Attachment A12

Aeronautical Impact Report

The O'Connell Precinct Planning Proposal — Aeronautical Impact Assessment

Version 1.1.2

28-Oct-2022

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Document Number: **21.004-01-001** *Version:* 1.1.2

Document Title: **The O'Connell Precinct Planning Proposal — Aeronautical Impact Assessment**

Purpose / Abstract: *This Aeronautical Impact Assessment (AIA) report has been prepared by Strategic Airspace and supports a Request for a Planning Proposal to amend the Sydney Local Environmental Plan 2012 (Sydney LEP) and amendments proposed to the Sydney Development Control Plan 2012 (Sydney DCP 2012) in relation to the O'Connell Precinct. This report is submitted to the City of Sydney Council (Council) on behalf of the Proponent*

The report assesses the Prescribed Airspace height constraints over the site. in view of existing operations and forecasted changes as included in the Sydney Airport Master Plan 2039 and the current airspace constraints related to Sydney Airport as defined in the Airports (Protection of Airspace) Regulations 1996 (APAR).

The assessment is based on the proposed building envelope, the height of which is governed by solar protection planes. The highest point of the envelope is 319.20m AHD. Based on this proposed top-of-envelope height, the findings are as follows:

- *The development would infringe Sydney Airport's Obstacle Limitation Surfaces (OLS) — triggering a requirement under the APAR to seek approval of the development as a Controlled Activity (prior to construction) from the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (DITRDCA).*
  Note that this kind of airspace-related height approval is not normally required for approval of rezoning planning applications.
- *Because the top heights of the development would be clear of (below) the most constraining of the prescribed airspace surfaces, in this case that associated with the Radar Terrain Clearance Chart (which is lower than PANS-OPS surfaces at the same location), such an application is technical approvable under the Regulations.*
- *The potential future impact of cranes required for construction would be considered as a factor by DITRDCA when evaluating the feasibility of constructing the proposed building prior to making a determination. A crane management plan will take advantage of the sloping rooftop to deploy cranes that will remain below the constraining surfaces, so this factor should not prove a burden on gaining approval under APAR for the building envelope.*

Given the above, we anticipate that a development based on the proposal herein would not adversely affect the safety, regularity or efficiency of current and future air transport operations to and from Sydney Airport, and thus a future APAR application would be approved.

Contract: - *StratAir Ref:* 21.004

Change History

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1.0	27-Sep-2022	P. Haubourdin	C. Pak-Poy	Revised envelope elevations & inclusion of planning text
1.1	05-Oct-2022	C. Pak-Poy	J. McCarthy	Minor text amendments
1.1.1	26-Oct-2022	C. Pak-Poy	C. Pak-Poy	Amend address, add Lot DP to Precinct
1.1.2	28-Oct-2022	C. Pak-Poy	C. Pak-Poy	Site area amended (section 2.2)

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	CASA	Civil Aviation Safety Authority	

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Report Authors

Author	*Credentials*
Cathy Pak-Poy *Lead Consultant*	The Lead Author of this report, Cathy Pak-Poy, has 30 years' experience as a specialist airspace consultant, including 9 years' experience as a Technical Advisor for Australia to the International Civil Aviation Organisation's Instrument Flight Procedures Panel, which was responsible for the international OLS, PANS-OPS and PBN standards. She has also consulted to Airservices, CASA and the Royal Australian Air Force (and trained some of their personnel), and has consulted to and trained civil and military aviation agencies, airports and airlines overseas. She held a Delegation for the Civil Aviation Safety Authority of PNG for two years and is the designated Chief Procedure Designer for the Part 173 design and validation approvals held by Strategic Airspace in the Republic of South Africa
John McCarthy *Senior Consultant*	A director of Strategic Airspace, with a background in mathematics, architecture, computer-aided design and IT. John has over 30 years' experience as a specialist airspace consultant, with deep technical expertise in OLS, PANS-OPS and PBN standards and application. Previously consulted to Airservices Australia, CASA, the RAAF, airports and private clients in Australia, as well as to EUROCONTROL and other international civil and military aviation agencies.
Paul Haubourdin *Senior Consultant*	Paul has conducted PANS-OPS instrument flight procedure design projects and many aeronautical impact assessments for StratAir. Previous experience includes the roles of Principle IFP Designer and Safety Investigator for Airways Corporation and Group EAD in NZ, and Manager Obstacle Assessments for the Belgian Air Force. HE also has experience as an Air Traffic Controller and is a qualified pilot (CPL Helicopters, and ATPL Fixed Wing Belgium)

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1. Executive Summary

This Aeronautical Impact Assessment (AIA) report has been prepared by Strategic Airspace and supports a Request for a Planning Proposal to amend the Sydney Local Environmental Plan 2012 (Sydney LEP) and amendments proposed to the Sydney Development Control Plan 2012 (Sydney DCP 2012) in relation to the O'Connell Precinct. This report is submitted to the City of Sydney Council (Council) on behalf of the Proponent.

This report should be read in conjunction with all supporting material associated with the Request for a Planning Proposal and DCP amendment, including the Planning Justification Report prepared by Ethos Urban.

Located in the northern part of the Sydney CBD, the site is affected only by the prescribed airspace of Sydney Airport; other airports are too remote to have any impact. As such, the report has been prepared having regard to the Prescribed Airspace of Sydney Airport. The report examines the current airspace height constraints overhead the site as defined by the *Airports (Protection of Airspace) Regulations 1996* (APAR) and which would:

a) Trigger the requirement to apply for an airspace height approval.
b) Constrain the maximum permissible building envelope height.
c) Potentially influence airspace height application evaluations and approval conditions, including possible mitigations that may be required.

The site is located approximately 9.43 km (5.09 Nautical Miles (NM)) north-north-east of the Aerodrome Reference Point (ARP) of Sydney Airport, as shown in Figure 1-1 below.

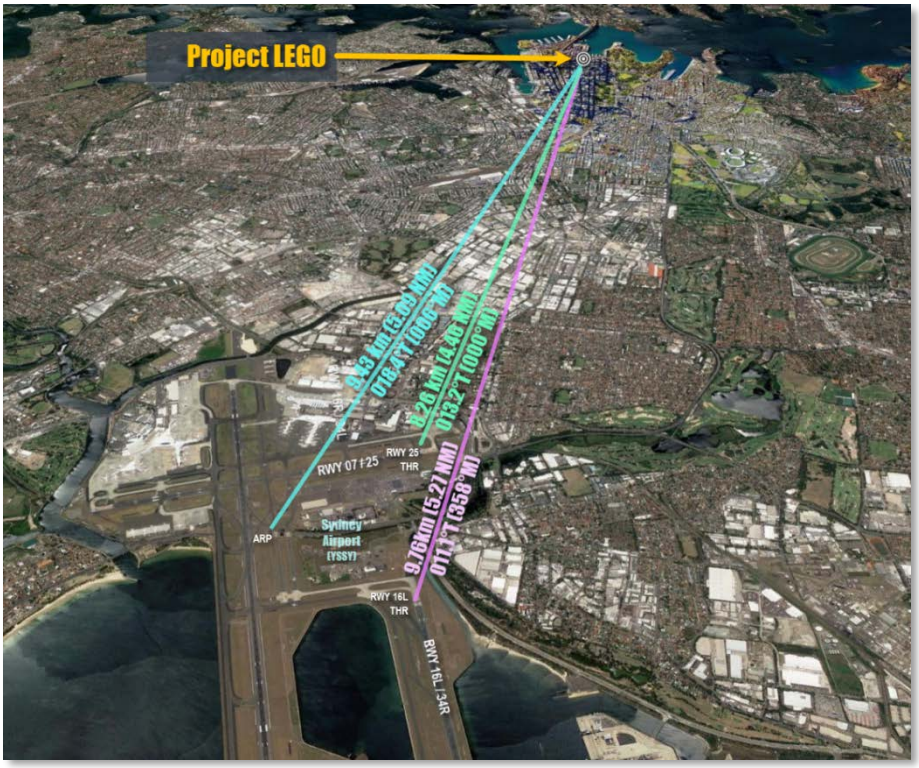


Figure 1-1 — Site Location in relation to Sydney Airport (Small Format)

For the purposes of the assessment, a single reference point was defined at the south-western corner of the proposed building envelope building, the point closest to the airport The roof of the building slopes up from the lowest point in the south-west up to the highest point in the north-east, to comply with solar plane restrictions. Assessing the reference

point in the south-west with a height equal to the building's overall maximum height results in a conservative assessment of the impact on aviation safety.

The critical airspace constraints overhead the site are summarised in the table below.

Table 1-1 — Summary — Airspace Height Constraints

Height Limits (m AHD)	*Height Limit Detail*	*Comment*
Max Pt.Ref **319.20**	Max Height	The maximum proposed building height.
156	OLS CONICAL Surface	As the proposed envelope would infringe the OLS, it would require a height application under the Airports (Protection of Airspace) Regulations 1996 (APAR) to be approved by the Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA) prior to construction. Infringement of the OLS in this case is not considered a barrier to approval of an application under the APAR.
335.28	Radar Terrain Clearance Chart (RTCC) Minimum Vector Altitude (MVA) 2100ft Sector	The site lies within the lateral limits of an RTCC surface which has an effective limit 243.84m AHD. See Table 4-9 (p16) for details. This surface protects the 2100ft MVA sector which is used by Air Traffic Controllers (ATCs) to vector aircraft. This surface typically cannot be breached by any obstacle, permanent or temporary, at night or during times of low visibility. For this reason, this is considered the most limiting height for the proposed development at the project site.
340	PANS-OPS Surfaces	The Minimum Sector Altitude within 10NM for the instrument procedures to Sydney airport is the most constraining PANS-OPS surface over the site.
Higher or N/A	Other Surfaces & Helicopter Route	The site is outside the extent of other protection surfaces, or the height limits are higher, and so considered Not Applicable.

The conclusion of the report is that:

- Because the proposed envelope would exceed the OLS, an "*airspace application*" for the approval of the development as a *Controlled Activity* under the Airports (Protection of Airspace) Regulations 1996 would need to be submitted to the Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA).
  Such applications are usually submitted via Sydney Airport. Under APAR approval is required prior to construction, but under most local planning regulations approval may be required prior to (or as a consent condition of) approval of a Development Application. It is not required for a Planning Proposal.
- As the maximum development height would not infringe the constraining surface height (in this case, the RTCC surface), the application is technically approvable under the APAR.
- The crane management plan will take advantage of the sloping rooftop to allow use of cranes for the construction of the higher floors of the building envelope without infringing the RTCC surface.

