



# AERONAUTICAL IMPACT ASSESSMENT

## Pitt Street South Over Station Development

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Aeronautical Impact Assessment: Pitt St South OSD

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The image features a large, light blue circle centered on a background of fine, diagonal blue lines. A thick black ring is positioned around the inner edge of this circle. A thin, dark blue arc is visible on the left side, and a light blue arc is on the right side, both partially overlapping the black ring. The text "Executive Summary" is centered within the light blue circle.

# **Executive Summary**

# Executive Summary



This Aeronautical Impact Assessment (AIA) has been prepared by Avlaw Pty Ltd, trading as Avlaw Aviation Consulting (Avlaw), on behalf of Pitt St Developer South Pty Ltd to satisfy the Secretary's Environmental Assessment Requirements (SEARs) relating to the State Significant Development (SSD) development application (DA) for the proposed Pitt St South Over Station Development (OSD). This AIA will supplement applications to Sydney Airport Corporation Limited (SACL) for controlled activity approvals seeking approval for the proposed mixed-used development above the yet to be constructed Pitt St Metro Station as well as details relating to the crane that will be used during construction.

The proposed building height is 166.35m AHD, with all plant and ancillary features captured within this envelope, while temporary crane activity will reach a maximum height of 240m AHD.

Avlaw's assessment has found that the critical (i.e. lowest) airspace protection surface covering the site is the Outer Horizontal Surface of the Sydney (Kingsford Smith) Airport (Sydney Airport) Obstacle Limitation Surfaces (OLS) at a height of 156m AHD. This surface will be penetrated permanently by the building structure and temporarily by construction crane, meaning both will require controlled activity approval to be carried out.

Above the OLS, the next lowest airspace protection surfaces covering the site is the Radar Terrain Clearance Chart (RTCC) at 335.28m AHD and the Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) which rises across the site to the north from 339m AHD to 340m AHD. The proposed development and temporary crane activity are both below these surfaces and therefore the proposed construction of the Pitt St South OSD will only involve penetration of the OLS.

An assessment of the proposed development against helicopter operations in the vicinity of the site has concluded that the building and crane will not adversely impact on these activities.

The conclusion of this AIA is that applications seeking approval for the OSD and crane used during construction should be assessed favourably by aviation stakeholders involved in the assessment process for controlled activity applications. The rationale for this is that the building and cranes to their currently proposed heights will in practice be shielded by existing taller structures in close proximity to the Pitt St South OSD. Therefore, allowing them to be carried out will not adversely affect the safety, efficiency or regularity of operations of aircraft at Sydney Airport or local helicopter operations in the vicinity of the site.



1

# Introduction

# Introduction

This report has been prepared to accompany a detailed State Significant Development (SSD) development application (DA) for a residential Over Station Development (OSD) above the new Sydney Metro Pitt Street South Station. The detailed SSD DA is consistent with the Concept Approval (SSD 17\_8876) granted for the maximum building envelope on the site, as proposed to be modified.

The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning, Industry and Environment (NSW DPIE) for assessment.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 28 October 2019.

TABLE 1 – SEARS REQUIREMENTS		
Item	Description of Requirement	Section Reference (this report)
SEARs 15 – Plans and Documents	Flight Path Report	Entire document addresses this requirement
SEARs 15 – Plans and Documents	Flight Path Report, required documentation: Architectural elevation clearly identifying and noting the maximum RL of the building (inclusive of aerials, lift overruns, BMU etc).	3.2
SEARs 15 – Plans and Documents	Aeronautical Impact Assessment, required documentation: Plans and elevations documenting the proposed location of cranes in plan and section, clearly identifying the offset from adjacent buildings and the maximum height of the crane.	3.3

The detailed SSD DA seeks development consent for the construction and operation of

- » New residential tower with a maximum building height of RL 171.6, including residential accommodation and podium retail premises, excluding station floor space
- » Use of spaces within the CSSI 'metro box' building envelope for the purposes of:
- » Retail tenancies;
- » Residential communal facilities, residential storage, bicycle parking, and operational back of house uses
  - Shared vehicle loading and service facilities on the ground floor
  - Landscaping
  - Utilities and services provision.
  - Stratum subdivision (Station/OSD).
- » Integration with the approved CSSI proposal including though not limited to:
  - Structures, mechanical and electronic systems, and services; and
  - Vertical transfers;



2

## **Sydney Metro Description**

# Sydney Metro Description

Sydney Metro is Australia's biggest public transport program. A new standalone railway, this 21st century network will revolutionise the way Sydney travels.

There are four core components:

## 1. Sydney Metro Northwest (formerly the 36km North West Rail Link)

This project is now complete and passenger services commenced in May 2019 between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and \$1 billion under budget.

## 2. Sydney Metro City & Southwest

Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of Metro Northwest at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

Sydney Metro City & Southwest will deliver new metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

In 2024, customers will benefit from a new fully-air conditioned Sydney Metro train every four minutes in the peak in each direction with lifts, level platforms and platform screen doors for safety, accessibility and increased security.

