

Aeronautical Impact Assessment

524-542 Pacific Highway, St Leonards

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Aeronautical Impact Assessment: 524-542 Pacific Highway, St Leonards.

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1

**Executive
Summary**

Executive Summary

This Aeronautical Impact Assessment (AIA) has been prepared by Avlaw Aviation Consulting Pty Ltd (Avlaw) for Home Apartments (Home) to supplement its Development Application (DA) as well as applications to Sydney Airport Corporation Limited (SACL) for controlled activity approvals. The controlled activity approvals will be in relation to a proposed multi-story building development as well as one temporary luffing jib tower crane that will be used during construction.

Home are proposing to construct a high-rise building at 524-542 Pacific Highway, St Leonards (the site) to a height of 235.75m AHD, with all plant and ancillary features captured within this envelope. Temporary crane activity will reach a height of 241.75m AHD.

Various airspace protection surfaces cover the site that form part of the prescribed airspace for Sydney Airport. Airspace protection surfaces also apply with respect to the Royal North Shore Hospital (RNSH) Helicopter Landing Site (HLS). The table below summarises the most relevant surfaces and the heights of each over the site.

Sydney Airport	
<i>Airspace Surface</i>	<i>Height</i>
Obstacle Limitation Surfaces	156m AHD
Procedures for Air Navigation Services – Aircraft Operations	279m AHD
Radar Terrain Clearance Chart	335.28m AHD
RNSH HLS	
<i>Standard/Guideline</i>	<i>Height</i>
National Airport Safeguarding Framework – Guideline H	N/A as helicopter flight paths do not cover the site
NSW Health Guideline – Hospital Helicopter Landing Sites in NSW	N/A as helicopter flight paths do not cover the site
CASA CAAP 92-2(2)	N/A as helicopter flight paths do not cover the site

Figure 1: Summary of Aeronautical Impact Assessment findings (Sydney Airport and RNSH HLS)

Note: the airspace assessment findings above were identified in September 2022. This version of the report has been updated to include updated Standard Text (Section 2) and these findings have not been checked for accuracy as of the date of this report.

Avlaw’s assessment has identified that the Outer Horizontal Surface (OHS) of the Obstacle Limitation Surfaces (OLS) for Sydney Airport at 156m AHD covers the site and will be penetrated permanently by the multi-story building. One temporary construction crane to a height of 241.75m AHD will also penetrate this surface meaning that both the building and temporary construction crane will require separate controlled activity approvals.

Above the OLS, the next lowest airspace protection surface which covers the site is the Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS) on the Standard Instrument Departure of RWY 34L departures for Sydney Airport at 279m AHD which provides a 29.25m vertical buffer for the construction crane above the proposed building height of 235.75m AHD.

With respect to the RNSH HLS, Avlaw notes the proposed development is not restricted by airspace protected under Guideline H of the National Airports Safeguarding Framework (NASF) for Strategic Helicopter Landing Sites (SHLS) as the flight paths for RNSH are not in the direction of the site. With that in mind, neither the NSW Health

Guideline or CASA Advisory Publication will apply and therefore not limit the height of the building at the site. Given the relative proximity of the site and the HLS, Avlaw also notes the while taller buildings exist between the site and the RNSH HLS, once the Construction Management Plan (CMP) is finalised the crane on the site will need to be considered with respect to the 1,000 ft “North Shore” helicopter access lane that covers the general area.

In summary, provided the temporary construction crane and the overall building height inclusive of plant room and ancillary features (e.g. lift overrun, masts, building maintenance unit (BMU) when in operation etc.) all remain below the PANS-OPS surface at 279m AHD, then the proposed development at the site will not adversely affect the safety, efficiency or regularity of aircraft operations at Sydney Airport and should be approved. Flight paths for the RNSH HLS do not specifically cover the site, however, further assessment will be required once the CMP is confirmed to ensure there is no adverse impact on the use of the “North Shore” helicopter access lane. Lighting of the temporary construction crane will likely be required in accordance with CASA Manual of Standards (MOS) as well as other requirements specified by the HLS asset owner.

