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Preliminary Aeronautical Impact Assessment

601 Pacific Highway, St Leonards

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PREPARED FOR:

Stockland Development Pty Ltd

PREPARED BY:

Avlaw Aviation Consulting Pty Ltd

Suite 6.13

6 Middlemiss St

Lavender Bay NSW 2060

Australia

Email: info@avlaw.com.au

PROJECT TEAM:

Amin Hamzavian (Project Manager)

Allan Frew (Airport Operations)

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Executive Summary

Executive Summary

This report has been prepared to support a Planning Proposal on behalf of Stockland Development Pty Ltd (Stockland) who sought advice in relation to identifying airspace constraints to support a Planning Proposal for 601 Pacific Highway, St Leonards, referred to herein as "the site".

Avlaw Aviation Consulting Pty Ltd (Avlaw), conducted a Preliminary Aeronautical Impact Assessment of the maximum building height restrictions at the site against prescribed airspace limits. These limits exist due to necessary safety clearances (mandated in legislation) that must be provided between an aircraft and an obstacle, such as buildings and cranes. This current aeronautical impact assessment updates the 2017 advice and provides details of the current airspace protection surfaces that cover the site which have been assessed following provision of a revised maximum building height of RL 259m. Sydney Airport airspace protection surfaces are the most relevant with respect to the site. The table below summarises the findings of the 2017 and most recent assessments:

Airspace Surface (Sydney Airport)	Height
Obstacle Limitation Surfaces (OLS) - Conical Surface	156m AHD
Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS)	340m AHD
Radar Terrain Clearance Chart (RTCC)	335.28m AHD
Combined Radar Departure Assessment Surfaces	455m AHD (N/A)

Note: the airspace assessment findings above were identified in February 2021. This version of the report has been updated with new Standard Text (Section 1) and a reduced building height. The findings above have not been checked for accuracy as of the date of this report.

The critical (i.e. lowest) airspace protection surface for operations at Sydney Airport which covers the site is the Outer Horizontal Surface of the OLS. As this surface will be penetrated both permanently by the building and temporarily by crane(s), each will require aeronautical assessment and be classified as a "controlled activity" which will need to be approved to be carried out.

Avlaw has determined that the OLS penetration itself should not be problematic in this instance because the site is clear of the approach and take-off areas for all runways at Sydney Airport. Avlaw has also determined that the Combined Radar Departure Assessment Surfaces should not be problematic because Sydney Noise Abatement Procedures (NAP) must be followed by all aircraft operating to and from Sydney Airport which dictates that there will be no random aircraft departures deviating from Standard Instrument Departures (SIDs) and the required safety clearances for these procedures are accounted for in the PANS-OPS surfaces. The minimum vertical distance between the proposed maximum building height of RL 259m and the next lowest and relevant airspace protection surface (i.e. RTCC) is 70.28m, providing a generous buffer for temporary crane activity.

With respect to helicopter operations, the "Northshore Lane" is the most relevant helicopter transit lane published in the Aeronautical Information Publication-En Route Supplement Australia (AIP-ERSA) with respect to the site and it is well clear to the SE of the site. Avlaw has also determined that the airspace protected under National

Airport Safeguarding Framework (NASF) - Guideline H for strategically important helicopter landing sites does not apply with respect to the development. Helicopter approaches and departures at the Royal North Shore Hospital (RNSH) Helipad are to the NE and SW away from the site that is SE of the helipad amongst other tall buildings.

In summary, provided temporary construction cranes and the overall building envelope inclusive of plant room and ancillary features (e.g. towers, masts, building maintenance unit (BMU) when in operation) all remain below the RTCC (335.28m AHD), aviation approvals should be granted.

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Introduction

Introduction

Avlaw has prepared this Addendum to the Preliminary Aeronautical Impact Assessment to support an amendment to Planning Proposal 2/23 that relates to 601 Pacific Highway, St Leonards.

The amended Planning Proposal seeks to change the statutory planning controls that apply to the site under the North Sydney Local Environmental Plan 2013 (LEP) as follows:

- Established a site-specific building height control, with maximum building height of RL259; and
- Establish a site-specific floor space ratio (FSR) control, with maximum FSR of 20:1.

