



# **Harbourside Shopping Centre, Darling Harbour (SSD 7874) Amended Stage 1 DA — Assessment of Airspace Approvability**

Version 1.0 FINAL

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**strategic  
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**Mirvac Projects**

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Document Title: **Harbourside Shopping Centre, Darling Harbour  
(SSD 7874) Amended Stage 1 DA — Assessment of  
Airspace Approvability**

Purpose / Abstract: *This report provides a response to submissions (as relevant) and an assessment of the proposed amended Concept Proposal in relation to the State Significant Development (SSD) Development Application (DA) for the redevelopment of the Harbourside Shopping Centre (SSD 7874).*

*The SSD DA was publicly exhibited for a second time from 2 April to 29 April 2020. During this time, six (6) submissions were received from government agencies and City of Sydney Council and 57 submissions were received from the general public and organisations.*

*This report should be read in conjunction with previous assessments prepared by Strategic Airspace (StratAir) dated 11th October 2016 to support the Harbourside Concept Proposal.*

*This report assesses the current regulated height constraints over the proposed site of the HSC in Darling Harbour and considers the approvability of the amended Concept Proposal — based on a maximum height of 166.95m AHD — under the Airports (Protection of Airspace) Regulations (APAR).*

- *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, Cities and Regional Development (DITCRD).*
- *Because the top height 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 (the RTCC, 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 DITCRD when evaluating the feasibility of constructing the proposed building prior to making a determination. Given the substantial clearance margin between the top of the proposed development and the limiting RTCC height there is a substantial margin for crane operations, so this factor would not be considered an impediment to approval under the 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.*

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## 1. Introduction & Executive Summary

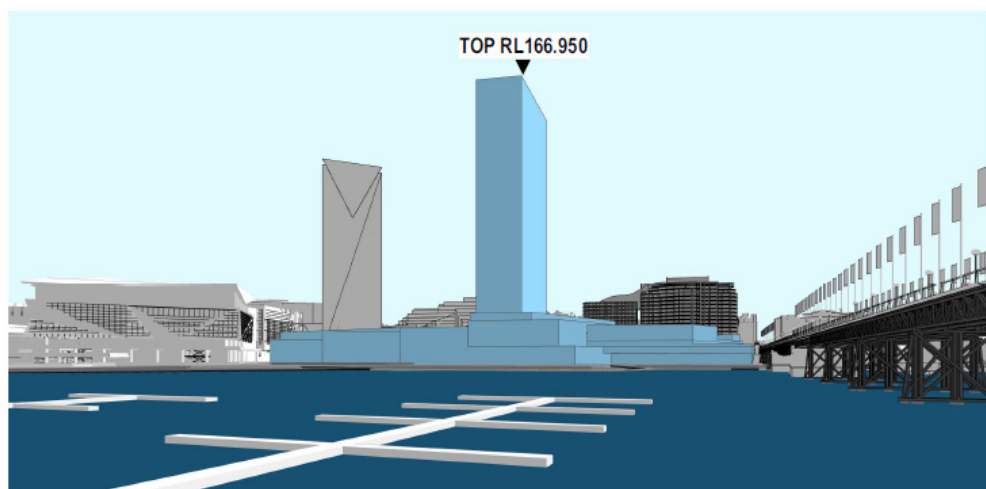
This report provides a response to submissions (as relevant) and an assessment of the proposed amended Concept Proposal in relation to the State Significant Development (SSD) Development Application (DA) for the redevelopment of the Harbourside Shopping Centre (SSD 7874).

The SSD DA was publicly exhibited for a second time from 2 April to 29 April 2020. During this time, six (6) submissions were received from government agencies and City of Sydney Council and 57 submissions were received from the general public and organisations.

This report should be read in conjunction with previous assessments prepared by Strategic Airspace (StratAir) dated 11<sup>th</sup> October 2016 to support the Harbourside Concept Proposal.

As part of this Amended Stage 1 Development Application (DA), the height of the tower has been increased to be consistent with the height originally proposed (from RL 153.75 to **RL 166.95**). The tower height has been increased in order to better align with the place outcomes identified within the Draft Pyrmont Place Strategy for Harbourside. This opportunity for additional height is supported by the provision of additional public benefit through the creation of a new significant public accessible area of open space on the northern podium rooftop

*Figure 1-1: Further and Final Amended Concept Proposal*



The location of the proposed development is on the western side of Darling Harbour, in close proximity to the Sydney CBD. The site is offset approximately 2.8km from the centreline of Sydney Airport's eastern parallel runway, Runway (RWY) 16L/34R, and approximately 8.5km (4.6 NM) from the 'centre' of the airport. This report examines the current and forecast regulated airspace height constraints overhead the site that are related to aviation airspace protection requirements under the Airports (Protection of Airspace) Regulations 1996 (APAR) and which would:

- Trigger the requirement to apply for an airspace height approval; and
- Constrain the maximum permissible building envelope heights.

