is outside Holsworthy Airport OLS.

5.5.4. PANS-OPS Surfaces

A detailed assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken.

Table 13 details the assessment for the instrument approach procedure.

Table 13 Holsworthy Airport PANS-OPS Assessment

<i>Instrument Approach Title</i>	<i>Minimum Altitude over Project (ft AMSL)</i>	<i>PANS- OPS Surface (ft AMSL)</i>	<i>Impact on procedure</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
SID HW2SI ONE DEPARTURE (HELICOPTER, RNAV) (RAAF)	Nil	Nil	Nil – outside	N/A	N/A
RNP 021	2300 (MSA)	1316	Nil – outside	N/A	N/A

5.6. Grid and Air routes LSALT

MOS 173 requires that the published lowest safe altitude (LSALT) for a particular airspace grid or air route provides a minimum of 1000 ft clearance above the controlling (highest) obstacle within the relevant airspace grid or air route tolerances.

5.6.1. Grid LSALT

The Project is located within an area with a Grid LSALT of 1067 m AHD (3500 ft AMSL) with a protection surface of 762 m AHD (2500 ft AMSL).

Figure 19 provides the Grid LSALT and air routes in proximity to the project site (source: ERC Low National, OzRunways, September 2024, Google Earth).

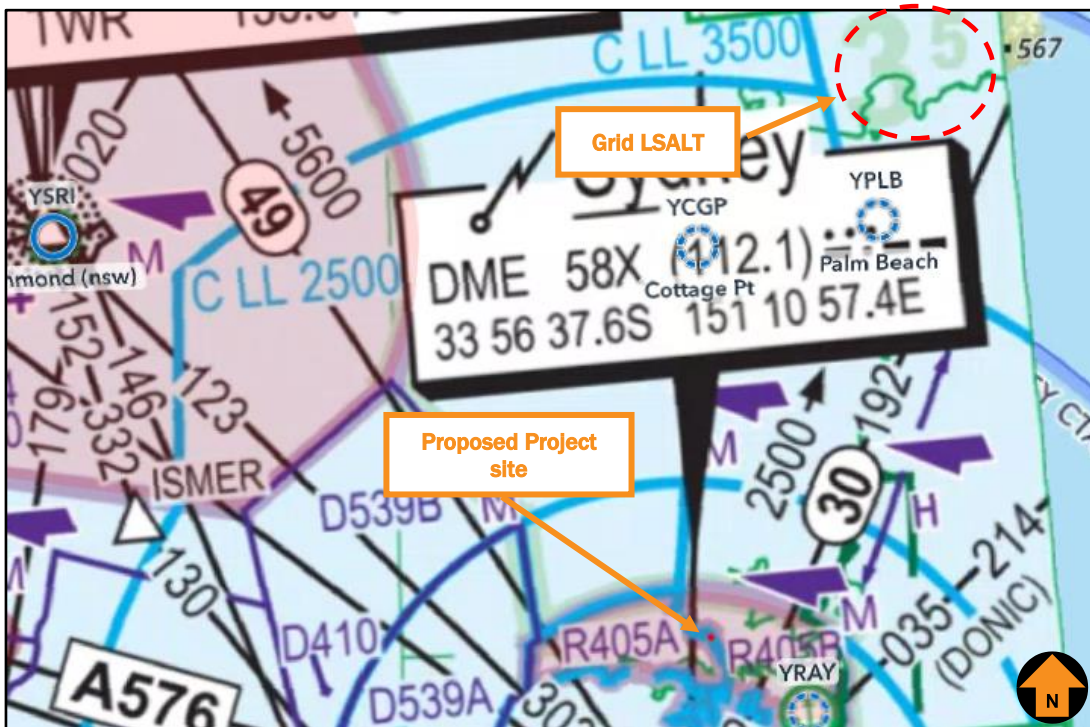


Figure 19 Grid LSALT in proximity to the project site

An impact analysis of the Grid LSALT is provided in Table 14.

The Project’s building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which is below the 2500 ft obstacle height limit. Therefore, the proposed site will not impact the Grid LSALT.

Table 14 Grid LSALT impact analysis

<i>Grid LSALT</i>	<i>Protection Surface</i>	<i>Impact</i>	<i>Potential solution</i>	<i>Impact on aircraft ops</i>
3500 ft AMSL	2500 ft AMSL	Nil	N/A	N/A

5.6.2. Air Route LSALTs

A protection area 7 nm laterally either side of an air route is used to assess the LSALT for the air route.

There are several air routes within 7 nm of the project site. The Project’s building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which is below all air route LSALTs. Therefore, the Project will not impact the air route LSALT.