The amended Planning Proposal responds to the North Sydney Council resolution at the meeting on 14 August 2023 and the subsequent correspondence issued by Council on 25 August 2023.

The amended Planning Proposal is informed by an amended indicative concept proposal which establishes a building envelope and footprint for a future developmental proposal.

The Addendum assesses the aviation impacts of the amended planning Proposal and the amended indicative concept proposal. It is prudent to point out that the airspace assessment findings of Avlaw's 2021 report have not been checked for accuracy as of the date of this report, however as the building height has been reduced since that assessment was completed, we do not expect the findings reached to be any different.

3

The Site

The Site

3.1. Site Description

The site to which this Planning Proposal relates is 601 Pacific Highway, St Leonards, within the North Sydney Local Government Area (LGA). The site is located approximately 4.5km north of the Sydney CBD and within close proximity to the commercial centres of St Leonards, Chatswood, and Macquarie Park.

The site has a primary (south-facing) frontage to the Pacific Highway and secondary frontages to Mitchell Street (to the east) and Atchison Street (to the north) (refer below site location plan).

Figure 1: Development site 601 Pacific Highway St Leonards

The site comprises a single allotment (Lot 71 in DP 749690) with a total area of 2,840 sqm (approximate).

The site is currently occupied by a 14-storey commercial office building, with ground and plaza level retail land uses, and four basement parking levels (accommodating 158 spaces).

