AVIATION PROJECTS

Jamie Bryant
Associate
Willowtree Planning

By email: jbryant@willowtp.com.au

December 2024

Our reference: 067501-01

Dear Jamie

Re: 93 Bridge Road, Westmead – Preliminary Aviation Impact Assessment

Reference is invited to your request for a Preliminary Aviation Impact Assessment of the proposed building at 93 Bridge Road, Westmead, NSW.

Please find following an assessment of possible development constraints due to aviation impacts. This analysis is based on the information provided in your email correspondence.

1.1. Project background

Willowtree Planning is proposing to construct an 18-storey development at 93 Bridge Road, Westmead, NSW, with a maximum height of up to RL 101.2 m.

Willowtree Planning has engaged Aviation Projects to provide a preliminary aviation impact analysis to support the refined proposal.

1.2. References

References used or consulted in the preparation of this report included:

- Airservices Australia, Aeronautical Information Package; including AIP Book, Departure and Approach Procedures, Designated Airspace Handbook and En Route Supplement Australia dated 28 November 2024
- Airports (Protection of Airspace) Regulations 1996
- Civil Aviation Safety Authority, *Civil Aviation Regulations 1998 (CAR)*
- Civil Aviation Safety Authority, *Civil Aviation Safety Regulations 1998* (CASR)
- Civil Aviation Safety Authority, *Part 139 (Aerodromes) Manual of Standards 2019*, dated 13 August 2020
- Civil Aviation Safety Authority, Manual of Standards Part 173 – Standards Applicable to Instrument Flight Procedure Design, version 1.8, dated August 2022
- Civil Aviation Safety Authority, Advisory Circular 139.E-01 v1.0—Reporting of Tall Structures , dated December 2021
- National Airports Safeguarding Framework (NASF) Guideline F: *Managing the Risk of Intrusions into the Protected Operational Airspace of Airports*

- NASF Guideline H: *Protecting Strategically Important Helicopter Landing Sites (HLS)*
- International Civil Aviation Organization (ICAO), *Doc 8168 Procedures for Air Navigation Services—Aircraft Operations (PANS-OPS)*
- ICAO Standards and Recommended Practices, Annex 14—*Aerodromes.*
- OzRunways, aeronautical navigation chart extracts, dated December 2024
- The Sydney Airport 2039 Master Plan
- Other references as noted.

1.3. Client material

Willowtree Planning provided the following material for the purposes of this analysis:

- 93 Bridge Road Draft Planning Proposal - Council Template - 15.12.2023.pdf (received 18 January 2024)
- Appendix 5 - Urban Design Report_V3 Final Draft Issue.pdf (received 18 January 2024)
- Appendix 6 - Survey Plan- 93 Bridge Rd, Westmead.pdf (received 18 January 2024)
- Appendix 8 - Transport Assessment (Finalised).pdf (received 18 January 2024)
- 240122 SMA BRI - Westmead Bridge Rd Section AA.pdf (received 18 January 2024)
- 240122 SMA BRI - Westmead Bridge Rd Section BB.pdf (received 18 January 2024)
- Ground floor.pdf (received 29 November 2024)
- Tower.pdf (received 29 November 2024)
- 241128_SMA BRI - Gateway Model Testing.pdf (received 29 November 2024)
- 241209_SMA_BRI_Westmead_Section aa 20 storeys.jpg (received 09 December 2024)

1.4. Site Overview

Willowtree Planning is preparing the re-submission of a Planning Proposal for the site at 93 Bridge Road, Westmead (Parramatta) – a 0.9 hectare lot to the north of the junction where Bridge Road intersects the railway line.

The site is currently occupied by 31 dwellings arranged around an internal access road and the communal facilities of the adjacent 16-storey Monarco Estate. The site forms part of the Westmead Health and Education Precinct and Innovation District, Australia's largest of its kind.

The overall objective is to support the future precinct-oriented development of the site for high-density residential development (approx. 350 units, including 20% affordable).

1.5. 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.

1.5.1. 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.

1.5.2. 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 HLS, 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.

1.6. 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.

1.7. 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.

1.8. Sydney Airport Master Plan

The Sydney Airport Master Plan 2039 establishes a clear vision for 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 council 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.

1.9. 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.