In summary, we anticipate no barrier to approval under the APAR of an application for proposed building envelope at the maximum planned height. An approval will contain conditions for obstacle lighting as a safety mitigation as required under aviation regulations for a building of the proposed height.

2. Introduction

This Aeronautical Impact Assessment (AIA) report has been prepared by Strategic Airspace and supports a Request for a Planning Proposal to amend the Sydney Local Environmental Plan 2012 (Sydney LEP) and amendments proposed to the Sydney Development Control Plan 2012 (Sydney DCP 2012) in relation to the O'Connell Precinct. This report is submitted to the City of Sydney Council (Council) on behalf of the Proponent.

The O'Connell Precinct represents a significant opportunity in Central Sydney to renew a number of aging assets and deliver a highly engaging and multi-dimensional destination. The holistic reimaging of the Precinct will unlock a key site in the commercial heart of Sydney's Central Business District (CBD), bringing a sense of activity, wonder and respite to an established, but evolving locality.

This report should be read in conjunction with all supporting material associated with the Request for a Planning Proposal and DCP amendment, including the Planning Justification Report prepared by Ethos Urban.

2.1 Background

The Central Sydney Planning Strategy (CSPS) was first released in 2016 and sets out a 20-year land use vision, planning priorities and actions to achieve a place-led and people-led vision for growth in Central Sydney. The CSPS were endorsed by Council on 14 December 2020 and amendments to the Sydney LEP 2012 were gazetted in December 2021, supported by amendments to the Sydney DCP 2012.

The central aim of the CSPS is to support good growth while balancing the need to protect and enhance the public places that make the city unique. It provides the strategic direction to continue to position and strengthen Central Sydney as Australia's most productive and strategically important employment centre. Through 10 key moves, the CSPS balances opportunities for development to meet demands and achieve Council's job targets through to 2036, being 100,000 jobs unlocked through an additional 2.9 million square metres of employment generating floor space.

Importantly, the CSPS includes opportunities for increased height and density in key locations, balanced with environmental sustainability initiatives and sets criteria for excellence in urban design.

In this context, and over a number of years, the Proponent has brought together the individual sites within the O'Connell Precinct to amalgamate a collective Precinct with the intention to deliver a world class mixed-use commercial redevelopment.

The amendments sought to the Sydney LEP 2012 and Sydney DCP 2012 have been discussed with Council staff over a number of years, including presentations of the proposal to Council's Design Advisory Panel. These pre-lodgement discussions have informed the proposed amendments and scope of the assessment provided within this Report.

2.2 Site Location & Context

The O'Connell Precinct is located within the City of Sydney Local Government Area (LGA). The precinct is within the north-eastern portion of the Sydney CBD and is in immediate proximity to existing public transport infrastructure and a diverse mix of business, retail, cultural and entertainment destinations. The Precinct is also strategically located adjacent to the future Hunter Street metro station.

Specifically, the O'Connell Precinct has a total area of approximately 6,737m2. It is irregular in shape and is bounded by Spring Street and Bent Street to the north, O'Connell Street to

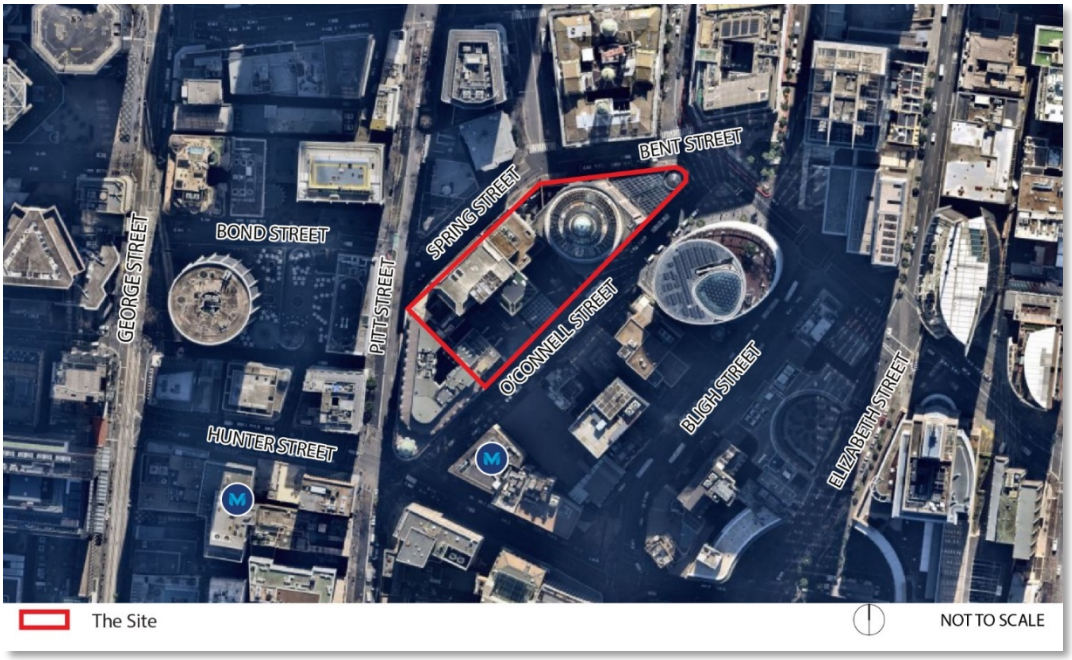
the south and south-east. The Precinct formally contains the following lots and street addresses:

- Lot 1 DP814858 or 1 O'Connell Street, Sydney
- Lot 2 DP172068, 8 Spring Street, Sydney
- Lot 1 DP74923 and Lot 1 DP176768 or 10-14 Spring Street, Sydney
- Lot 1 DP724946, 16 Spring Street, Sydney
- Lot 2 DP74923, 17 O'Connell Street, Sydney
- Lot 1 DP131917 or 19 O'Connell Street, Sydney
- Strata DP63932, 23 O'Connell Street, Sydney

Collectively, these lots and addresses are referred to as the 'Precinct' or 'Site' throughout this Report.

The Precinct includes a number of existing buildings, the majority of which are anticipated to be demolished to facilitate the renewal for the new commercial redevelopment. Of note, the heritage listed at 19 O'Connell Street building will be retained, as well as the existing 1 O'Connell Street commercial building, including the heritage listed facades of 1 O'Connell Street.

The boundaries of the O'Connell Precinct are illustrated in Figure 2-1.



Source: Ethos Urban

Figure 2-1 — Site Aerial

2.3 Overview of the Proposal

The reimaging of the O'Connell Precinct will comprise an integrated mixed-use commercial development that retains the existing 1 O'Connell Street commercial building, protects existing heritage, introduces a highly permeable and activated ground plane with enhanced public realm edges, provides opportunities for diverse cultural uses, and delivers premium grade commercial floor space in a new office tower.

The realisation of the O'Connell Precinct will be achieved through amendments to the Sydney LEP 2012 and Sydney DCP 2012.

The amendments sought to the Sydney LEP 2012 will encourage and facilitate the reimagining of the Precinct for a non-residential development by allowing for:

- an increased maximum Floor Space Ratio (FSR); and
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls that address matters such as building envelope; pedestrian connections; parking; vehicular access and loading; design excellence; heritage; sustainability; and public art.

The proposed amendments will directly support Council's endorsed CSPS by unlocking additional employment generating floor space. They will also facilitate significant public benefits to be delivered on site, through new cultural and community uses, east-west through site link, enhanced activation and embellishment of the public domain.

For assessment purposes, the vision for the O'Connell Precinct has been articulated in a reference design prepared by Matt Pullinger Architect and Stewart Architecture (provided under separate cover). This reference design is provided as a supporting document with the Request for a Planning Proposal and DCP amendment, and serves as a baseline proof of concept.

3. Methodology

This report examines the current and forecast regulated airspace height constraints overhead the site which are related to aviation airspace protection requirements under the *Airports (Protection of Airspace) Regulations 1996* (APAR) and which would:

a) Trigger the requirement to apply for an airspace height approval.
b) Constrain the maximum permissible building envelope heights.
c) Potentially influence airspace height application evaluations and approval conditions, including possible mitigations that may be required.

With regard to the influence on the proposed development, the following elements of the airport's prescribed airspace have been considered.

3.1 Airspace Regulations

The proposed development site is subject to the Airports (Protection of Airspace) Regulations (APAR), under the Commonwealth's Airports Act, 1996), because of its proximity to Sydney Airport and because of its proposed height. These regulations define both: how building height limitations due to airspace safety can be determined; and the process for gaining approval of the proposed development under the regulations.

The Prescribed Airspace Regulations, and their impact upon building height limitations, are described below.

Where a proposed development would infringe the Prescribed Airspace, a height approval must be obtained from DITRDCA prior to the intrusion into the airspace. A permanent intrusion, such as a building, is termed a *controlled activity*, and temporary intrusions that are not expected to continue longer than 3 months, such as cranes, are termed *short-term controlled activities*.

Applications are usually submitted via the nearest relevant airport (in this case, Sydney Airport), which then contacts relevant stakeholders and ultimately forwards the application to DITRDCA for the final determination.

Height approvals under APAR are not required for rezoning applications. They are however usually required by local planning authorities prior to, or as consent conditions of, approval of Development Applications (DAs).

3.2 Prescribed Airspace

Prescribed airspace, under these regulations, includes at minimum:

- **Obstacle Limitation Surfaces (OLS)**
  - The OLS surfaces are used to identify buildings and other structures that may have an impact upon the safety or regularity of aircraft operations at an airport. This impact depends upon both the type of operations at the aerodrome and which OLS surfaces are penetrated by a (proposed) building or structure.
  - The OLS are flat and rising (invisible) surfaces around the airport. They are based on the geometry of the airport and its runways and therefore they rarely change.
  - If a permanent building development (or temporary crane) that is proposed at a height that will penetrate (exceed) the height limit of an OLS surface, then an application must be made to the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA) — via the closest airport, and with copies to any other potentially affected airport — for an airspace height approval prior to construction of the permanent development &/or erection of the temporary crane obstacle. Such applications should demonstrate the proposed building does not penetrate or adversely affect surfaces protecting the instrument flight procedures (PANS-OPS surfaces); radar vectoring; navigation infrastructure; or anything else that might affect the safety or regularity of operations at the airport.