Figure 2: Development site 601 Pacific Highway St Leonards

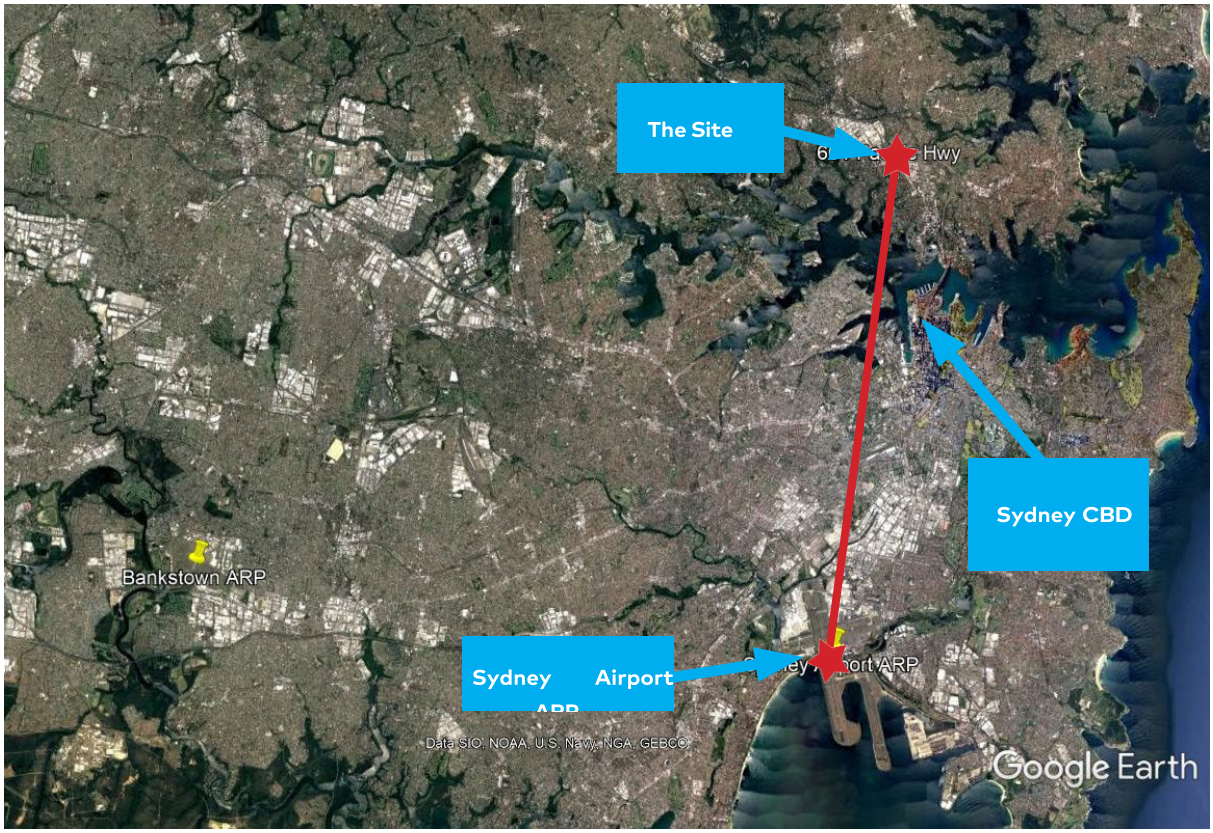

Figure 3: Site location in relation to Sydney Airport

3.2. Surrounding Context

The site occupies a prominent location on the corner of the Pacific Highway and Mitchell Street, with a secondary frontage to Atchinson Street. The site is located in the heart of St Leonards within convenient walking distance of the facilities and services available within the St Leonards rail precinct.

The area is well advanced in its transition from an older style commercial precinct to a thriving mixed-use area incorporating commercial and residential land uses, in tall tower building forms. This transition is facilitated by ongoing construction activity, recent development approvals, and further planning proposals.

The immediate surrounding include a range of building forms which are predominantly medium and high rise commercial and multi-storey mixed-use residential buildings.

