



Anson City Developments 1 Pty Ltd

AERONAUTICAL IMPACT ASSESSMENT

617-621 Pacific Highway St Leonards

1 June 2017



avlaw.com.au



Publication Title

Aeronautical Impact Assessment – 617-621 Pacific Highway St Leonards

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Contents

About AvLaw Pty Ltd	6
Executive Summary	7
1. Background	9
2. Regulatory Framework	11
2.1 International Civil Aviation Organisation	12
2.2 Relevant Legislation and Regulations	12
3. Controlled Activity Approval Process	13
4. Proposed Controlled Activity	15
4.1 Location	16
4.2 Height of permanent structures	18
4.3 Height of temporary structures	19
5. Prescribed Airspace Assessment	21
5.1 Obstacle Limitation Surface (OLS)	22
5.2 Procedures for Air Navigation services – Aircraft Operations Surfaces (PANS-OPS)	23
5.3 Radar Terrain Clearance Chart (RTCC)	24
6. Assessment of Instrument Flight Procedures	25
7. Radar Navigation, Communications Performance Impact	27
8. Sydney Airport Master Plan	29
9. Helicopter Operations	31
10. Conclusions	37

Acronyms

ACRONYM	DEFINITION
AHD	Australian Height Datum
AIA	Aeronautical Impact Assessment
AIP	Aeronautical Information Publication
ARP	Aerodrome Reference Point
ATC	Air Traffic Control
BMU	Building Maintenance Unit
CAAP	Civil Aviation Advisory Publication
DAP	Departure and Approach Procedures
ERSA	Enroute Supplement Australia
ICAO	International Civil Aviation Organisation
IMC	Instrument Meteorological Conditions
NM	Nautical Mile (1.852km)
OLS	Obstacle Limitation Surfaces
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
PAPI	Precision Approach Path Indicator
RNSH	Royal North Shore Hospital
RSALT	Radar Lowest Sector Altitude
RTCC	Radar Terrain Clearance Chart
SARPS	Standards and Recommended Practices
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions



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The AvLaw team of consultants and auditors are comprised of senior airline executives, airport directors, engineers, planning and operations specialists and safety regulators.

Our subject matter experts each have extensive operational experience across a wide range of disciplines including airport and flight operations, maintenance, engineering, air traffic management, aviation law and regulations, aviation security, aviation economics and drones/RPA.

The image features a large, light blue circle centered on a dark blue background. A thick black ring is positioned around the inner edge of the light blue circle. A thin, light blue arc is visible on the right side, partially overlapping the black ring. Two thin, curved black lines are also present: one on the left side and one at the bottom, both curving around the central circle.

Executive Summary

Executive Summary

Anson City Developments 1 Pty Ltd (Anson) on 4 May 2017 requested AvLaw assist with the provision of all information required for an application of a “controlled activity” with respect to their proposed high rise mixed use retail, commercial and residential development at 617-621 Pacific Highway, St Leonards. This Aeronautical Impact Assessment (AIA) provides that information. The proposed maximum building height inclusive of towers, masts and building maintenance unit (BMU) is 263m AHD and temporary crane activity will reach a maximum height of 312.46m AHD.

As explained in this AIA, AvLaw has determined that no aeronautical surfaces relative to Sydney Airport will be affected by the proposed development, nor will helicopter operations at the Royal North Shore Hospital (RNSH) helipad be adversely impacted.

AvLaw’s assessment is that the current published Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) height across the site is 335.2m AHD (1100ft) and that the Radar Lowest Sector Altitude (RLSALT) or Radar Terrain Clearance Chart Height (RTCC) is 1100ft AHD (335m). The proposed development is below and clear of these surfaces. The Obstacle Limitation Surface (OLS) across the site is 156m AHD and will be penetrated by the development causing it to be a “controlled activity”. Penetration of the OLS requires aeronautical assessment to show whether there is likely to be any adverse impact on the safety or regularity of aircraft operations. This AIA by AvLaw concludes that the proposed development is clear of all aircraft operational surfaces and the controlled activity will not adversely affect safety or significantly affect regularity of operations of aeroplanes for Sydney Airport or helicopter operations at RNSH.



1

Background

Background

The Anson Group contacted AvLaw in August 2015 and again in October 2016 for advice on the potential impact on prescribed airspace with respect to a proposed mixed use high rise development at 617-621 Pacific Highway, St Leonards. AvLaw's preliminary assessment were provided in letters of advice based on a building height of 265m AHD and provision for 70 meters of temporary construction activity up to 335M AHD. AvLaw's advice was that the prescribed aeronautical surfaces for Sydney Airport would not be impacted, and that RNSH Helipad operations would not be adversely affected.

To address details recently required by Council with respect to Anson's Development Application, Anson further requested on 4 May 2017 for AvLaw to assist with the provision of all of the information that is required when applying for a "controlled activity" per the "Sydney Airport Application of Approval of Development Application" online form. This Aeronautical Impact Assessment contains the required information and specifically addresses item 5 of the online form (i.e. "Proposed Safety Case if the controlled activity breaches the OLS or PANS-OPS").