2

Introduction

Introduction

This AIA is submitted to the Department of Planning and Environment (DPE) in support of a concurrent State Led Rezoning and State Significant Development Application (SSDA) for a new mixed-use development, comprising build-to-rent housing, commercial and retail land uses at the Telstra Exchange Site at 524-542 Pacific Highway, St Leonards (the site)

The proposed development will specifically comprise the following:

- Site preparation and excavation.
- Retention and integration of the existing Telstra Exchange Building:
- Construction of a new 42-storey mixed-use development, comprising:
 - 21,472m² of build-to-rent housing across 31 storeys, including 272 dwellings.
 - 3,840m² of non-residential space within an 8-storey podium used for the purposes of short stay accommodation, including:
 - 721m² of Key Worker Housing across level 1, within the podium, delivering a total 10 dwellings to be managed as part of the build to rent development.
 - 2,014m² of community amenity facilities throughout the building.
- Residential lobby accessed via Christie Street and separate commercial use lobby accessed via Pacific Highway;
- Podium car parking and loading area with vehicular access via Christie Street, comprising a 48-space car stacker;
- Associated landscaping and public domain works; and
- Augmentation of, and connection to, existing utilities services as required.

It is noted that to facilitate the abovementioned development, amendments to the *Lane Cove Local Environmental Plan 2013* are proposed via a concurrent State Led Rezoning to rezone the site from B3 Commercial Core to B4 Mixed Use and to increase the maximum building height of 72m to 155m. The maximum FSR of the site will remain as per existing at 17.1:1.

Relevant SEARs and Study Requirements

This AIA addresses the following relevant Secretary's Environmental Assessment Requirements (SEARs) set out in the Figure 2 below.

24. Aviation

- If the development proposes a helicopter landing site (HLS), assess its potential impacts on the flight paths of any nearby airport, airfield or HLS.
- If the site contains or is adjacent to a HLS, assess the impacts of the development on that HLS.

- Aviation Report

Figure 2: Secretary's Environmental Assessment Requirements relevant to this Report

Avlaw notes that the SEARs relate specifically to helicopter operations and specifically HLSs on or near the site. Although Avlaw acknowledges this needs to be assessed, they do not reference the prescribed airspace for Sydney Airport which Avlaw considers to be a key part of determining the impact of any proposed development activities on aviation operations. The relevant reference to this key component of Avlaw's assessment is found in the In addition to the SEAR's, this Aeronautical Impact Assessment has also been prepared in accordance with

the Study Requirements (IRF22/649) issued in March 2022 by the DPE in collaboration with other government agencies:

- An Aeronautical Assessment considering the potential impact of development utilising the proposed development controls on the operations of Sydney Airport and its Obstacle Limitation Surface.

3

Regulatory Framework

Regulatory Framework

3.1. Airspace Height Controls

As a signatory to the *Chicago Convention 1944*, Australia adopts ICAO Standards and Recommended Practices (SARPs) with respect to airspace which define sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms an airport's prescribed airspace which in the case of Sydney Airport (and other federally leased airports across the country) refers to various volumes of airspace which include the OLS, PANS-OPS and Radar Terrain Clearance Chart (RTCC).

The airspace which is protected to ensure the safety of helicopter operations at hospital helipads is not encapsulated in the aforementioned prescribed airspace. Instead, there are various guidelines and advisory publications in circulation that define what volumes of airspace should remain free of obstacles and therefore what development activities can be safely approved. These are discussed further in section 2.2.2.

3.2. Airspace Approval Process

The aviation approval process for penetrations of Sydney Airport's airspace and that which applies to helicopter operations at RNSH are covered by various legislation and administrative processes. Each has been described below separately.

3.2.1 Sydney Airport

Part 12 of the *Airports Act 1996* (Act) and the *Airports (Protection of Airspace) Regulations 1996* (Regulations) establish a framework for the protection of airspace at and around airports. The Act defines any activity resulting in an intrusion into an airport's prescribed airspace to be a "controlled activity" and requires that controlled activities cannot be carried out without approval. Controlled activities include the following:

- Permanent structures, such as buildings, intruding into the prescribed airspace;
- Temporary structures such as cranes intruding into the prescribed airspace; or
- Any activities causing intrusions into the prescribed 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 (not expected to continue longer than 3 months) and long-term controlled activities. The Regulations allow for the airport operator to approve short-term penetrations of the OLS under delegation from the Department following consultation with the Civil Aviation Safety Authority (CASA) and Airservices Australia (Airservices).

With respect to long-term penetrations (e.g. a building penetrating the OLS), the airport operator is required to invite the following stakeholders to assess or comment on an application if there is an intrusion into prescribed airspace:

- CASA for an assessment of the impact on aviation safety;
- Airservices for assessments of proposals resulting in a penetration of surfaces including the PANS-OPS, RTCC etc.;
- The local council authority responsible for building approvals; and
- The Department of Defence in the case of joint-user airports.

