AVIATION IMPACT ASSESSMENT REPORT

AIRSPACE IMPLICATIONS DUE TO THE CONSTRUCTION OF THE UNSW BUILDING E25 BIOLINK MODIFICATION 1

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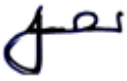
		Signature			
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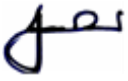
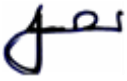
		Signature			
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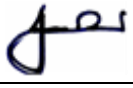
		Signature			

This Report on the airspace implications, both during and following construction of the development is prepared for the University of NSW, by Resolution Response Pty. Ltd. ABN: 94 154 052 883, trading as ‘AviPro’.

The Report relates to the coordination aspects associated with prescribed/protected airspace at Sydney (Kingsford-Smith) Aerodrome and the Helicopter Landing Site (HLS) at Prince of Wales (POW) Hospital (and adjacent Randwick Hospitals) due to the establishment and site design of the UNSW Building E25 Biolink. It is intended to inform design and planning.

Contents

1. EXECUTIVE SUMMARY

This Aviation Impact Assessment (AIA) Report has been prepared by AviPro to accompany a Modification Application (Mod 1) to the issued State Significant Development (SSD) for alterations and additions to a UNSW teaching facility within the Kensington campus at 356 Anzac Parade, Kensington, NSW 2052. The site is made up of a single building within a large lot. The legal description of the site is outlined in Table 1.

Descriptor	Site Details
Street Address	356 Anzac Parade, Kensington
Legal Description	Lot 5 in DP 1264171
Site Area	2,173 m^2

Table 1: Legal Description

This report has been amended to address Mod 1 to SSD-73456206.

This report concludes that the proposed Mod 1 does not materially change the original AIA findings, conclusions and recommendations; is still suitable; and warrants approval of Mod 1 subject to the implementation of the following mitigation measure:

- Appropriate marking and lighting of construction crane(s)

Following the implementation of the above mitigation measure, the remaining impacts are appropriate.

2. BACKGROUND

2.1. Introduction

A State Significant Development Application (SSDA) was approved on 16 December 2025 for the University of New South Wales (UNSW) at Building E25 Biolink within the UNSW Kensington Campus. The SSDA grants approval for: *Upgrade and extension to Building E25 for the purpose of teaching and research facilities including partial demolition of Building E25 (the UNSW Biolink Building), earthworks, extension of the existing building, internal and external alterations, facade works and landscaping*.

Mod 1 is now being prepared to seek approval for minor external and internal modifications to Building E25.

This AIA report has been amended in response to Mod 1 requirements corresponding to issued SSD-73456206. Specifically, this report has been prepared to review and /or revise the previously issued SEARs requirements below.

Item	SEARS Requirement	Relevant Section of Report
24.1	If the development proposes a helicopter landing site (HLS), assess its potential impacts on the flight paths of any nearby airport, airfield or HLS.	*N/A*
24.2	If the site contains or is adjacent to an HLS, assess the impacts of the development on that HLS.	*See Section 4.12*

Table 2: Secretary's Environmental Assessment Requirements - Aviation

AviPro has been engaged to provide advice regarding the aviation specific impacts that the E25 Biolink development, including Mod 1, will have on the prescribed/protected airspace at Sydney (Kingsford-Smith) Aerodrome and the Helicopter Landing Site (HLS) at Prince of Wales (POW) Hospital. This includes an assessment of the impacts caused by the construction crane(s), and also the building itself once complete.

The site of the proposed E25 Biolink development is shown at Image 1 below.

2.2. The Site

The site is legally described as Lot 5 in Deposited Plan 1264171. The project site area is part of Lot 5 in DP 1264171, with an area of 2,173sqm. The wider lot has an approximate area of 10ha. The UNSW Kensington campus is made up on Lot 5 in DP 1264171 and Lot 3 in DP 1264172 and has a site area of approximately 35ha.

The urban context surrounding the site is characterised by a mix of education, health, commercial, retail and residential land uses.

The surrounding locality is described below:

North: Directly to the north of the site is Building D26 Biological Sciences (north). Further to the north of the site is High Street, residential land uses and Randwick Racecourse.

East: Directly to the east of the site is Building E26 Biological Sciences (south). Further to the east is the Prince of Wales and Sydney Children's Hospitals

South: Directly south of the site Building F25 Samuels. Further to the south of the site is residential land uses comprising low and medium density housing.

West: To the west of the site is Chancellery Walk, Building E24 Matthews Pavilion and the wider UNSW campus.

The site benefits from excellent access to public and active transport. The site has access to the L2 light rail along High Street to the north which provides routes to Sydney CBD through Moore Park and Surry Hills. Additionally, multiple bus routes also run along High Street and Avoca Street to the east which provide access to various areas of the city and the eastern suburbs.

The existing development includes a six-storey building known as Building E25 Biolink built in the mid-1970s. The building is part of the Faculty of Science and is currently underutilised University office space and storage with a number of spaces being vacant. Vehicle access to the building is via the Library Walk internal road which connects onto Botany Road. Service vehicle access is provided via campus Gate 11 and the existing service road to the east of the building. Staff car parking is available in close proximity to the site at the UNSW campus Botany Street car park to the south of the site. The building has pedestrian access from multiple points. There is no existing vegetation on the site.