In accordance with the latest drawings provided by Anson, the maximum building height inclusive of towers, masts and BMU is 263m AHD and temporary crane activity is to a maximum height of 312.46m AHD.



2

Regulatory Framework

Regulatory Framework

2.1 International Civil Aviation Organisation

Protection of airspace surrounding an airport is a critical component of maintaining requisite safety standards that facilitate the efficient use of runways, whilst also managing the associated impacts of their use on other critical infrastructure (e.g. taxiways), the environment and the general public. Australia, as a member state of the International Civil Aviation Organisation (ICAO), is bound by its commitment to adopt the Standards and Recommended Practices (SARPS) found in the 19 Annexes to the Chicago Convention to which it is a signatory. In the context of erecting permanent or temporary structures, a number of these Annexes define the operational requirements that must be adhered to with respect to ensuring safe and efficient aircraft operations are maintained by establishing parameters for a number of invisible surfaces surrounding airports which ensure requisite separation between aircraft and obstacles are in place.

2.2 Relevant Legislation and Regulations

Part 12 of the Airports Act 1996 and the Airports (Protection of Airspace) Regulations 1996 establish a framework for the protection of airspace at and around airports. The Airports Act 1996 defines any activity resulting in an intrusion into an airport's protected airspace to be a "controlled activity", and requires that controlled activities cannot be carried out without approval. The Regulations provide for the Department of Infrastructure and Regional Development or the airport operator to approve applications to carry out controlled activities, and to impose conditions on an approval.

Certain development and structures in the vicinity of an airport have the potential to limit the scope the airport's existing or future operations. Terrain, buildings and temporary structures (e.g. cranes) are examples of what may constitute a controlled activity, each of which must be assessed individually to determine the potential limitations their existence may have on safe and efficient aircraft operations, including adverse weather conditions.

With respect to Sydney Airport, PANS-OPS surfaces, OLS surfaces, and RTCC clearances have been "declared" by the Commonwealth Department of Infrastructure and Regional Development on 20 March 2015 and are therefore enshrined in legislation as prescribed airspace. The accuracy of the background reference material in the PANS-OPS chart relied on for horizontal location is +/- 20 metres.



3

**Controlled Activity
Approval Process**

Controlled Activity

Approval Process

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

- » Permanent structures, such as buildings, intruding into the protected airspace
- » Temporary structures such as cranes intruding into the protected airspace
- » Any activities causing intrusions into the protected airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter.

Carrying out a controlled activity without approval is an offence under Section 183 of the Airports 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.

International standards have been adopted which define two sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's protected airspace. These two surfaces are the:

- » Obstacle Limitation Surface (OLS); and
- » Procedures for Air Navigation Services—Aircraft Operations (PANS-OPS) surface

The Regulations differentiate between short-term (not expected to continue longer than 3 months) and long-term controlled activities. The Regulations provide for the airport operator to approve short-term controlled activities, excluding PANS-OPS infringements, and for the Department of Infrastructure and Regional Development to approve long-term controlled activities, or short-term controlled activities referred to it by the airport operator. This includes short-term infringements of the PANS-OPS surface. However, long term intrusions of the PANS-OPS surface are prohibited.

The heights advised in the application for approval must include all towers, masts, BMU, construction crane(s), and ancillary features. An application will be considered in two elements, one being for the building itself (inclusive of all features) and one for construction crane(s).

Each penetration of the PANS-OPS and OLS has to be assessed against the effect on published Departure and Approach procedures and other matters, including published survey data and Air Traffic Control procedures and practices including compatibility with the promulgated Air Traffic Control (ATC) RTCC used for safe vectoring of aircraft in instrument meteorological conditions (IMC) i.e. non-visual. Each proposal has to be checked for proximity to published procedures with statutory tolerances and safety buffers applied. The tolerances vary according to the type of navigation or aid being utilised and cover vertical, lateral and longitudinal aspects.



4

**Proposed
Controlled
Activity**

Proposed Controlled Activity

4.1 Location

The development site for a mixed-use retail, commercial, and residential high rise building is 617-621 Pacific Highway St Leonards as shown in Figure 1 and Figure 1a. It is north of Sydney Harbour and 13,750 metres from Sydney Airport Aerodrome Reference Point (ARP). The coordinates at the centre of the site are 333024.73 m E 6256001.19 m S.