The final approving authority for all long-term penetrations of the OLS (as is the case on this development) is the Department as specified in the Act and the Regulations. In making its determination, the Department is required to assess the respective assessments of the airport operator, Airservices Australia and CASA. The Department cannot approve long-term penetrations of the OLS in the event CASA's assessment is not supportive of the application. It should be noted that long term intrusions (i.e. intended to last longer than three months) of the PANS-OPS surface are prohibited, so in the event the crane height changes and increases above 279m AHD, this limitation will need to be considered by Home.

The information required in the application must include:

- A description of the proposed controlled activity (building construction, crane operation etc.)
- Its precise location (street address and grid reference)

- If the controlled activity consists of the erection of a building or structure:
 - The proposed maximum height of the structure above the Australian Height Datum (including any antennae, towers, BMU etc.), and
 - The proposed maximum height of any temporary structure or equipment (e.g. cranes) intended to be used in the erection of the structure

Each penetration of prescribed airspace has to be assessed against the effect on published Departure and Approach procedures and other matters. These include published survey data and Air Traffic Control (ATC) procedures and practices, including compatibility with the promulgated ATC RTCC that is used to safely vector aircraft in instrument meteorological conditions (non-visual). Each proposal has to be checked for proximity to published procedures to ensure statutory tolerances and safety buffers are maintained in the event buildings and cranes are erected. The tolerances vary according to the type of navigation or aid being utilised and cover vertical, lateral and longitudinal criteria.

The approval process requires separate assessments of the permanent building structure and temporary construction cranes. Applications can be made in advance of planning approval for both, however CASA does require detailed architectural drawings to be provided prior to completing its assessment.

Timing to assess applications varies depending on the complexity of the assessment and the workload within the respective agencies at the time of receipt. Avlaw's experience suggests proponents should allow approx. three to four months for SACL, Airservices Australia, CASA and the Department to conduct their own assessments in succession. Avlaw recommends that applications for both building and temporary structures be made as soon as the final building design and construction management plan is finalised.

Carrying out a controlled activity without approval is an offence under Section 183 of the Act 1996 and is punishable by a fine of up to 250 penalty units. It is an offence under Section 185 of the Act to contravene any conditions imposed on an approval. Under Section 186 of the Act it is an offence not to give information to the airport operator that is relevant to a proposed controlled activity.

3.2.2 RNSH HLS

The triggers for assessment of proposed development activities with respect to airspace surrounding hospital helipads are not captured within those that are protected in legislation described in section 3.1 above. Applications for airspace approval for developments in close proximity to hospital HLSs are instead lodged with the asset owner (i.e. the hospital) who in turn refer the application to their aviation advisors and HEMS operators that fly to/from the HLS in question for assessment.

CASA does not currently have a legal instrument for the registration or certification of HLSs other than those located within an airport. Therefore, the airspace associated with HLSs not at an airport like that at RNSH are not protected in legislation. Instead, developers (and therefore their aviation consultants e.g. Avlaw) must determine if a proposed development has an adverse impact on aircraft safety by assessing it against guidelines and advisory publications including:

- NASF Guideline H: Protecting Strategically Important Helicopter Landing Sites
- NSW Health Guideline - Hospital Helicopter Landing Sites in NSW
- CASA CAAP 92-2(2)

The findings against each set of criteria are explained below in section 9.

4

Proposed Development

Proposed Development

4.1. Location

The site is located on the SE corner of the Pacific Highway and Christie Street diagonally opposite St Leonards Railway Station. The coordinates at the centre of the site are 333040.00 m E, 6255940.00 m S. The SE corner of the site is 13,679 metres from Sydney Airport Aerodrome Reference Point (ARP).



Figure 3: Site boundary indicated in red



Figure 4: Site location in relation to Sydney Airport

4.2. Permanent Structure

The proposed building height is 235.75m AHD, with all plant and ancillary features captured within this envelope. An elevation view image of the proposed development indicating its height is provided on the following page at Figure 5.

4.3. Crane Activity

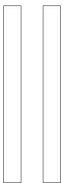
Crane activity will consist of one single luffing jib crane which will reach a height of 241.75m AHD. Figures 6 and 7 below show the crane at its maximum height and its swing arc respectively.