5.7. Airspace

The project site is located outside controlled airspace but infringes Class C airspace with a lower limit of 500 ft and is not located in any Prohibited and Danger areas. There is no impact to military aviation activity.

The project site is located within restricted area R405B as shown in Figure 20.

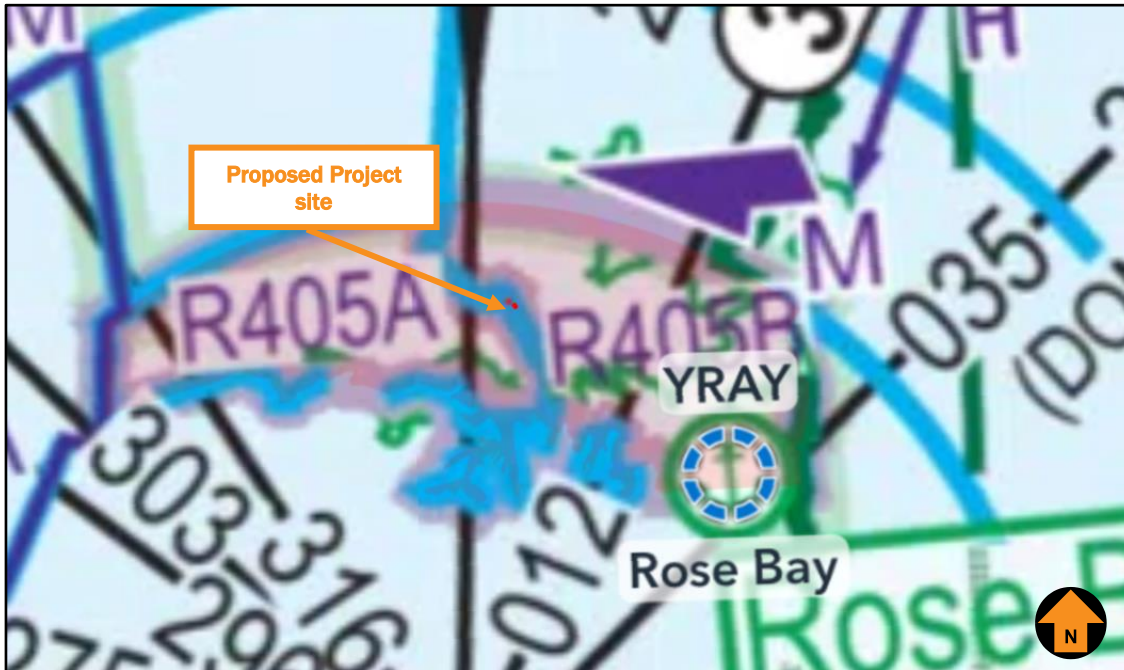


Figure 20 Project site in relation to restricted area.

The restrictions of R405A and R405B on the airspace is shown below in Figure 21 and Figure 22 (Source: DAH 15 June 2023).

YMMM/R405A SYDNEY
CONDITIONAL STATUS: RA3
HELICOPTERS & SEAPLANES
LATERAL LIMITS: 335037S 1510748E - 335030S 1510714E
 335037S 1510654E - 335104S 1510454E
 335028S 1510456E
 then along HOMEBUSH BAY 5 - 334932S 1510518E
 then along the clockwise arc of a circle radius 8.50NM centre
 335638S 1511057E (SY/DME) - 334807S 1511053E
 then along THE PACIFIC HWY 3 - 335110S 1511241E
 335120S 1511228E
 then along SY HarbourA - 335037S 1510748E
VERTICAL LIMITS: SFC - 500
HOURS OF ACTIVITY: H24
CONTROLLING AUTHORITY: Regulatory Oversight Division
 (CASA)

Figure 21 Restrictions of R405A

YMMM/R405B SYDNEY**CONDITIONAL STATUS: RA3****HELICOPTERS & SEAPLANES****LATERAL LIMITS:** 334949S 1511705E - 335006S 1511652E

then along THE COAST 61 - 335134S 1511705E

then along THE COAST 16 - 335222S 1511701E

335224S 1511446E

then along SY HarbourB - 335120S 1511228E

335110S 1511241E

then along THE PACIFIC HWY 3 - 334807S 1511053E

then along the clockwise arc of a circle radius 8.50NM centre

335638S 1511057E (SY/DME) - 334949S 1511705E

VERTICAL LIMITS: SFC - 1000**HOURS OF ACTIVITY:** H24**CONTROLLING AUTHORITY:** Regulatory Oversight Division
(CASA)

Figure 22 Restrictions of R405B

Within R405A, the aircraft can fly between surface and 500 ft AMSL, while R405B, the aircraft can fly between surface to 1000 ft AMSL without infringing controlled airspace.