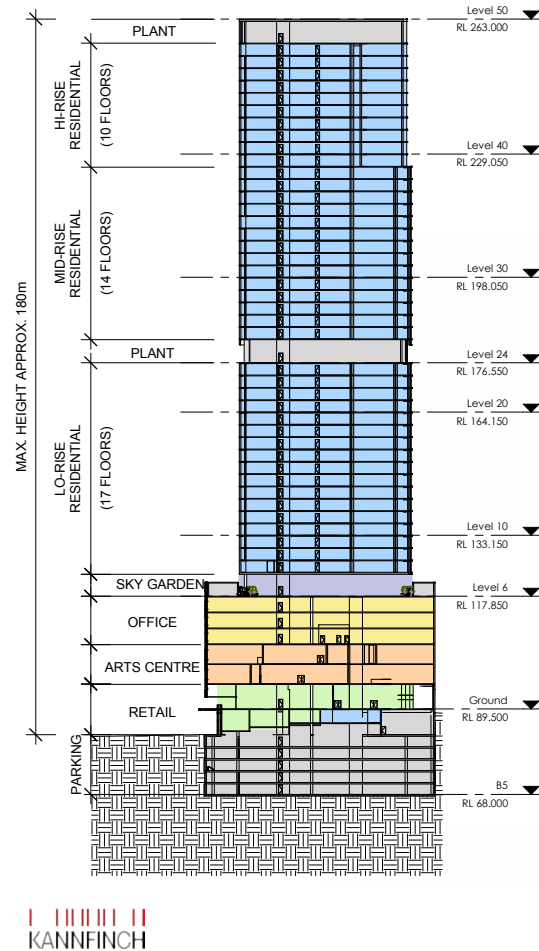
Figure 1: Site location
(Source: KANFINCH September 2016)



Figure 1a: Site location

4.2 Height of permanent structures

The maximum proposed height of the building development inclusive of towers, masts and BMU is 263m AHD.



INDICATIVE 3D PERSPECTIVES

SECTION & BIRD'S EYE PERSPECTIVE

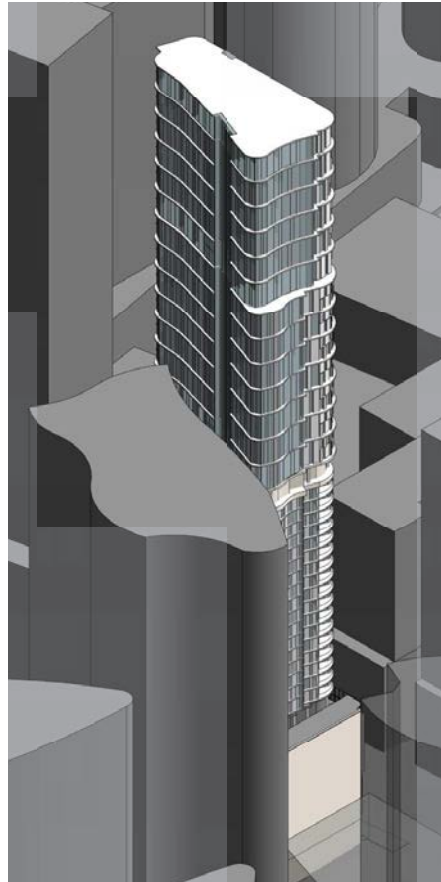


Figure 2: Building height
(Source KANNFINCH May 2017)

4.3 Height of temporary structures

An allowance of 49.46m extending upwards from the highest point of the permanent structure is proposed up to 312.46m AHD for temporary crane activity during construction at the final building height stage. Refer to Figure 3.