The effect of each of the relevant airspace limitation types on maximum permissible building heights is summarised in the following table.

**Table 1-1: Summary of Aviation-Related Height Constraints**

<i>Height Limits (Metres AHD)</i>	<i>Limit Detail</i>	<i>Comment</i>
<b>156</b>	OLS Outer Horizontal Surface	THRESHOLD HEIGHT limit: As the tower of the Concept Proposal would exceed this height, it would require an 'airspace height' approval under the Airports (Protection of Airspace) Regulations (APAR) from the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) prior to construction.
<b>166.95</b>	<b>Proposed Maximum Development Height</b>	Proposed maximum height of the tower envelope in the Concept Proposal.
<b>243.84</b>	RTCC above the Darling Harbour site	<b>This is the maximum building height that would be approved by the aviation authorities.</b> <b>The maximum proposed height of the development is clear of (below) the limiting surface.</b>
< 243.84	Recommended Max Crane Height no higher than RTCC limit	Cranes that infringe the RTCC surface height, but below the PANS-OPS surface limit, could potentially be approved, but if approved would most likely be subject to a range of time and operational conditions.
<b>PANS-OPS &amp; Other Airspace-related Surface Height Constraints</b>		
<i>Other height constraints are higher than the RTCC height limit and are therefore omitted from this summary.</i>		

As can be seen from the above table, the proposed maximum tower height is well below the current maximum allowable height imposed by the RTCC surface. The margin of almost 77m, between the proposed maximum tower height and the constraining RTCC surface height limit at the site, leaves considerable room for cranes that would need to be erected for the construction of the tower.

Therefore, based on this assessment, **we believe that there is no technical impediment to approval of the development as proposed, and that an application under the Airports (Protection of Airspace) Regulations, supported by a full aeronautical assessment and safety case would be approved by the Department of Infrastructure, Transport, Regional Development and Communications (DITRDC).**



## 2. Proposed Amended Development

Following the second exhibition of the proposal in April 2020 and given the nature and range of submissions made from agencies and the public, Mirvac has again reviewed the overall approach and elements of the Concept Proposal. This has accordingly led to developing a Further Amended Concept Proposal. This further and final Concept Proposal therefore includes amendments made by Mirvac pursuant to Clause 55 of the Environmental Planning & Assessment Regulation, in the main to address matters raised in the submissions and to deliver an overall significantly improved outcome on the site and for the broader Darling Harbour precinct and Pyrmont Peninsula.

In addition to the further amendments made to the Concept Proposal, Mirvac are also now including detailed Stage 1 Early Works, comprising demolition of existing site improvements down to ground slab level (no ground disturbance). Revised SEARs were accordingly issued by the Department on 12 May 2020.

The following further key amendments have been made to the Concept Proposal since its April 2020 public exhibition:

### **Increase in Height of the Tower**

The height of the tower has been increased to be consistent with the height originally proposed (from RL 153.75 to RL 166.95). The tower height has been increased in order to better align with the place outcomes identified within the Draft Pyrmont Place Strategy for Harbourside. This opportunity for additional height is supported with the provision of additional public benefit through the creation of a new significant public accessible area of open space on the northern podium rooftop.

### **Reduction in Height of the Northern Podium**

A portion of the podium height at its northern extent has been further reduced from RL 25 to part RL 17.6 and part 13.75. The reduction in height provides for an improved relationship to the state heritage listed Pyrmont Bridge, further improve view sharing from 50 Murray Street, along with providing an opportunity to create a new publicly accessible open space area.

### **Gross Floor Area / Land Use Mix**

The amended proposal retains the same overall 87,000sqm of GFA, however there is a minor adjustment in the split between non-residential and residential. The final proposal now includes:

- Non-residential uses floor space – 45,000sqm; and
- Residential uses floor space – 42,000sqm

In response to market demand and the focus of local and regional strategic planning policies, it is proposed for the podium to now include predominantly commercial land uses along with supporting retail. Indicatively, comprising ~28,000sqm net lettable area of commercial office and ~8,500sqm gross lettable area of retail.

The podium enables large campus sized commercial floor plates that are favoured by large multinational tech, media, finance and professional services companies.

### **Apartment numbers**

No change is proposed to the indicative number of apartments (357), with the minor increase in the tower height resulting in a review of the mix and sizing of apartments. Note, this yield is on the 'Indicative Design' only and will be subject to future design development

and a Stage 2 DA. This Stage 1 DA only seeks approval for land uses and the building envelope comprising a total of 87,000sqm GFA.

### **Car Parking**

The overall footprint of the basement has been reduced, but there is proposed to be an additional basement level of parking (increase from 3 levels to 4 levels). There is no change to proposed indicative parking spaces, remaining at 306 spaces. As above, this is based on the 'Indicative Design' only.