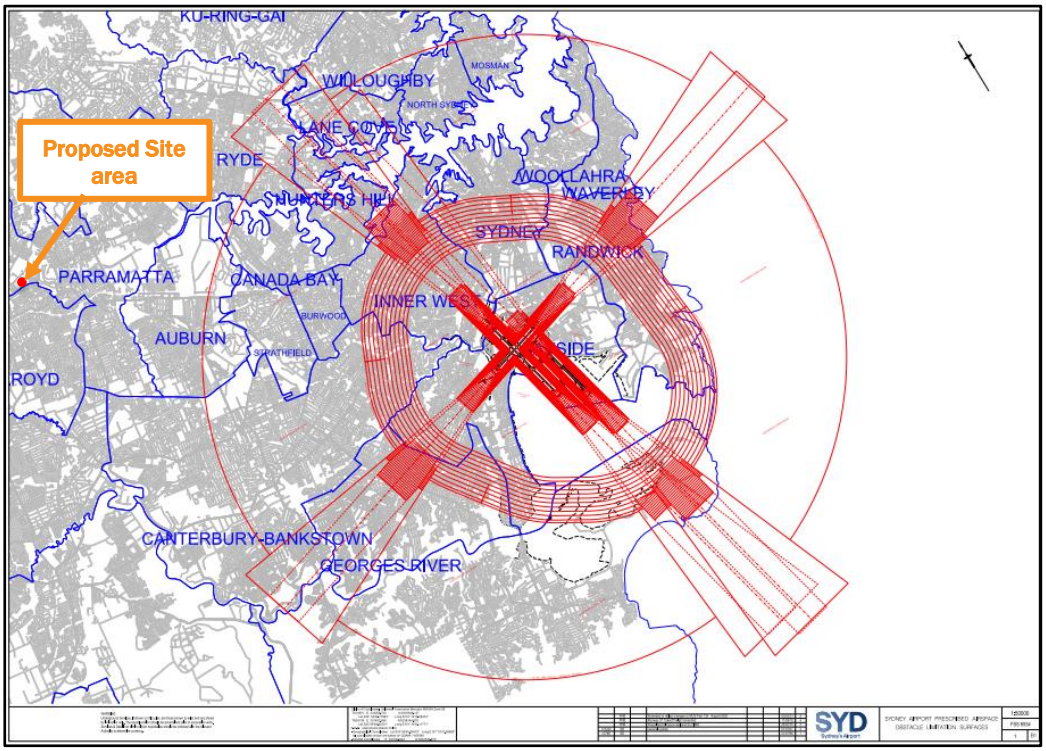


Figure 1 Sydney Airport Obstacle Limitation Surfaces

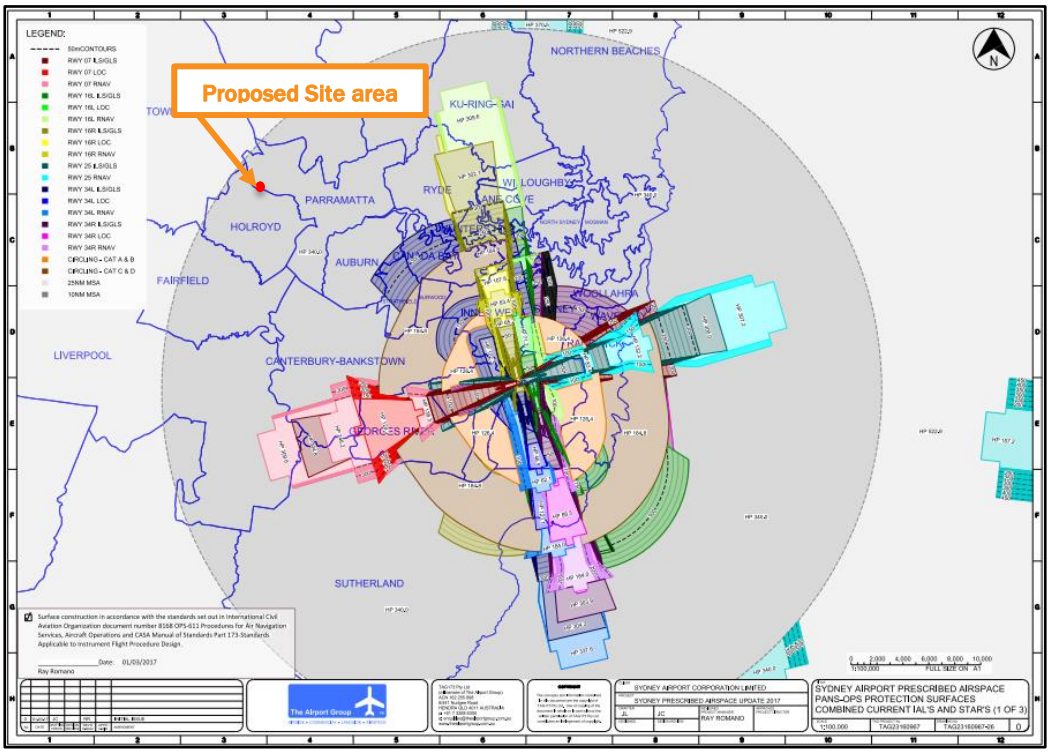


Figure 2 Sydney Airport PANS-OPS Surfaces

1.10. Bankstown Airport Master Plan 2019

The Bankstown Airport Master Plan 2019 was approved by the Commonwealth Minister for Infrastructure, Transport and Regional Developments on 7 November 2019.

5.0 Aircraft Noise

The most effective means for reducing the impact of aircraft noise is through the proper planning of land use for areas adjacent to the Airport. BAL works closely with Canterbury-Bankstown, Liverpool and Fairfield Councils in relation to the application of land use planning controls surrounding the Airport. This is further addressed in Chapter 6.0.

Aside from land use planning, other noise mitigation measures include the use of alternative runway

alignments, flight paths, restrictions of aircraft movements and aircraft operational procedures aimed at reducing noise.

Airservices implemented a detailed noise monitoring program around Bankstown Airport in 2013. This program produced an in-depth analysis of aircraft movements, including numbers of aircraft operating, seasonal variations in aircraft movements, time of operations, runway usage and types of aircraft operating at the Airport. Such data, along with the detailed flight path data from the previous Master Plan, have provided a base of information about the spread of approaching and departing aircraft and circuit training around the Airport.

The Airports Act requires this Master Plan to forecast noise levels resulting from the operation of the Airport. The Australian Government has specified the use of a computer-based Integrated Noise Model (INM) which produces Australian Noise Exposure Forecast (ANEF) contours for the prediction of exposure to aircraft noise. ANEF contours assist to determine aircraft noise impacts on surrounding land and communities and assist planning authorities to regulate land use and future development around airports.

The modelling of noise generated by aircraft movements in this Master Plan provides the most accurate estimates of noise exposure to surrounding communities. The forecasts indicate minor changes in the level of noise generated by aircraft activity compared with the 2014 Master Plan.

6.0 Airport Safeguarding and Airspace Protection

The capacity of an airport to operate and respond to growth in the aviation sector is directly impacted by what occurs on and surrounding the airport.