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Project Name
Date
Scale

524-542 Pacific Highway, St Leonards
000043070
18/07/2022
@A3

Drawing Name
Drawing Number
Revision

EV Section
DA307
1/300

1

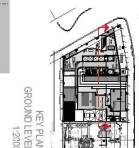
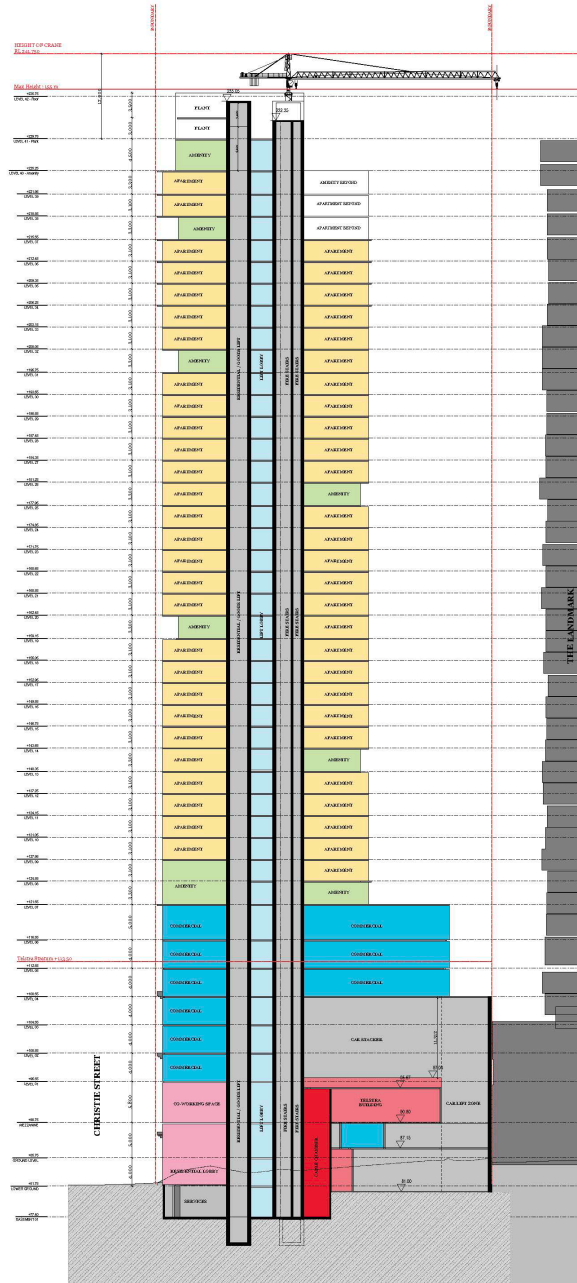


Figure 6: Elevation view image showing crane at maximum height of 241.75m AHD

5

**Prescribed Airspace
Assessment**

Prescribed Airspace Assessment

It is a regulatory requirement for federally leased airports including Sydney Airport to produce and make available charts which illustrate each of their prescribed airspace. Although charts are available for all the aforementioned airports, based on recent experience on other projects, it has become apparent that published PANS-OPS charts may not accurately reflect current instrument procedures due to changes in standards and the procedures themselves. To mitigate against the risk of drawing incorrect conclusions of the actual airspace restrictions which cover the site, Avlaw has based its assessment of Sydney Airports instrument procedures on first principles and produced a model which based on recent experience has been demonstrated to be accurate after subsequent detailed assessments by aviation stakeholders.

Avlaw has identified the OLS, PANS-OPS and RTCC for Sydney Airport as the most critical volumes of airspace for which further analysis would be required to achieve requisite approvals. These are explained in more detail in section 4.1-4.4 below. Figure 8 on the following page provides a summary of the findings.

Prescribed airspace – Sydney Airport					
Airspace Surface	Height	Building (235.75m AHD)		Crane (241.75m AHD)	
		Above surface?	Clearance/penetration	Above surface?	Clearance/penetration
OLS	156m AHD	YES	79.75m	YES	85.75m
PANS-OPS	279m AHD	NO	43.25m	NO	37.25m
RTCC	335.28m AHD	NO	99.53m	NO	93.53m

Figure 8: Summary of Aeronautical Impact Assessment Findings (Sydney Airport)

5.1. Obstacle Limitation Surfaces

The site lies under the Outer Horizontal Surface of the OLS for Sydney Airport. It is indicated by the marker on Figure 9 below. The proposed building height at 235.75m AHD will penetrate the OLS by 79.75m. One construction crane up to 241.75m AHD will penetrate the OLS by 85.75m. Since the building and temporary crane activity will penetrate the prescribed airspace for Sydney Airport, they will be considered controlled activities and require approval from aviation authorities prior to proceeding.