### **Landscaped Open Space and Public Domain**

The key concepts and public benefits as originally proposed are retained under the amended Concept Proposal, with the addition of a new significant area of publicly accessible open space created on the rooftop of the northern podium (referred to as "Guardian Square").

### **Final Description of Development**

The Harbourside Shopping Centre Redevelopment application will include a Concept Proposal and detailed Stage 1 Early Works.

The final Concept Proposal seeks approval for the following key components and development parameters:

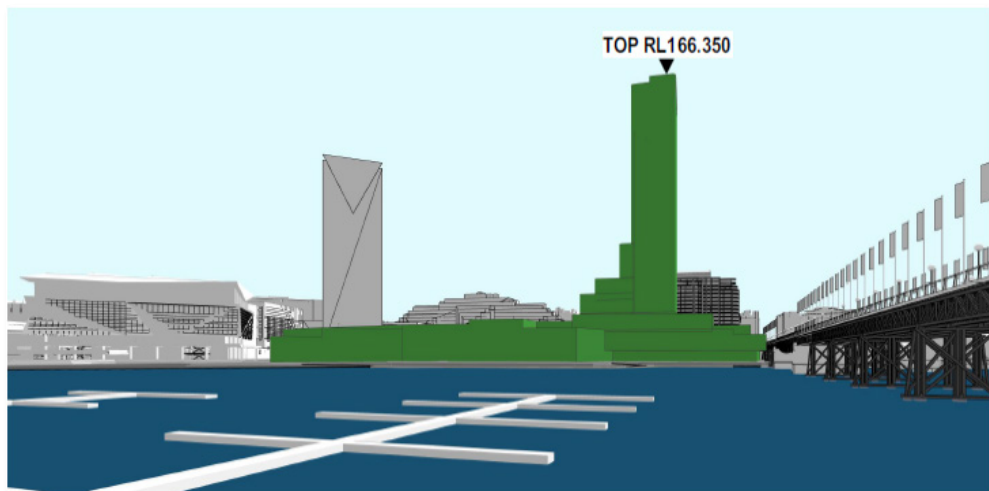
- A network of open space areas and links generally as shown within the Public Domain Concept Proposal, to facilitate re-integration of the site into the wider urban context;
- Building envelopes;
- Land uses across the site, non-residential and residential uses;
- A maximum total Gross Floor Area (GFA) across the Harbourside site of 87,000sqm for mixed use development (45,000sqm non-residential and 42,000sqm residential development);
- Basement car parking;
- Car parking rates to be utilised in subsequent detailed (Stage 2) Development Applications);
- Urban Design and Public Realm Guidelines to guide future development and the public domain; and
- Strategies for utilities and services provision, drainage and flooding, and ecological sustainable development.

The Stage 1 Early Works comprises:

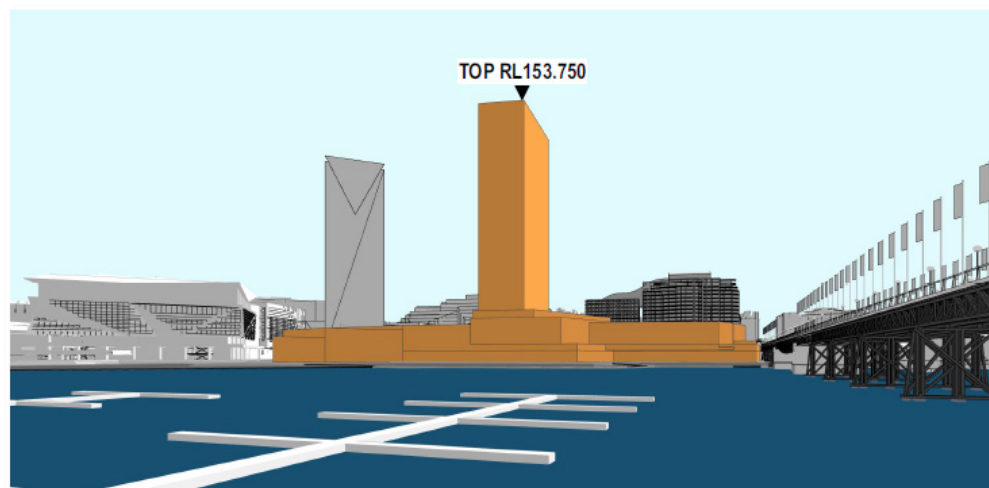
- Demolition of the existing site improvements, including the Harbourside Shopping Centre, obsolete monorail infrastructure, and associated tree removal.