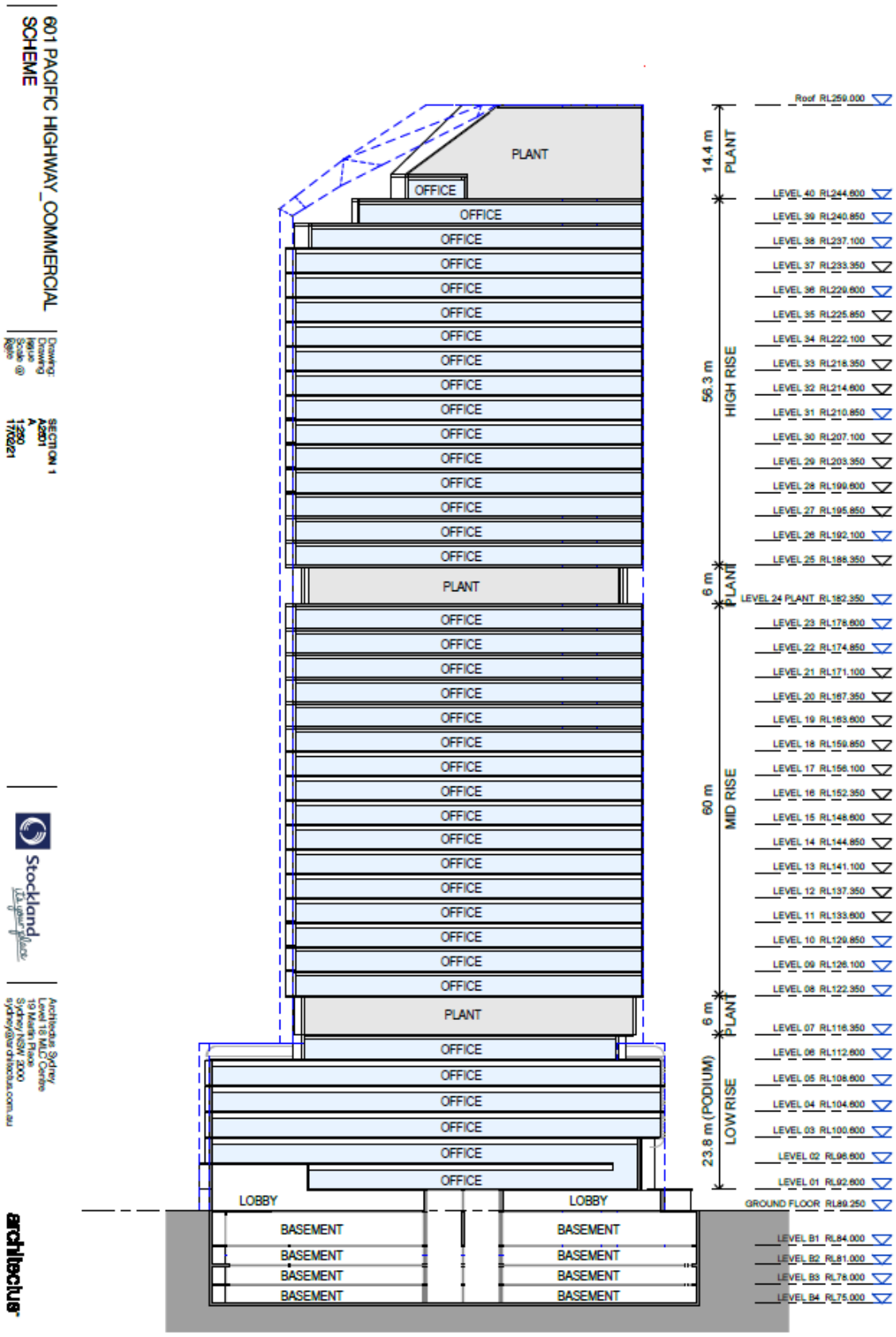

Figure 4: Indicative concept building envelope within the proposed maximum building height control that will apply (RL 259m)

4

Airspace Height Controls

Airspace Height Controls

As a signatory to the Chicago Convention 1944, Australia adopts International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPS) with respect to airspace which define sets of invisible surfaces above ground around an airport. The airspace above these surfaces forms the airport's prescribed airspace. With respect to Sydney Airport, the following airspace protection surfaces have been "declared" at either or both aerodromes by the Department of Infrastructure, Transport, Cities and Regional Development (Department) and therefore enshrined in legislation as each airport's prescribed airspace:

- Precision Approach Path Indicator (PAPI) system protection surfaces;
- OLS;
- PANS-OPS surfaces;
- Navigation Aid Protected Surfaces;
- High Intensity Light Protected Surfaces;
- Radar Terrain Clearance Chart (RTCC); and
- Combined Radar Departure Assessment surfaces.

5

Airspace Approval Process

Airspace Approval Process

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 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 of Infrastructure, Transport, Regional Development and Communication (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 PAPI, PANS-OPS etc;
- **the Department of Defence** in the case of joint-user airports.

The final approving authority for all short-term penetrations of the PANS-OPS and RTCC and long-term penetrations of the OLS 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 and CASA. The Department cannot approve short-term penetrations of the PANS-OPS without the support of the airport operator and also cannot approve long-term penetrations of the OLS in the event CASA's assessment is not supportive of the application.

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, scaffolding) 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 relating to the management and use of airspace surrounding airports. 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. The tolerances vary according to the type of navigation or aid being utilised by aircraft and cover vertical, lateral and longitudinal criteria.

The approval process requires separate assessments of the permanent building structure and temporary construction crane(s). 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. **Based on this, Avlaw's advice is that applications for controlled activity approvals supplemented with a complete Aeronautical Impact Assessment be submitted to the airport when final building designs, construction methodologies and timelines are known.**

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 on previous tall building projects suggests Proponents should allow at least three (3) months for Sydney Airport, Airservices, CASA and the Department to conduct their own assessments in succession.

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.

6

Preliminary Aeronautical Impact Assessment Findings

Preliminary Aeronautical Impact Assessment Findings

Based on the site location provided, interrogation of satellite imagery, OLS requirements, PANS-OPS limitations as well as RTCC stipulations, Avlaw's assessment of the heights of airspace protection surfaces covering the site and the respective clearance/penetration of each by the proposed building heights across the site are tabulated on the following page. The "PAPI" and "High Intensity Light Protected Surfaces" are excluded because they only cover an area close to Sydney Airport and the site is outside the extremity of these surfaces. Also, the "Navigation Aid Protected Surfaces" are excluded because assessment of that is conducted by Airservices with reference to coverage by overlapping radar, and other approved tall buildings in the vicinity of the site do not pose an issue.