## 3. Sydney Metro West

Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is assessing an optional station at Pyrmont and further planning is underway to determine the location of a new metro station in the Sydney CBD.

## 4. Sydney Metro Greater West

Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service. The Australian and NSW governments are equal partners in the delivery of this new railway.

The Sydney Metro Project is illustrated in the figure below.

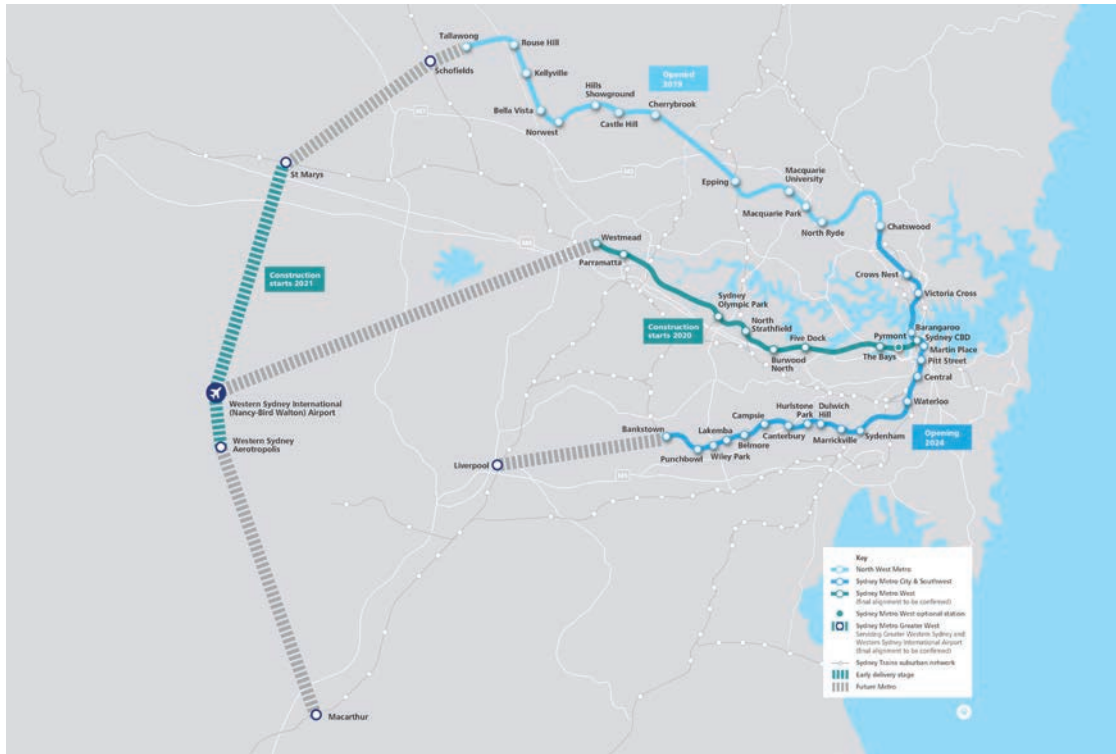


Figure 1 – Sydney Metro Alignment Map

Source: Sydney Metro

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a Critical State Significant Infrastructure project (reference SSI 15\_7400) (CSSI Approval). The terms of the CSSI Approval includes all works required to construct the Sydney Metro Pitt Street Station, including the demolition of existing buildings and structures on both sites (north and south). The CSSI Approval also includes construction of below and above ground works within the metro station structure for appropriate integration with over station developments.

The CSSI Approval included Indicative Interface Drawings for the below and above ground works at Pitt Street South Metro Station site. The delineation between the approved Sydney Metro works, generally described as within the “metro box”, and the Over Station Development (OSD) elements are illustrated below. The delineation line between the CSSI Approved works and the OSD envelope is generally described below or above the transfer slab level respectively.



3

## **Regulatory Framework**

# Regulatory Framework

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## 3.1 Airspace Height Controls

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. 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 the 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" by the Department of Infrastructure, Transport, Cities and Regional Development (Department) and are therefore enshrined in legislation as the 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)/Radar Lowest Sector Altitude (RLSALT) surfaces; and
- » Combined Radar Departure Assessment surfaces.

## 3.2 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 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 of Infrastructure, Transport, Cities and Regional Development (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 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 short-term penetrations of the PANS-OPS 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. Although not an issue with regards to this proposed development, Avlaw notes that long term intrusions of the PANS-OPS surfaces (e.g. cranes penetrating for longer than three months) are prohibited.

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 applications for the permanent building structure and temporary construction cranes, although approvals for permanent structures (even if assessed favourably) will not be issued to the Proponent until the all aviation stakeholders have completed their assessment of temporary structures (e.g. cranes).

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.