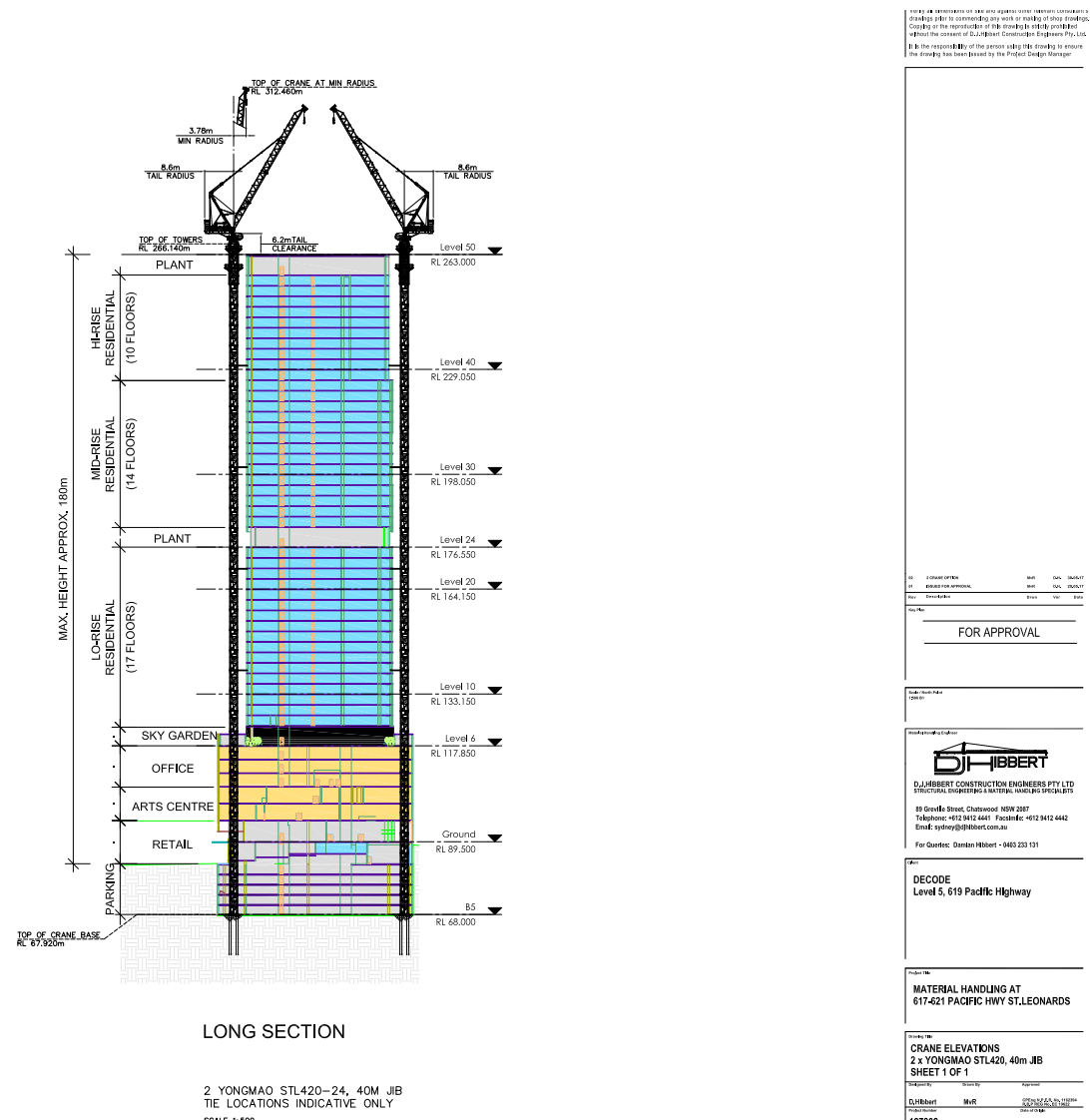


Figure 3: Building height
(Source KANNFINCH May 2017)

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5

**Prescribed
Airspace
Assessment**

Prescribed Airspace Assessment

A review of the airspace charts made available by Sydney Airport through their website provides the basis upon which the aeronautical impact of any proposed controlled activity will have on the safety and regulatory of aircraft operations. With respect to the proposed development by Anson at the site, AvLaw has determined that Charts 3 (Navigation Aids Protected Surfaces), 4 (High Intensity Light Protected Surfaces), 6 (Combined Radar Departure Assessment Surfaces) and 7 (Precision Approach Path Indicator (PAPI) system protection surfaces) are not relevant because the development site is 13.75 kilometres from Sydney Airport and well clear of the horizontal limits of these surfaces. AvLaw has identified the OLS, PANS-OPS and RTCC 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 6.1-6.3 below.

5.1 Obstacle Limitation Surface (OLS)

The Anson development site lies under to 156m AHD OLS Outer Horizontal Surface for Sydney Airport and is indicated by the red marker on Figure 4. The proposed building height will penetrate the OLS by 107 metres. As the building and temporary crane activity will penetrate these surfaces, it will be considered a controlled activity and require aeronautical assessment. That assessment is covered in the following sections.



Figure 4:
Location with respect to the Sydney Airport OLS

5.2 Procedures for Air Navigation services – Aircraft Operations Surfaces (PANS-OPS)

The Anson development site is under the 335.2m AHD horizontal plane of the PANS-OPS as indicated by the red marker on Figure 5. The proposed building inclusive of towers, masts and BMU and temporary crane(s) at 263m AHD and 312.46m AHD respectively do not penetrate the PANS-OPS surface. Figure 5 shows the combined PANS-OPS surfaces applicable in the vicinity of the proposed development.