Long-term and effective protection and safeguarding of Bankstown Airport is critical to ensuring ongoing aviation operations and safety. Consideration therefore needs to be given to:

- *Land use planning around the Airport, to minimise development which may be impacted by aircraft noise and operations*
- *Siting, location and design of buildings and structures which may impact windshear and turbulence, affecting aircraft operations*
- *Minimising impacts from ground lighting that may distract or confuse aircraft pilots*
- *Protecting the airspace surrounding the Airport from buildings and structures, which may impinge on the safe arrival and departure of aircraft*
- *Protecting aviation facilities from development encroachment.*
- *Protecting areas at the end of runways, through public safety areas.*

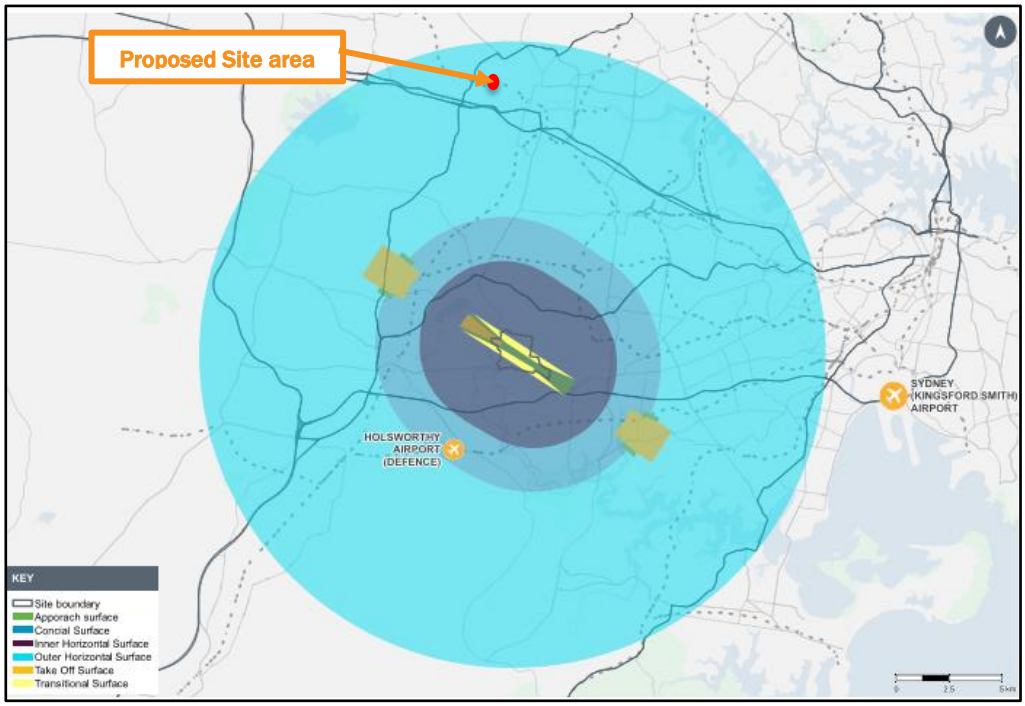


Figure 3 Bankstown Airport OLS

1.11. Project description

The Project includes the development of an 18-storey building at 93 Bridge Road, Westmead, NSW.

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

- The building height is 69 m, plus 5.6 m for structures and lift overruns
- As per the survey plan, the natural ground line is approximately 28 m RL along the western boundary and 23.0 m RL along the eastern boundary
- The RL of the building would sit will be up to 101.2 m AHD
- Temporary crane operations: It is assumed that the temporary crane(s) will be 20 m above the installed building height.

For this preliminary aviation impact assessment, the maximum building height will be 101.2 m RL (332 ft AMSL), plus a 20 m temporary crane above the building, up to 121.2 m AHD (397.6 ft AMSL).

Figure 1 depicts The project section plan (source: Hatch).

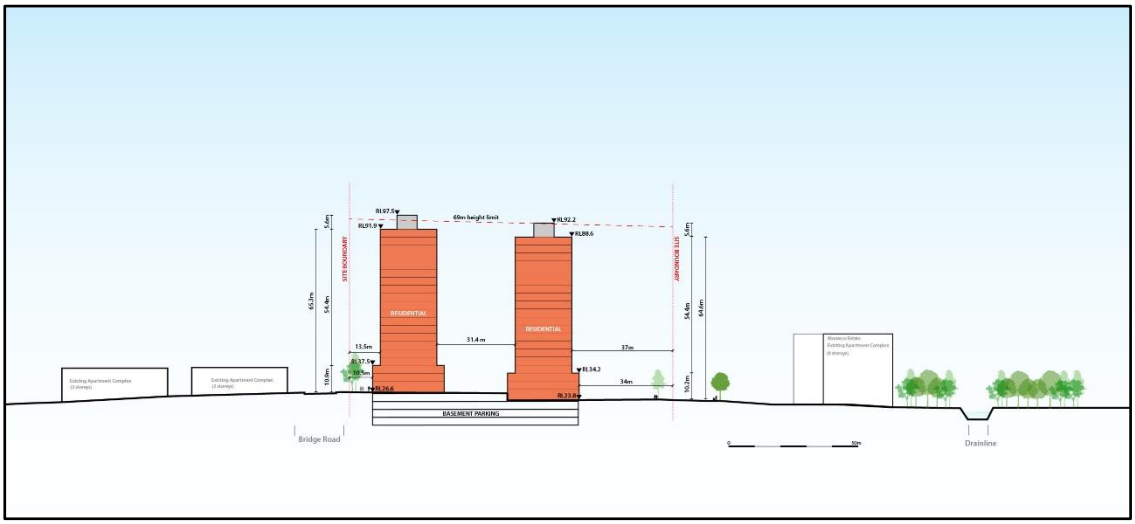


Figure 4 Project site section drawing

1.12. Helicopter landing sites

A Helicopter Landing Site (HLS) is a specific nominated area (not located on an aerodrome) wholly or partly used to arrive or depart helicopters for strategically important purposes.

NSW Government addresses Hospital Helicopter Landing Sites in NSW guidelines. The revised Guidelines incorporate international experience and best practices in the establishment of HLS, both at ground level and on elevated structures.