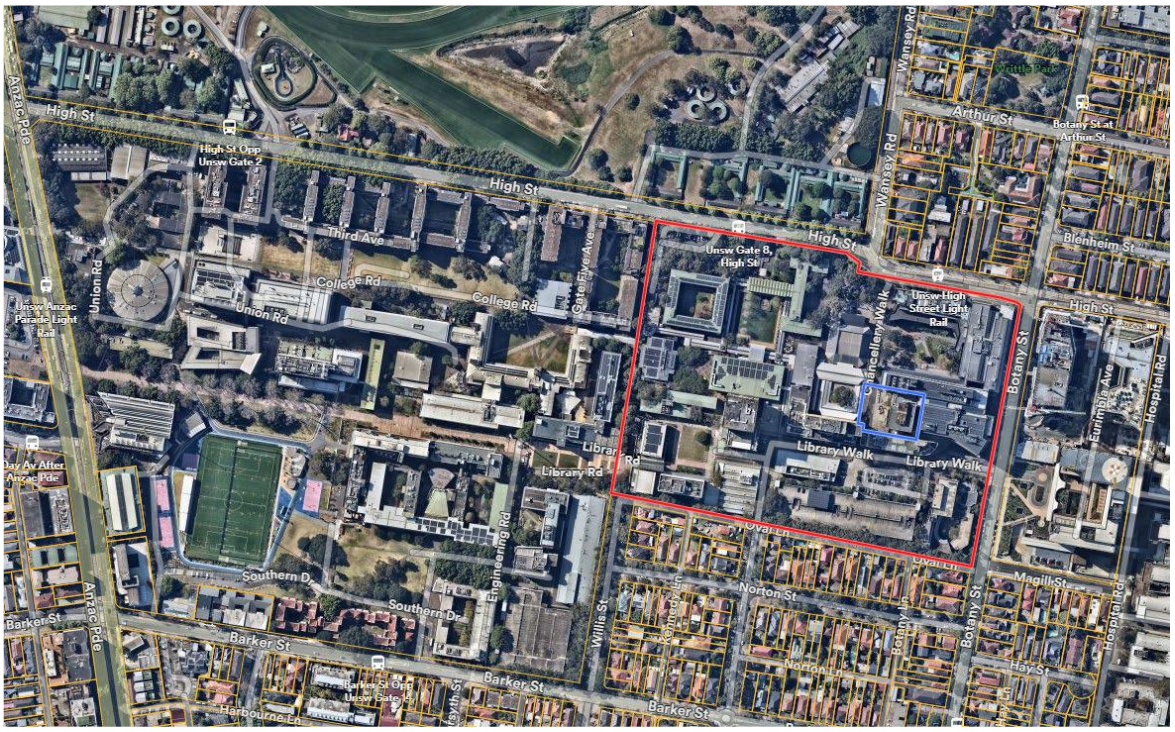


Figure 1: Site Location Plan within Lot 5

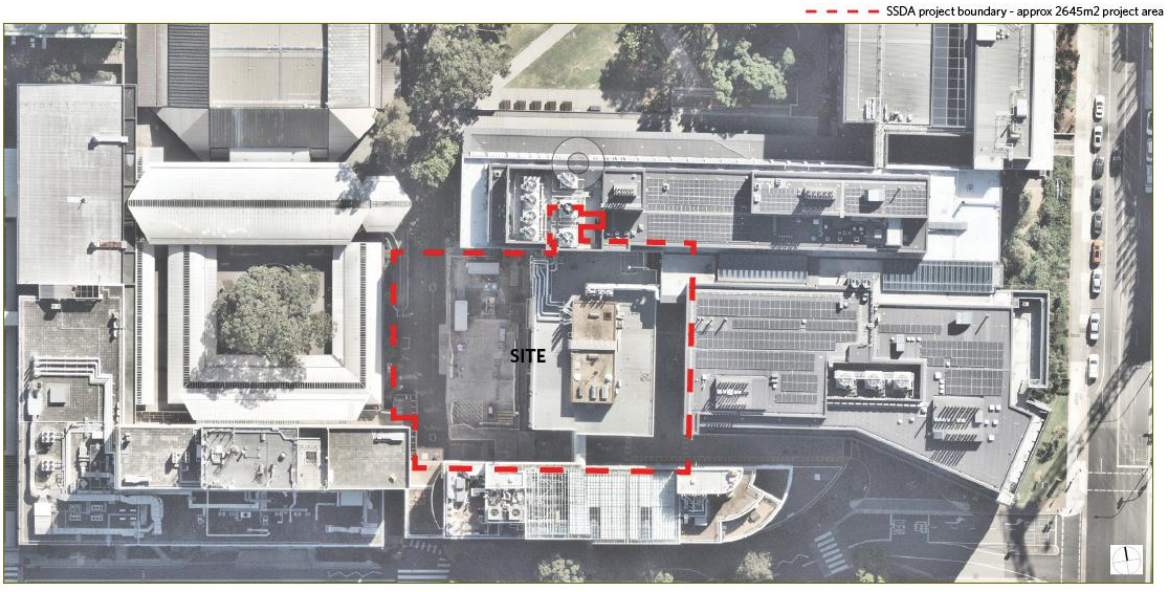


Figure 2: Aerial Photograph

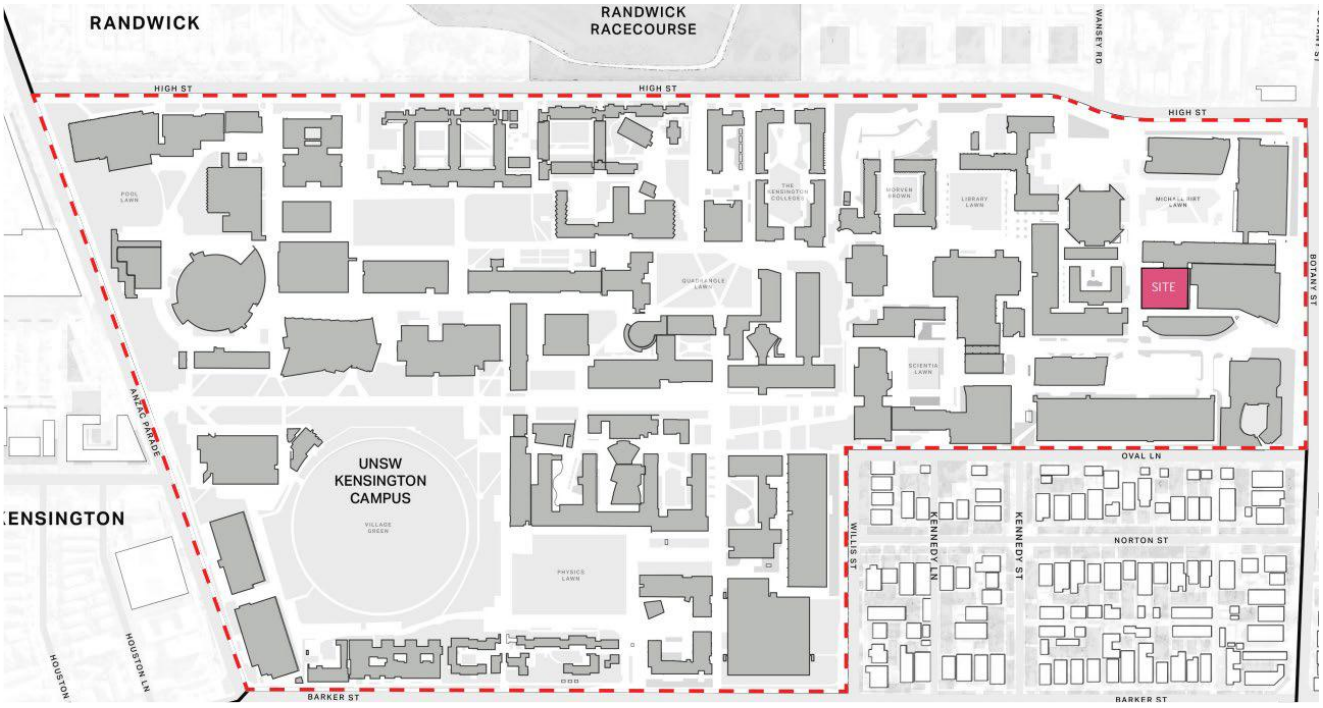


Figure 3: Building E25 Location Within UNSW Campus

2.3. Methodology

Reference material drawn and provided by HDR Pty Ltd in support of the report include early planning designs and concept drawings. Criteria from all relevant references were assessed, with the Sydney Airport airspace overlays used as the primary tool.

2.4. Consultant Qualifications and Experience

AviPro has been a consultant to the NSW Government for almost 20 years working on similar projects, and to UNSW for approximately six years. CVs of those responsible for the development of this report are available upon request.

2.5. Explanation of Terms

Aircraft. Refers to both aeroplanes (fixed wing) and helicopters (rotorcraft).

Approach and Departure Path (IFR). The flight track helicopters follow when landing at or departing from the FATO of an HLS under the Instrument Flight Rules. The IFR approach and departure path extends upwards and outwards from the edge of the FATO safety area with an obstacle free gradient of 2.6^0/4.5%/ 1:22.2 (22.2 units horizontal in 1 unit vertical), to a height of 152m above the FATO at a distance of ~3,386 m. The approach and departure path commences at the forward edge of the FATO safety area at a width of 34m, and increases in width uniformly to 152m m above the elevation of FATO surface at a distance of ~3,386 m.

Approach/Departure Path (VFR). The flight track helicopters follow when landing at or departing from the FATO of an HLS. Updated standards to align with ICAO requirements now has the VFR (day and) night approach and departure path extending upwards from the forward edge of the FATO safety area with an obstacle free gradient of 2.6^0/4.5%/ 1:22.2 (22.2 units horizontal in 1 unit vertical), to a height of 152m above the FATO at a distance of ~3,386 m. The approach and departure path commences at the forward edge of the FATO safety area at a width of 34m, and expands uniformly, laterally at an angle of 8.7^0/15%/1:12.8 to a total width of 140 m, then remains parallel to a distance of ~3,386m, where the height is 152 m above the elevation of FATO surface.

Design Helicopter. The Agusta AW139 contracted to the NSW Ambulance. The type reflects the latest generation Performance Class 1 capable helicopters used in HEMS and reflects the maximum weight and maximum contact load/minimum contact area. The design helicopter has a maximum all up mass of 7 tonnes, however for HLS design purposes it is assumed the helicopter will never exceed 6.8 tonnes on the HLS.

D Value (Overall Length). The distance from the tip of the main rotor tip plane path to the tip of the tail rotor tip plane path or the fin if further aft, of the Design Helicopter.

Elevated Helicopter Landing Site. An HLS located on a roof top or some other elevated structure where the Ground Effect Area/Touchdown and Lift-off Area (TLOF) is at least 2.5m above ground level.

Final Approach. The reduction of height and airspeed to arrive over a predetermined point above the FATO of an HLS.

Final Approach and Takeoff Area (FATO). A defined area over which the final phase of the approach to a hover, or a landing is completed and from which the takeoff is initiated. For the purposes of these guidelines, the specification of 1.5 x D Value or Overall Length of the Design Helicopter is used and equates to 25m. diameter. Area to be load bearing.

Ground Taxi. The surface movement of a wheeled helicopter under its own power with wheels touching the ground.

Hazard to Air Navigation. Any object having a substantial adverse effect upon the safe and efficient use of the navigable airspace by aircraft, upon the operation of air navigation facilities, or upon existing or planned airport/heliport capacity.

Helicopter Landing Site (HLS). One or more may also be known as a **Heliport**. The area of land, water or a structure used or intended to be used for the landing and takeoff of helicopters, together with appurtenant buildings and facilities.

Helicopter Landing Site Elevation. At an HLS without a precision approach, the HLS elevation is the highest point of the FATO expressed as the distance above mean sea level.

Helicopter Landing Site PC1 Survey Reference Point. A position at the forward edge of the FATO safety area in the centre of the approach and departure path, from which the PC1 survey at 2.6º (4.5%) is initiated.

Helicopter Landing Site Reference Point (HRP). The geographic position of the HLS expressed as the latitude and longitude at the centre of the FATO.

Hospital Helicopter Landing Site. HLS limited to serving helicopters engaged in air ambulance, or other hospital related functions.

Note:

*A designated HLS located at a hospital or medical facility is an emergency services HLS and **not** a medical emergency site.*

Heliport. Two or more co-existing helicopter landing sites (HLS). There are no implications for operating a heliport as opposed to an HLS, other than having a “Heliport Operations Manual” rather than an “HLS Operations Manual” which would address the various interactions and interoperability (aviation, clinical etc) at the dual sites.

Hover Taxi. The movement of a helicopter above the surface, generally at a wheel/skid height of approximately one metre. For facility design purposes, a skid-equipped helicopter is assumed to hover-taxi.

Landing and Lift Off Area (LLA). A load-bearing, nominally paved area, normally located in the centre of the TLOF, on which helicopters land and lift off. Minimum dimensions are based upon a 1 x metre clearance around the undercarriage contact points of the Design Helicopter.

Lift Off. To raise the helicopter into the air.

Movement. A landing or a lift off of a helicopter.