Sydney Airport			
Airspace Surface	*Height*	*Concept building envelope (RL 259m)*	
		Clearance/penetration **(building)**	Clearance/penetration **(crane)**
OLS	156m AHD	103m	TBA
PANS-OPS	279m AHD	20m	TBA
RTCC	335.28m AHD	76.28m	TBA
Combined Radar Departure Surfaces	455m AHD	196m	TBA

Figure 5: Summary of Preliminary Aeronautical Impact Assessment Findings

Note: the airspace assessment findings above were identified by Avlaw in February 2021. This version of the report has been updated with new Standard Text (Section 1) and a reduced building height. The findings above have not been checked for accuracy as of the date of this report however as the building height has been reduced since that assessment was completed, we do not expect the findings reached to be any different.

Figure 6: Extract from OLS Chart (2018 revision)

Figure 7: Extract from Combined Radar Departure Assessment Surfaces Chart (2015)

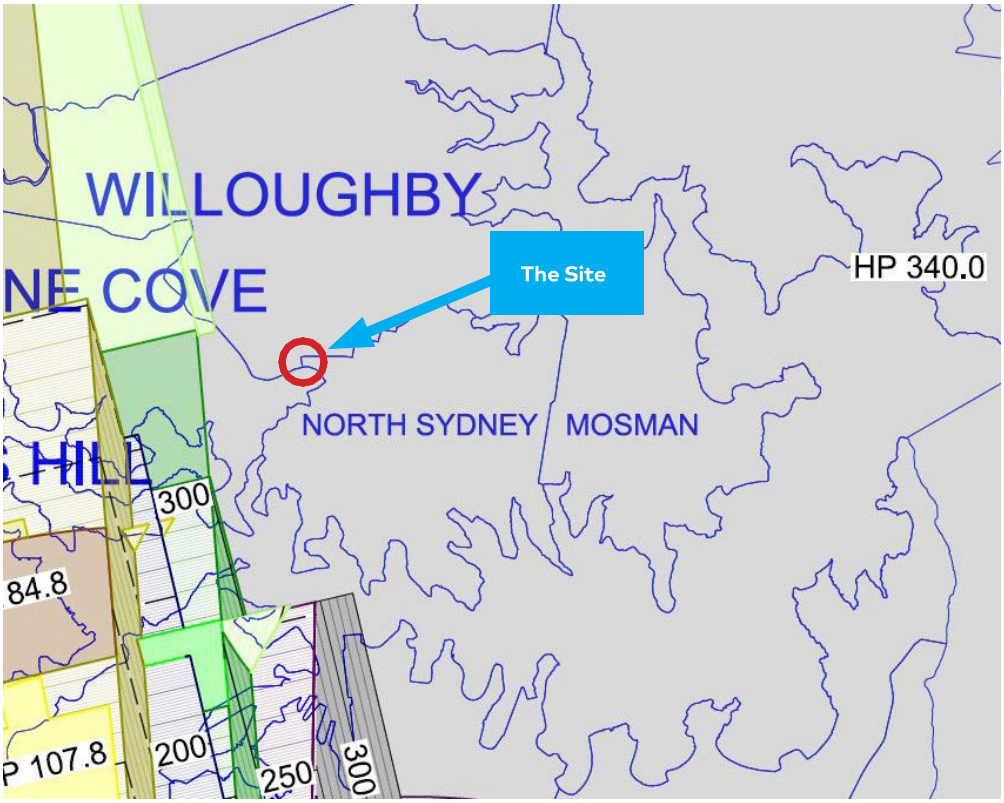

Figure 8: Extract from PANS-OPS Chart (2017)