4

**Proposed  
Development**

# Proposed Development

## 4.1 Location

The site is located within the Sydney CBD, on the corner of Bathurst Street and Pitt Street. It has two separate street frontages, Pitt Street to the west and Bathurst Street to the north. The area surrounding the site consists of predominantly residential high-density buildings and some commercial buildings, with finer grain and heritage buildings dispersed throughout.

The site has an approximate area of 1,710sqm and is now known as Lot 10 in DP 1255507. The street address is 125 Bathurst Street, Sydney.

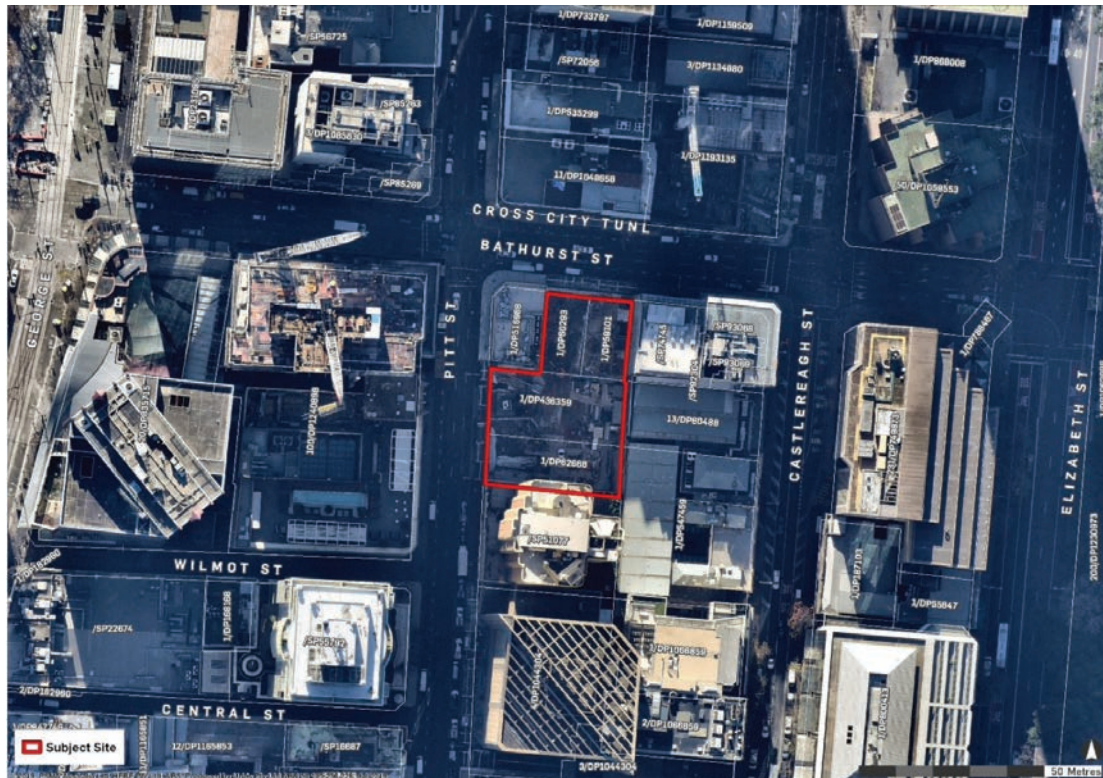


Figure 2: Site boundary indicated in red

The coordinates of the centre of the site are 334282.99 m E, 6250286.06 m S. The south western corner of the site is 8,389 metres from Sydney Airport Aerodrome Reference Point (ARP).



Figure 3: Site location in relation to Sydney Airport

## 4.2 Permanent Structure

The proposed maximum building height is 166.35m AHD, with all plant and ancillary features captured within this envelope – refer to Figure 4.