- **PANS-OPS Surfaces**
  - PANS-OPS surfaces represent the protection surfaces for published instrument flight procedures to and from the airport. These surfaces comprise flat, sloping and complex surface components.
  - PANS-OPS surfaces must not be penetrated by permanent buildings or structures. However, for a variety of reasons, PANS-OPS surfaces can and do change over time. Approval may be granted, under certain conditions, for temporary obstacles (such as cranes) which at their maximum height would infringe the limiting PANS-OPS surface, and in such cases operation at such heights would most likely be capped by the RTCC surface constraint (see below) and limited to 3 months duration.
  - As flight procedures are changed from time to time (usually by Airservices), the PANS-OPS Surface Plan published by an airport may not reflect the current situation — which is why we not only reference the airport's plans but also review the published charts for current (or pending) instrument flight procedures and evaluate the associated PANS-OPS height limits. The regulations also make a provision for any factor which may be deemed to adversely affect the safety, regularity or efficiency of aircraft operations at an airport. In light of this, it is necessary to consider the following factors.

- **Other Considerations**
  - **Sydney Airport's Declared Airspace Plans** additionally include:
    - Radar Terrain Clearance Charts (RTCC), which depict the areas and height limits related to the Minimum Vector Altitude (MVA) sectors used by Air Traffic Controllers when vectoring aircraft.
    - Lighting and visual guidance protection plans — used for approach guidance by aircraft, especially at night and in times of poor visibility.
    - Navaid and radar evaluation / protection surface plans.
  - **Sydney Airport's 2039 Master Plan**
  - **Other Factors**
    - Airline Engine-Out (Contingency) Take-Off Splays
      (as per Civil Aviation Order 20.7 1b)
      These are generally assessed independently by the airlines as part of their

own evaluations of any given airspace height application, but it is prudent to evaluate any potential impact in advance.

- Proximity to the critical parts of flight paths to/from Strategic Helicopter Landing Sites (SHLS), which are usually limited to the helipads used by Helicopter Emergency Management Services (HEMS) at major trauma hospitals.
- Other miscellaneous factors that may be considered as potential safety issues by any of the key stakeholders, and the Civil Aviation Safety Authority (CASA) in particular.

➢ Note: Airspace that is approved by DITRDCA as Declared Airspace is considered part of an airport's Prescribed Airspace.

3.3 About Airspace Heights

All "heights" provided in this document are elevations expressed in metres in the Australian Height Datum (AHD) — and thus they are true elevations, and NOT heights above ground level (AGL).

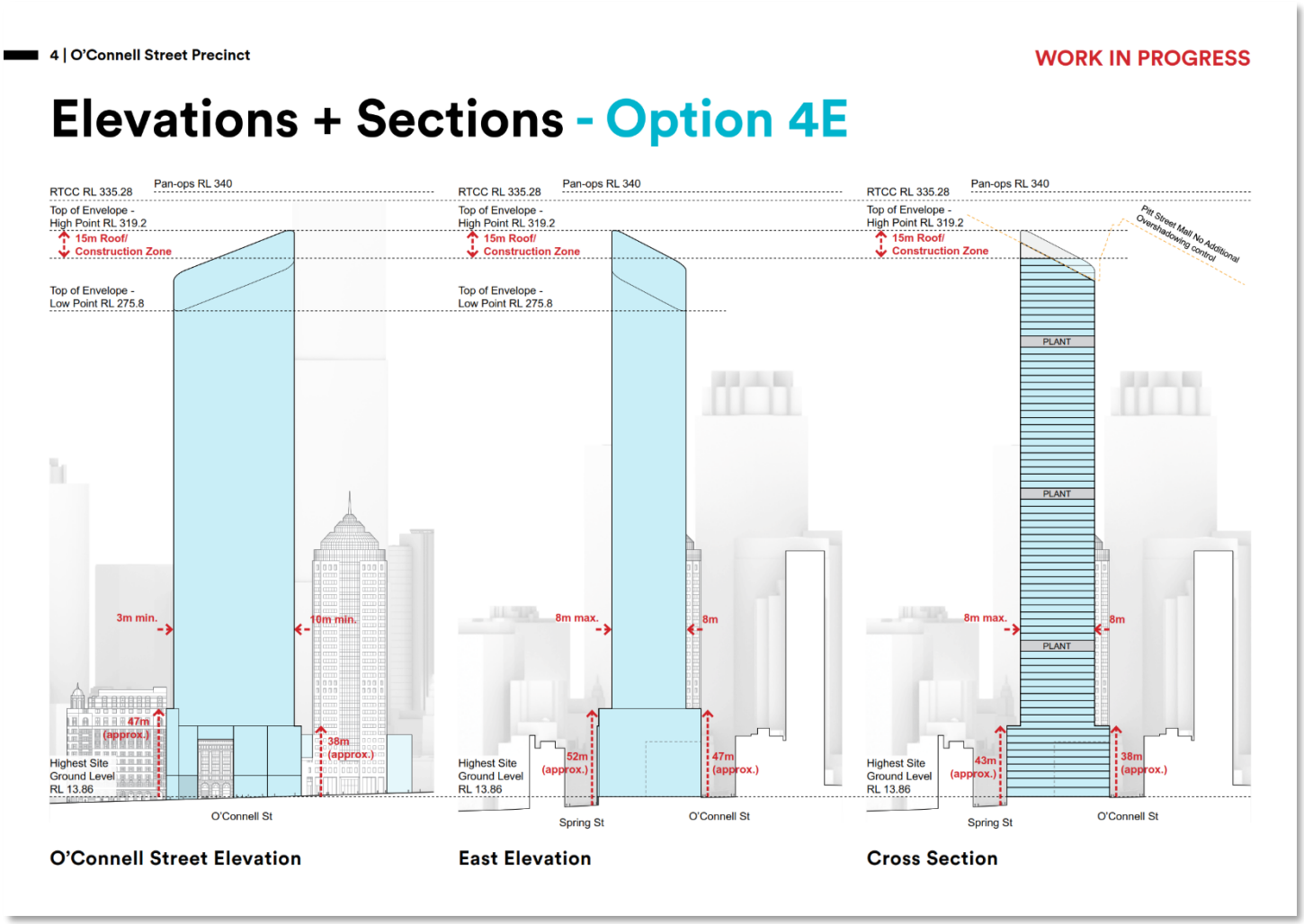
For estimating maximum development heights AGL, the ground elevation^{AHD} should be subtracted from the airspace height limits^{AHD}.

Note also — for aviation-related building airspace height approval under the Airports (Protection of Airspace) Regulations, approved heights are inclusive of the building itself, all rooftop furniture and overruns (eg, plant, lift risers, antennae, signage, building maintenance units (BMUs), etc) and any significant rooftop vegetation (eg, trees).

4. Assessment and Findings

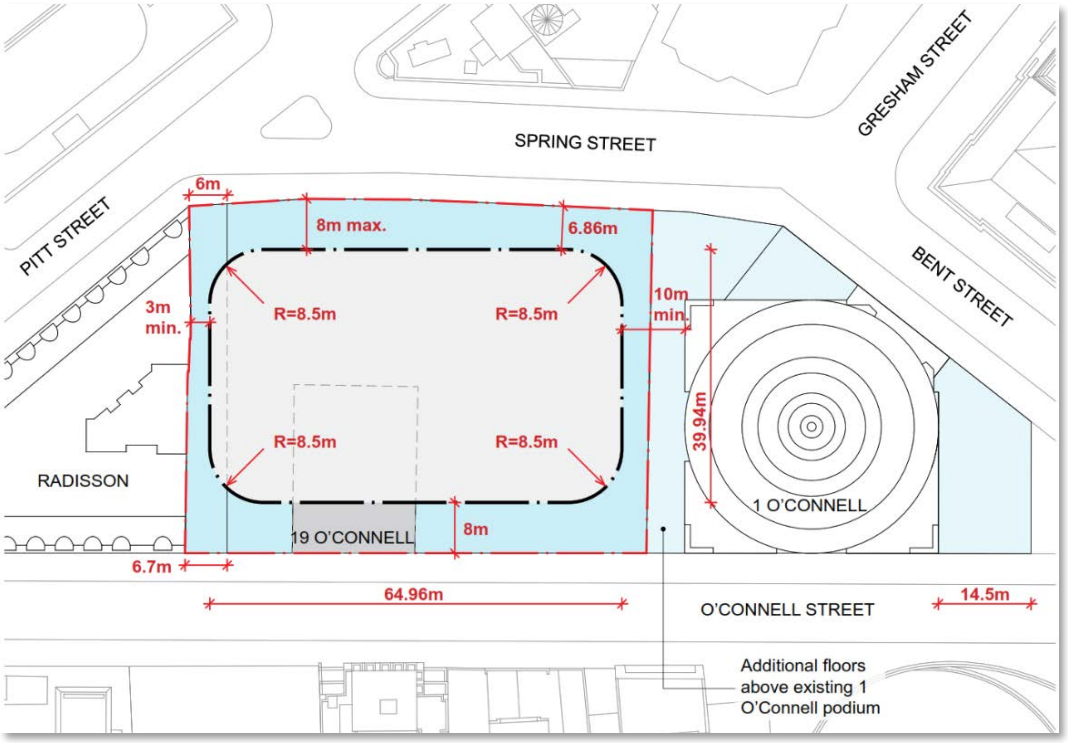
4.1 Aeronautical Impact Context

The assessment is made on the building envelope plans submitted for Planning Proposal. The focus of the AIA is the tower building envelope, as illustrated in elevation in Figure 4-1, and in the plan showing the site in the local context in Figure 4-2 below.



Source: Stewart Architecture

Figure 4-1 — Building Envelope Elevations & Section



Source: Lendlease DAP Feedback Envelope Drawings

Figure 4-2 — Site Plan

4.1.1 Reference Points used for Analysis

For the purposes of assessment, a single reference point was established at the south-western corner of the building. The reference point coordinates were determined from the architectural floor plans, which were geo-referenced against CAD-based cadastral data.

Whilst analysis against airspace heights has been conducted for a single point on the south-western corner of the building envelope — Pt.Ref — the height used for the assessment was assumed to be the height of the highest point of the building envelope. This is because the sloping nature of the roof would otherwise have the highest point on the north-eastern corner of the building envelope, which is not necessarily the most relevant point for aeronautical assessment as it is located further away from the airport. The result is a conservative assessment of height clearances against aeronautical assessment surfaces, where actual clearances are assured to be either equal to or higher than the calculated values.