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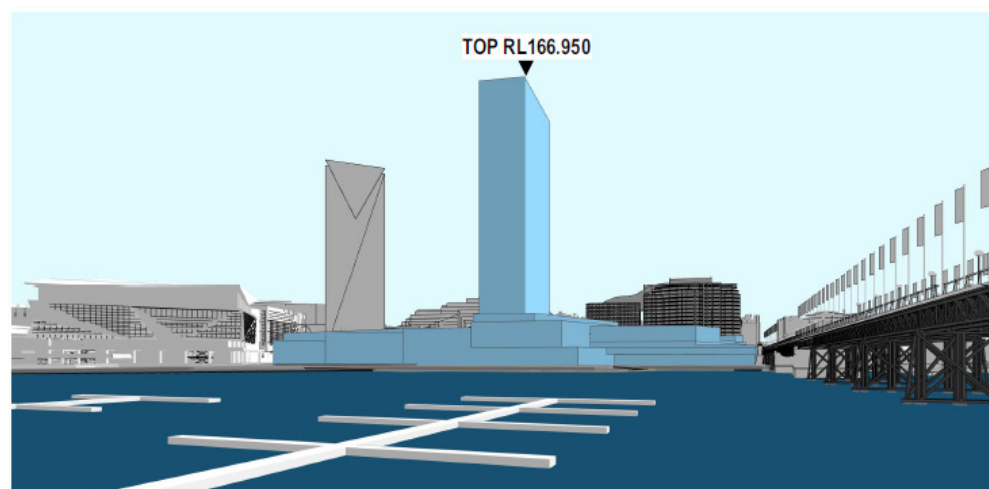
*Figure 2-1: Original submitted Concept Proposal*



*Figure 2-2: Amended Concept Proposal*



*Figure 2-3: Further and Final Amended Concept Proposal*

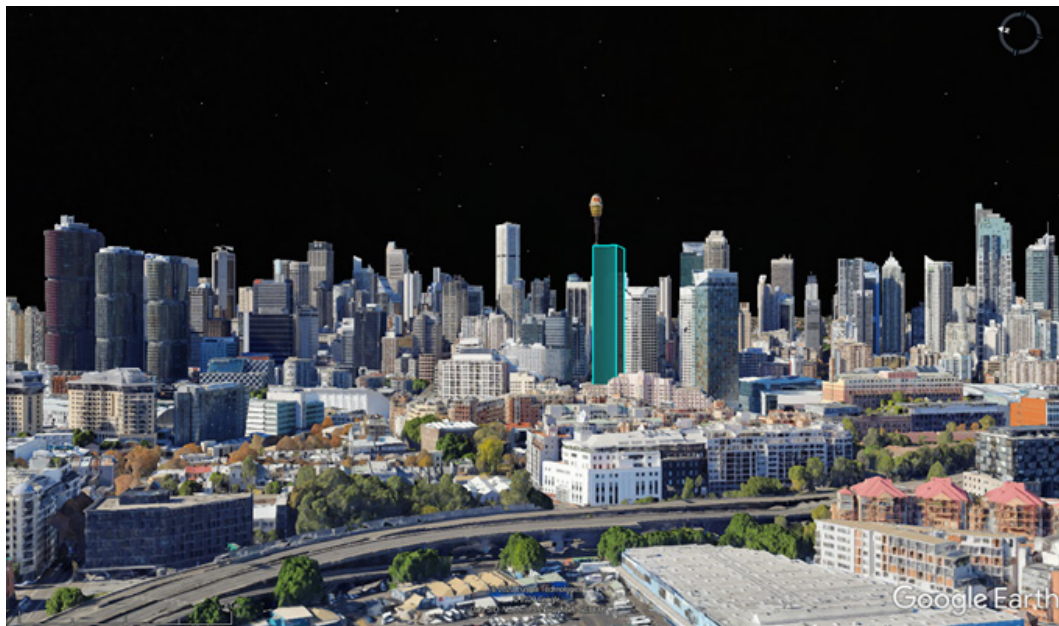


## 3. Context

### 3.1 Location of the Proposed Development

The location of the proposed development is on the foreshore of Darling Harbour and adjacent to the western end of the footbridge across Darling Harbour. The proposed development is in close proximity to the central business district of the city of Sydney. The site's proximity to the city is important because the protection surfaces for landings and departures have to clear taller buildings in the centre of the city; so most of the procedures that could affect the building height are well clear of the proposed height.