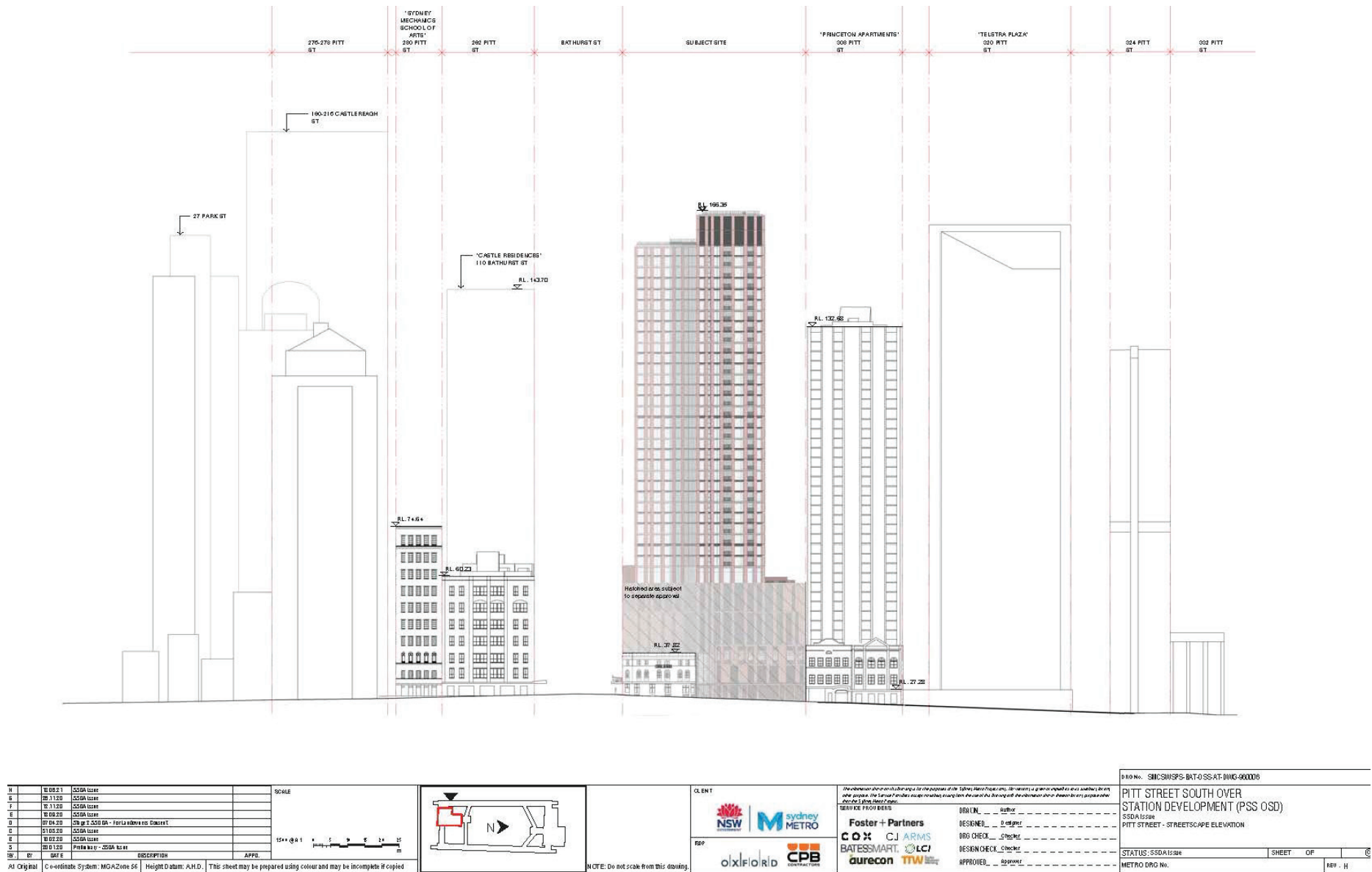


Figure 4: Building height indicating top of roof at 166.35m in reference to other nearby buildings

### 4.3 Crane Activity

The proposed maximum height of temporary crane activity is 240m AHD. Refer to Figure 4 below.