Table 4-1 — Assessment Reference Locations & Coordinates

Point	*Assessment Heights (m AHD*)*	*Location*	*WGS84 Geographic Coordinates*	*GDA94 Coordinates (Zone 56)*
Pt.Ref	**319.20**	General Site Reference Point	33° 51' 55.02" S 151° 12' 33.20" E	334354.217 E 6251341.662 N
Pt.H	319.20	Highest point of the proposed tower (Northern corner)	33° 51' 52.73" S 151° 12' 33.90" E	334371.352 E 6251409.087 N
Pt.L	275.80	Lowest point of the proposed tower (Southern corner)	33° 51' 54.91" S 151° 12' 33.20" E	334354.469 E 6251341.661 N

***** *Assessment Heights — Indicative Max RLs for of the Proposed building envelope Envelope*
m AHD = RL Heights expressed in Metres Australian Height Datum (AHD)

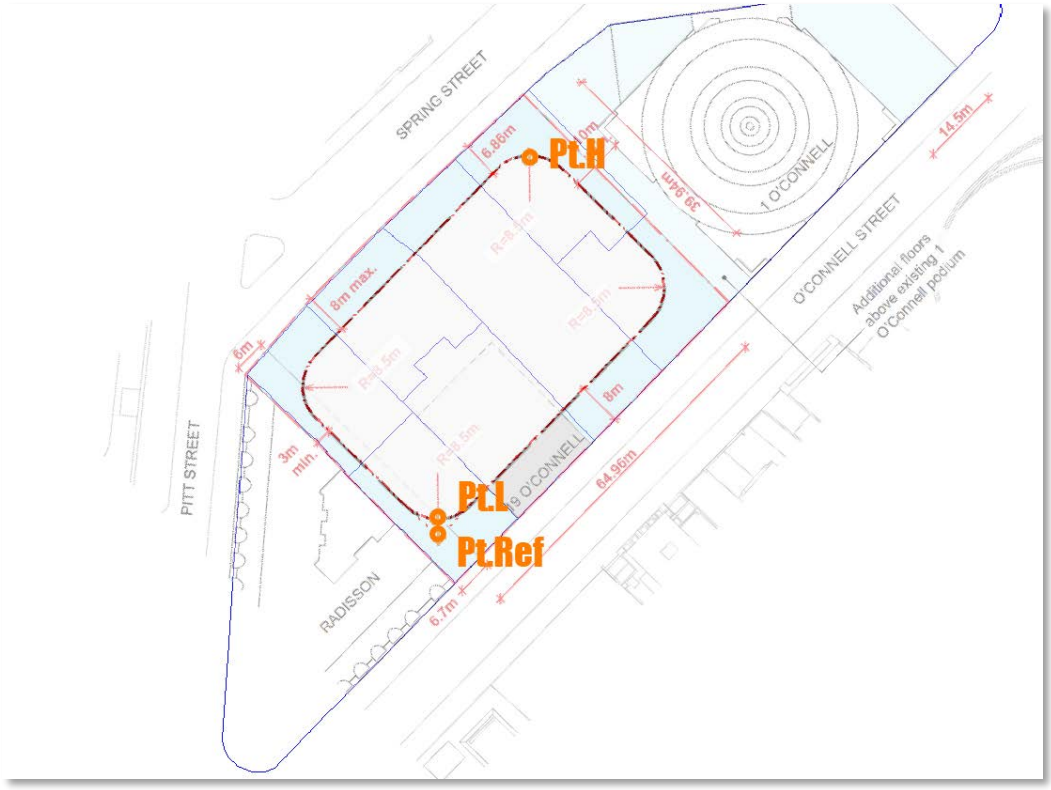


Figure 4-3 — Key Reference Points for the Aeronautical Assessment

4.1.2 Site in relation to Sydney Airport

The site reference point (Pt.Ref) is located approximately **9.43** km (**5.09** Nautical Miles (NM)) north-north-east of the Aerodrome Reference Point (ARP) of Sydney Airport, as shown in Figure 4-4 below.

The distance and bearing to the ARP and the northern ends of Runways 07/25 and 16L/34R are detailed in Table 4-2 below. Procedures to/from the western parallel runway, RWY 16R/34L, are considered irrelevant because those procedures must stay safely to the west of those for the eastern parallel runway – and therefor remain clear of the precinct.

Table 4-2 — Site Reference Point (Pt.Ref) – Location in Relation to Sydney Airport

Airport Feature	*Distance (Km)*	*Dist (NM)*	*Bearing (°T)*	*Bearing (°M)*
Aerodrome Reference Point (ARP)	**9.43**	**5.09**	**018.4**	**006**
RWY16L Threshold	9.73	5.27	011.1	358
RWY 25 Threshold	8.26	4.46	013.2	000

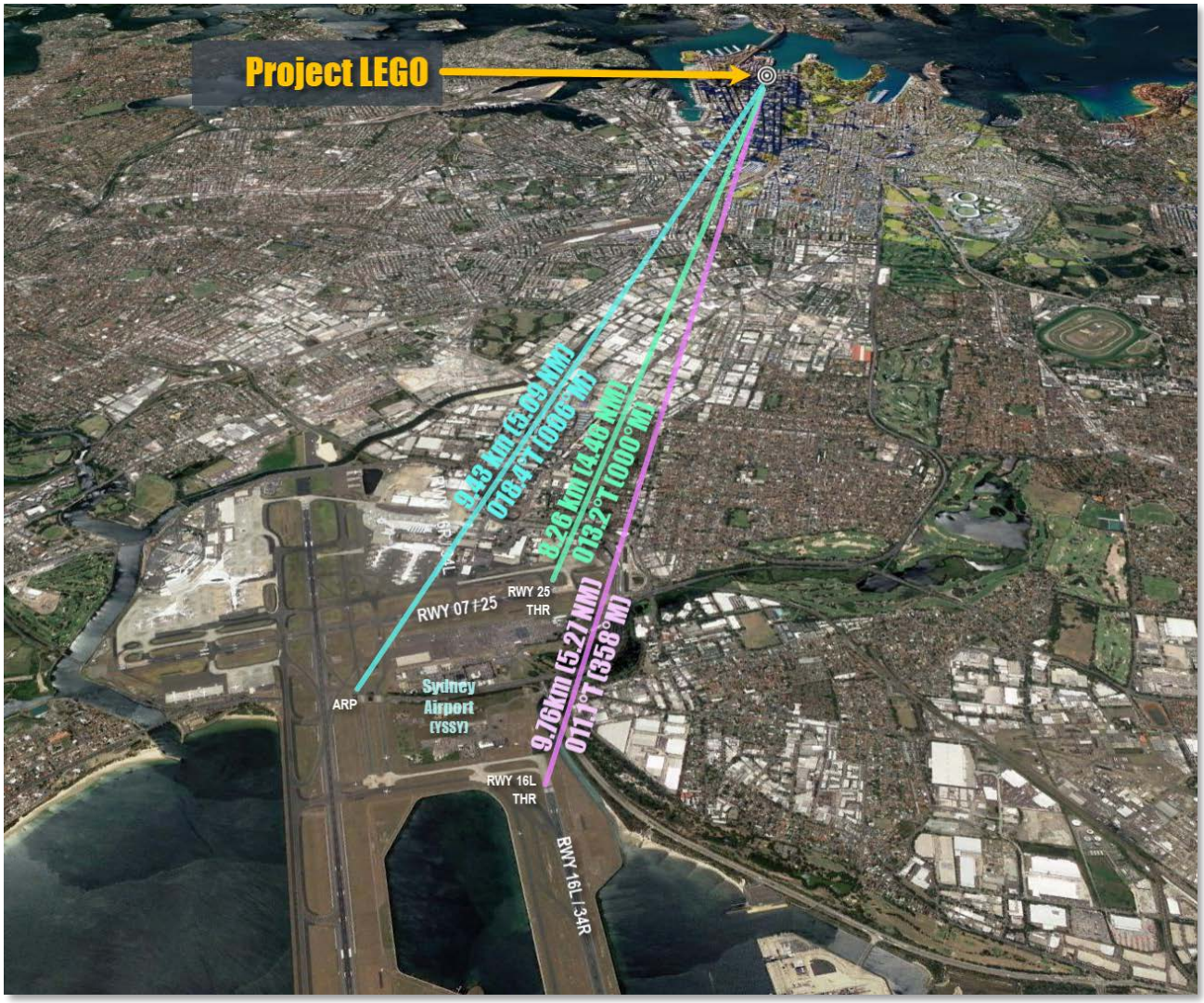


Figure 4-4 — Proposed Development Site in relation to Sydney Airport (Large Format)

4.1.3 Site in relation to Other Key Obstacles

This information is provided for reference when evaluating mitigation requirements such as obstacle lighting.

At the proposed maximum height of the building envelope, the development would be the tallest in the northern part of the CBD. Other key tall structures (obstacles) in the vicinity are listed in Table 4-3 below.

Table 4-3 — Tall Structures (Obstacles) in the Vicinity of the Proposed Development

Feature / Obstacle	*Max Elevation mAHD*	*Location*
Sydney Tower Eye	332.0	~0.6 km, S
Barangaroo One	283.0	~0.8 km, WNW

4.2 Analysis

4.2.1 OLS Analysis

The location of the proposed development, with respect to the OLS of Sydney Airport, is shown in Figure 4-5 below.