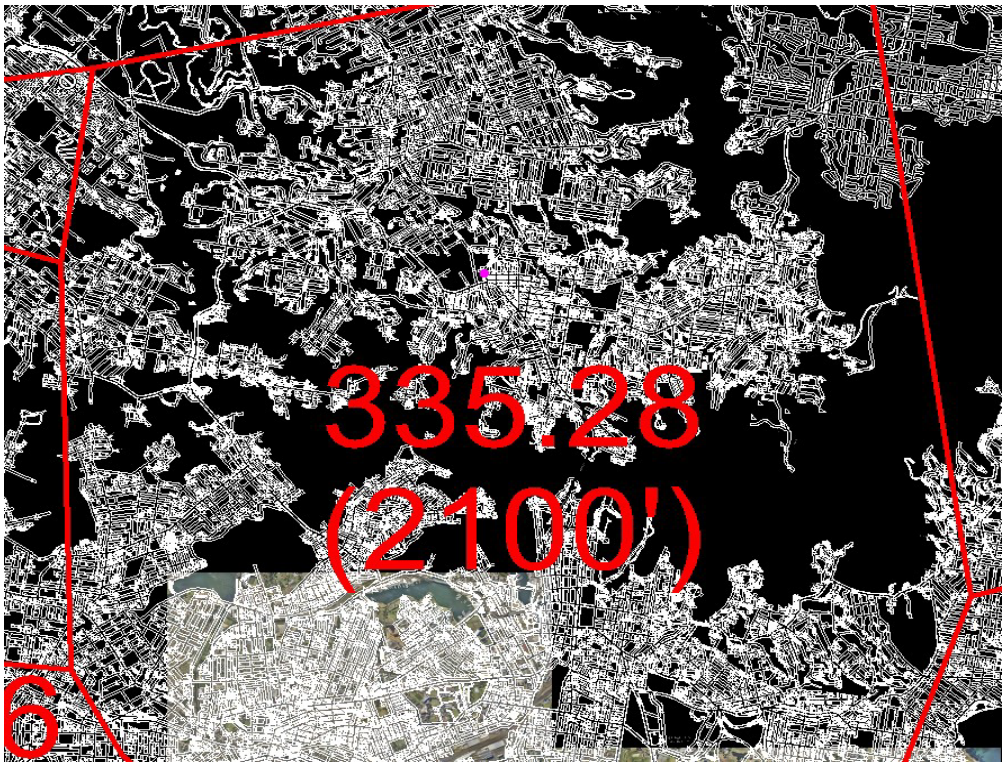

Figure 9: Extract from RTCC (2018)

The airspace protection surfaces of operational relevance over the site associated with flight operations are the OLS, PANS-OPS and RTCC for Sydney Airport. Since the OLS is proposed to be penetrated by the building structure and temporary construction cranes, each will therefore be considered a controlled activity and trigger detailed aviation assessment at DA. A maximum building envelope including any protrusions from a building (e.g. masts, BMU etc.) must be included in the final height of the building itself for aviation approval, as does temporary construction crane activity.

Penetration of the OLS is not considered problematic in this instance because the site is not in the approach and take-off area for any runway at Sydney Airport and provided there is no penetration of the PANS-OPS or RTCC, then no flight operational surfaces will be affected.

Avlaw's assessment is that the Combined Radar Departure Assessment surface is at a greater height than the RTCC and PANS-OPS but in any case, is not a limitation because Sydney NAP must be followed which dictates that there will be no random aircraft departures deviating from the SIDs which are covered by the PANS-OPS limitations.

As mentioned, Avlaw's assessment has identified that the proposed building will only penetrate the OLS which Avlaw believes is not problematic. Crane heights are unknown at the time of writing, however if they remain below the RTCC, no current published flight operation surfaces will be affected by the proposed development at the site and therefore should receive aviation approval.

7

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 proposed development is clear of specific helicopter transit routes. The helicopter operations assessed are all conducted under Visual Flight Rules (VFR) whereby the pilot in command (PIC) is solely responsible for safe navigation clear of any obstacles.

7.1. Coded Clearances and Sightseeing Flights

The nearest corner of site is located approximately 13,7040m NE of Sydney Airport's Aerodrome Reference Point (ARP). There are a number of prescribed helicopter transit routes published in AIP-ERSA for helicopter operations in the Sydney Control Zone. The "North Shore Lane" from Sydney Harbour to St Leonards provides one form of access to the Royal Northshore Hospital and is defined by the specific route and prescribed altitudes to be flown. This transit lane published in AIP-ERSA is clear of the site.