Object Identification Surface. The OIS are a set of imaginary surfaces associated with a heliport. They define the volume of airspace that should ideally be kept free from obstacles in order to minimise the danger to a helicopter during an entirely visual approach.

Obstacle Limitation Surface. The OLS are a set of imaginary surfaces associated with an aerodrome. They define the volume of airspace that should ideally be kept free from obstacles in order to minimise the danger to aircraft during an entirely visual approach.

Obstruction to Air Navigation. Any fixed or mobile object, including a parked helicopter, which impinges the approach/departure surface or the transitional surfaces.

Performance Class 1 (PC1). Similar to Category A requirements. For a rotorcraft, means the class of rotorcraft operations where, in the event of failure of the critical power unit, performance is available to enable the rotorcraft to land within the rejected take-off distance available, or safely continue the flight to an appropriate landing area, depending on when the failure occurs. For an elevated HLS, the reject area is that area within the FATO (25 m. diameter) and therefore this area is to be load bearing. PC1 also requires Civil Aviation Safety Authority (CASA) approved flight path surveys to/from the HLS.

Performance Class 2 (PC2). For a rotorcraft, means the class of rotorcraft operations where, in the event of failure of the critical power unit, performance is available to enable the rotorcraft to safety continue the flight, except when the failure occurs early during the take-off manoeuvres, in which case a forced landing may be required. PC2 also requires CASA approved flight path surveys to/from the HLS.

Performance Class 2 With Exposure (PC2WE). PC2WE is very similar to PC2 as mentioned above. The primary difference is that there need not be any provision for a suitable forced landing area during the take-off and landing phases of flight, within the designated exposure period for the rotorcraft. PC2WE offers operators alternative mitigation strategies based on: a defined exposure time limit, demonstrated engine reliability, engine maintenance standards, pilot procedures and training, and operator risk assessments. Specific approval to operate with exposure is required from CASA and will require a number of mitigation strategies from the operator to gain that approval.

Performance Class 3 (PC3). For a rotorcraft, means the class of rotorcraft operations where, in the event of failure of the critical power unit at any time during the flight, a forced landing:

- in the case of multi-engine rotorcraft – may be required; or
- in the case of single-engine rotorcraft – will be required.

Pilot Activated Lighting (PAL). A PAL system utilises a hospital-based VHF radio and timed switching device, activated by the pilot via a radio transmission on a pre-set frequency, to turn on the associated HLS lighting.

Prior Permission Required (PPR) HLSs. An HLS developed for exclusive use of the owner and persons authorized by the owner, i.e. a hospital-based emergency services HLS.

Note:

The HLS owner and the HEMS operator are to ensure that all pilots are thoroughly knowledgeable with the HLS (including such features as approach/departure path characteristics, preferred heading, facility limitations, lighting, obstacles in the area, size of the facility, etc.). This is addressed as part of the HLS commissioning process.

Rotor Downwash. The volume of air moved downward by the action of the rotating main rotor blades. When this air strikes the ground or some other surface, it causes a turbulent outflow of air from beneath the helicopter.

Safety Area. A defined area on an HLS surrounding the FATO intended to reduce the risk of damage to helicopters accidentally diverging from the FATO. This area should be free of objects, other than those frangible mounted objects required for air navigation purposes. The Safety Area for the Design Helicopter extends 4.5 m. beyond the FATO perimeter forming a 34 m. X 34 m. square or a 34m. diameter circle.

Safety Net. Surrounds the outer edge of a rooftop HLS. It is to be a minimum of 1.5 m. wide and have a load carrying capacity of not less than 122 kg/m^2. The outer edge is not to project above the HLS deck, and slope back and down to the deck edge at approximately 10 degrees, and not more than 20 degrees. Both the inside and outside edges of the safety net are to be secured to a solid structure.

Shielded Obstruction. A proposed or existing obstruction that does **not** need to be marked or lit due to its close proximity to another obstruction whose highest point is at the same or higher elevation.

Take off. To accelerate and commence climb at the relevant climb speed.

Take off Position. A load bearing, generally paved area, normally located on the centreline and at the edge of the TLOF, from which the helicopter takes off. Typically, there are two such positions at the edge of the TLOF, one for each of two takeoff or arrival directions.

Touchdown and Lift-off Area (TLOF). A load bearing, generally paved area, normally centred in the FATO, on which the helicopter lands or takes off, and that provides ground effect for a helicopter rotor system. Size is based on 1 x main rotor diameter of Design Helicopter, and is 14m diameter.

Transitional Surfaces. Starts from the side edges of the FATO safety area parallel to the approach and departure path centre line, and extends upwards and outwards (to the sides) at a slope of 2:1 (two-units horizontal in one-unit vertical or 26.6°) to a height of 45m above the elevation of the FATO surface. Further, from the forward edge of the side transitional surfaces, the transitional surface joins the outer edges of the approach and departure surface, and proceeds upwards and outwards until the outer edges are 152m wide at ~3386m which corresponds with the end of the approach and departure surface.

Unshielded Obstruction. A proposed or existing obstruction that may need to be marked or lit since it is **not** in close proximity to another marked and lit obstruction whose highest point is at the same or higher elevation.

2.6. Applicable Abbreviations

Acronym	Meaning
AC	Advisory Circular (from Aviation Regulator)
ACC	Aeromedical Control Centre (HQ Eveleigh). Responsible for control and tasking of HEMS
CASA	Civil Aviation Safety Authority (Australia)
CASRs	Civil Aviation Safety Regulations (1998) Australia
CBD	Central Business District
CTR	Control Zone (Air Traffic)
DCP	Development Control Plan
DDO	Design and Development Overlay
ERSA	Enroute Supplement Australia
FAA	Federal Aviation Administration, USA
FATO	Final approach and Take-Off Area (1.5 x helicopter length)
FARA	Final Approach Reference Area
GPS	Global Positioning System
HEMS	Helicopter Emergency Medical Service
HLS	Helicopter Landing Site
HLSRO	HLS Reporting Officer (Airservices requirement)

Acronym	Meaning
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions - requiring flight under IFR
L	Length (also referred to as Overall Length), in relation to a helicopter, the total distance between the main rotor and tail rotor tip plane paths when rotating
LDP	Landing Decision Point (Category A/Performance Class 1 operations)
LEP	Local Environment Plan
LLA	Landing and Lift Off Area. Solid surface meeting dynamic loading requirements, with undercarriage contact points + I metre in all directions
MoH	Ministry of Health NSW
MRI	Magnetic Resonance Imagers
MTOW	Maximum Take Off Weight
NOTAM	Notice to Airmen. Issued by Airservices in relation to airspace and navigation warnings
NVG	Night Vision Goggle(s)
OIS	Object Identification Surface(s) (Heliport/HLS)
OLS	Obstacle Limitation Surface(s) (Aerodrome)
PC1	Performance Class 1
PC2	Performance Class 2
PC2(WE)	Performance Class 2 (With Exposure)
PC3	Performance Class 3
POW	Prince of Wales
RD	Main Rotor Diameter
RHC	Randwick Hospitals Campus
RTCC	Radar Terrain Clearance Chart
SACL	Sydney Airports Corporation Limited
SARPS	Standards and Recommended Practices developed by ICAO and promulgated in the Annexes to the Convention of International Civil Aviation
TDP	Takeoff Decision Point (Category A/Performance Class 1 operations)
TLOF	Touch Down and Lift Off Area. Load bearing min. 1 x main rotor diameter.
UNSW	University of NSW
VFR	Visual Flight Rules
VHF	Very High Frequency radio
VMC	Visual Meteorological Conditions - allowing flight under VFR
V_{TOSS}	Take off Safety Speed

2.7. List of Figures

3. GENERAL AIRSPACE REQUIREMENTS AND CONSIDERATIONS

3.1. Purpose of this Section

It is important that the reader has a good understanding of the fundamentals of airspace protection for aerodromes and heliports/HLSs in order to be able to understand the analysis later in this report. Section 3 provides this general overview.

3.2. Airspace Regulation in Australia - Aerodromes

Approvals will be required if prescribed airspace could be impinged. The normal contact for this process is through Sydney Airport, the operator of Sydney (Kingsford-Smith) Airport.

Prescribed airspace includes an airport's Obstacle Limitation Surfaces (OLS) involving a set of imaginary surfaces associated with an aerodrome that should be kept free of obstacles. Additionally, the Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) surfaces that takes account of the airspace associated with aircraft instrument procedures, and the airspace associated with the Radar Terrain Clearance Chart (RTCC) must be considered.

The Airports (Protection of Airspace) Regulations 1996 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 that penetrate the OLS, and for the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications for approval of long-term controlled activities and those short-term controlled activities referred to it by the airport operator. However, the airport operator must refer short-term PANS-OPS infringements to the Department for approval. Long term intrusions of the PANS-OPS surface are prohibited.

CASA Advisory Circular (AC) 139.E-01 Reporting of Tall Structures provides guidance on what needs to be reported.

Regulation 139.165 (Notifying CASA of certain proposed objects or structures) of Civil Aviation Safety Regulations Part 139 states: "This regulation applies if a person proposes to construct or erect an object or structure that…will have a height of 100 metres or more above ground level…or is of a kind prescribed by the Part 139 Manual of Standards." This is done through Airservices Australia.