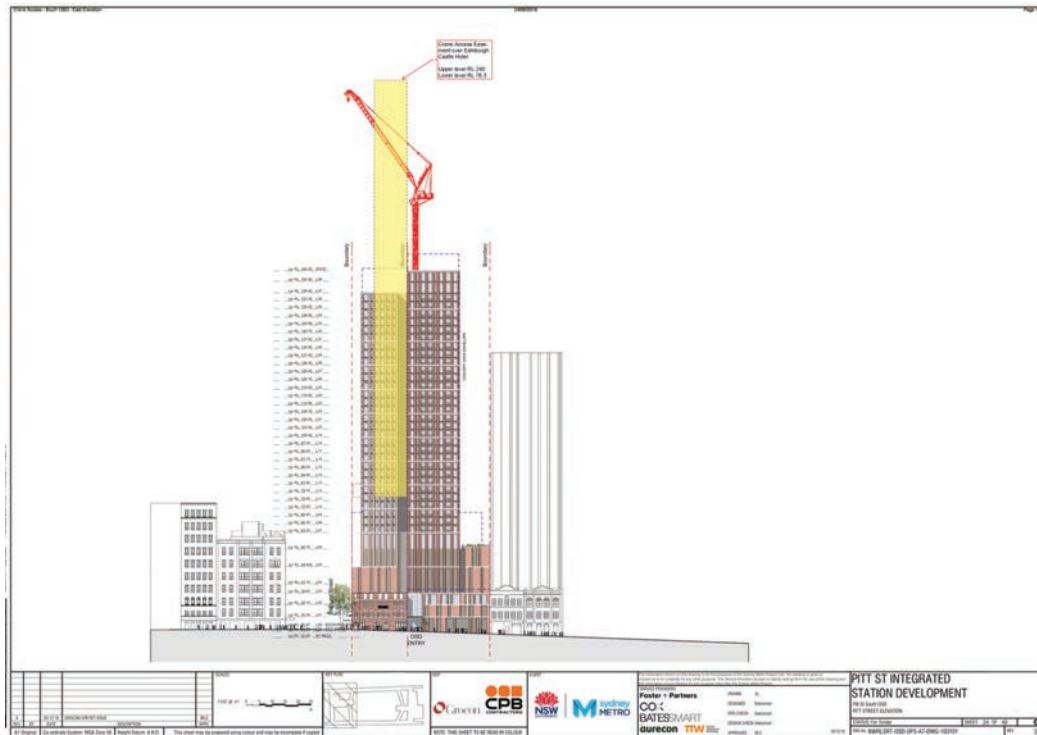


Figure 5: Maximum crane height of RL 240m in reference to OSD South and other nearby buildings (Revision A 20/12/2018)

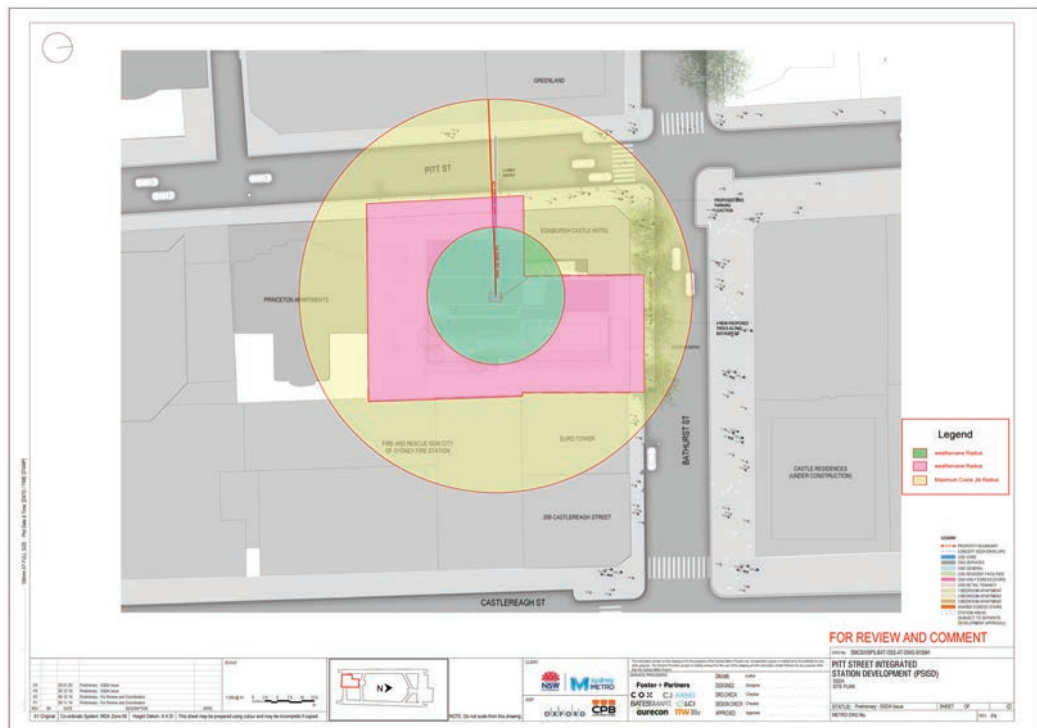


Figure 6: Movement arc of temporary construction crane (Revision P4 20/01/2020)

The construction crane will penetrate prescribed airspace (commencing at 156m AHD) on 16 December 2021 and will be considered an obstacle from an aeronautical perspective until 15 July 2023 (inclusive).



5

**Prescribed Airspace  
Assessment**

# Prescribed Airspace Assessment

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A review of the airspace charts which form Sydney Airport's prescribed airspace and are made available through their website provides the basis upon which the aeronautical impact of any proposed controlled activity will have on the safety, efficiency and regulatory of aircraft operations. With respect to the proposed Pitt St South OSD, Avlaw has determined that the following charts and associated airspace are not relevant because the site is approximately 8.4km from Sydney Airport and well clear of the horizontal limits of these surfaces:

- » 3 (Navigation Aids Protected Surfaces);
- » 4 (High Intensity Light Protected Surfaces); and
- » 7 (Precision Approach Path Indicator (PAPI) system protection surfaces)

The Combined Radar Departure Assessment Surfaces have also been deemed irrelevant and excluded from Avlaw's assessment as SACL have advised that these surfaces have been incorporated into the PANS-OPS chart.

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 sections 4.1-4.4. Figure 6 on the following page provides a summary of the findings.