Section 3.13 contains a detailed explanation regarding HLS object identification surfaces (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.*

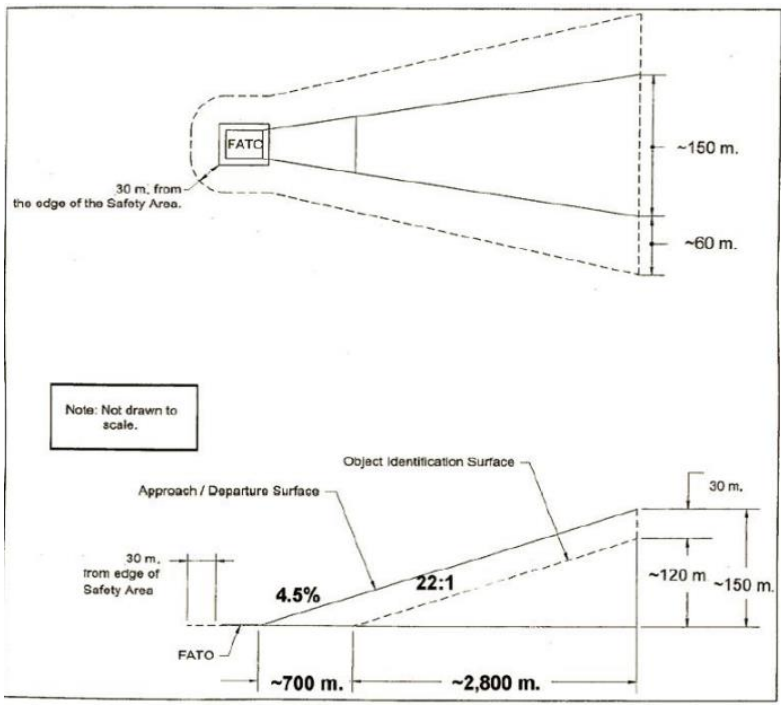


Figure 5 HLS Surfaces

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.

There are four (4) HLS within a 3.5 km distance of the project site based on OZRuways and Airservices Australia:

- Westmead Hospital A & E (Rooftop) (YWST) - 700 m east of the project site
- Westmead Children Hospital (YXWM) – 1.24 km east of the project site
- Westmead CASB (YXWS) – 930 m east of the project site
- Westmead Hospital – Oval / Care Flight Base (OZHJD) – 980 m northeast of the project site.

1.12.1. Westmead Hospital A & E (Rooftop) (YWST)

The Westmead Hospital A & E (Rooftop) (YWST) is approximately 700 m away from the development site. Airservices Australia and OzRunways have airspace information regarding YWST:

OzRunways:

Description: Class G. NPA's service this site (Ref AIP DAP)

Elevation: 127 ft

Approach: NE or SW

Departure: NE or SW

The flight path based on OZRunways is shown in Figure 6 (Source: Google Earth). The project site is located outside of the flight path of YWST HLS.

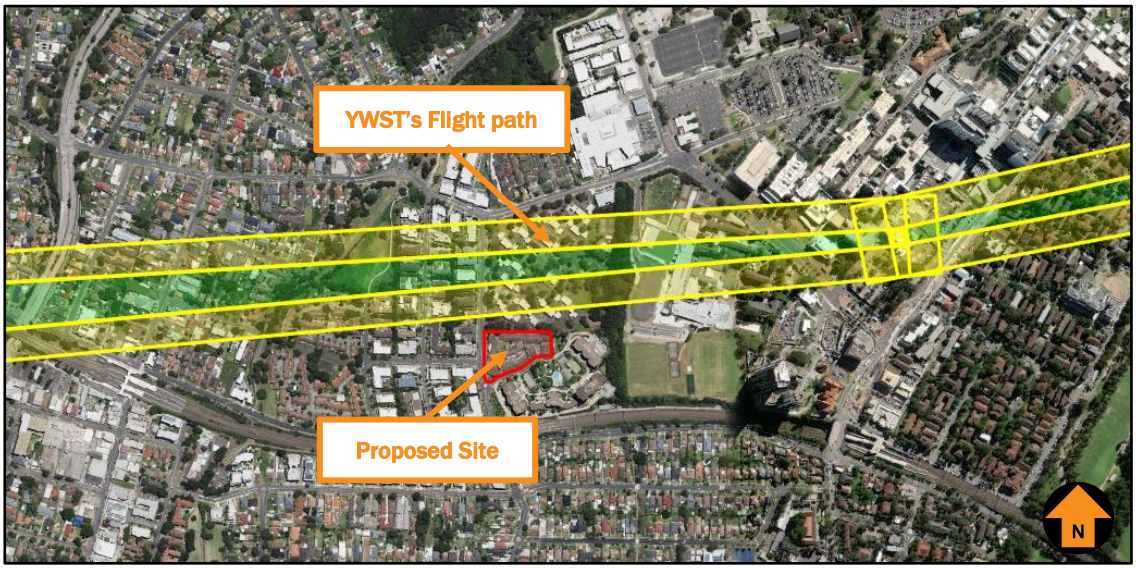


Figure 6 YWST HLS flight path in relation to the site

Airservices Australia:

An AIP via the Airservices Australia website showed that YWST is served by non-precision flight procedures (source: AsA, effective 28 November 2024).

Table 1 identifies the aerodrome and procedure charts for YWST designed by Airservices Australia.

Table 1 YWST procedure charts

Chart name (Procedure Designer)	*Effective date*
RNP 052 (AsA)	28 November 2024 (Am 181)
RNP 127 (AsA)	13 June 2024 (Am 179)

The project site will be beneath the Level obstacle limitation area (OIS) of RNP 127.

Also, the Project will be beneath the missed approach area and the sloping obstacle clearance surface (OCS) of RNP 052. (Airservices Australia advised the height of the procedure protection surface will be 108.2 m AHD (355 ft AMSL).

The project site will not affect the flight path of YWST HLS; however, the temporary crane operation will affect the flight path. Options of solution been advised by Airservices Australia in May 2024 via emails.

> *Summary – Westmead HLS*
>
> *It is our view that the proposed activity impacts Airservices designed airspace procedures, CNS facilities or ATC operations at Westmead HLS.*
>
> *Options are:*
>
> *Reduce the height of the proposed activity to less than the above height. No further assessment/comment required if the proposed activity remains below the above height.*
>
> *OR,*

Reduce the duration of the proposed activity to less than three months. Please contact Airservices to organise for any NOTAM(s) as required.