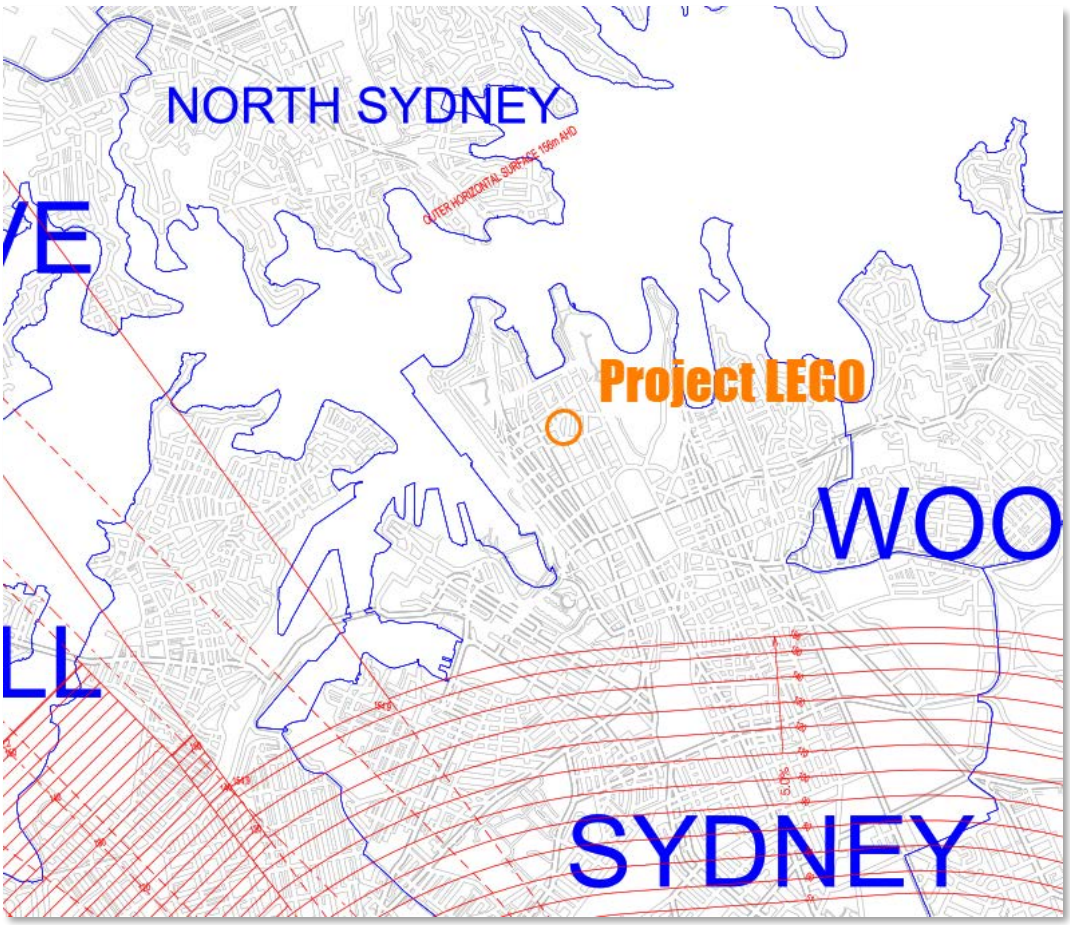


Figure 4-5 — Site in relation to Sydney Airport's OLS

Table 4-4 — OLS Height Impact & APAR Application Implications

		OLS Height		
Location	*Assessment Height (m AHD)*	*Surface Height*	*Clearance / Infringement*	*Approvability Comment*
Pt.Ref	**319.20**	**156.00**	**-163.20**	The building envelope building requires prior approval under APAR because it infringes the OLS. Approval is subject to the maximum height being below the most limiting PANS-OPS or RTCC surface height.

4.2.2 PANS-OPS Analysis

In addition to reviewing the PANS-OPS (Approach) Surfaces chart of Sydney Airport's Prescribed Airspace (current at 2017, but published by the airport in 2019), assessment was conducted of the following instrument procedure types for Sydney Airport, as published in the Australian Aeronautical Information Publication (AIP) Departure and Approach Procedures (DAP), up to Amendment 172 (effective 08-Sep-2022 to 30-Nov-2022).

- The Circling Minima and Minimum Sector Altitudes (MSAs) for existing PANS-OPS procedures
- The discrete minima for the Instrument Approach Procedures.
- Missed Approaches — as part of the evaluation of Approach Procedures
- The existing Standard Instrument Departure Procedures (SIDs)
- Minimum Sector Altitude — 10 NM Sector

The site in relation to the PANS-OPS surfaces shown on Sydney Airport's 2017 chart — as depicted in Figure 4-6 below — is shown for information only, as it is known to not fully reflect the currently published PANS-OPS procedures and it does not include PANS-OPS departure procedures. The limiting surface, according to the chart, was that related to MSA altitude with a protection surface at 340m AHD.

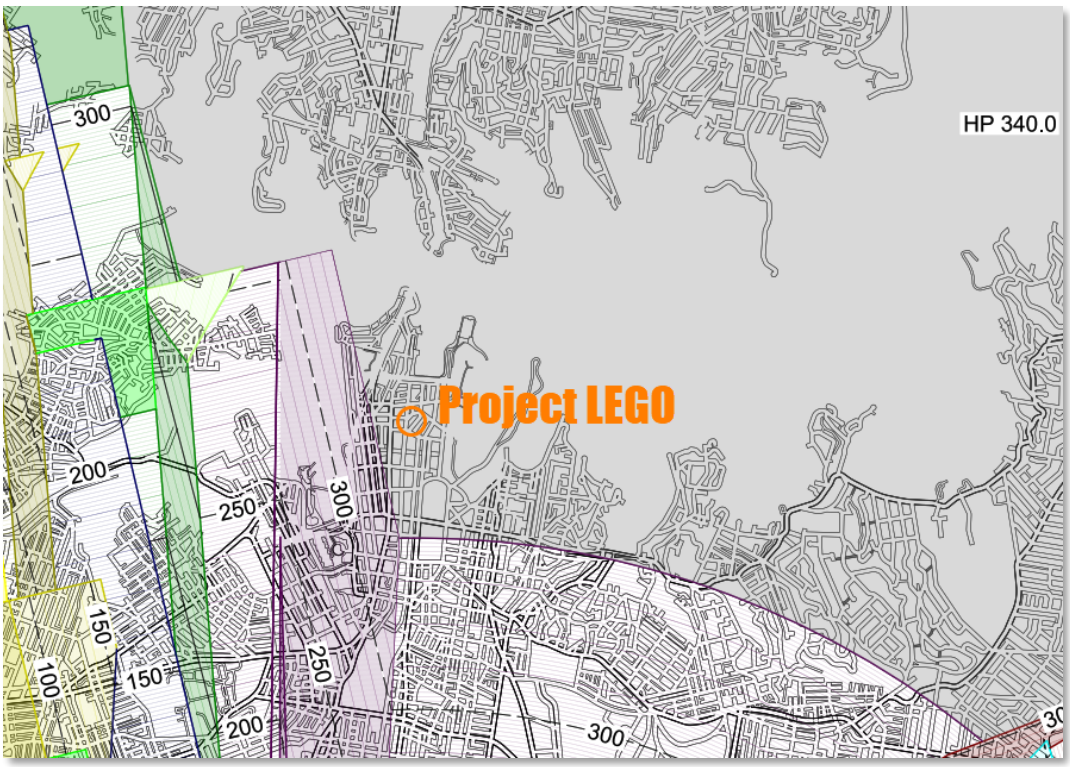


Figure 4-6 — Site in relation to Sydney Airport's PANS-OPS (Approach) Surfaces

The StratAir analysis of the Instrument Flight Procedures (IFPs) currently published by Airservices Australia (refer also to Appendix 2 — PANS-OPS Procedures) determined that the site is below the protection areas for missed approach procedures to RWY 34R and within the protection areas for departures from RWY 34R and RWY 07. The key details of the assessment of the current IFPs are in the following sections and summarised in Table 4-5 below.

Table 4-5 — Sydney (YSSY) PANS-OPS Height Limit Summary

Procedure	*Height Limit (m AHD)*	*Description*
Minimum Sector Altitude (MSA)	340.08	The 10 NM Minimum Sector Altitude of 2100 ft imposes this surface height constraint across the entire site.
STARs	≥ 340.08	Outside the lateral protection areas or too high overhead to have any impact on the proposed development.
Approaches and Missed Approaches to all Runways	≥ 349.02	Outside the lateral protection areas of many procedures. Where protection surfaces overlay the site, StratAir analysis indicates that the lowest limit is related to the Missed Approach of the RWY34R RNP VNAV procedure.
Departures	≥ 376.82	Analysis indicates that most limiting surface constraint for the Omnidirectional Radar departure from RWY07 is applicable.
Circling Area	N/A	Outside the extent of the circling procedures.

A "Area" Procedures

A.1 Minimum Sector Altitudes (MSAs)

The relevant sector is the inner 10 NM sector around the airport which has a 2,100ft minimum flight altitude. Overall, this is the most restrictive of the surfaces related to PANS-OPS procedures affecting the site.

Procedure	*Feature and / or Restriction*	*Description*
10NM MSA	Horizontal Surface: • 340.08m	Covers the entire site. This surface height is based on a conservative minimum obstacle clearance of 1000ft instead of the ICAO value of 300m.

A.2 Circling Minima

Not applicable: the site is outside the extent of the circling procedures.

A.3 STARs

The minimum segment altitude of any of the STARs over the site is 2,100ft, which is covered by the same protection as the MSA at 2100ft. A detailed study of the extent of impact by STARs is not included.

B Instrument Approaches & Missed Approaches

The impact of each of the relevant PANS-OPS protection surfaces for current approach and departure procedures for Sydney Airport were evaluated.

B.1 Approach Procedures to RWY 07, RWY 16L & RWY 25

The site is laterally clear of the protection surfaces of all approaches.

B.2 Missed Approaches

The missed approaches related to the RWY 34R approach procedures were analysed. The most limiting of the missed approach surfaces overhead the site is associated with the RNP VNAV approach to RWY 34R. With a lowest surface height of 349.02m AHD over the tower it is above the protection surface for the MSA.

Table 4-6 —Limiting PANS-OPS Approach Surface Height and Envelope Height Clearance

		Limiting PANS-OPS Approach Surface	
Location	*Assessment Height (m AHD)*	***RWY 34R RNP RNAV Missed Approach Surface Height***	***Clearance / Infringement***
Pt.Ref	319.20	349.02	29.82

C Departures

The departure procedures from RWY 07 and RWY 34R were evaluated for potential impact. Based on the data published in the Omnidirectional Radar Departures All Runways chart, the RWY 07 departure procedure was determined to be the most limiting of all PANS-OPS procedures. The limiting height and the impact in relation to the building envelope is summarised in Table 4-7 below.

Table 4-7 — Limiting PANS-OPS Departure Surface Height & Envelope Height Clearance

		PANS-OPS Departure Surfaces	
Location	*Assessment Height (m AHD)*	*RWY 07 Omnidirectional Radar Departure*	*Clearance / Infringement*
Pt.Ref	319.20	376.82	57.620

4.2.3 Other Assessment Considerations

The following table provides a brief assessment of other considerations.