Figure 9: OLS Chart extract supplied by Sydney Airport

5.2. Procedures for Air Navigation Services – Aircraft Operations

The site sits beneath several protection surfaces for Instrument Flight Procedures, including the 25nm and 10nm Minimum Safe Altitude, the RNAV approach to runway 16L (including the vertically guided procedure) and departure procedures for runway 07 and 34L. Of these, the lowest is the Standard Instrument Departure for runway 34L (Airservices are using evaluation criteria not supported by ICAO PANS-OPS). Using the more restrictive ICAO criteria, Avlaw has determined the climbing surface from runway 34L achieves a height of 279m and slightly less for a crane south of the site. The site is covered by a horizontal segment of the published Sydney Airport’s PANS-OPS surfaces at 340m AHD and will therefore, in either case, not be penetrated by the building or temporary crane activity at the site.

Figure 10 shows Avlaw modelling of the building against the most restrictive PANS-OPS.

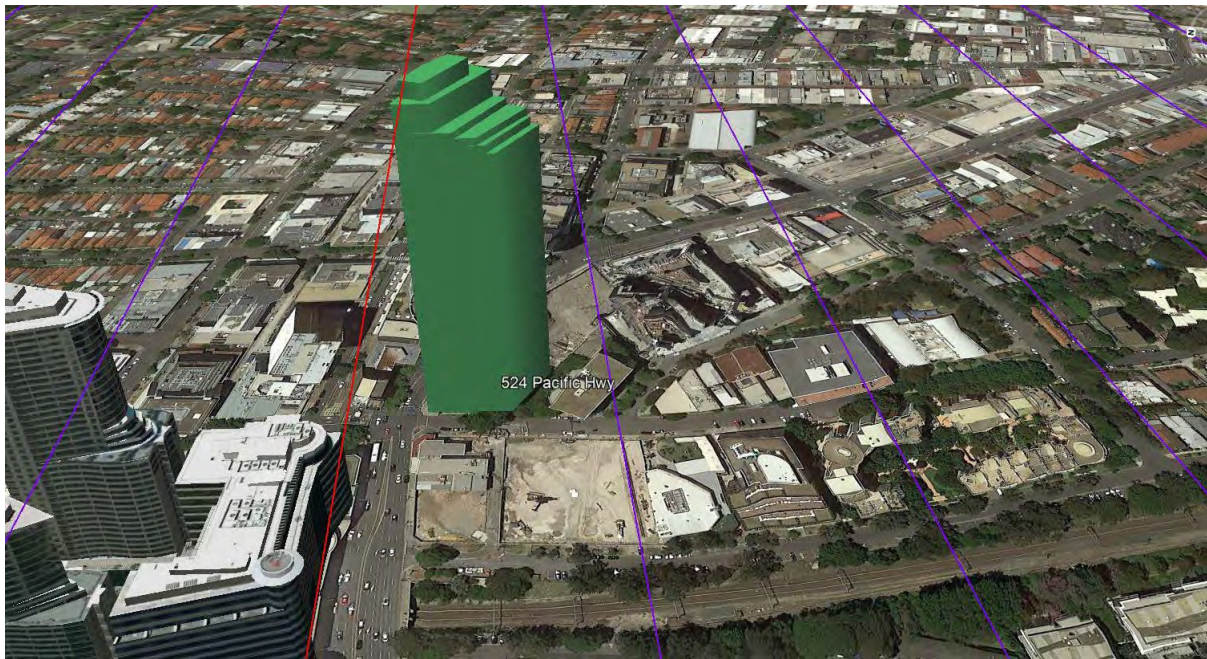


Figure 10: PANS-OPS RWY 34L Departure Contours (280m contour in red)

5.3. Radar Terrain Clearance Chart

The RTCC depictions are contained in the Radar Lowest Safe Altitude (RLSALT) chart. The site is located within the 335.28m AHD sector.

The proposed maximum building height (inclusive of all plant and ancillary features) to a height of 235.75m AHD and temporary crane activity to a height of 241.75m AHD will both remain below this surface.