*Figure 3-1: Concept Proposal Tower Envelope with City Skyline*



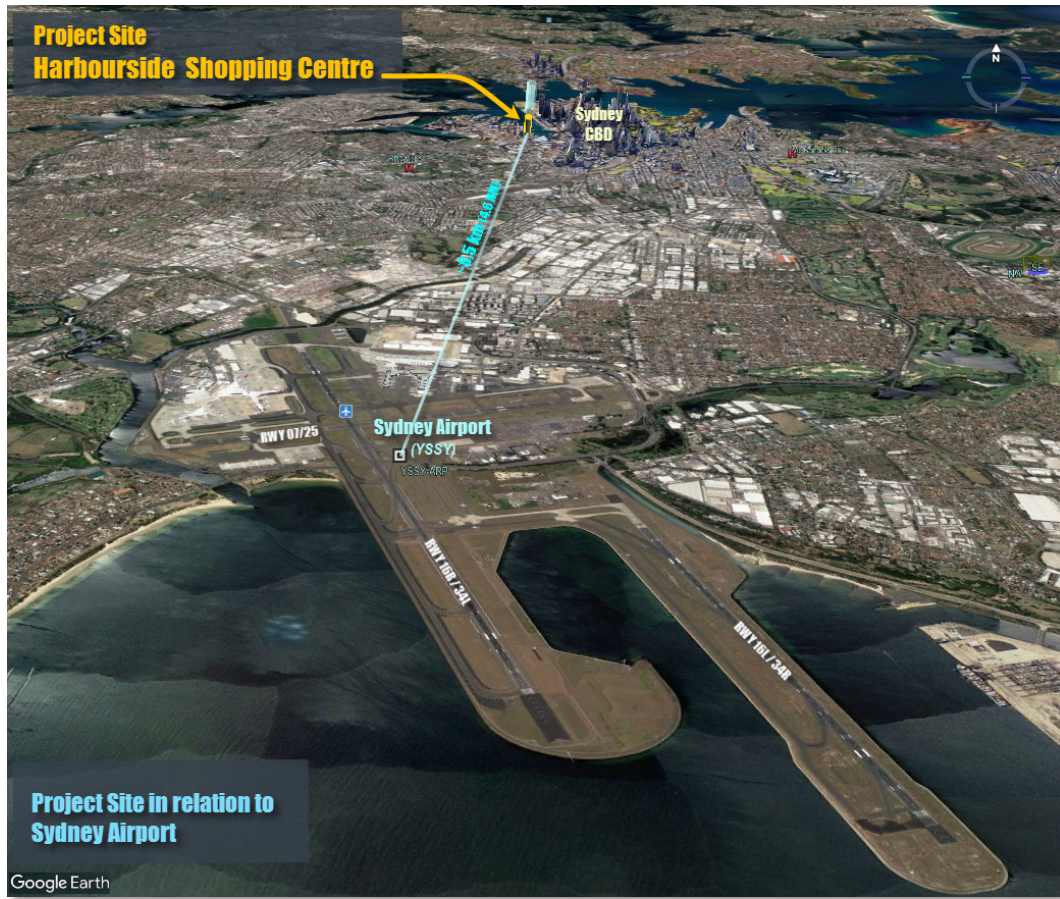
The site lies to the north-north-east of Sydney Airport, approximately 8.5km (4.6 Nautical Miles, NM) from the aerodrome reference point (ARP) — as indicated in Figure 3-2 below.

It is approximately 2.8km (1.5 NM) offset from the extended centreline of the eastern parallel runway, RWY 16L/34R, which in aviation terms is relatively close. Because of this, surfaces protecting landing procedures from the north and departure procedures to the north impose airspace restrictions on the proposed development.

The site is not affected by protection surfaces related to flight procedures to/from other runways at Sydney Airport.



Figure 3-2: Site in Relation to Sydney Airport



The other airports in the Sydney Basin are too distant from the proposed development to have any impact on the airspace surrounding it.

## 3.2 Methodology

The methodology used to determine the maximum building height (or minimum airspace height limitation) above the development site takes into consideration each of the following.

### 3.2.1 Airspace Regulations

The proposed development site is subject to the Airports (Protection of Airspace) Regulations (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 DITRDC 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 DITRDC 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).

### 3.2.2 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 and Communications (DITRDC) — 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 either permanent or temporary buildings or structures. However, for a variety of reasons, PANS-OPS surfaces can and do change over time.
  - 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.

For: Mirvac

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

### 3.2.3 Note about Heights: Australian Height Datum (AHD) vs Above Ground Level (AGL)

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<sup>AHD</sup> should be subtracted from the airspace height limits<sup>AHD</sup>.

It is assumed that building heights expressed as 'RL's in metres, as provided by the proponent's technical consultants, are the equivalent of heights in metres AHD.

Note also for aviation-related airspace height limits, any building height approval under the Airports (Protection of Airspace) Regulations is regarded as inclusive of the building itself, plus all rooftop furniture and overruns (plant buildings, lift risers, antennae, etc).