1.12.2. Other HLSs

The Westmead Children's Hospital (YXWM) is approximately 1.24 km away from the development site.

OzRunways has airspace information regarding YXWM:

Description: GNSS approaches service this HLS

Elevation: 140 ft

Procedures: Call 9845 1999 with 15 minutes prior notice before landing or take-off. Avoid low flight (rotor downwash) over the hospital roof to the immediate West of HLS, and avoid, if possible, overflying the Rehab facility East of the HLS. See the attached CHW Helipad Operational Manual for full details.

Approach: N & SSE

Departure: N & SSE

The Westmead CASB (YXWS) is approximately 930 m away from the development site. OzRunways has airspace information regarding YXWS:

Elevation: 264 ft

Approach: East or West (Marked)

Departure: East or West (Marked)

The Westmead Hospital – Oval / Care Flight Base (OZHJD) is approximately 980 m away from the development site. OzRunways has airspace information regarding OZHJD:

Description: Non-precision instrument approaches service this HLS

Elevation: 60 ft

Approach: East & along creek from West

Departure: East & West

As shown in Figure 7, red lines represent Westmead Children Hospital (YXWM)'s flight path based on OzRunways, while blue lines represent Westmead CASB (YXWS)'s flight path, and green lines represent Westmead Hospital – Oval / Care Flight Base (OZHJD)'s flight path. The project site will not affect the flight path of the three HLS.

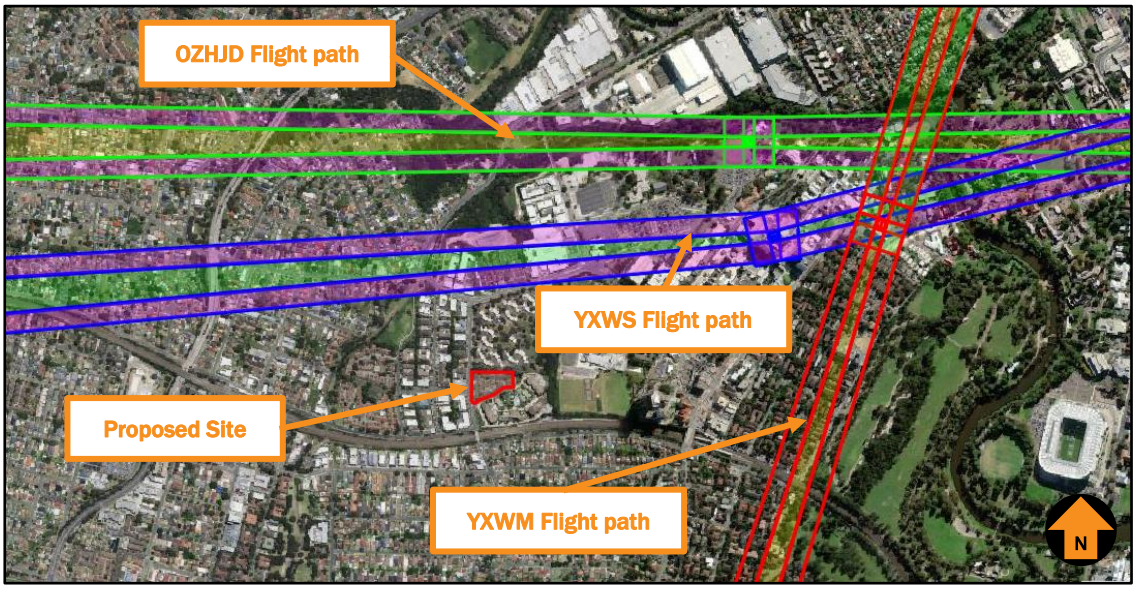


Figure 7 HLS flight path in relation to the development site

1.13. Sydney Airport (YSSY)

Sydney Airport (YSSY) is operated by Sydney Airport Corporation Limited (SACL). A check of Airservices Australia's Aeronautical Information Package (AIP), dated 28 November 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 28 November 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).

1.13.1. 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 21 March 2024).

Table 2 identifies the aerodrome and procedure charts for Sydney Airport designed by Airservices Australia.

Table 2 Sydney Airport (YSSY) aerodrome and procedure charts

Chart name (Procedure Designer)	*Effective date*
AERODROME CHART PAGE 1 (AsA)	28 November 2024 (Am 181)
AERODROME CHART PAGE 2 (AsA)	13 June 2022 (Am 179)
SID SYDNEY TWO DEPATURE (RADAR) (AsA)	30-November-2023 (Am 177)
ILS OR LOC RWY 07 (AsA)	13-June-2024 (Am 179)
ILS OR LOC RWY 16L PAGE 1 (AsA)	13-June-2024 (Am 179)
ILS RWY 16L PAGE 2 (AsA)	13-June-2024 (Am 179)

Chart name (Procedure Designer)	*Effective date*
ILS OR LOC RWY 16R PAGE 1 (AsA)	13-June-2024 (Am 179)
ILS RWY 16R PAGE 2 (AsA)	13-June-2024 (Am 179)
ILS OR LOC RWY 25 (AsA)	13-June-2024 (Am 179)
ILS OR LOC RWY 34L PAGE 1 (AsA)	13-June-2024 (Am 179)
ILS RWY 34L PAGE 2 (AsA)	13-June-2024 (Am 179)
ILS OR LOC RWY 34R PAGE 1 (AsA)	13-June-2024 (Am 179)
ILS RWY 34R PAGE 2 (AsA)	13-June-2024 (Am 179)
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)	28-November-2024 (Am 181)
GLS RWY 16L (AsA)	28-November-2024 (Am 181)
GLS RWY 16R (AsA)	28-November-2024 (Am 181)
GLS RWY 25 (AsA)	28-November-2024 (Am 181)
GLS RWY 34L (AsA)	13 June 2024 (Am 179)
GLS RWY 34R (AsA)	13 June 2024 (Am 179)

1.13.2. MSA Surfaces

The minimum sector altitude (MSA) is applicable for each instrument approach procedure at Sydney Airport. An image of the MSA published for Sydney Airport is shown in Figure 8 (Source: Airservices Australia, 30 November 2023).