3.3. Airspace Management in Australia – Heliports and Helicopter Landing Sites

Currently within Australia, there are no set rules or regulations applicable to the design, construction or placement of HLS'. The appropriate national regulatory guidance at present for the use of HLS' is Civil Aviation Safety Regulation (CASR) 91-410 which places the onus on the helicopter pilot to determine the suitability of a landing site. CASA, as the regulator of aviation in Australia divested itself of direct responsibility for regulating HLS' in the early 1990s and currently provides only basic operating guidelines via CASA Advisory Circular (AC) 91-29 Guidelines for helicopters – suitable places to takeoff and land.

Because no Federal or State (NSW) legislation is in place to protect VFR approach and departure paths and the transitional surfaces associated with hospital HLSs, in May 2018, the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications issued Guideline H: Protecting Strategically Important Helicopter Landing Sites under the National Airports Safeguarding Framework (NASF). Whilst this publication has no legal effect in NSW as yet, its content is gradually being aligned within the NSW MoH Guidelines for Hospital Helicopter Landing Sites in NSW.

3.4. Helicopter Routes

In addition to considering the impacts on heliports, HLSs and their associated approach and departure paths (see paragraph 3.3) it is also necessary to consider special routes designed for, and used by, helicopters to navigate the complex airspace around major aerodromes. These routes are typically associated with key destinations such as aerodromes, heliports and hospitals. Details of these routes can be found in the Sydney (Kingsford-Smith) Aerodrome entry of the Enroute Supplement Australia (ERSA).

3.5. State Government Requirements

There are no specific articles of legislation for aerodromes in NSW. Matters pertaining to aerodromes are governed under the guise of State environmental legislation. The various legislative/regulatory requirements relating to HLSs in NSW are complex. Current regulation excludes emergency service landing sites from the definition of “designated development” in the Environmental Planning and Assessment Regulation (which otherwise includes most HLSs). Generally, hospital HLSs are considered “ancillary-uses” to hospital purposes and are thus not separate “development”. The same cannot necessarily be said about off-site emergency medical HLSs, e.g. local sports fields.

Whilst not an aviation requirement, cranes may need access to airspace above neighbouring properties in which case the NSW Access to Neighbouring Land Act 2000 may apply.

3.6. Local Government Requirements

For Federally-leased aerodromes, requirements emanate from the Airports Act 1996 and the Airports (Protection of Airspace) Regulations 1996.

The Airports (Protection of Airspace) Regulations 1996 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 that penetrate the OLS, and for the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications for approval of long-term controlled activities and those short-term controlled activities referred to it by the airport operator. However, the airport operator must refer short-term PANS-OPS intrusions to the Department for approval. Long term intrusions of the PANS-OPS surface are prohibited.

Where an aerodrome is owned or operated by a Local Government Authority (LGA) or other entity, local government requirements for airspace protection are normally included in a Local Environment Plan (LEP), Development Control Plan (DCP) or similar document.

3.7. Obstacle Limitation Surfaces

The objective of the OLS is to define a volume of airspace in proximity to the airport which should be kept free of obstacles that may endanger aircraft in visual operations, or during the visual stages of an instrument approach.

The intention is not to restrict or prohibit all obstacles, but to ensure that either existing or potential obstacles are examined for their impact on aircraft operations and that their presence is properly taken into account. Since they are relevant to visual operations, it may sometimes be sufficient to ensure that the obstacle is conspicuous to pilots, and this may require that the obstacle be marked or lit.

In reality, there is little issue with breaching the OLS as pilots will be visual with the obstruction and can work on “see and avoid” principles. OLS at a multi-runway aerodrome look akin to Figure 4 below:

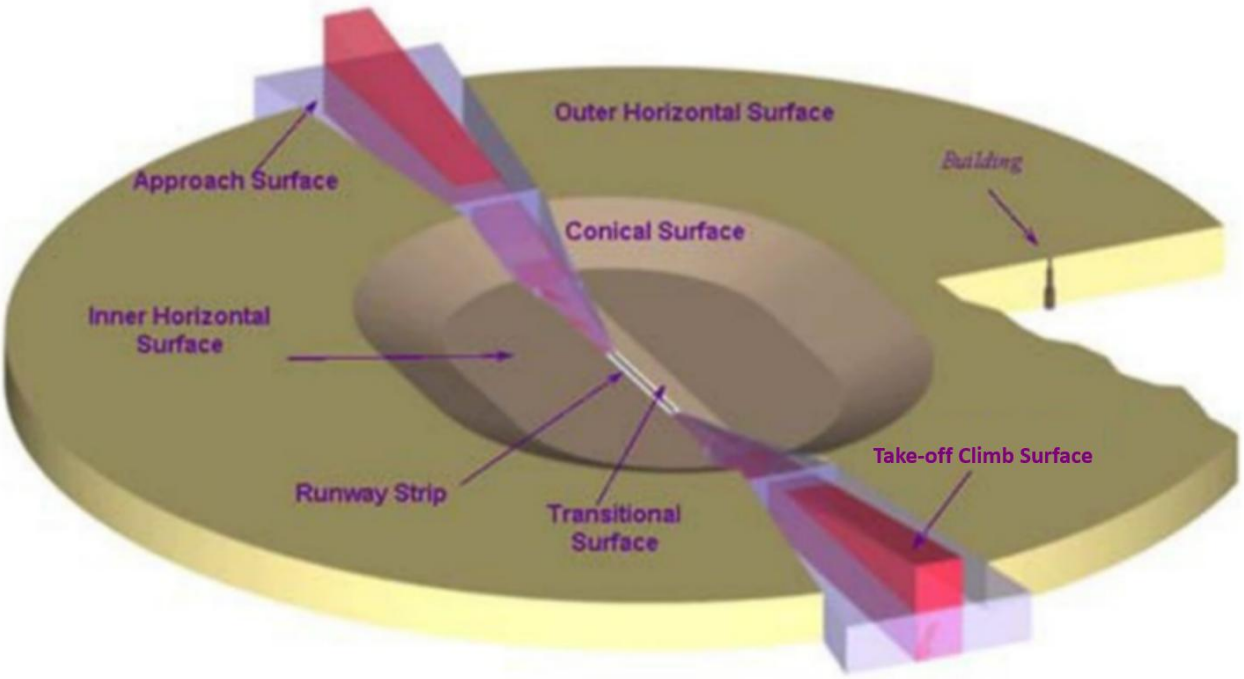


Figure 4: Example of Obstacle Limitation Surfaces

3.8. Procedures for Air Navigation – Aircraft Operations (PANS-OPS) Surfaces

PANS-OPS surfaces detail essential areas and obstacle clearance requirements for the achievement of safe, regular instrument flight operations.

The instrument flight procedures enable pilots to either descend from the high enroute environment of cruise type flight to establish visual contact with the landing runway, or climb from the runway to the enroute environment, with a prescribed safe margin above terrain and obstacles, by use of aircraft instruments and radio navigation aids or GPS in conditions where the pilot cannot maintain visual contact with the terrain and obstacles due to inclement weather conditions.

Pilots must be protected against protrusions into the PANS-OPS surfaces as they have no way of avoiding obstructions if they get off track and they cannot see such obstructions.

PANS-OPS surfaces are constructed differently to OLS however they serve a similar purpose. An example of PANS-OPS surfaces is in Figure 5 below:

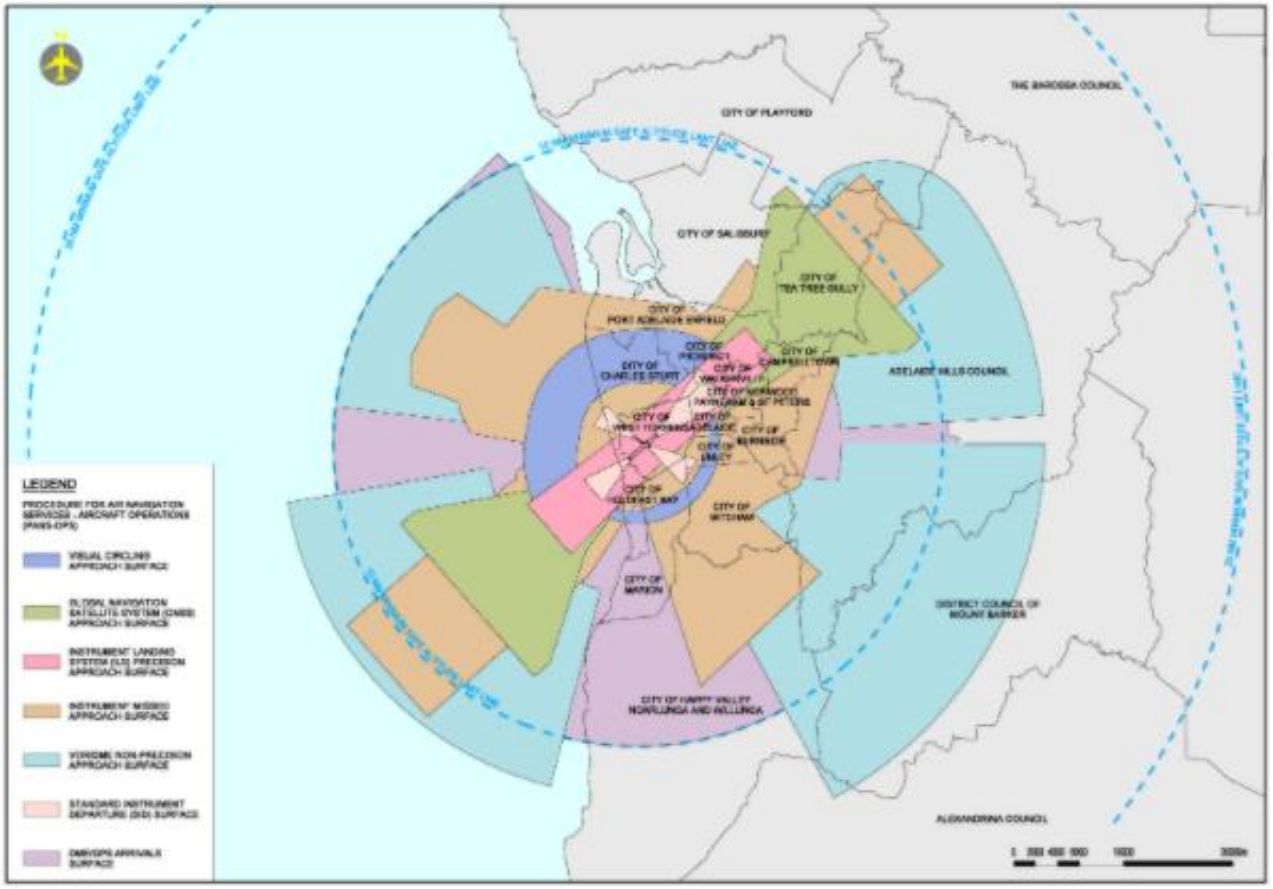


Figure 5: Example of PANS-OPS Surfaces

3.9. Radar Terrain Clearance Charts

The Radar Terrain Clearance Chart defines an area in the vicinity of an aerodrome, in which the minimum safe levels allocated by an Air Traffic Controller (ATC) vectoring Instrument Flight Rules (IFR) flights with Primary and/or Secondary Surveillance RADAR equipment have been predetermined. The figure shown on the chart is the lowest altitude which an ATC may assign to a pilot. An example of an RTCC is in Figure 6 below:

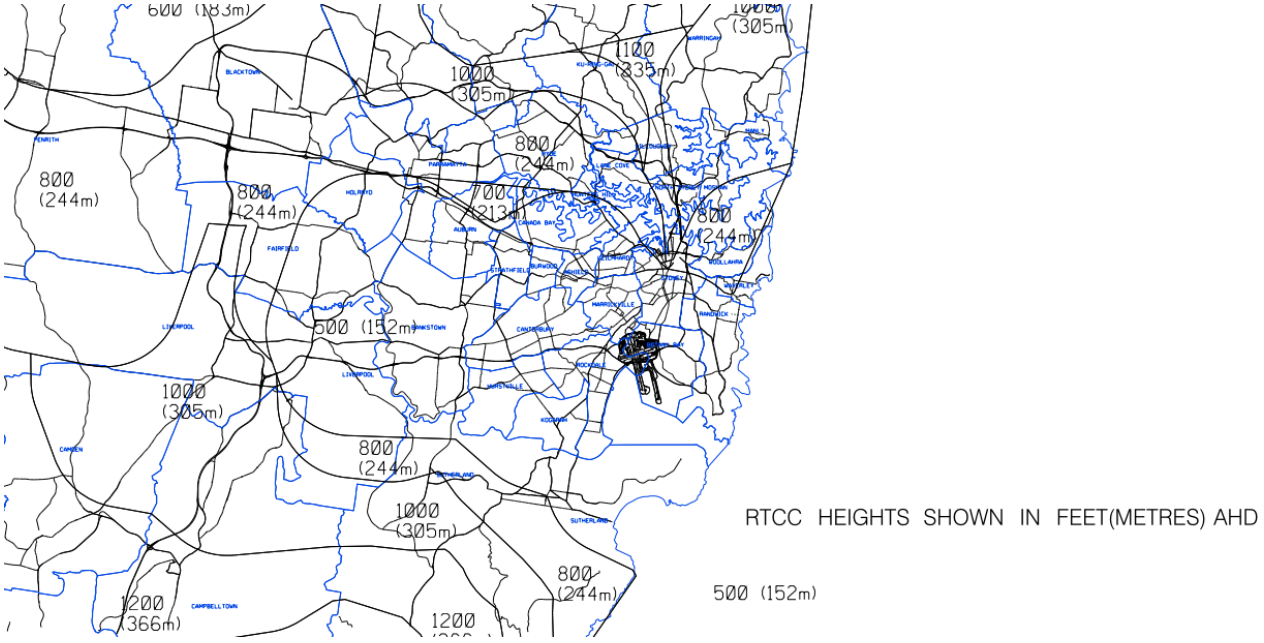


Figure 6: Example of a Radar Terrain Clearance Chart (RTCC)

4. SPECIFIC E25 BIOLINK DEVELOPMENT CONSIDERATIONS

4.1. The E25 Biolink Development Location

The location of the lot of the proposed E25 Biolink development footprint is shown in Figure 7 below. It is approximately 6 km from Sydney (Kingsford-Smith) Aerodrome and close to the strategically important HLS at Prince of Wales (POW) Hospital.

Figure 7: Location of the Proposed E25 Biolink development

4.2. The E25 Biolink Development Elevation

The E25 Biolink development is planned to be built to a maximum elevation of RL 96.298 (see Figure 8 below). This elevation is to the top of the tallest associated flue.

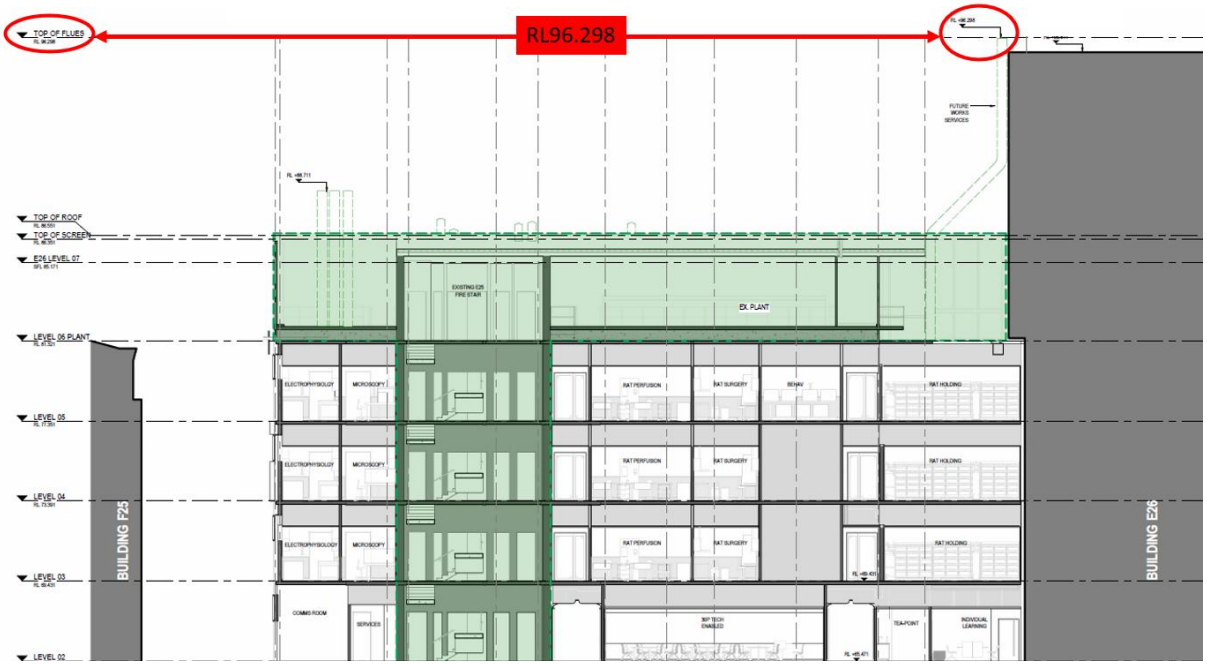


Figure 8: Elevation of the E25 Biolink development

4.3. Local Government Requirements

Clause 6.8 of the Randwick Local Environment Plan 2012 states that one objective of the Clause is "to provide for the effective and on-going operation of the Sydney (Kingsford-Smith) Airport by ensuring that such operation is not compromised by proposed development that penetrates the Limitation or Operations Surface for that airport."

In this case, the term "Limitation or Operations Surface" means "the Obstacle Limitation Surface or the Procedures for Air Navigation Services Operations Surface as shown on the Obstacle Limitation Surface Map or the Procedures for Air Navigation Services Operations Surface Map for the Sydney (Kingsford-Smith) Airport."

Further, Clause 6.8 states that "If a development application is received and the consent authority is satisfied that the proposed development will penetrate the Limitation or Operations Surface, the consent authority must not grant development consent unless it has consulted with the relevant Commonwealth body about the application."

4.4. General Airspace Overhead the E25 Biolink Development

The E25 Biolink development sits to the south-east of the Sydney City Central Business District and within the Sydney Aerodrome's Control Zone (CTR). See Figure 9 below.