Seaplanes and helicopters use both Restricted areas for access to/from helicopter landing sites on land and seaplane landing sites within Sydney Harbour. Seaplanes must only operate over water when within them.

Aircraft and helicopters operating within each Restricted Area must comply with Civil Aviation Safety Regulations related to minimum heights above the built-up area on the north shore of Sydney Harbour.

5.8. Aviation facilities

The closest aviation facilities to the project site are located at Sydney Airport (YSSY) (Ground Based Augmentation System (GBAS), Glide Path (GP), Distance measuring equipment (DME), an instrument landing system (ILS) and localiser (LOC)).

According to National Airports Safeguarding Framework Guideline G *Protecting Aviation Facilities - Communications, Navigation and Surveillance (CNS)*, the navigation facilities have areas restricted to developments.

The project site is located approximately 13.4 km north of Sydney Airport and outside the areas restricted to developments for noted aviation facilities, and therefore will not interfere with these facilities.

5.9. Radar

Airservices Australia currently requires an assessment of the potential for a development site to affect radar lines of sight.

With respect to aviation radar facilities, the following facilities are referenced:

- Sydney Primary Surveillance Radar (PSR) - approximately 13.8 km south of the project
- Sydney Secondary Surveillance Radar (SSR) - approximately 13.8 km south of the project
- Cecil Park Primary Surveillance Radar (PSR) - approximately 34 km west of the project
- Cecil Park Secondary Surveillance Radar (SSR) - approximately 34 km west of the project

The antenna elevation at Sydney Airport is 38.2 m AHD. The clearance plane elevation at the development will be 98.4 m AHD. The Project's building height is 158 m (518.4 ft AMSL), and the temporary overall height (including 65 m crane above the building height) is 223 m AHD (731.6 ft AMSL), which will affect the Sydney PSR and SSR. As there are high buildings in the Sydney CBD area, there is an effect on the lines of sight of Sydney Airport. Cecil Park PSR and SSR provides coverage for radar shadows produced by large buildings on the Sydney radars systems.

Cecil Park PSR and SSR is 34 km away from the site, the site will outside the interest area and will not affect line of sight of both Cecil Park PSR and SSR.

Table 15 Surveillance System Clearance Plane

<i>Surveillance System</i>	<i>Distance from development</i>	<i>Antenna Elevation (AHD)</i>	<i>Clearance Plane Elevation at development site</i> <i>(Distance x Tan 0.25 + TAR elevation (m AHD))</i>
Sydney PSR/SSR	13.8 km	38.2m	98.4

6. HELICOPTER LANDING SITES

An Helicopter Landing Site (HLS) is a specific nominated area (not located on an aerodrome) wholly or partly used for the arrival or departure of helicopters for strategically important purposes

There is one HLS within a 3.5 km distance of the project site – Royal North Shore Hospital (YXNS) (Source: Google Earth, Airservices Australia).

In Hospital Helicopter Landing Sites in NSW, section 3.13 contains the detailed explanation regarding HLS OIS:

1.13 Object Identification Surfaces

The object identification surfaces (OIS) can be described as:

- in all directions from the safety area, except under the approach/departure paths, the object identification surface starts at the safety area perimeter and extends out horizontally for a distance of ~30m
- under the approach/departure surface, the object identification surface starts from the FATO outside edge and extends horizontally out for a distance of ~700. From this point, the object identification surface extends out for an additional distance ~2,800m while rising on a 2.5° or 22:1 slope (22 units horizontal in one unit vertical). From the point ~700m from the FATO perimeter, the object identification surface is ~30m beneath the approach/departure surface
- the width of the safety surface increases as a function of distance from the Safety Area. From the safety area perimeter, the object identification surface extends laterally to a point ~30m outside the safety area perimeter. At the upper end of the surface, the object identification surface extends laterally ~60m on either side of the approach/departure path.