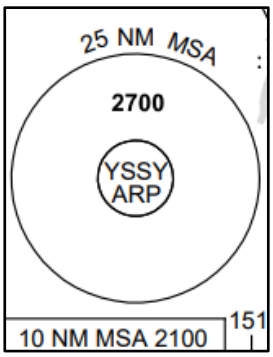


Figure 8 Sydney Airport MSA

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.

Obstacles within the 10 nm and 25 nm MSA of Sydney Airport's ARP define the minimum height at which an IFR aircraft can fly when within 10 nm and 25 nm of the airport when not in visual flight conditions.

The proposed project will be within Sydney Airport's 10 nm and 25 nm MSA. The orange circle represents Sydney Airport's 10 nm and 25 nm MSA, as shown in Figure 9 (Source: Willowtree, Google Earth).

The 10 nm MSA minimum altitude is 640 m AHD (2100 ft AMSL), with a PANS-OPS surface elevation of 340 m AHD (1116 ft AMSL).

The 25 nm MSA minimum altitude is 823 m AHD (2700 ft AMSL), with a PANS-OPS surface elevation of 523 m AHD (1716 ft AMSL).

The Project height is 121.2 m AHD (397.6 ft AMSL), including temporary crane operations. It will not affect Sydney Airport's MSA protection surfaces.

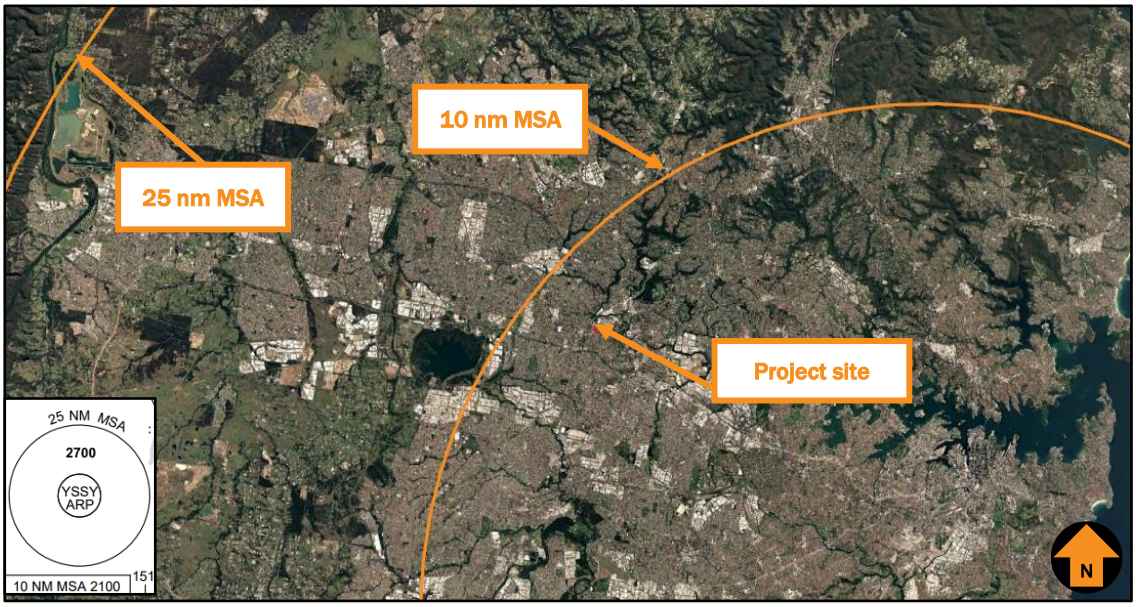


Figure 9 Sydney Airport MSA

1.13.3. IFR Circling areas

A 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 procedures is Category D.

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

- Category A – 1.68 nm / 3.11 km

- Category B – 2.66 nm / 4.93 km
- Category C – 4.20 nm / 7.78 km
- Category D – 5.28 nm / 9.78 km

The Project is 12 nm / 22 km from the threshold of Runway 16R and is beyond the circling area of all runway ends at Sydney Airport.

The Project will not impact circling areas established for instrument flight procedures.

1.13.4. Obstacle Limitation Surface (OLS)

Obstacle Limitation Surfaces (OLS) are established for each certified aerodrome runway.

For the Code 4 precision runway at Sydney Airport, 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, and 15 km for the outer horizontal surface.

The Project is located approximately 22 km northwest of the airport's ARP, which is beyond the horizontal extent of the obstacle limitation surfaces of Sydney Airport.

1.13.5. PANS-OPS Surfaces

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

The Project will be beneath the RNP RWY 07 procedure's holding surfaces at Sydney Airport. It will not have any impact on approach procedures.

1.14. Bankstown Airport (YSKB)

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

A check of Airservices Australia's Aeronautical Information Package (AIP), dated 28 November 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 28 November 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 m AHD (34 ft AMSL).

1.14.1. 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 21 March 2024).

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

Table 3 Bankstown Airport (YSBK) aerodrome and procedure charts

Chart name (Procedure Designer)	*Effective date*
AERODROME CHART PAGE 1 (AsA)	13 June 2024 (Am 179)
AERODROME CHART PAGE 2 (AsA)	13 June 2024 (Am 179)

Chart name (Procedure Designer)	*Effective date*
SID BANKSTOWN EIGHT DEP – RWY 11C/29C (AsA)	13 June 2024 (Am 179)
NDB RWY 11C (AsA)	13 June 2024 (Am 179)
NDB A (AsA)	13 June 2024 (Am 179)
RNP RWY 11C (AsA)	13 June 2024 (Am 179)

1.14.2. MSA Surfaces

The minimum sector altitude (MSA) is applicable for each instrument approach procedure at Bankstown Airport. Images of the MSA published for Bankstown Airport is shown in Figure 10 (Source: Airservices Australia, 23 March,2023).