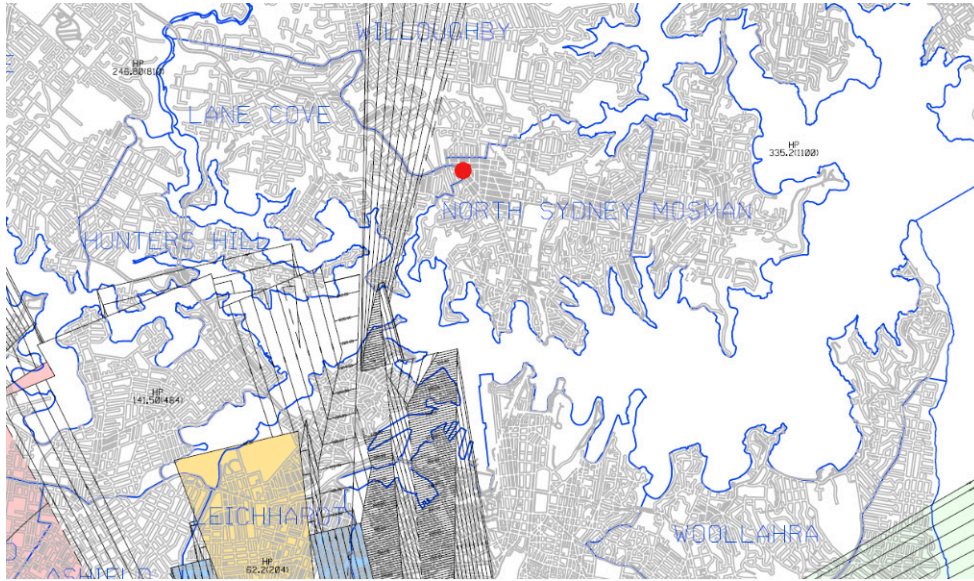


Figure 5:
Location with respect to the PANS-OPS

5.3 Radar Terrain Clearance Chart (RTCC)

The RTCC depictions are contained in the RSALT Chart made available by Sydney Airport. The proposed building inclusive of towers, masts and BMU and temporary crane activity is to a maximum height of 263m AHD and 312.46m AHD respectively do not penetrate the 335m height as depicted on an extract of the RLSALT Drawing at Figure 6. The development location is indicated by the red dot.

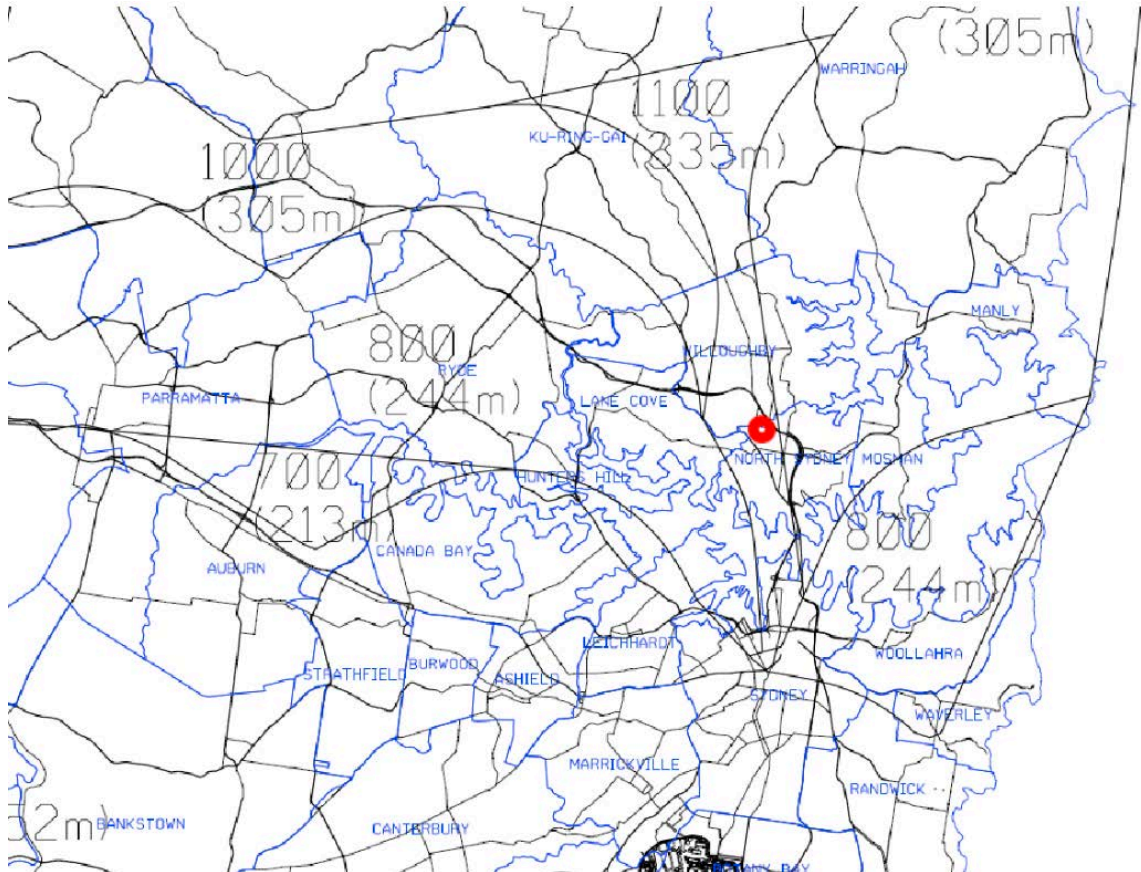


Figure 6: Location with respect to the RTCC

(Source: Prescribed Airspace Drawing FSS 6934 7A 20/3/15)



6

**Assessment of
Instrument Flight
Procedures**

Assessment of Instrument Flight Procedures

A thorough assessment by AvLaw 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 the proposed building height inclusive of towers, masts and BMU of 263m AHD and maximum temporary crane height of 312.46m AHD is procedurally clear.