SYDNEY AIRPORT			
Airspace Surface	Height	Pitt St South OSD	
		(-) Clearance/(+) Penetration (building @ 166.35m AHD)	(-) Clearance/(+) Penetration (crane @ 240m AHD)
OLS	156m AHD	+10.35m	+84m
PANS-OPS	339-340m AHD	-172.65-173.65m	-99-100m
RTCC	335.28m AHD	-168.93m	-95.28m

Figure 7: Summary of Preliminary Aeronautical Impact Assessment Findings

## 5.1 Obstacle Limitation Surfaces

The site lies under the 156m AHD Outer Horizontal Surface of the OLS for Sydney Airport and is indicated by the red marker on Figure 3. The proposed building height will penetrate the OLS by 8.95 metres and temporary construction cranes will penetrate the by 84 metres. Since the building and temporary crane activity will penetrate the prescribed airspace for Sydney Airport, both will be considered controlled activities and require aeronautical assessment. That assessment is covered in the following sections.

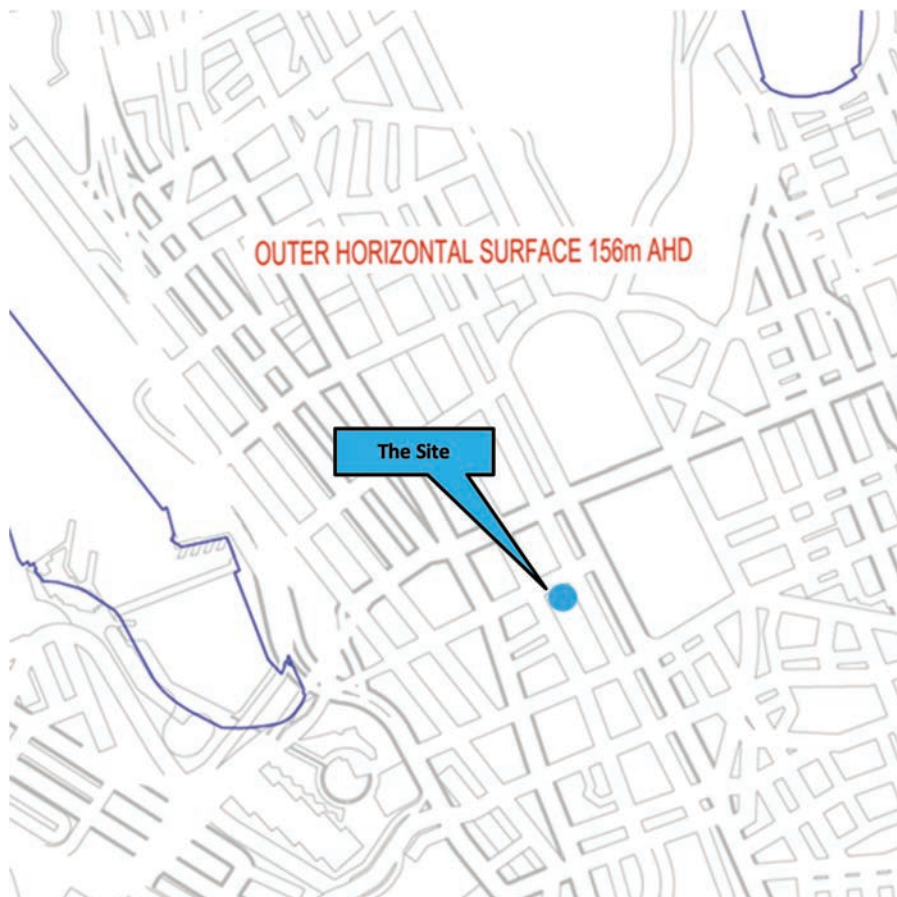


Figure 8: Location with respect to the Sydney Airport OLS (2019)

## 5.2 Procedures for Air Navigation Services – Aircraft Operations Surfaces

The site is a rising PANS-OPS surface which ranges from 339m AHD to 340m AHD, rising to the north. The proposed building (166.35m AHD) and temporary crane (240m AHD) do not penetrate the PANS-OPS surface. Figure 4 shows the combined PANS-OPS surfaces applicable in the vicinity of the proposed development.