## 4. Analysis

### 4.1 Impact Summary

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

**Table 4-1: Hierarchy of Height Limitations & Proposed Max Development Height Impact**

Height Limits (Metres AHD)	Limit Detail	Clearance / Infringement	Comment
<b>156</b>	OLS Outer Horizontal Surface	- 10.95	THRESHOLD HEIGHT limit: As the tower of the Concept Proposal would exceed this height, it would require an 'airspace height' approval under the Airports (Protection of Airspace) Regulations (APAR) from the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) prior to construction.
<b>166.95</b>	<b>Proposed Maximum Development Height</b>		Proposed maximum height of the tower envelope in the Concept Proposal.
<b>243.84</b>	RTCC above the Darling Harbour site	<b>76.89</b>	This is the maximum building height that would be approved by the aviation authorities. The maximum proposed height of the development is clear of (below) the limiting surface.
< 243.84	Recommended Max Crane Height no higher than RTCC limit	<b>≥ 76.9</b>	Cranes that infringe the RTCC surface height, but below the PANS-OPS surface limit, could potentially be approved, but if approved would most likely be subject to a range of time and operational conditions.
<b>PANS-OPS &amp; Other Airspace-related Surface Height Constraints</b> <i>Other height constraints are higher than the RTCC height limit and are therefore omitted from this summary.</i>			

### 4.2 OLS Analysis

The height limit of Sydney Airport's OLS above the site is imposed by the OLS Outer Horizontal Surface, as depicted in Figure 4-1 below.

**Table 4-2: OLS Height Impact & APAR Application Implications**

Assessment Height (m AHD)	OLS Height		Approvability Comment
	Surface Height	Clearance / Infringement	
166.95	156.0	- 10.95	As the max envelope height infringes the OLS, the Tower building would require prior approval under APAR; approval being subject to the maximum height being below the most limiting PANS-OPS or RTCC surface height.

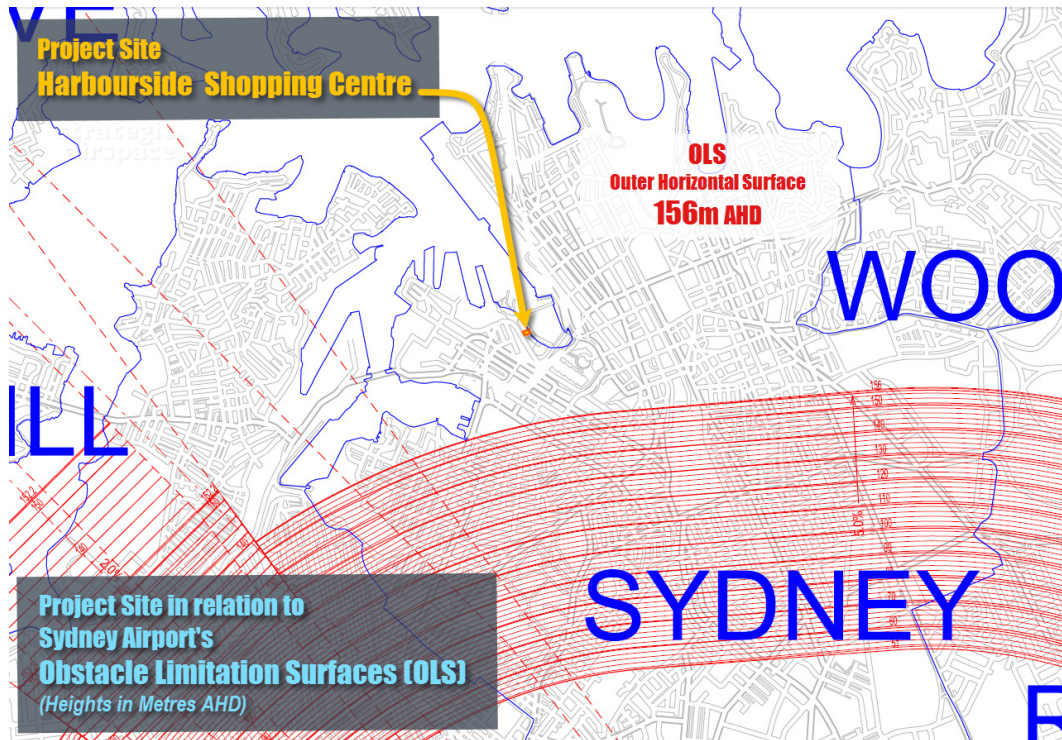
Similar or greater penetrations of the OHS are quite common, particularly in the nearby Sydney CBD, and are generally considered acceptable. However, any infringement of the OLS triggers the requirement under the APAR for approval, by the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications, of the Concept Proposal to the proposed maximum height.



For: Mirvac

Failure to obtain such approval before construction commences can result in significant penalties under the Airports Act (1996).