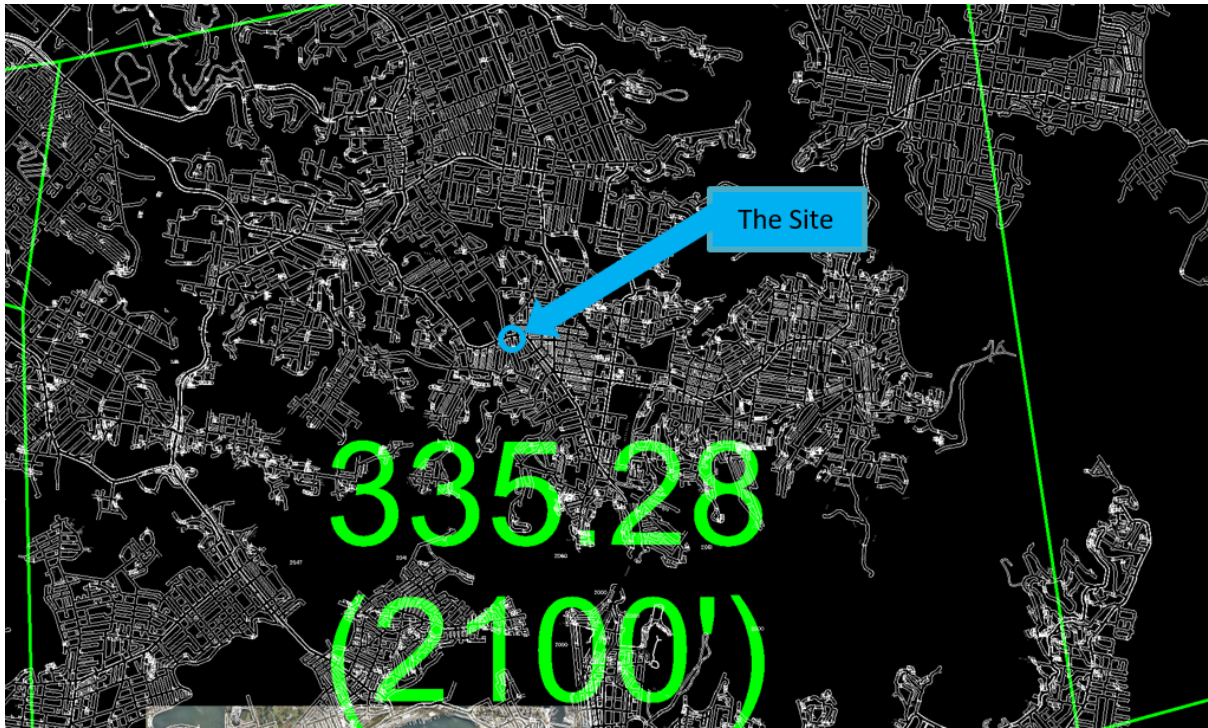


Figure 11: RTCC extract supplied by Sydney Airport

6

**Assessment of
Instrument Flight
Procedures**

Assessment of Instrument Flight Procedures

A review of all published approach and departure procedures as described in Aeronautical Information Publication/Departure and Approach Procedures (AIP/DAP) for Sydney Airport has been undertaken and confirms that the proposed building height of 235.75m AHD and temporary crane activity up to a maximum height of 241.75m AHD will not impact on any instrument flight procedures. Modelling conducted by Avlaw at Figure 10 was undertaken against the lowest PANS-OPS over the site being the Runway 34L Standard Instrument Departure. The building and temporary construction crane are below the instrument flight protected surfaces.

7

**Radar, Navigation and
Communications
Performance Impact**

Radar, Navigation and Communications Performance Impact

[NASE](#) Guideline G Attachment 3 provides advice on areas of concern for interference with Communications, Navigation and Surveillance (CNS) facilities. Avlaw has identified only the Terminal Area Radar (TAR) CNS facility for potential assessment.

The proposed development is 14,058 metres from the Sydney Airport TAR and 36,503 metres from the Cecil Park TAR. With respect to a TAR, an “area of Interest” is stipulated as being within 15,000m and above 0.25 degrees from the height of the TAR (38.2m AHD). At 14,058m the height at the site (99.6m AHD) is within the area of interest. The proposed development however is at a similar height to existing neighbouring buildings so is not expected to introduce any additional safety concerns from an airspace perspective.

Ultimately however, Airservices are the only stakeholder who can conclusively comment on this matter and will conduct their own assessment to confirm that there are no performance issues from penetration of standard TAR clearance surfaces.

8

Airport Master Plans

Airport Master Plans

The Sydney Airport Master Plan 2039 identifies future planning including assessment of aircraft traffic, passenger movements and instrument flight procedures in use. Avlaw has noted that passenger and aircraft movements at Sydney are predicted to increase and that there are no identified changes to instrument flight procedures. In assessing the master plan predictions of increased movements, Avlaw is cognisant of the fact that aircraft movements that are predicted to increase should be insignificant. Sydney Airport has regulated caps on the number of movements per hour that are permitted and movements are already operating at near capacity during peak periods.