7

**Radar Navigation,
Communications
Performance Impact**

Radar Navigation, Communications Performance Impact

A thorough assessment by AvLaw has identified no potential performance issues from the proposed building development.

The proposed development is 7.43 nautical miles from the Sydney Airport ARP and there are no facilities in the vicinity of the proposed development for their performance to be compromised.

A large, white, stylized number 8 is centered within a blue circle. The circle is outlined by a thick black ring. A thin, light blue arc is positioned at the bottom right of the circle, and a thin black arc is at the top left. The background is a solid blue color with a fine, diagonal line pattern.

8

Sydney Airport Master Plan

Sydney Airport Master Plan

The Sydney Airport Master Plan 2033 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 but nonetheless notes that Sydney Airport has regulated caps on the number of movements per hour that are permitted and which are already reached during peak periods.



9

Helicopter Operations

Helicopter Operations

The Anson site is located approximately 425 metres SE of the RNSH Helipad and clear of preferred helicopter flight paths. AvLaw has assessed that at the time of writing, instrument approaches are only in use at the following helicopter landing sites:

- » Charlie 1
- » Facing Island
- » Gosford District Hospital
- » Lithgow Medical
- » Maclean Hospital
- » Merriwa Hospital
- » Mossman Hospital
- » Newcastle Westpac Base
- » Seabuooy
- » Tully Hospital
- » Victor Island East
- » Victor Island West
- » Westmead Hospital
- » Wollongong Hospital

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, emergency landing in the event of engine failure and “fly neighbourly” procedures. Guidance to pilots for operations at helicopter landing sites is provided in CASA publication CAAP 92-2(2)

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:

- » Approach and take-off to the SW (clear of the Anson Development 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 Anson Development 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 Anson Development Site) is over a highly populated existing dense low, medium and high rise development providing no emergency landing in the event of an engine failure at low altitude and adds a level of risk for operations in this direction
- » Online helipad information at helipads.org provided by Careflight in association with other rescue helicopter operators 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.
- » AIP-ERSA entry for Sydney Airport of 25/5/17 at note 17b identifies a helicopter access lane to RNSH at 1000ft from the harbour via St Leonards and Cammeray Parks.