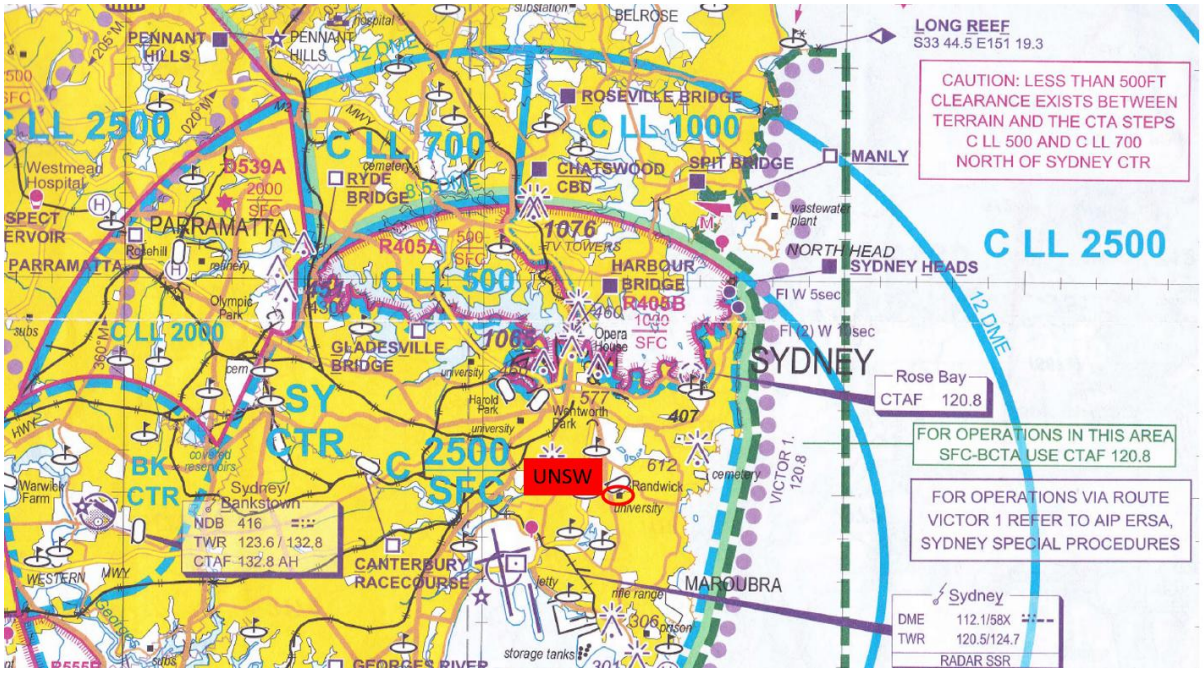


Figure 9: Sydney (Kingsford-Smith) Aerodrome General Airspace

4.5. The Sydney (Kingsford-Smith) Aerodrome OLS Overlay

The Sydney (Kingsford-Smith) Aerodrome OLS is depicted in Figures 10 and 11 below. The approximate location of the E25 Biolink development is also indicated.

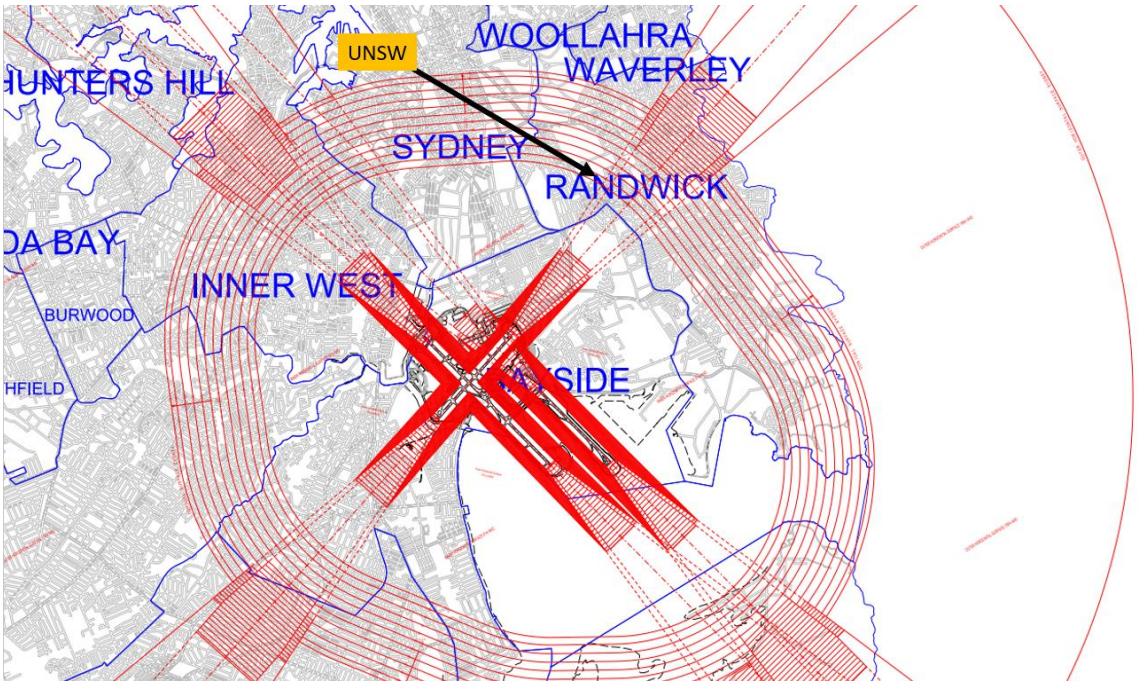


Figure 10: Sydney (Kingsford-Smith) Aerodrome Obstacle Limitation Surfaces (1)

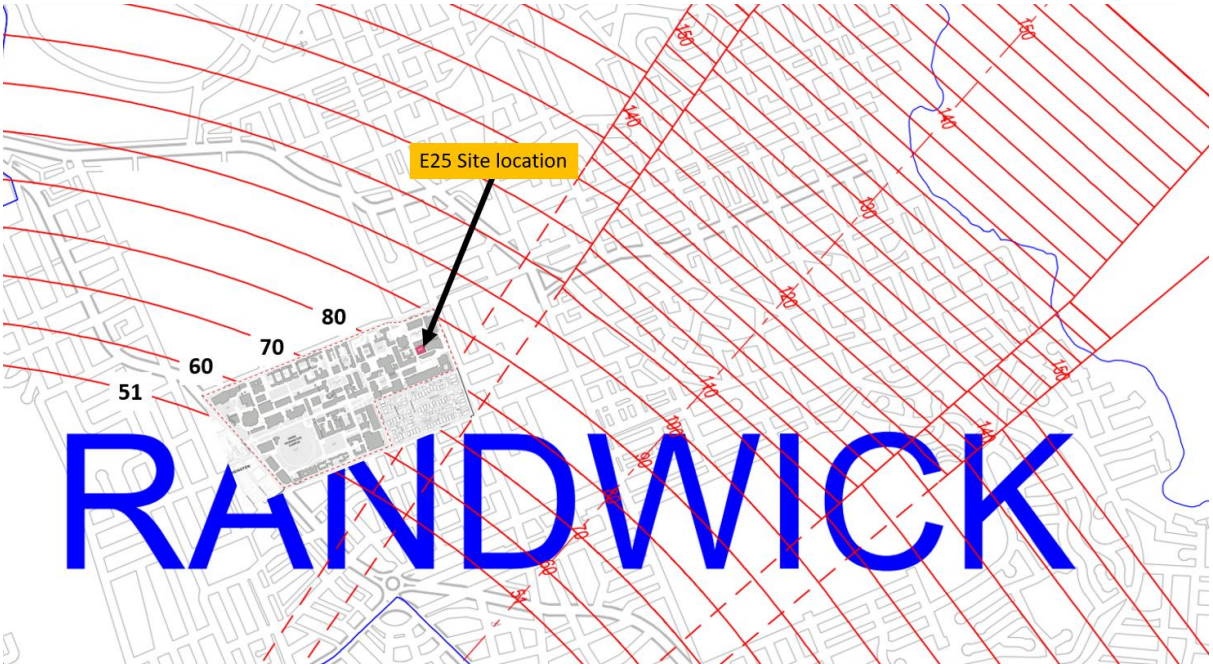


Figure 11: Sydney (Kingsford-Smith) Aerodrome Obstacle Limitation Surfaces (2)

4.6. Impact on the Sydney (Kingsford-Smith) Aerodrome OLS

The E25 Biolink development will enter the Sydney (Kingsford-Smith) Aerodrome OLS from approximately 82 AHD. Construction crane(s) will also intrude into the OLS.

4.7. The Sydney (Kingsford-Smith) Aerodrome PANS-OPS Overlay

The Sydney (Kingsford-Smith) Aerodrome PANS-OPS is depicted in Figures 12 and 13 below. The approximate location of the E25 Biolink development is also indicated.