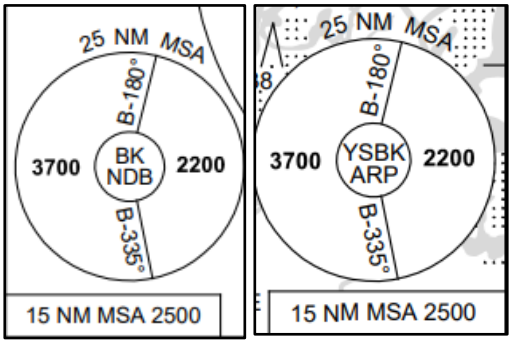


Figure 10 Bankstown Airport MSA

The project site is located within the 10 nm MSA and 25 nm MSA. The orange circle represents the 10 nm and 25 nm MSA from the ARP of the airport, while the green circle represents the 10 nm and 25 nm MSA from the NDB, as shown in Figure 11 (Source: Willowtree, Google Earth).

The 10 nm MSA minimum altitude is 762 m AHD (2500 ft AMSL), with a PANS-OPS elevation of 462 m AHD (1516 ft AMSL).

The eastern sector of the 25 nm MSA's minimum altitude is 671 m AHD (2200 ft AMSL), with a PANS-OPS elevation of 371 m AHD (1216 ft AMSL).

The western sector of the 25 nm MSA's minimum altitude is 1128 m AHD (3700 ft AMSL), with a PANS-OPS elevation of 828 m AHD (2716 ft AMSL).

The project height is 121.2 m AHD (397.6 ft AMSL), including temporary crane operations. It will not affect Bankstown Airport's MSA protection surfaces.

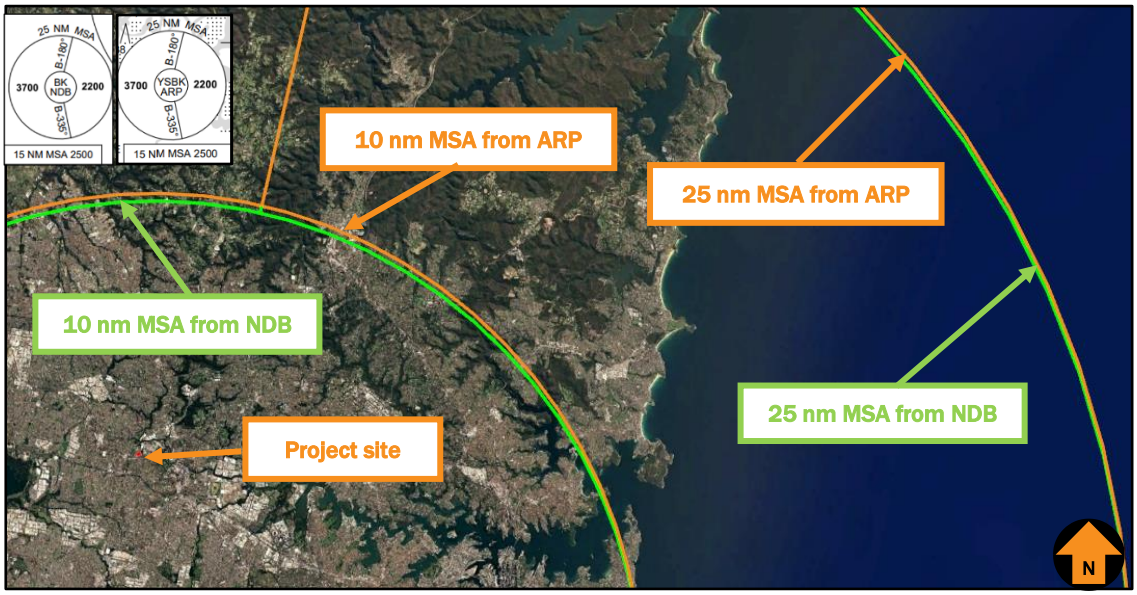


Figure 11 Bankstown Airport MSA

1.14.3. IFR Circling areas

The most demanding aircraft category provided for instrument flight procedure's is Category C. The radius for Category C is 7.78 km (4.20 nm).

The Project is located 6.8 nm / 12.6 km from Bankstown Airport and is outside airport's Circling surfaces.

1.14.4. Obstacle Limitation Surface (OLS)

At Bankstown Airport, the maximum lateral extent of the OLS is up to 15 km for the outer horizontal surface and 15 km for the take-off and approach surfaces.

The Project is located approximately 12.6 km northwest of the airport's ARP and within the outer horizontal surface, with a height limitation of 152 m AHD. The project height is 121.2 m AHD (397.6 ft AMSL), including temporary crane operations. It will beneath the OLS outer horizontal surface of Bankstown Airport.

1.14.5. PANS-OPS Surfaces

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

The Project will be beneath the SID departure, NDB RWY 11 and RNP RWY 11 procedures surfaces at Bankstown Airport. It will not have any impact on approach procedures.

1.15. 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.

1.15.1. Grid LSALT

The project site is located within an airspace grid with a LSALT of 5900 ft AMSL, which provide clearance above obstacles with heights up to 4900 ft AMSL.

Figure 12 provides the air routes in proximity to the project site (source: ERC Low National, OzRunways, December 2024, Google Earth).