There are no identified issues in the Master Plan which have not been taken into account in the preparation of this AIA.

9

Helicopter Operations

Helicopter Operations

Legislation requires the pilot of a helicopter to determine the safe take-off and landing approach taking into account all factors including aircraft performance, wind direction, obstacles, and emergency landing in the event of engine failure. The helicopter operations relevant to development at the site have been assessed against each of the criteria in circulation regarding the volumes of airspace which trigger assessment by the HLS asset owner, the findings of which are summarised below.

9.1. RNSH HLS

A [NASF](#) guideline relating to the protection of airspace surrounding hospital helipads has been developed to offer some form of protection to hospital HLS owners and users. Guideline H regarding protection of what are termed *Strategic Helicopter Landing Sites (SHLS)* stipulates that hospital helipads are considered as SHLS and therefore protected from obstacles being erected in close proximity to it. The guideline defines 140m wide rectangular steps in the direction of the approach/take-off area in 500m long increments until reaching 125m above the SHLS which would be protected from obstacles such as buildings and cranes. The steps, rising in 15m increments, are shown in Figure 12 on the following page that has been sourced from the guideline and illustrates the protection of SHLS and the heights above which it is triggered.

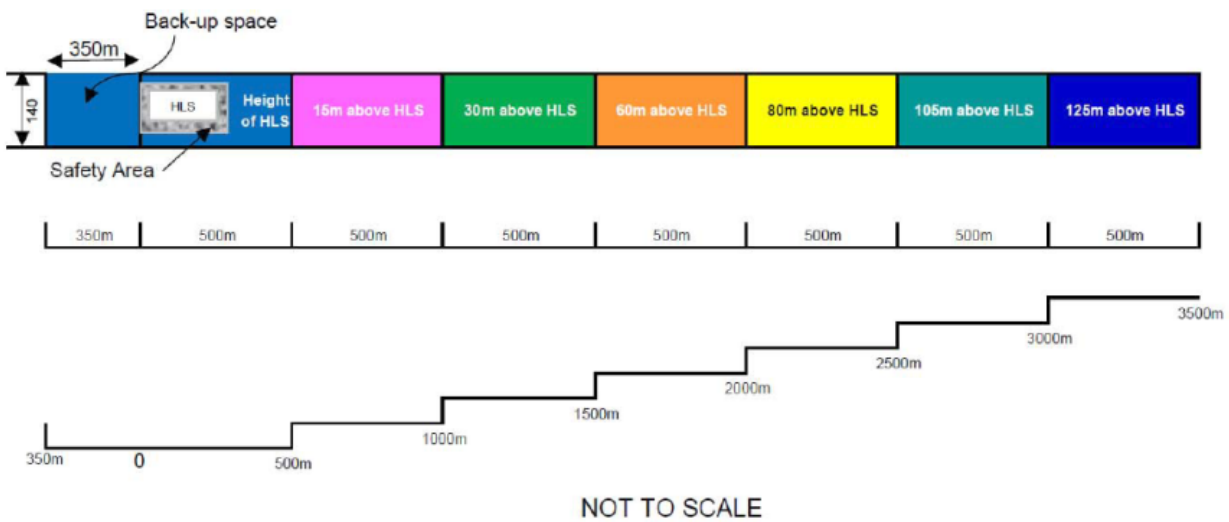


Figure 12: Referral trigger for SHLS



Figure 13: Location of Royal North Shore Hospital HLS with respect to the site

RNSH HLS flight path assessment				
Track	Source	NASF Guideline H	NSW Health Guideline	CASA CAAP 92-2(2)
188T (departure)	Helipad markings	No impact	No impact	No impact
083M (approach)	ERSA	No impact	No impact	No impact
290M (approach)	ERSA	No impact	No impact	No impact
110M (departure)	ERSA	No impact	No impact	No impact
263M (departure)	ERSA	No impact	No impact	No impact
008T (approach)	OzRunways	No impact	No impact	No impact
219T (approach)	OzRunways	No impact	No impact	No impact
039T (departure)	OzRunways	No impact	No impact	No impact
N/A ('North Shore Lane')	ERSA	N/A	N/A	N/A

Figure 14: Royal North Shore Hospital HLS flight path assessment

The footprint for the proposed development is outside the lateral limits of the NASF Guideline with respect to RNSH HLS as the direction of approaches approach and departures are either further west of the site or to the north-east. Therefore, the proposed building will not penetrate airspace protected by the guideline. Details relating to the construction management plan for the site are not known at the time of writing but should be assessed by Avlaw once a builder is contracted and a CMP is confirmed.