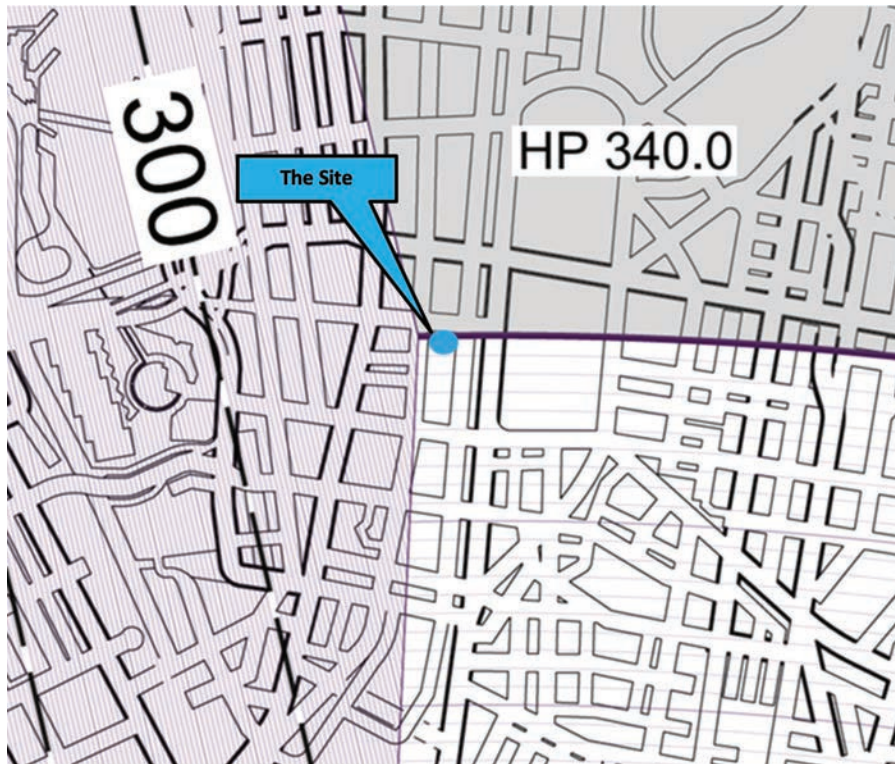


Figure 9: The site plotted on the Sydney Airport PANS-OPS Chart (2019)  
Note: HP = Horizontal Plane

### 5.3 Radar Terrain Clearance Chart

The RTCC depictions are contained in the Radar Lowest Safe Altitude (RLSALT) Drawing. The proposed building height is 166.35m AHD, with all plant and ancillary features captured within this envelope. Temporary crane activity is to a maximum height of 240m AHD. Therefore, neither permanent or temporary obstacles will penetrate the 335.28m AHD height as depicted on the extract of the RLSALT Drawing at Figure 8. The development location is indicated by the blue marker.



Figure 10: The site plotted on the Sydney Airport PANS-OPS Chart (2019)  
Note: HP = Horizontal Plane

## 5.4 Rationale for approval

In considering the application, aviation authorities will consider the principle of “shielding” that specifies that if an obstacle is below a 10 per cent downward slope from an existing obstacle, it is assessed as not being a hazard. This principle over-rides other airspace limitations and can expedite an application.

Avlaw notes that the strict application of shielding applies to existing permanent obstacles only (as specified in Manual of Standards Part 139 7.4.1.4) i.e. a temporary structure like a crane cannot shield another crane. The concept of shielding does apply with respect to this proposed development and shows that the Pitt St OSD and its associated crane activity will not introduce additional risks from an aviation perspective to those which either already exist (or will do once construction commences) and have been accounted for in the management of air traffic over the Sydney CBD.

EXISTING OBSTACLE	OBSTACLE HEIGHT (M AHD)	DISTANCE FROM OBSTACLE TO OPPOSITE SIDE OF SITE SWING ARC OF CRANE (M)	SHIELDED HEIGHT AT SITE (M AHD)	BUILDING HEIGHT AT SITE (M AHD)	CRANE HEIGHT AT SITE (M AHD)
Sydney Tower (Centrepont)	327	522	274.8	166.35m	240
Greenland Centre Sydney	261	82	252.8	166.35m	240

Figure 11: Shielding principle applied from nearby obstacles

The Greenland Centre Sydney is currently under construction, and while not at its final height of 254.45m AHD until February 2021, it will be completed prior to the construction crane penetrates the 156m AHD Outer Horizontal surface of the OLS. In any event the building and crane on the site will be shielded by Sydney Tower (Centrepont)

The proposed development at the site will involve penetration of the Sydney Airport OLS which in this case Avlaw considers as not being problematic as the Pitt St South OSD is in close proximity to existing taller buildings in the CBD and will therefore not introduce additional risks to those already assessed in the approval of those structures.

The generous vertical buffer between the proposed building and crane heights and the next most limiting airspace protection surfaces (i.e. the RTCC at 335.28m AHD and the PANS-OPS ranging from 339m AHD to 340m AHD) means that the construction will not have adverse impacts on the safety, regularity or efficiency of aircraft operations at Sydney Airport and therefore should be approved.



6

**Assessment of  
Instrument Flight  
Procedures**

# Assessment of Instrument Flight Procedures

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A review of all published approach and departure procedures as described in AIP/DAP for Sydney Airport has been undertaken and confirms that the proposed building height of 166.35m AHD and temporary crane activity up to a maximum height of 240m AHD will not impact on any instrument flight procedures. The PANS-OPS chart extract at Figure 6 shows the obstacle clearance heights for all instrument flight procedures over the site which will have no adverse effect on instrument flight operations. The building and temporary construction crane is well below the instrument flight protected surfaces



7

**Radar, Navigation  
and Communications  
Performance Impact**

# Radar, Navigation and Communications Performance Impact

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A thorough assessment by Avlaw has identified no potential performance issues from the proposed building development. The proposed development is 8,389m or 4.53nm from the Sydney Airport ARP and there are no facilities in the vicinity of the proposed development for their performance to be compromised.