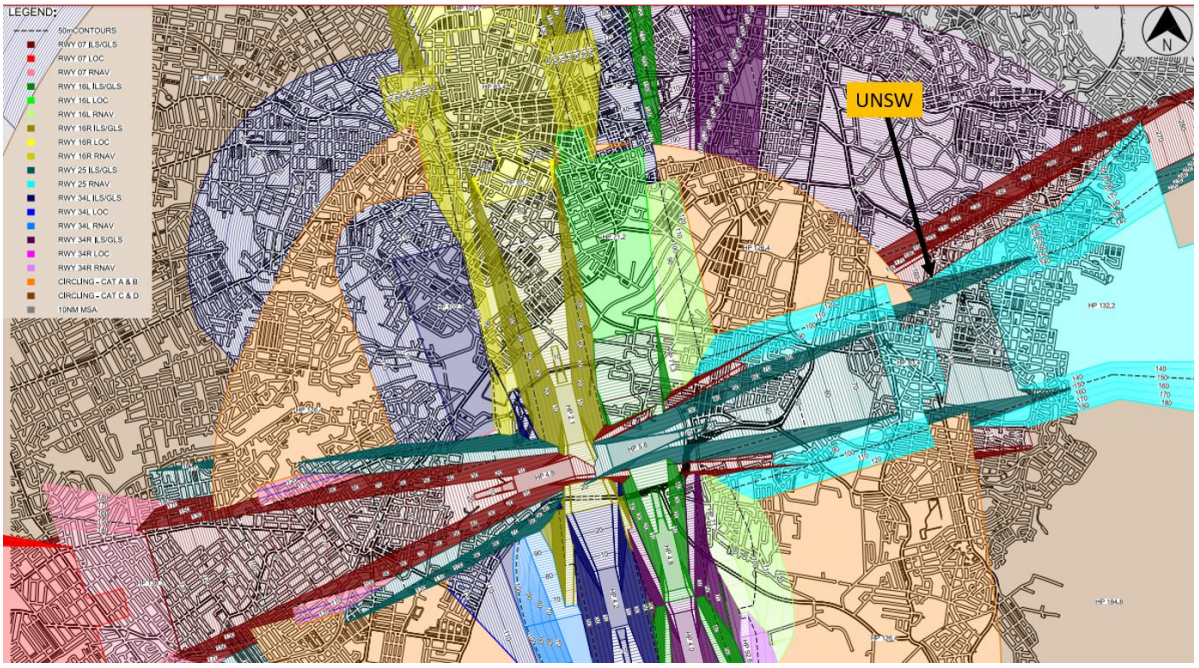


Figure 12: Sydney (Kingsford-Smith) Aerodrome PANS-OPS Surfaces (1)

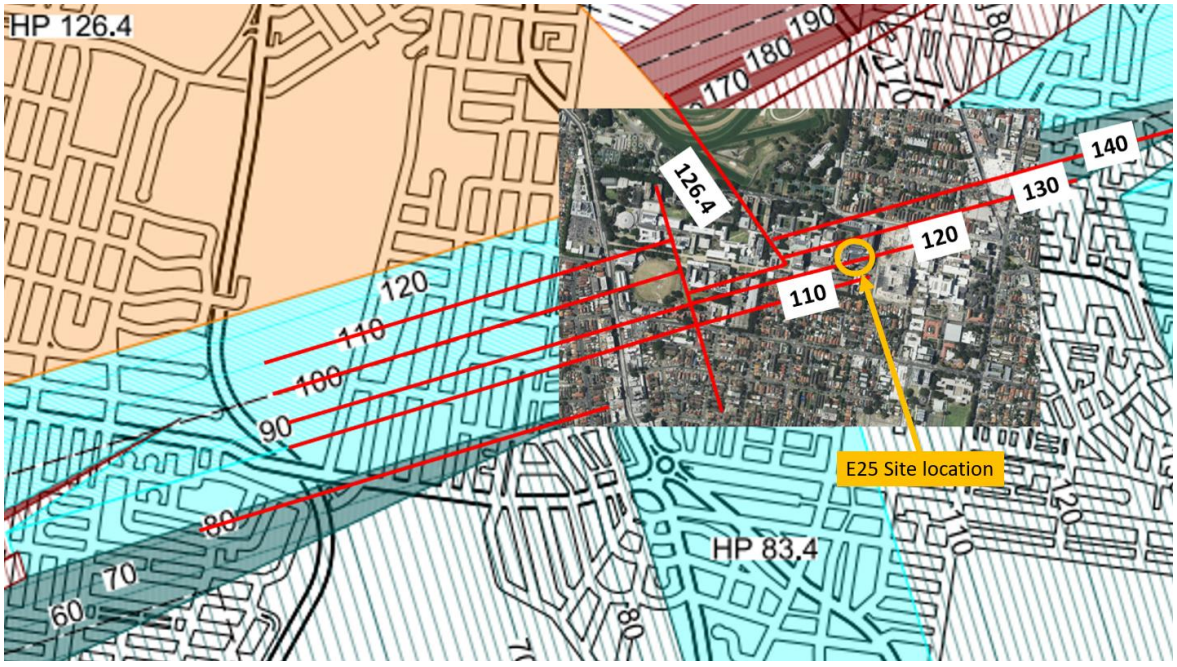


Figure 13: Sydney (Kingsford-Smith) Aerodrome PANS-OPS Surfaces (2)

4.8. Impact on the Sydney (Kingsford-Smith) Aerodrome PANS-OPS Surfaces

The Sydney (Kingsford-Smith) Aerodrome PANS-OPS surfaces extend over the E25 Biolink development at approximately 120 AHD. There will be no intrusion for this building. Construction crane(s) would begin to intrude into the PANS-OPS surfaces from approximately 120 AHD.

4.9. The Sydney Aerodrome Radar Terrain Clearance Chart (RTCC) Overlay

The Sydney Aerodrome RTCC overlay is depicted in Figure 14 below. The approximate location of E25 Biolink is also indicated.

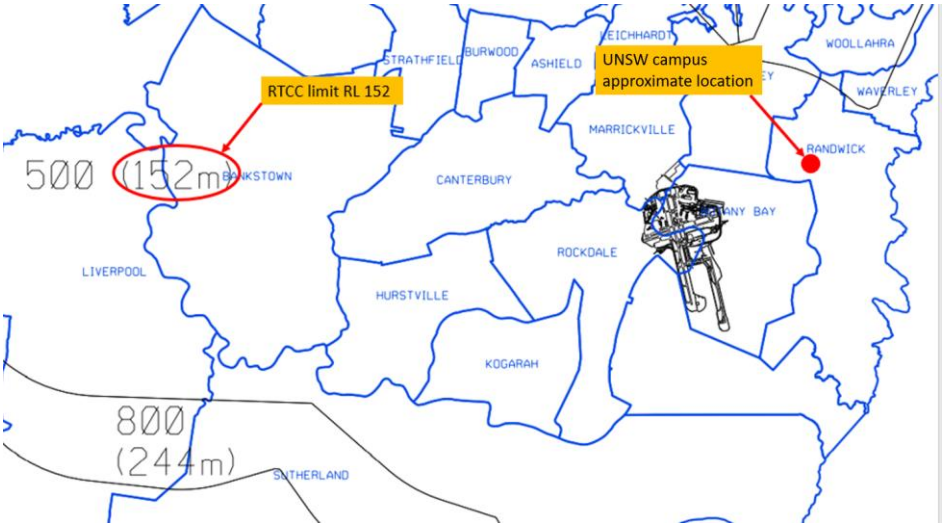


Figure 14: The E25 Biolink development within the Sydney RTCC

4.10. Impact on the Sydney Aerodrome RTCC

At its current height, the development (including construction cranes) will be well below the RTCC lower level for the area of 152m AHD.

4.11. Overall impacts on Sydney (Kingsford-Smith) Aerodrome OLS, PANS-OPS and RTCC

The development (and any associated construction cranes), will intrude into the Sydney (Kingsford-Smith) Aerodrome OLS. The development will not intrude into either the PANS-OPS surfaces or RTCC. Construction crane(s) may intrude into the PANS-OPS surfaces if above approximately 120 AHD but will not intrude the RTCC.

4.12. Impact on the POW Hospital HLS

There is one strategically important HLS within close proximity to E25 Biolink being the new HLS at POW Hospital (RL 65.572) which will be operational prior to E25 Biolink construction. The existing HLS will be closed by the time construction commences. See Figure 15 below.