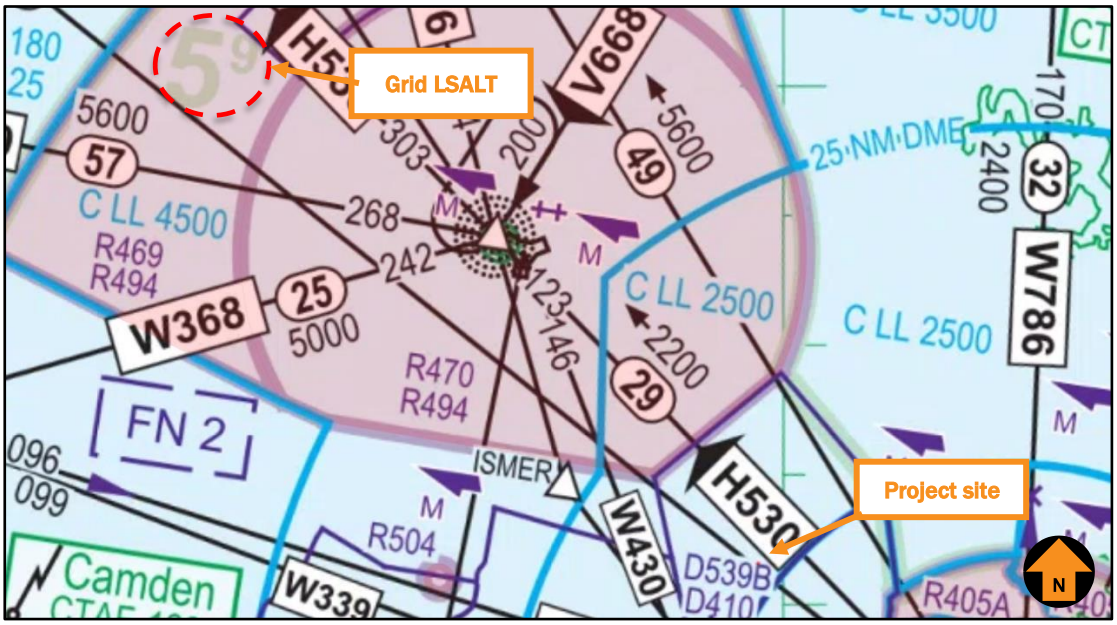


Figure 12 Grid LSALT in proximity to the project site

The project height is 121.2 m AHD (397.6 ft AMSL), including temporary crane operations. It will be below the 4900 ft obstacle height limit.

The Project will not impact the 5900 ft Grid LSALT.

1.15.2. Air Route LSALTs

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

There are few air routes within 7 nm of the project site. The project's height is 121.2 m AHD (397.6 ft AMSL), including temporary crane operations. It will be below all air route LSALTs.

The Project will not impact the air route LSALT.

1.16. Airspace Protection

The project site is located outside controlled airspace, wholly within Class G. It is not located in any prohibited or restricted areas.

The project site is located within Danger Area D539B, as shown in Figure 13.

Figure 13 Project site in relation to restricted area.

The derails of D539B on the airspace is shown below in Figure 14 (Source: DAH 30 November 2023).

YMMM/D539B BANKSTOWN
LANE OF ENTRY
LATERAL LIMITS: 335349S 1505617E - 334505S 1505400E
334105S 1505953E - 334548S 1510443E
then along the counter clockwise arc of a circle radius 12.00NM centre
335638S 1511057E (SY/DME) - 335301S 1505712E
then along the counter clockwise arc of a circle radius 3.00NM centre
335528S 1505918E (YSBK/AD) - 335349S 1505617E
VERTICAL LIMITS: SFC - 2500
HOURS OF ACTIVITY: HJ
CONTACT: Airservices Australia Traffic Managers

Figure 14 Details of D539B

The vertical limit within D539B is between the surface and 2500 ft AMSL. The project site will infringe danger airspace.

Consultation with Airservices Australia will be required.

1.17. Aviation facilities

The proposed transmission line is located a sufficient distance away from nearby certified airports and aviation facilities and will not have an impact.

1.18. Radar assessment

No temporary or permanent obstructions should infringe on Zone A (500 m) or Zone B (4 km). Any sharp discontinuity protruding into the area of interest (15 km) such as single metal light towers, power pylons and city buildings, will impact on performance and should be avoided where possible.

If development is within Zone A, B, and areas of interest, they must be referred to Airservices Australia for assessment.

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

- Sydney Primary Surveillance Radar (PSR) - approximately 24.6 km southeast of the project
- Sydney Secondary Surveillance Radar (SSR) - approximately 24.6 km southeast of the project
- Cecil Park Primary Surveillance Radar (PSR) - approximately 15.2 km southwest of the project
- Cecil Park Secondary Surveillance Radar (SSR) - approximately 15.2 km southwest of the project

Both Sydney PSR / SSR and Cecil Park PSR / SSR will be more than 15 km from the project site. The Project will not affect the line of sight of all radars.

1.19. Summary

Following a high-level evaluation of aviation operation aspects of the Project, Aviation Projects has concluded that:

- The proposed site has the following characteristics:
    a. Building height is 101.2 m AHD RL (332 ft AMSL)
    b. Temporary crane(s) will be assumed 20 m above installed building height, which will be up to 121.2 m AHD (397.6 ft AMSL)
- The project development:
    a. The building will not impact Westmead Hospital HLS operations; however, the temporary crane operation will infringe the RNP 052 procedure of Westmead Hospital HLS
    b. Will not affect the MSA of any airport.
    c. Will not infringe the OLS surface of any airport.
    d. Will not infringe on Circling areas of any airport.
    e. Will not infringe the obstacle clearance heights applicable to any of the instrument procedures.
    f. Will not impact Grid LSALT and air routes LSALT.
    g. It is located outside controlled airspace, wholly within Class G. It is not located in any prohibited or restricted areas.
    h. Is located within Danger Area –D539B. The vertical limit within D539B is between the surface and 2500 ft AMSL. The project site will infringe on the Danger airspace. Consultation with the Airservices Australia will be required.
    i. Will not impact any aviation navigation facilities.
    j. Will not impact ATC surveillance radar coverage.

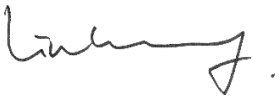
1.20. Recommendation

- Detailed studies are required when detailed information of the building is available.

- Subject to a final full AIA report, consultation will be required with AsA, CASA and the Department of Defence.

If you wish to clarify or discuss the contents of this correspondence, please contact me on 0433 747 835.

Kind regards



Lyn Wang

Aviation Specialist Consultant

09 December 2024