Table 4-8 — Other Assessable Height Limitations (including the RTCC & SHLS Impact)

Procedure	*Height Limit (m AHD)*	*Description*
Radar Terrain Clearance Chart (RTCC) / Minimum Vector Altitude (MVA)	**335.28**	This height constraint is applicable over the entire site. This is the limit related to the 2100ft Minimum Vectoring Altitude (MVA) sector, which is used by air traffic controllers. This information is sourced from the RTCC published as part of Sydney Airport's Prescribed Airspace Plans.
Navigation Infrastructure Surfaces	N/A	The proposed development is too far from the airport to affect any ground-based navigation infrastructure.
Approach Lighting & VGSI Surfaces	N/A	The site is outside the lateral extent of published approach lighting surfaces.
Airlines Engine Out Procedures	N/A	The Engine Out procedures from RWY 34R (the most relevant take-off runway end), are designed and maintained by each of the passenger transport aircraft operators in accordance with the relevant regulations. All such procedures necessarily take into account Sydney building envelope Eye in the Sydney CBD, which given its relevant proximity and taller height, will take precedence. As such this proposal will not adversely affect any contingency procedures.
Helicopter Operations	N/A	There are no nearby existing or proposed helicopter routes, HLS or SHLS that would be adversely impacted.

There are no other considerations that might limit the building height at the project site.

A Radar Terrain Clearance Chart (RTCC) / Minimum Vector Altitude (MVA) Surface

The Radar Terrain Clearance Chart (RTCC) overhead the site protects the airspace used by air traffic controllers as the lowest Minimum Vector Altitude (MVA) they can use for vectoring aircraft. With an MVA of 2100ft over the entire site, the RTCC surface height limit is defined as being 1000ft below that, at a height of 335.28m AHD*.

* *On Sydney Airport's RTCC chart they show the value rounded up to the nearest metre, 335m AHD. This represents*

Table 4-9 — Proposed Envelope in relation to the RTCC Surface Height

		RTCC (2100ft MVA Sector)		
Location	*Assessment Height (m AHD)*	*Surface Height (1100 ft)*	*Clearance / Infringement*	*Comment*
Pt.Ref	319.20	335.28	16.08	Refer also to Section 5 Crane Considerations (p18)

Note that because the RTCC surface constraint is lower than the lowest PANS-OPS surface, it becomes relevant as a cap on the building height.

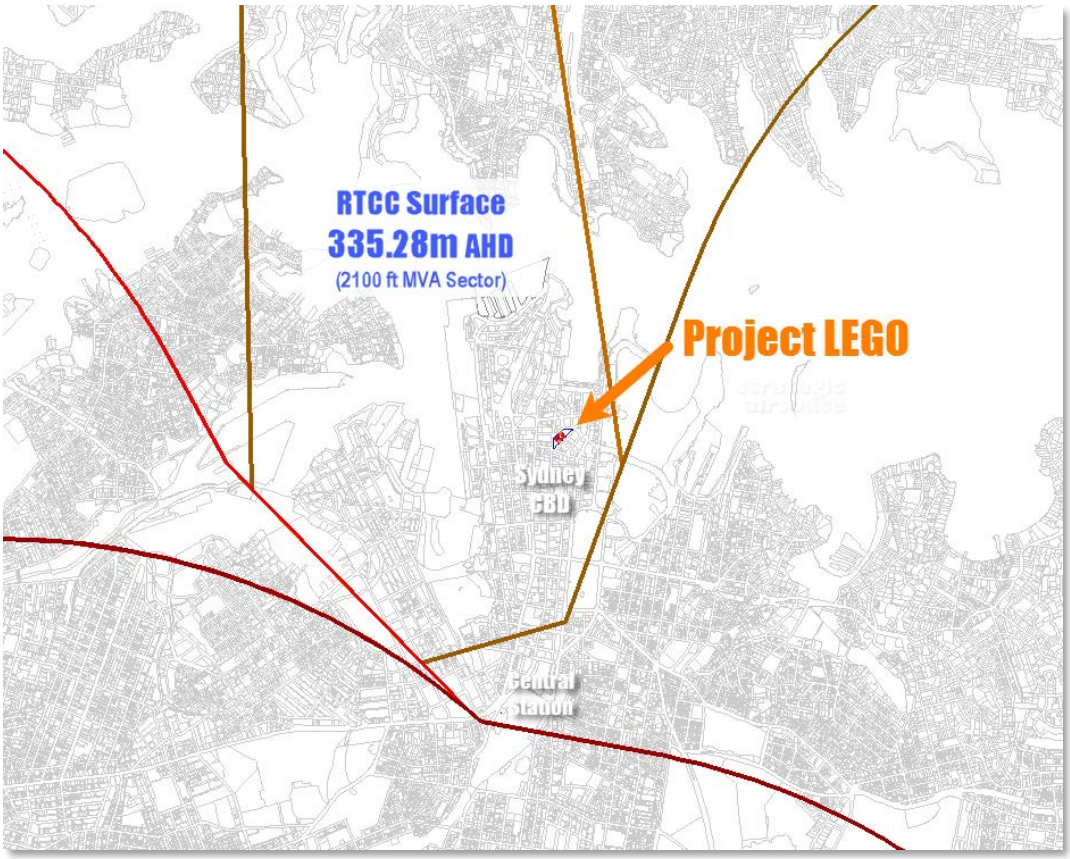


Figure 4-7 — Radar Terrain Clearance Chart (RTCC) Height Constraint

B HLS Status & Helicopter Impact (SEARs Study Requirement)

The development proposal does not include any plans for a Helicopter Landing Site (HLS), and thus there will be no helicopter flight path activity to/from the development.

The site is not adjacent to any other strategic or non-strategic HLSs, nor is it near any published helicopter transit routes.

4.2.4 Airspace Analysis Summary

The impact of the various building height limitations, from lowest to highest, is summarised in the following table.

Table 4-10 — Analysis Summary — Airspace Height Constraints

Height Limits (m AHD)	*Height Limit Detail*	*Comment*
Max Pt.Ref **319.20**	Max Height	This is the maximum height of the building envelope.
156	OLS Outer Horizontal Surface	The site is under the OLS Outer Horizontal Surface, which is a flat surface with a fixed elevation. As the proposed envelope would infringe the OLS, it would require a height application under the Airports (Protection of Airspace) Regulations 1996 (APAR) to be approved by DITRDCA prior to construction. Infringement of the OLS in this case is not considered a barrier to approval of an application under the APAR.
335.28	Radar Terrain Clearance Chart (RTCC) Minimum Vector Altitude (MVA) 2100ft Sector	The site lies within the lateral limits of an RTCC — this is published as 335m AHD on Sydney Airport's RTCC chart as part of their Declared Airspace. See Table 4-9 (p16) for details. At the equivalent of 1100ft altitude, this surface protects the 2100ft MVA sector which is used by Air Traffic Controllers (ATCs) to vector aircraft. This surface typically cannot be breached by any obstacle, permanent or temporary, at night or during times of low visibility. For this reason, this is considered the most limiting height for the proposed development at the project site.
340	PANS-OPS Surfaces	The Minimum Sector Altitude within 10NM for the instrument procedures to Sydney airport is the most constraining PANS-OPS surface over the site. See Table 4-5 (p14) for details.
Higher or N/A	Other Surfaces & Helicopter Route	The site is outside the extent of other protection surfaces, or the height limits are higher, and so considered Not Applicable.

5. Crane Considerations

This section is provided for advance information.

An assessment of the feasibility of constructing a building envelope as tall as proposed in relation to the potential airspace impact cranes required for construction may be conducted by the aviation agencies when evaluating their responses to an airspace height application for the building under the APAR — even though airspace height applications for cranes are usually submitted separately after DA consent but prior to construction.

Any crane which would exceed the OLS relevant height will require prior approval under the APAR. Cranes which would not exceed the limiting RTCC surface height are likely to be given an APAR approval for operating for an unlimited duration, subject to the agreement of Sydney Airport.

Under the APAR, cranes which would exceed the most limiting of the PANS-OPS and RTCC surface limits could only be considered approvable as Short-Term Controlled Activities (ie, temporary obstacles), and in such cases the approval would contain a number of specific conditions. The key regulatory implications are that applications for cranes must be acceptable to Sydney Airport, and the operating period during which a crane height may exceed the PANS-OPS height limit would be limited to a period not exceeding 3 months.

In addition to standard requirements such as hazard warning lights, other approval conditions that could be reasonably anticipated would include operating procedures and requirements such as:

- A defined communications system between the Site Manager or Crane Supervisor and the Sydney Air Traffic Management (ATM) Unit at Sydney Airport; and
- The potential need to lower cranes during periods of low visibility (and that this may need to be put into place at short notice) and at night — subject to such a requirement being stated by Airservices in response to an APAR application for the crane(s).

The available clearance heights for cranes above the top of the proposed envelope range from 16.0m to 82.2m (see Table 5-1 below), where the minimum clearance may normally be insufficient for cranes for cranes to operate.