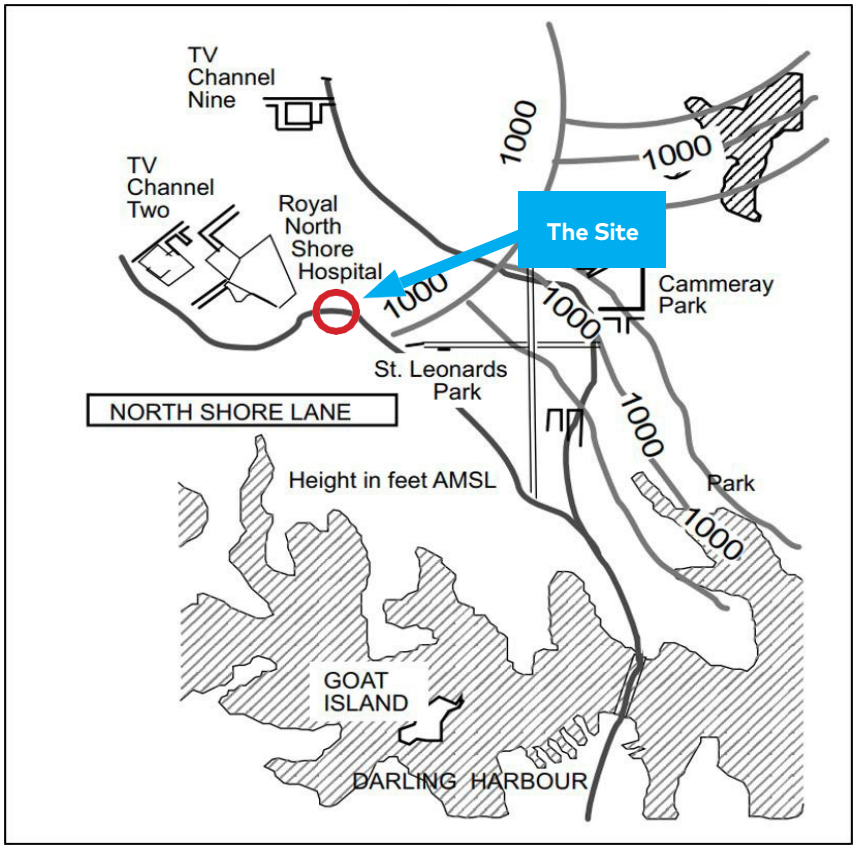

Figure 10: Extract from AIP-ERSA (2021)

7.2. Hospital Helipads

A National Airport Safeguarding Framework (NASF) Guideline H has been issued regarding protection of what are being termed Strategic Helicopter Landing Sites (SHLS). Under the guideline, hospital helipads would be considered as SHLS and therefore protected from obstacles being erected in close proximity to it. The guideline provides for 140m wide rectangular steps in the direction of approach/take-off in 500m increments until reaching 125m above the SHLS which would be protected from obstacles such as buildings and cranes. The figure below has been sourced from the guideline and illustrates this proposed protection of SHLS and the heights above which it is triggered.