The dimensions for airspace protected in the NSW Health Guideline are less conservative than the NASF Guideline, so it is concluded that since the NSW Health Guideline is not triggered, neither is the NSW Health Guideline.

9.2. Other helicopter operations

The 'North Shore Lane' which is illustrated in the Aeronautical Information Publication Enroute Supplement Australia (ERSA) does not specify the specific track or dimensions of the lane itself. However, by interrogating the image below which is an extract from the relevant section of the ERSA, it can be seen that the site is to the west of the boundary of the lane indicated in 'purple'.

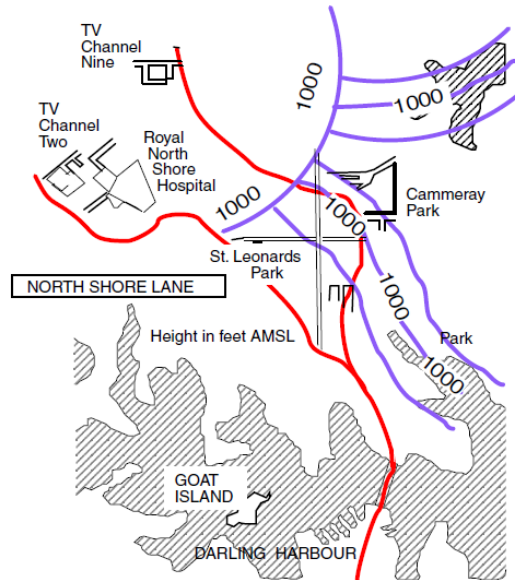


Figure 15: RNSH HLS helicopter access lane shown in purple (altitude to be flown is 1000ft QNH)

The proposed development is to the south-east of the RNSH HLS with a surrounding area at 1,000ft on QNH for helicopter operations and an associated helicopter transit route to the east of the site also prescribed at 1,000ft on QNH (i.e. 304.8m AHD on pressure altitude). The helicopter operations at RNSH HLS are all conducted under Visual Flight Rules (VFR) whereby the pilot in command (PIC) is solely responsible for safe navigation and separation from any obstacles.

Therefore, Avlaw's assessment of current and future helicopter operations in the vicinity of the site concludes the proposed development (i.e. buildings and crane) will pose no increased safety risk to those that already exist due to other obstacles in the area.

10

Conclusions

Conclusions

The Regulations require any decision by the Department 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. An approval may be subject to specific conditions, which may concern how the controlled activity is carried out (e.g. hours of operation of a crane) or may require the building or structure to be marked or lit in a certain way as detailed in CASA MOS 139. These conditions must also be in the interests of the safety, efficiency and regularity of existing or future air transport operations.

The building at the site to 235.75m AHD and temporary crane to 241.75m AHD will penetrate the OLS for Sydney Airport over the site which is at 156m AHD. This will trigger aviation safety assessment by SACL, CASA and Airservices Australia with each respective assessment delivered to the Department who will make a decision on whether the application for each is approved.

The building at 235.75m AHD will not penetrate the PANS-OPS or the RTCC.

The temporary construction crane will not penetrate the PANS-OPS or the RTCC.

Neither the building nor the temporary construction crane will penetrate defined NASF clearances for the Royal North Shore Hospital HLS.

This AIA concludes that the building and temporary construction crane should receive approval as they are clear of the PANS-OPS and RTCC and will not penetrate any defined flight operational surfaces and therefore will not adversely affect the safety, efficiency or regularity of operations at Sydney Airport.

The helicopter operations in the vicinity of the site will also not be impacted by the permanent structure. At 1000ft (304.8m AHD) prescribed for the "North Shore" access lane which is higher than the top of the proposed crane at 249.5m AHD, there being another tall building between the site and the RNSH HLS, the site not in a take-off or approach direction of the RNSH HLS, and a pilot requiring to ensure visual separation from all obstacles, neither the building nor the crane should have an adverse affect on safety of helicopter operations. However A response should be sought from the RNSH and will need to be considered. Applications for airspace approval for developments in close proximity to hospital HLSs are separately lodged separately with the asset owner (i.e. RNSH in this instance) who in turn refer the application to their aviation advisors and HEMS operators that fly to/from the HLS in question for assessment.



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