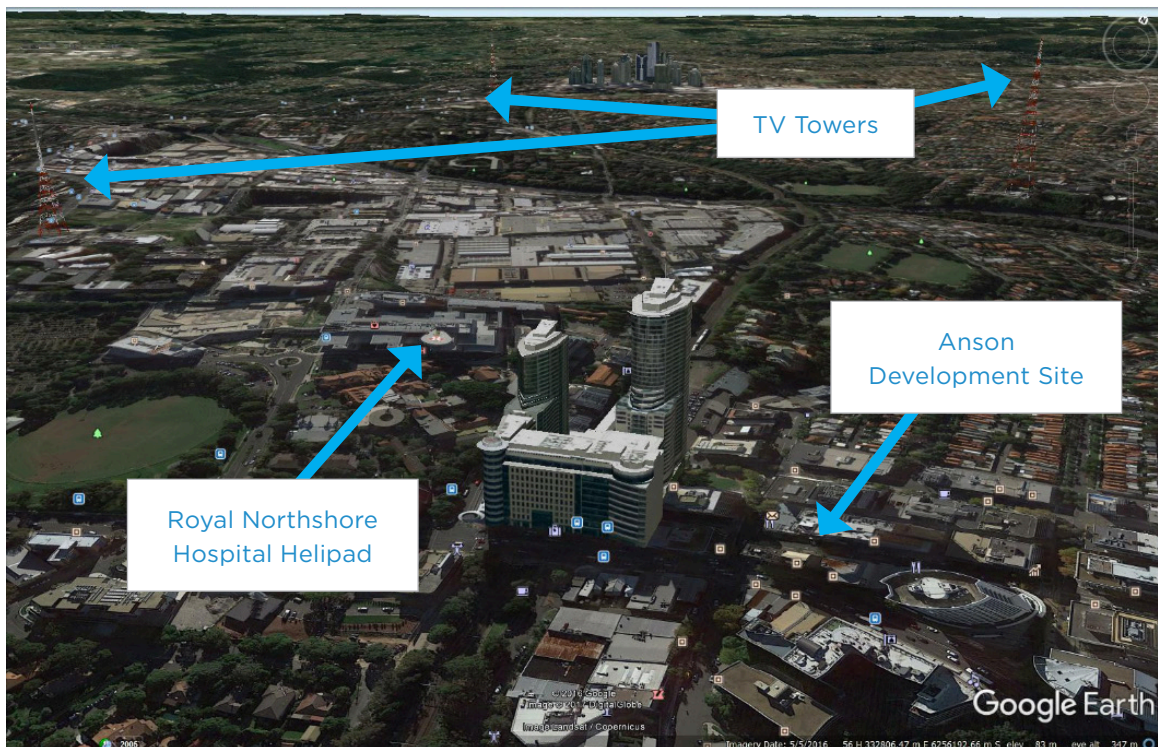


Figure 7:
Royal Northshore Hospital Helipad

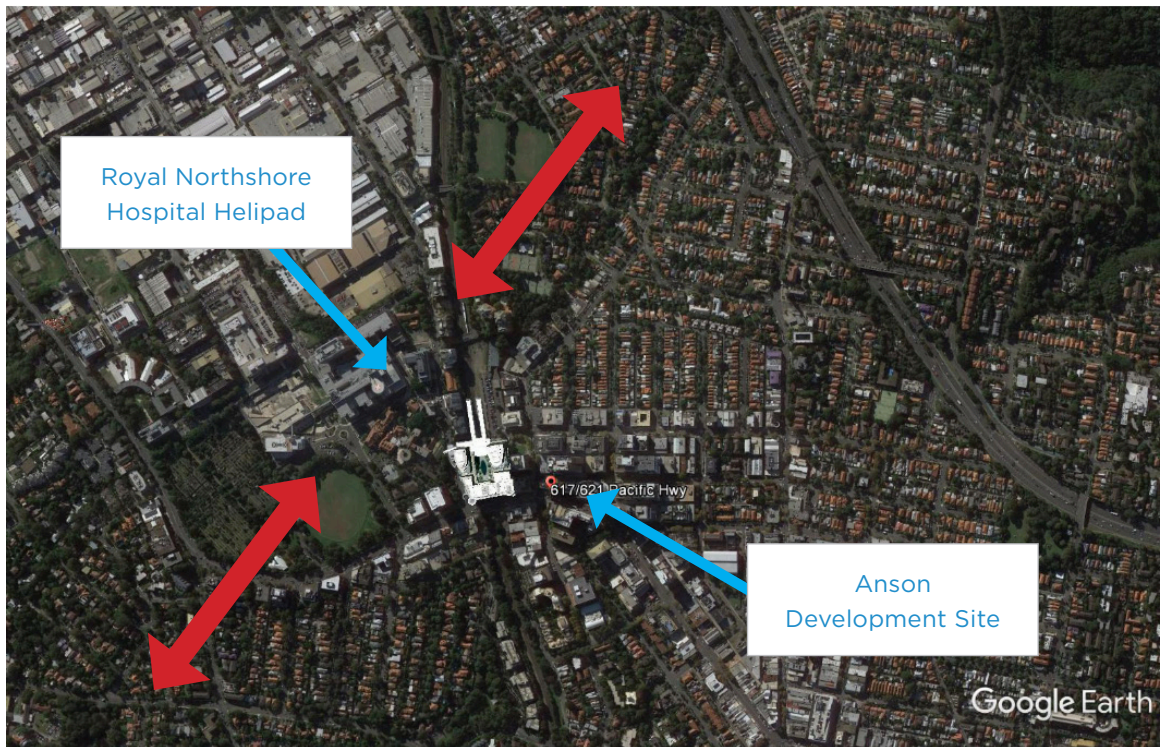


Figure 8:
RNSH Helipad preferred flight paths shown in red



Figure 9:
RNSH Helipad preferred approach point from end of helicopter access lane