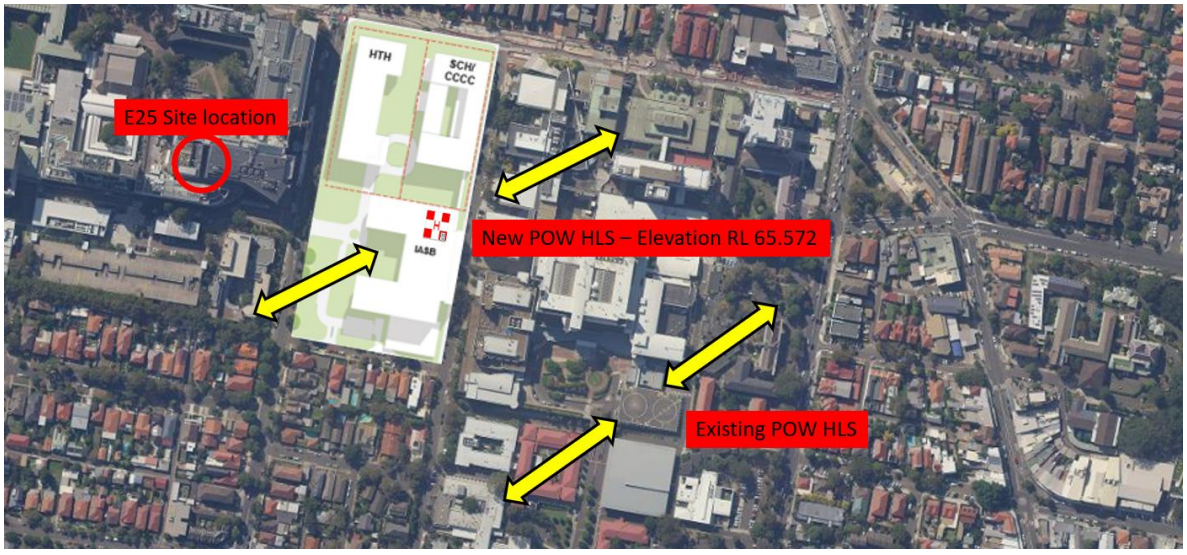


Figure 15: POW Hospital HLS Approach and Departure Paths

Neither of the approach and departure paths surveyed for the new POW Hospital HLS will transit directly overhead the E25 Biolink development. The new HLS deck is at RL 65.572 or 65.572 AHD which is over 30m below the elevation of the E25 Biolink. Any tower crane used to construct the E25 Biolink building will be a hazard to helicopters operating in the vicinity of the new POW Hospital HLS. This hazard will be more pronounced if a crane sits above buildings surrounding the E25 Biolink development.

4.13. Impact on Helicopter Routes

The E25 Biolink development will not impact any helicopter routes. There are two helicopter routes in the Enroute Supplement - Australia (ERSA) that enter and leave the Sydney Aerodrome CTR near E25 Biolink. The Barracks 5 route tracks north-south wel to the west of the E25 Biolink and the Maroubra 5 tracks east-west well to the south of the E25 Biolink. See Figure 16 below.

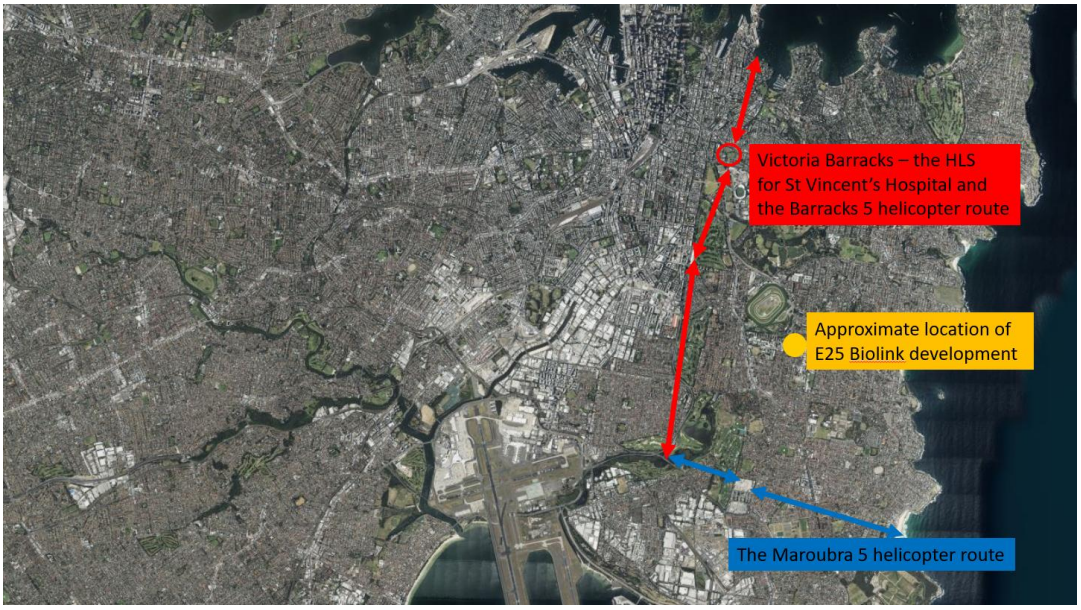


Figure 16: The Barracks 5 and Maroubra 5 Helicopter Routes

4.14. Tall Structure Considerations

CASA AC 139.E-01 v1.0 Reporting of tall structures dated December 2021 states that "Any object that extends to a height of 100 m or more above local ground level, must be notified to CASA by the proponent or owner." At less than 100 m above ground level, this building need not be notified to CASA for assessment. AC 139.E-01 v1.0 also states that "the RAAF and Airservices Australia require information on structures that are 30 m or more above ground level - within 30 km of an aerodrome or 45 m or more above ground level elsewhere for the RAAF, or 30 m or more above ground level elsewhere for Airservices Australia." This building therefore will need to be notified to Airservices Australia as a tall structure.

4.15. Construction Crane Considerations

As a construction crane(s) will be close to an HLSs, the Guidelines require such cranes to be lit when "in the vicinity" of a Hospital HLS. The illumination requirements for cranes in the vicinity of a Hospital HLS are detailed below. It should be noted that there are no specified lighting requirements for mobile cranes however a similar level of safety should be applied for these as would be applied for tower cranes.

As a minimum for all tower [hammerhead] cranes:

- top of crane A frame or cabin: medium intensity flashing red obstruction light;
- both ends of Jib: medium intensity flashing red obstruction light
- along Jib: line of white LED fluoro on a PE cell along the full length of the jib, and
- tower section: stairway lights or spot lights attached to the top of the tower pointing down and onto the tower (not up into pilot eyes).

As a minimum for all luffing cranes:

- top of crane A-frame or cabin: medium intensity red obstruction light;
- end of Jib: medium intensity red obstruction light;
- along Jib: line of white LED fluoro on a PE cell along the full length of the jib; and
- tower section: stairway lights or spot lights attached to the top of the tower pointing down and onto the tower (not up into pilot eyes).

The LED jib fluoro lights are to be LED weather proof emergency fluoros controlled via a PE cell with a minimum 90-minute battery back-up.

4.16. Assessment and Findings: Airspace, Cranes, Obstructions and HLSs

The following key deductions can be made:

- The E25 Biolink development, once constructed, will intrude into the Sydney (Kingsford-Smith) Aerodrome OLS, and will require approval to do so.
- The E25 Biolink development, once constructed, will not intrude into the Sydney (Kingsford-Smith) Aerodrome PANS-OPS surfaces; or Sydney RTCC.
- The E25 Biolink development, once constructed, will not impact the approach and departure path the POW Hospital HLS.
- The E25 Biolink development construction crane(s) will intrude into the Sydney (Kingsford-Smith) Aerodrome OLS and will require approval to do so.
- The E25 Biolink development construction crane(s) may intrude into the Sydney (Kingsford-Smith) Aerodrome PANS-OPS surfaces if above approximately RL 120, and will require approval to do so.
- The E25 Biolink development construction crane(s) will not intrude into the Sydney RTCC.
- The E25 Biolink development construction crane(s) will not intrude into the approach and departure paths of the POW Hospital HLS.
- The E25 Biolink development, once constructed, will be shielded by surrounding taller buildings and therefore should not require aviation-standard obstacle lighting.
- The E25 Biolink development construction crane(s) will be a hazard to helicopters operating in the vicinity of the new POW Hospital HLS and will require aviation-standard obstacle lighting (due to OLS intrusion and HLS proximity).
- The E25 Biolink development, and any associated construction crane(s) will require formal assessment by both CASA and Airservices Australia, with approvals for airspace intrusion required from the Commonwealth Department of Infrastructure, Transport, Regional Development, Communication and the Arts.

4.17. Cumulative Impacts

This report has considered the cumulative impacts of this project and the current project under SSD-74670005 Building G25 which covers the construction of a 13-storey building at Lot 5 DP 1264171. From an aviation/airspace perspective there are no cumulative impacts.

4.18. Mitigations

There is nothing other than routine considerations to mitigate in relation to aviation impact and airspace protection matters for the proposed E25 Biolink development. Aviation-standard obstacle lighting for construction crane(s) are routine issues that are considered on all projects in the vicinity of aerodromes, helicopter landing sites or helicopter routes. See Table 3 below.

Project Stage	Mitigation Measures	Relevant Section
C	Appropriate marking and lighting of construction crane(s)	4.15

Table 3: Mitigation Measures

4.19. Conclusion

The E25 Biolink development, including its construction cranes, will not adversely impact aviation safety in relation to either Sydney (Kingsford-Smith) Aerodrome or the new POW Hospital HLS. Approvals will be required for the completed building and construction crane(s) to intrude into the the Sydney (Kingsford-Smith) Aerodrome OLS; and also the PANS-OPS surfaces if it is/they are planned to be above approximately 120 AHD. The construction crane(s) will require aviation standard obstacle lighting. The competed building will be notifiable to Airservices Australia as a tall structure.

4.20. Recommendations

Ensure that the proposed E25 Biolink development construction tower crane(s) is/are fitted with NSW Ministry of Health standard obstacle lighting. If operating at night or in low visibility, ensure that the proposed E25 Biolink development construction mobile crane(s) is/are fitted with aviation standard obstacle lighting.