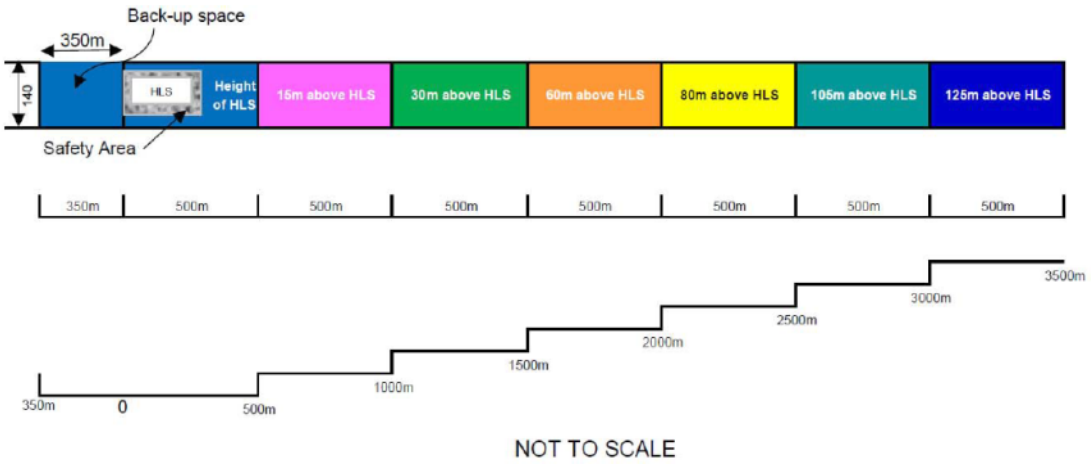

Figure 11: Referral trigger for SHLS

The RNSH is the closest hospital with a HLS to the site and is located 450m to the NW, therefore within the zone at the same elevation of the HLS. The declared elevation of the helipad is 134.7m AHD, so the NASF clearance level is 134.7m AHD if the direction of approach/take-off was in line with the site.

While individual flight paths are up to the helicopter pilot to determine, there are factors he/she will take into account specific to the RNSH Helipad operations, including:

- Approach and take-off to the SW (clear of the site) is over Gore Hill Park providing for an emergency landing area in the event of engine failure at low altitude;
- Approach and take-off to the NE (clear of the site) is over Naremburn Park, Artarmon Reserve, Bicentennial Reserve providing for an emergency landing area in the event of an engine failure at low altitude;
- Approach and take-off to the SE (over the site) is over a highly populated existing dense low, medium and high-rise development providing no clear flight path and no emergency landing in the event of an engine failure at low altitude and adds a level of risk for operations in this direction; and
- Information provided at helipads.org advises approach to be in the SW sector over Gore Hill Oval or alternate approach in the NE sector, and departure to be in the SW sector over Gore Hill Oval or alternative NE sector, all of which are clear of the site.

Therefore, Avlaw's assessment of helicopter operations in the vicinity of the site concludes the Planning Proposal will pose no increased safety risk to those that might already exist due to other obstacles in the area.

8

Rationale for Obtaining Approval

Rationale for Obtaining Approval

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. The Concept Design Proposal at the site will involve penetration of the Sydney Airport OLS which in this case, Avlaw considers as not being problematic as it is not in the approach and departure paths and not affecting declared flight operational surfaces. 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 Manual of Standards (MOS) 139. These conditions must also be in the interests of the safety, efficiency and regularity of existing or future air transport operations. Avlaw considers that aviation approval should be given because no flight operation surfaces, will be affected by proposed permanent building structure.

9

Future Controlled Activity Approval Requirements

Future Controlled Activity Approval Requirements

Avlaw's experience suggests proponents should allow at least three (3) months for project planning purposes with respect to processing time with Sydney Airport, Airservices Australia, CASA and the Department conducting their own assessments in succession.

The proposed development at the site will require two separate controlled activity applications as there is penetration of the OLS. With respect to development at the site, maximum building and crane heights that may be considered acceptable to aviation regulatory authorities must not penetrate the RTCC. Avlaw's assessment based on current airspace restrictions across the site and proposed building (and likely) crane heights to remain below the RTCC is that the proposed development and associated crane activity should both receive controlled activity approval.

This Preliminary Aeronautical Impact Assessment assesses the airspace impacts of the indicative concept design scheme prepared by Architectus to inform the Planning Proposal. This Preliminary Aeronautical Impact Assessment demonstrates that the site is capable of accommodating future development aligned with the proposed planning control changes and the applicable prescribed airspace restrictions for Sydney Airport and operational airspace relevant to helicopter operations at RNSH helipad.

A comprehensive Aeronautical Impact Assessment to complement controlled activity applications that will need to be lodged with Sydney Airport and associated with a detailed development proposal will be required as part of a future development application for the site.

Suite 6.13
6 Middlemiss St
Lavender Bay NSW 2060
Australia

P. +61 2 9980 7717
E. info@avlaw.com.au