Table 5-1 — Airspace Surfaces & Potential Crane Impact

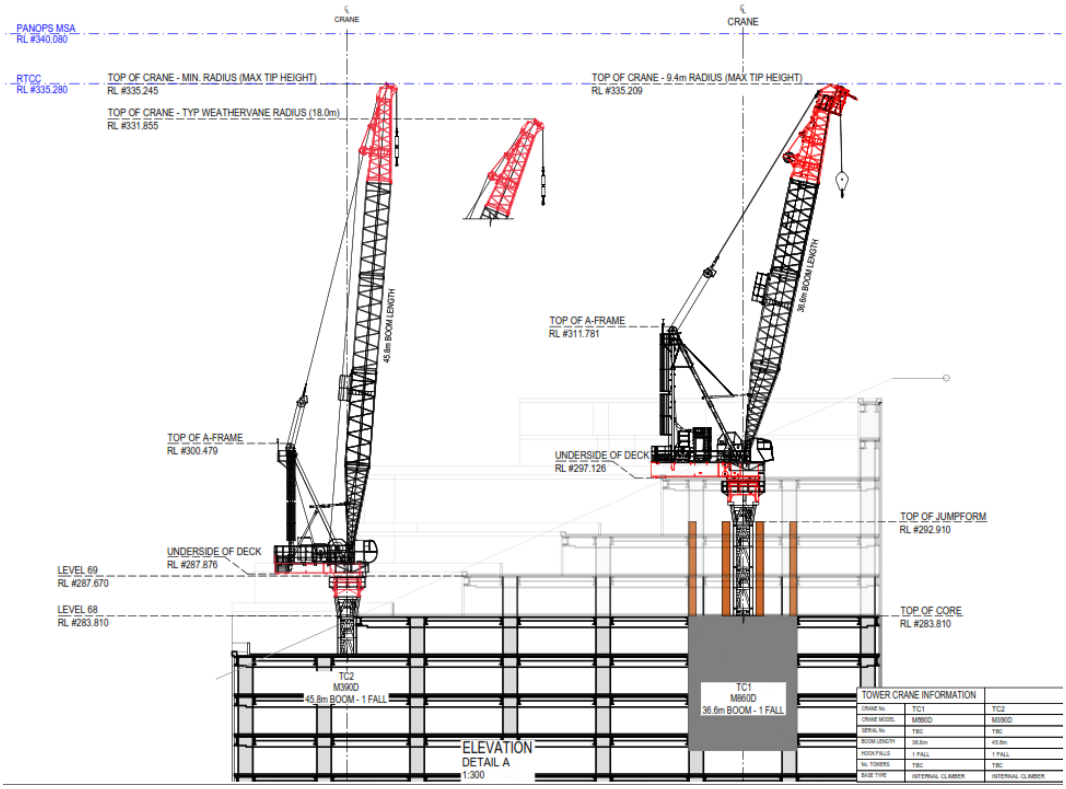
Building ID & Assessment Location		*Height m AHD*	***Lowest PANS-OPS*** *PANS-OPS Surface Hgt Clearance*	***RTCC Surface*** *RTCC Surface Hgt Clearance*
Site Reference Point	**Pt.Ref**	**319.20**	20.8	16.0
Highest point on tower	Pt.H	319.20	20.8	16.0
Lowest point on tower	Pt.L	257.80	77.4	82.2

However, the proposed construction management plan aims to allow for unrestricted deployment of cranes for the duration of construction without infringing on the limiting RTCC and PANS-OPS surfaces.

Crane plans for this project aim to take advantage of the sloping envelope profile and adopt a strategy of using self-climbing cranes at carefully considered locations within the building so as to facilitate the effective use of cranes throughout the construction program without adversely affecting airspace.

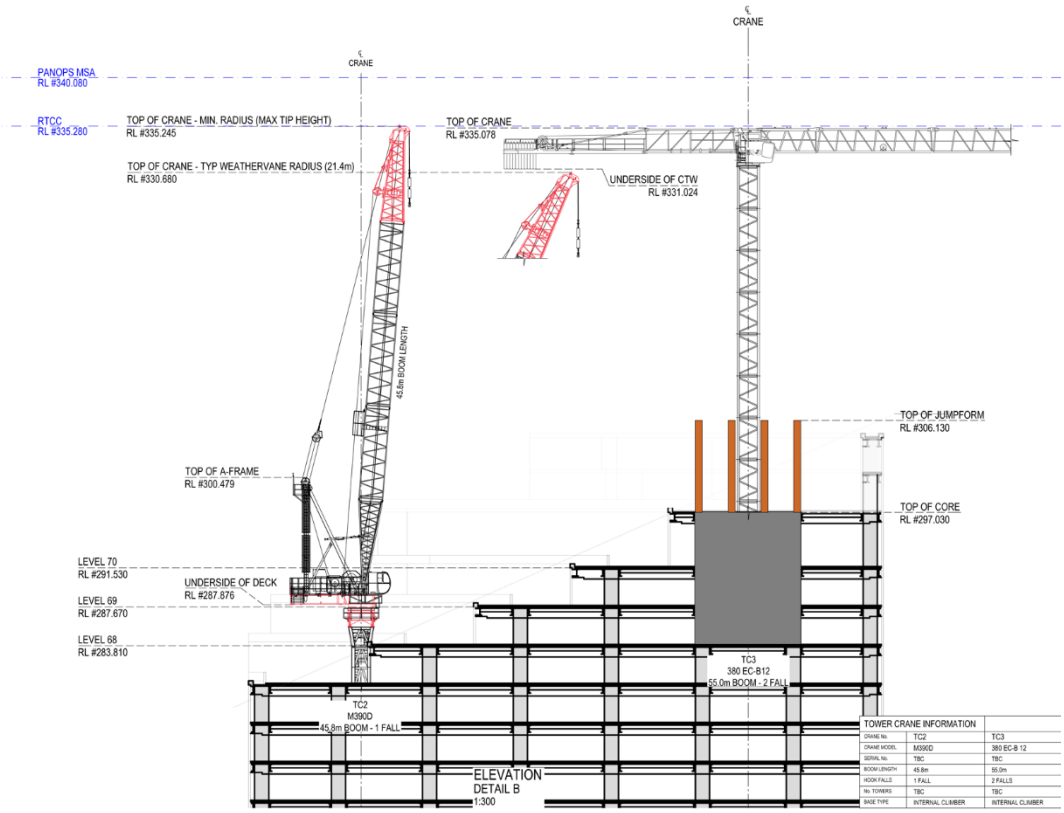
This is conceptually depicted in Figure 5-1 (two luffing cranes) and Figure 5-2 (one luffing and one hammerhead), where cranes installed at rooftop levels below the top height to install cranes on the lower levels that would be able to reach the top levels during construction. It should be noted that this is a conceptual crane strategy based on the planning proposal reference design. A detailed crane strategy will be subject to the design excellence building outcome, to be submitted after DA and prior to construction.

Any future height applications for cranes will require a detailed airspace assessment, current at the time of the application, inclusion of the then current Construction Management Plan (CMP), crane plans and operations programme and, subject to the final height impact, demonstration that the cranes could be operated within the anticipated time and operational constraints without any adverse impact on the safety, regularity or efficiency to air transport operations. Separate applications would be required for each crane and for different stage heights.



Source: MARR Contracting (Dwg 22-P0085 MARR-000–02-02, 12/8/2022)

Figure 5-1 — Rooftop Cranes (Luffing) operating below the limiting RTCC Surface



Source: MARR Contracting (Dwg 22-P0085 MARR-000–02-04, 12/8/2022)

Figure 5-2 — Rooftop Cranes (Luffing & Hammerhead) operating below the limiting RTCC Surface

6. Mitigation Measures

Under the CASA MOS Part 139 (Chapter 9, Division 4), obstacle lighting would need to be installed as a warning to aircraft (helicopters included) at night and times of low visibility because the height of the building will exceed a height of 100m above ground level, and it will infringe the OLS Conical Surface.

Given the location of the proposed development in the CBD and the proposed height (also in relation to other key tall obstacles in the vicinity as noted in section 4.1.3 (p11)), it is likely that CASA will make a recommendation for a minimum of one obstacle light on the tallest section of the building. Given the orientation of the tower and the proposed slope of the roof, placement of an obstacle light at the tallest point at the northern corner of the building will provide the greatest safety mitigation.

The requirement for this and the number and type of obstacle lights — to be recommended by CASA upon evaluation of any airspace height application — and the obstacle monitoring and maintenance procedures will be specified as a condition of any airspace height approval under the APAR.

7. Conclusion

The proposed development would infringe the OLS — and therefore requires prior approval as a Controlled Activity under the APAR.

Given the location of the building envelope in the Sydney CBD, its proximity to the existing building envelope buildings in the CBD which are taller than that now proposed for this development, and the fact that the maximum height of the planning envelope is well clear of the constraining RTCC surface height, the proposed building would not create any adverse impact on the safety, regularity or efficiency of current or future air transport operations to and from Sydney Airport, nor on any helicopter traffic overhead. It is therefore technically approvable under the APAR.

As a standard safety mitigation for a building of this height, and because it infringes the OLS Conical Surface, any approval for the development is likely to contain a condition for the installation and monitoring of obstacle lighting.

Planning to date includes construction strategies that have considered airspace implications on cranes. Separate applications for cranes that would infringe the OLS would also be required in the future.

In summary, based on this assessment, we anticipate that a height application under APAR for the building envelope as proposed would be successful.

APPENDICES

APPENDIX 1 — ABBREVIATIONS

Abbreviations used in this report and/or associated reference documents, and the meanings assigned to them for the purposes of this report are detailed in the following table:

Abbreviation	*Meaning*
AC	Advisory Circular (document supporting CAR 1998)
ACFT	Aircraft
AD	Aerodrome
AGL	Above Ground Level (Height)
AHD	Australian Height Datum
AHT	Aircraft Height
AIP	Aeronautical Information Publication
Airports Act	Airports Act 1996, as amended
AIS	Aeronautical Information Services
ALARP	As Low As Reasonably Practicable
ALC	Airport Lease Company
Alt	Altitude
AMAC	Australian Mayoral Aviation Council
AMSL	Above Minimum Sea Level
ANEF	Australian Noise Exposure Forecast
ANSP	Airspace and Navigation Service Provider
APCH	Approach
APARs, or A(PofA)R	Airports (Protection of Airspace) Regulations, 1996 as amended
ARP	Aerodrome Reference Point
AsA	Airservices Australia
ASDA	Accelerated Stop Distance Available
ATC	Air Traffic Control(ler)
ATM	Air Traffic Management
BA (Planning)	Building Application or Building Approval (Planning)
BMU	Building Maintenance Unit
CAAP	Civil Aviation Advisory Publication
CAO	Civil Aviation Order
CAR	Civil Aviation Regulation
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation
Cat	Category
CBD	Central Business District
CG	Climb Gradient
CMP	Construction Management Plan
CNS/ATM	Communications, Navigation, Surveillance / Air Traffic Management
CoS	City of Sydney (Council)
DA (Aviation)	Decision Altitude (Aviation)
DA (Planning)	Development Application or Development Approval (Planning)
DAH	Designated Airspace Handbook
DAP	Departure and Approach Procedures (published by AsA)
DEP	Departure
DER	Departure End of Runway
DEVELMT	Development
DH	Decision Height
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications & the Arts (Commonwealth) (former abbreviations include DIRD, DIRDC, DITRDCA)
DME	Distance Measuring Equipment
Doc nn	ICAO Document Number nn
DoD	Department of Defence
DODPROPS	Dependent Opposite Direction Parallel Runway OPerations
DPIE	Department of Planning, Industry & Environment (NSW)
EIS	Environmental Impact Study