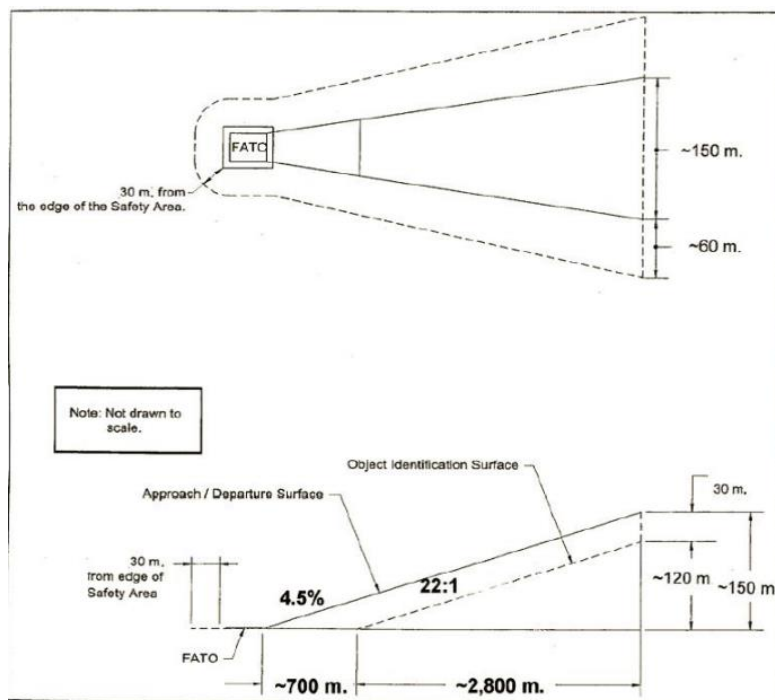


Figure 23 HLS Surfaces

For the purpose of the Design Development Overlay (DDO), the OIS below the VFR approach and departure paths are the limit for the penetration of obstructions. That is, there should be no future development penetrating the OIS, which extends out to 3.5km from the forward edge of the FATO.

The Royal North Shore Hospital HLS (YXNS) is approximately 800 m away from the development site. Both ERSA and OzRunways have airspace information regarding YXNS. The data in ERSA is incorrect and related to a non-operational HLS at RNSH.

Ozrunways:

Approach : "Fly Neighbourly" approach in SW sector over Gore Hill Oval on 008 T. Alternate "Fly Neighbourly" approach in NE sector on 219 T.

Departure: "Fly Neighbourly" departure in SW sector over Gore Hill Oval on 188 T. Alternate "Fly Neighbourly" departure in NE sector on 039 T. Yellow in NE sector is yet to be positioned on the HLS deck.

As shown in Figure 24, green lines represent flight path based on Ozrunways.



Figure 24 HLS flight path in relation to development site

7. CONCLUSIONS

As a result of this aeronautical assessment, the following conclusions are made:

- The proposed site has the following characteristics:
 - a. Building B's height is 158 m AHD (518.4 ft AMSL)
 - b. Temporary crane(s) will be 65 m above installed building height, which will be up to 223 m AHD (731.6 ft AMSL)
- The project development:
 - a. Will be within 30 nm of 5 certificated airports:
 - i. Sydney Airport (YSSY)
 - ii. Bankstown Airport (YSBK)
 - iii. Holsworthy Airport (YSHW)
 - iv. Camden Airport (YSCN)
 - v. Richmond Airport (YSRI)

Sydney Airport:

- i. Will not affect MSA
- ii. Will infringe OLS surface – Outer Horizontal
- iii. Will not infringe Circling areas
- iv. Will not infringe the obstacle clearance heights applicable to any of the instrument procedures

Bankstown Airport:

- i. Will not affect MSA
- ii. Will not infringe OLS surface
- iii. Will not infringe Circling areas
- iv. Will not infringe the obstacle clearance heights applicable to any of the instrument procedures

Camden Airport:

- i. Will not affect MSA
- ii. Will not infringe OLS surface
- iii. Will not infringe Circling areas
- iv. Will not infringe the obstacle clearance heights applicable to any of the instrument procedures

RAAF Richmond Airport:

- i. Will not affect MSA
- ii. Will not infringe OLS surface
- iii. Will not infringe Circling areas
- iv. Will not infringe the obstacle clearance heights applicable to any of the instrument procedures

Holsworthy Airport:

- i. Will not infringe OLS surface
 - ii. Will not infringe the PANS-OPS surface heights applicable to any of the instrument procedures
- b. Will not impact Grid LSALT and air routes LSALT
 - c. Is located outside of controlled airspace but the building and cranes would infringe a Class C area with a lower limit of 500 ft AMSL adjacent to the Sydney Control Zone.
 - d. Is located within Restricted Area –R405B
 - i. Will not create an adverse impact to flight operations within R405B as all aircraft must comply with CASRs in relation to minimum heights above built-up areas.
 - e. Will not impact any aviation navigation facilities
 - f. Will not impact ATC surveillance radar coverage
 - g. Will not impact Royal North Shore Hospital HLS operation.

8. RECOMMENDATIONS

As a result of this aeronautical assessment, the following recommendations are made:

- If approved, details of the Project should be reported to Airservices Australia via this email address: vod@airservicesaustralia.com, and published in En Route Supplement Australia (ERSA) and other relevant aeronautical chart products.
- Sydney Airport advises that approval to operate construction equipment (i.e. cranes) should be obtained prior to any commitment to construct. Information required by Sydney Airport prior to any approval is set out in attached crane application form.



(+61) 7 3371 0788
enquiries@aviationprojects.com.au

www.aviationprojects.com.au