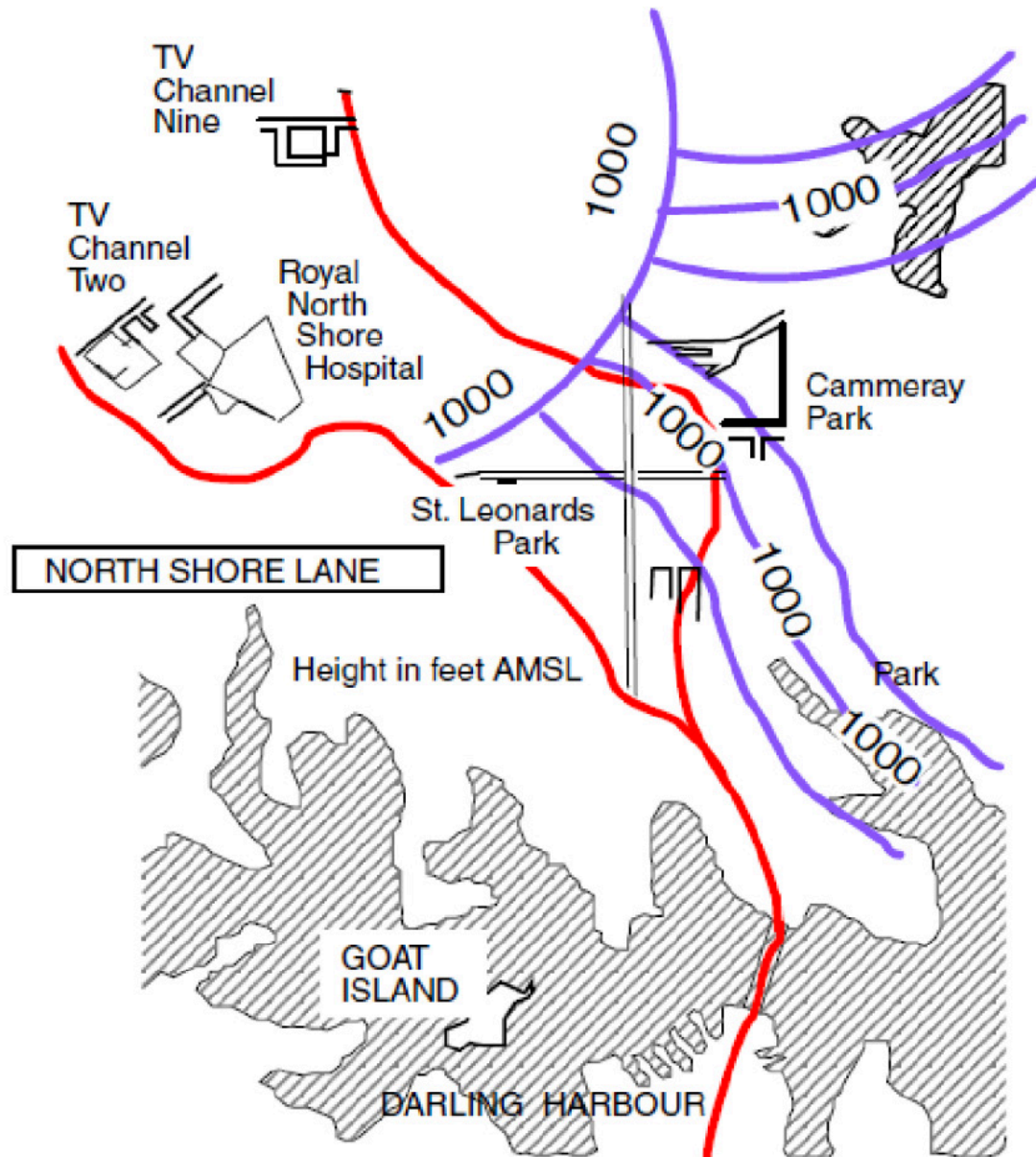


Figure 10:
RNSH Helipad helicopter access lane shown in purple

The development proposal has been assessed for its impact on published helicopter operations in the area surrounding the site. There are helicopter transit lanes published in AIP/ERSA which are to the SE of the proposed development. These lanes are for use by helicopters flying by day in visual meteorological conditions (VMC) which require the use of visual navigation procedures to avoid obstacles. The development site is in the vicinity of the RNSH and also to the three television transmission towers in the vicinity of the proposed development site depicted on Figure 7. There is also a high-rise development over the St Leonards Railway Station between the proposed development and the hospital helipad. There are no published helicopter arrival/departure procedures into the RNSH except as provided by emergency helicopter operators and made available at helipads.org. TV masts are depicted on aviation charts and are illuminated at night by prescribed obstruction lighting requirements.

AvLaw's assessment is that because published procedures and preferred helicopter flight paths to and from the hospital helipad are clear of the proposed building development site, that the helicopter access lane is for Visual Flight Rules (VFR) operations and terminates 1 nautical mile to the SE, and there is an existing tall building adjacent to the proposed development and closer to the hospital helipad, the proposed development itself will not adversely affect the safety of helicopter operations.

A large circular graphic with a thick black border. A segment of the border at the bottom right is highlighted in light blue. Two thin black arcs are positioned outside the circle, one on the top left and one on the bottom right.

10

Conclusions

Conclusions

The proposed development heights of the building inclusive of towers, masts and BMU at 263m AHD and the temporary construction crane activity to a maximum of 312.46m AHD penetrate the prescribed OLS surface of 156m AHD and therefore triggers the requirement for an aeronautical assessment.

The proposed development heights of the building inclusive of towers, masts and BMU at 263m AHD and the temporary construction crane activity to a maximum of 312.46m AHD do not penetrate the prescribed PANS-OPS aeronautical operation surfaces of 335.2m AHD, nor do they penetrate the applicable published RTCC/RLSALT surface of 335m AHD with respect to Sydney Airport.

Helicopter operations at the RNSH helipad are covered by standard procedures which require helicopter flights paths to the SE and NW which is clear of the Anson development site.

The proposed development heights of the building inclusive of towers, masts and BMU at 263m AHD and the temporary construction crane activity to 312.46m AHD is clear of all aircraft operational surfaces and the controlled activity will not adversely affect safety or significantly affect regularity of operations of aircraft (aeroplanes and helicopters).



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