Abbreviation	*Meaning*
ELEV	Elevation (above mean sea level)
ENE	East North East
ERSA	EnRoute Supplement Australia
ESE	East South East
FAF	Final Approach Fix
FAP	Final Approach Point
Ft	Feet
GDA94	Geocentric Datum of Australia 1994
GDA2020	Geocentric Datum of Australia 2020
GLS	GNSS Landing System – a precision landing system like ILS but based on augmented GNSS using ground and satellite systems.
GNSS	Global Navigation Satellite System
GP	Glide Path
HIAL	High Intensity Approach Light
HLS	Helicopter Landing Site
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
IHS	Inner Horizontal Surface, an Obstacle Limitation Surface
ILS	Instrument Landing System, a precision approach landing system
IMC	Instrument Meteorological Conditions
IPA	Integrated Planning Act 1997, Queensland State Government
ISA	International Standard Atmosphere
IVA	Independent Visual Approach
Km	Kilometres
Kt	Knot (one nautical mile per hour)
LAT	Latitude
LDA	Landing Distance Available
LEP	Local Environment Plan (Planning)
LLZ	Localizer
LNAV	Lateral Navigation
LONG	Longitude
LSALT	Lowest Safe ALTitude
M	Metres
MAPt	Missed Approach Point
MDA	Minimum Descent Altitude
MDH	Minimum Descent Height
MDP	Major Development Plan
MGA94	Map Grid Australia 1994
MGA2020	Map Grid Australia 2020
MOC	Minimum Obstacle Clearance
MOCA	Minimum Obstacle Clearance Altitude
MOS	Manual Of Standards, published by CASA
MP	Master Plan
MSA	Minimum Sector Altitude
MVA	Minimum Vector Altitude
NASF	National Airports Safeguarding Framework
NDB	Non-Directional Beacon
NE	North East
NM	Nautical Mile (= 1.852 km)
nnDME	Distance from the DME (in Nautical Miles)
NNE	North North East
NNW	North North West
NOTAM	NOTice to AirMen
OAR	Office of Airspace Regulation
OCA	Obstacle Clearance Altitude (in this case, in AMSL)

Abbreviation	*Meaning*
OCH	Obstacle Clearance Height
ODPROPS	Opposite Direction Parallel Runway OPerations
OHS	Outer Horizontal Surface, an Obstacle Limitation Surface
OLS	Obstacle Limitation Surface, defined by ICAO Annex 14; refer also CASA MOS Part 139
PANS-OPS	Procedures for Air Navigation – Operations, ICAO Doc 8168; refer also CASA MOS Part 173
PAPI	Precision Approach Path Indicator (a form of VGSI)
PBN	Performance Based Navigation
PRM	Precision Runway Monitor
RAAF	Royal Australian Air Force
REF	Reference
RL	Relative Level
RNAV	aRea NAVigation
RNP	Required Navigation Performance
RNP AR	Required Navigation Performance – Authorisation Required
RPT	Regular Public Transport
RTCC	Radar Terrain Clearance Chart (refer also MVA)
RWY	Runway
SACL	Sydney Airport Corporation Limited
SHLS	Strategic Helicopter Landing Site
SID	Standard Instrument Departure
SODPROPS	(Independent) Simultaneous Opposite Direction Parallel Runway OPerations
SSDA	State Significant Development Application
SSP	State Significant Precinct
SSR	Secondary Surveillance Radar
STAR	STandard Arrival
TAR	Terminal Approach Radar
TAS	True Airspeed
TfNSW	Transport for NSW
THR	THReshold (of Runway)
TMA	TerMinal Area
TNA	Turn Altitude
TODA	Take-off Distance Available
TORA	Take-Off Runway Available
VFR	Visual Flight Rules
VIS	Visual
VMC	Visual Meteorological Conditions
V_n	Aircraft critical velocity reference
VNAV	Vertical Navigation
VNC	Visual Navigation Chart
VOR	Very high frequency Omni-directional Range
VSS	Visual Segment Surface
VTC	Visual Terminal Chart
WAM	Wide-Area Multilateration
WNW	West North West
WSW	West South West
WGS84	World Geodetic System 1984
WSA	Western Sydney Airport

APPENDIX 2 — PANS-OPS PROCEDURES

The versions of the IFPs consulted were from the AIP Amendment 172, effective from 08-Sep-2022 to 30-Nov-2022, the latest available as of the date of this report — as indicated in Table 7-1 below.

Table 7-1 — Appendix: PANS OPS Instrument Flight Procedure Charts for Sydney Airport (AIP Amendment 172 – Effective 08-Sep-2022 to 30-Nov-2022)

SYDNEY (YSSY)

Chart	*Effective Date (Amdt No)*
AERODROME CHART PAGE 1	2-Dec-2021 (Am 169)
AERODROME CHART PAGE 2	16-Jun-2022 (Am 171)
AERODROME GROUND MOVEMENT CHART	16-Jun-2022 (Am 171)
APRON CHART - INTERNATIONAL PAGE 1	2-Dec-2021 (Am 169)
APRON CHART - INTERNATIONAL PAGE 2	2-Dec-2021 (Am 169)
APRON CHART - DOMESTIC PAGE 1	7-Nov-2019 (Am 161)
APRON CHART - DOMESTIC PAGE 2	16-Jun-2022 (Am 171)
APRON CHART - DOMESTIC PAGE 3	13-Aug-2020 (Am 164)
STANDARD DOMESTIC TAXI ROUTES - ARRIVALS	16-Jun-2022 (Am 171)
STANDARD DOMESTIC TAXI ROUTES - DEPARTURES	16-Jun-2022 (Am 171)
NOISE ABATEMENT PROCEDURE PAGE 1	7-Nov-2019 (Am 161)
NOISE ABATEMENT PROCEDURE PAGE 2	2-Dec-2021 (Am 169)
NOISE ABATEMENT PROCEDURE PAGE 3	7-Nov-2019 (Am 161)
NOISE ABATEMENT PROCEDURE PAGE 4	21-May-2020 (Am 163)
NOISE ABATEMENT PROCEDURE PAGE 5	21-May-2020 (Am 163)
NOISE ABATEMENT PROCEDURE PAGE 6	7-Nov-2019 (Am 161)
NOISE ABATEMENT PROCEDURE PAGE 7	7-Nov-2019 (Am 161)
NOISE ABATEMENT PROCEDURE PAGE 8	7-Nov-2019 (Am 161)
NOISE ABATEMENT PROCEDURE PAGE 9	7-Nov-2019 (Am 161)
NOISE ABATEMENT PROCEDURE PAGE 10	7-Nov-2019 (Am 161)
AIRPORT EFFICIENCY PROCEDURES	7-Nov-2019 (Am 161)
IVA USER GUIDE PAGE 1	7-Nov-2019 (Am 161)
IVA USER GUIDE PAGE 2	7-Nov-2019 (Am 161)
PRM USER INSTRUCTIONS	17-Jun-2021 (Am 167)
SID SYDNEY TWO DEPARTURE (RADAR)	24-Mar-2022 (Am 170)
SID RWY 34L SOUTH WEST DEP (JET)	24-Mar-2022 (Am 170)
SID RWY 16R DEENA SEVEN (JET) (RNAV)	24-Mar-2022 (Am 170)
SID RWY 34R ENTRA FIVE (JET) (RNAV)	24-Mar-2022 (Am 170)
SID RWY 07 FISHA EIGHT (JET) (RNAV)	24-Mar-2022 (Am 170)
SID RWY 16R KAMPI FIVE (RNAV)	24-Mar-2022 (Am 170)
SID RWY 16L KEVIN SIX (RNAV)	24-Mar-2022 (Am 170)
SID RWY 16L ABBEY THREE (JET) (RNAV)	16-Jun-2022 (Am 171)
SID RWY 34R MARUB SIX (JET) (RNAV)	24-Mar-2022 (Am 170)
SID RWY 34L RICHMOND FIVE DEP (JET)	24-Mar-2022 (Am 170)
STAR BOREE THREE A ARRIVAL (RNAV)	24-Mar-2022 (Am 170)
STAR BOREE THREE P ARRIVAL (RNAV)	24-Mar-2022 (Am 170)

Chart	*Effective Date (Amdt No)*
STAR MEPIL THREE ARRIVAL (RNAV)	24-Mar-2022 (Am 170)
STAR MARLN FIVE ARRIVAL (RNAV)	24-Mar-2022 (Am 170)
STAR ODALE SEVEN ARRIVAL (RNAV)	24-Mar-2022 (Am 170)
STAR RIVET THREE ARRIVAL (RNAV)	24-Mar-2022 (Am 170)
ILS OR LOC RWY 07	7-Nov-2019 (Am 161)
ILS OR LOC RWY 16L PAGE 1	9-Sep-2021 (Am 168)
ILS RWY 16L PAGE 2	9-Sep-2021 (Am 168)
ILS OR LOC RWY 16R PAGE 1	9-Sep-2021 (Am 168)
ILS RWY 16R PAGE 2	9-Sep-2021 (Am 168)
ILS OR LOC RWY 25	17-Jun-2021 (Am 167)
ILS OR LOC RWY 34L PAGE 1	9-Sep-2021 (Am 168)
ILS RWY 34L PAGE 2	9-Sep-2021 (Am 168)
ILS OR LOC RWY 34R PAGE 1	8-Sep-2022 (Am 172)
ILS RWY 34R PAGE 2	8-Sep-2022 (Am 172)
RNP RWY 07	9-Sep-2021 (Am 168)
RNP RWY 16L	8-Sep-2022 (Am 172)
RNP RWY 16R	8-Sep-2022 (Am 172)
RNP RWY 25	9-Sep-2021 (Am 168)
RNP RWY 34L	8-Sep-2022 (Am 172)
RNP RWY 34R	8-Sep-2022 (Am 172)
GLS RWY 07	7-Nov-2019 (Am 161)
GLS RWY 16L	9-Sep-2021 (Am 168)
GLS RWY 16R	9-Sep-2021 (Am 168)
GLS RWY 25	17-Jun-2021 (Am 167)
GLS RWY 34L	9-Sep-2021 (Am 168)
GLS RWY 34R	8-Sep-2022 (Am 172)

Last Modified: 2022-08-16

Source: AIP Book (08-Sep-2022 to 30-Nov-2022) via http://www.airservicesaustralia.com/aip/aip.asp?pg=10