8

**Sydney Airport  
Master Plan**

# Sydney Airport Master Plan

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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 already operating at near capacity during peak periods.

The proposed development is in close vicinity to other tall buildings in the Sydney CBD and if there were to be a change to instrument flight procedures, these other tall building would be the influencing factor.

A large, white, stylized number 9 is centered within a blue circle. The circle is surrounded by a thick black ring, which is further enclosed by a thin black arc. A light blue curved shape is positioned at the bottom right of the circle.

# **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, the findings of which are summarised below.

## 9.1 Sydney Airport Coded Clearances

The nearest corner of site is located approximately 8,375m NE of the Sydney Airport Aerodrome Reference Point. There are a number of prescribed helicopter transit routes published in Aeronautical Information Publication (AIP) En-Route Supplement Australia (ERSA) for helicopter operations in the Sydney Control Zone. These are included in the Coded Clearances and Operating Requirements for Sydney Airport, with the coded clearances containing the specific routes and prescribed altitudes to be flown. Avlaw's assessment has found that the proposed development site is clear of specific helicopter transit routes.

## 9.2 Hospital Helipads

The NASF Guideline H has been issued regarding protection of what are being termed 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 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 10 below that has been sourced from Guideline H and illustrates the protection of SHLS and the heights above which further assessment is triggered.

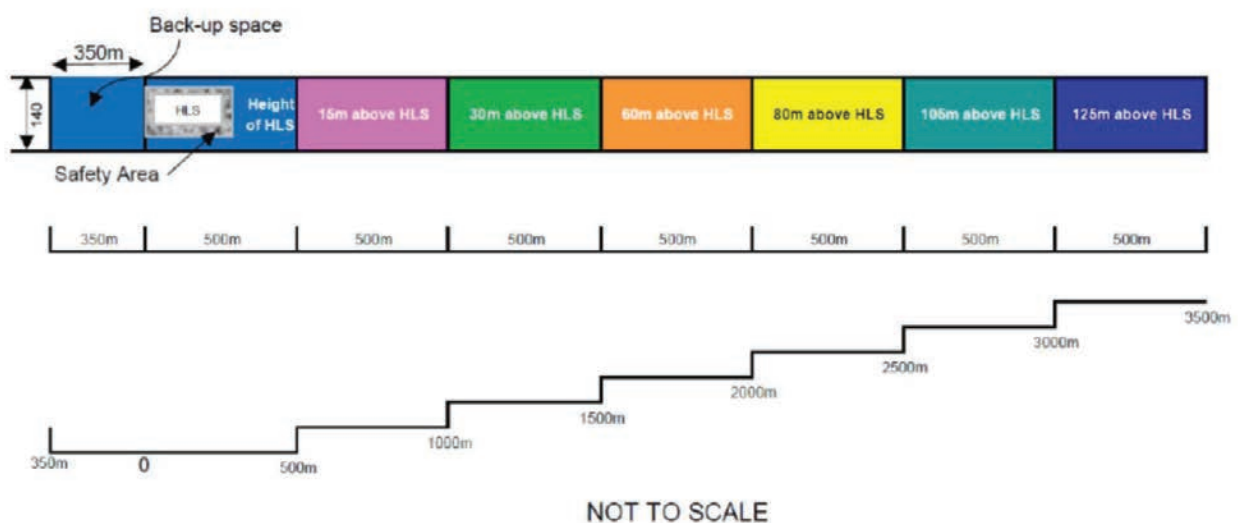


Figure 11: Referral trigger for SHLS

The nearest hospital with a helipad to the site is the Royal Prince Alfred Hospital, which is approximately 3,840m to the SW and is therefore beyond the lateral limits (i.e. 3,500m) within which protection of airspace is provided under Guideline H.

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



10

**Conclusions**

# Conclusions

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The Pitt St South OSD is proposed to reach a maximum height of 166.35m AHD, with all plant and ancillary features captured within this envelope whilst temporary crane activity will reach a maximum height of 240m AHD. The only airspace protection surface that will be penetrated is the Outer Horizontal Surface of the Sydney Airport OLS, which in this instance Avlaw does not believe is problematic because no flight operational clearance surfaces are affected and the building and temporary construction crane will be shielded by existing obstacles. Aviation approval will be readily given for both the building and cranes as they are in a less critical location from an aviation perspective and at lower heights than existing taller developments in close proximity.

This AIA concludes that the proposed development heights of 166.35m AHD and temporary crane activity to a maximum height of 240m AHD is clear of all aircraft operational surfaces, and the controlled activities will not adversely affect safety, efficiency or regularity of operations of aircraft (aeroplanes and helicopters) at Sydney Airport.



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