Figure 4-1: Site in Relation to Sydney Airport's OLS



### 4.3 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 164 (effective 13-Aug-2020 to 04-Nov-2020).

- 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

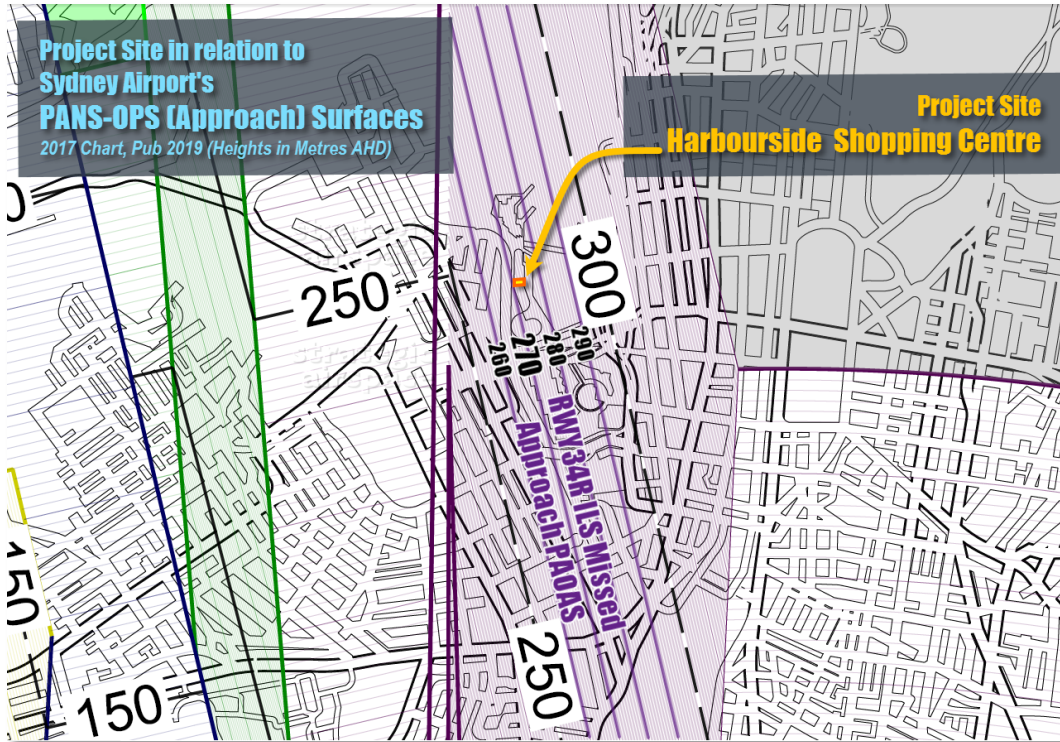
The site in relation to the PANS-OPS surfaces shown on Sydney Airport's 2017 chart is shown for information. The limiting surface, at the time the chart was drawn, was that related to the parallel runway obstacle assessment surfaces (PAOAS) in the missed approach of the precision approach (ILS/GLS) approach procedures to RWY34R.

Due to the coarseness of the street boundary data shown on the chart, it is not possible to determine the height limit according to that chart precisely — but it indicates that the constraining height at the closest point of the proposed envelope would be approximately 270m± AHD.

The StratAir analysis of current flight procedures determined that the site is laterally outside the protection surfaces related to the northern approaches to the right parallel runway (ie, to RWY16L), to all procedures related to the western parallel runway (RWY 16R/34L) and those of the short cross runway (RWY 07/25). It is below the protection surfaces for the departure procedure from RWY34R. Below is an overview of the restrictions based on the

assessment of the site in relation to the PANS-OPS Instrument Flight Procedures (IFPs) currently published by Airservices Australia (refer also to Appendix 2 — PANS-OPS Procedures).

Figure 4-2: Site in Relation to Sydney Airport's PANS-OPS (Approach) Surfaces



It is only necessary to consider those procedures that use RWY 16L/34R. The effect that each of these procedures has upon the maximum allowable building height (including cranes) is shown in the table below.

Table 4-3: PANS-OPS Height Constraints

Procedure	Height Limit (m AHD)	Description
Circling	N/A	Outside the Circling area protection surface.
RWY 16L ILS / GLS Approach	N/A	Outside the Basic ILS surfaces.
RWY 16L RNAV GNSS Approach	N/A	Outside the RNAV GNSS protection areas.
<b>RWY 34R ILS / GLS Approach</b>	<b>~ 270</b>	As indicated in Figure 4-2 above, the site is under the ILS Missed Approach protection area. As depicted, the height limitations vary across site. Calculations of the published PANS-OPS instrument flight procedure indicate that the limiting height is higher than the 270m indicated in the airport's chart.
RWY 34R Departure	~340	The Omnidirectional Radar Departure from RWY34R is the constraining Departure procedure.
Minimum Sector Altitude (MSA) — 10NM Inner Sector	~ 335	The relevant sector is the inner 10NM sector around the airport, which has a 2100ft minimum flight altitude. Covers the entire site. This surface height is based on a conservative minimum obstacle clearance of 1000ft instead of the ICAO value of 300m.
STARs	> 335	Outside the lateral protection areas or too high overhead to have any impact on the proposed development.

**Table 4-4: Proposed Envelope in relation to the Most Limiting PANS-OPS Surface Height**

Assessment Height (m AHD)	PANS-OPS		Approvability Comment
	Most Limiting Surface Height	Clearance / Infringement	
166.95	~ 270	~ 103	Based on the lowest PANS-OPS surface height — in this case related to the RWY 34R ILS/GLS Missed Approach (refer Table 4-3 above).

## 4.4 Other Assessment Considerations

The following table provides a brief assessment of other considerations.

**Table 4-5: Other Assessable Height Limitations**

Procedure	Height Limit (m AHD)	Description
<b>Radar Terrain Clearance Chart (RTCC)</b>	<b>243.84</b>	Refer section 4.4.1 and Figure 4-3 below.
Navigation Infrastructure	N/A	The proposed development is too far from the airport to affect any navigation infrastructure.
Airlines Engine Out Procedures	N/A	Engine Out procedures (from RWY 34R, the closest take-off runway end) either turn to the east well before the city or well after the city. The Darling Harbour site is outside or below the protection areas for Engine Out Procedures. In this case, the location of the site in relation to the taller buildings in the nearby CBD and the airport means that aircraft must clear the buildings in the CBD.
Helicopter Procedures related to the Nearest Strategic Helicopter Landing Site (SHLS)	N/A	There are no nearby hospital-related SHLS that would be adversely affected by the development. Any other helicopter traffic that traverses the CBD must maintain visual clearance from any obstacles, including existing tall buildings.

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

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

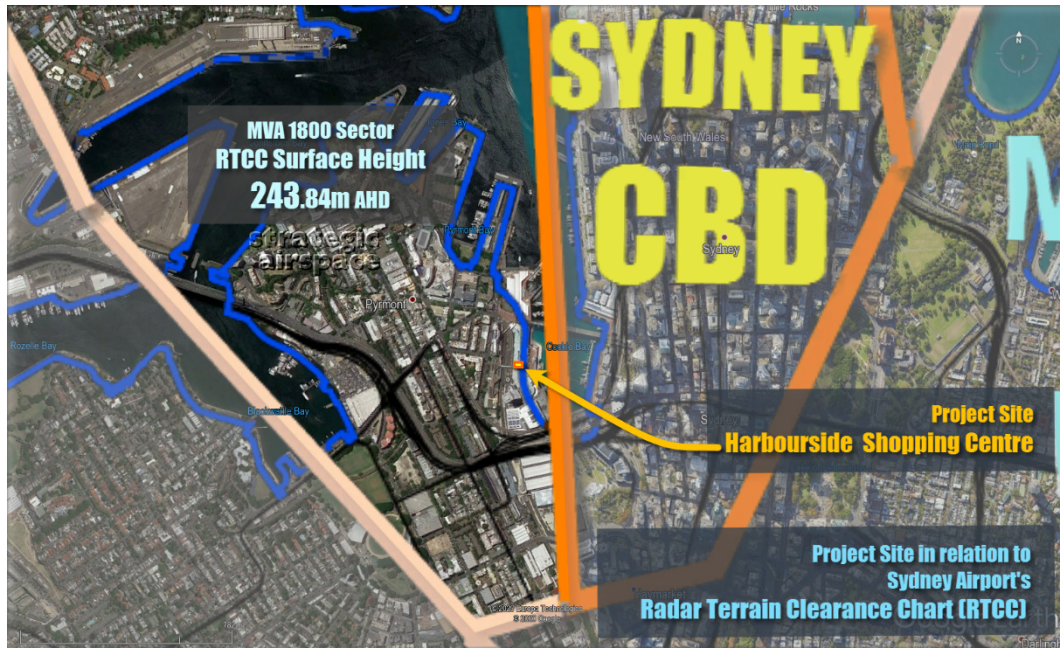
The Radar Terrain Clearance Chart (RTCC) overhead the site protects the airspace used by air traffic controllers as the lowest Minimum Vector Altitude (MVA) they can use for vectoring aircraft. The RTCC surface height limit overhead the entire study area is 243.84m AHD — but on Sydney Airport's RTCC chart they use the value rounded up to the nearest metre, 244m AHD.

**Table 4-6: Proposed Envelope in relation to the RTCC Surface Height**

Assessment Height (m AHD)	RTCC (1800ft MVA Sector)		Approvability Comment
	Surface Height (880 ft)	Clearance / Infringement	
166.95	243.84	76.89	Substantial clearance above the maximum envelope height. The clearance margin is also sufficient for crane operations.



Figure 4-3: Radar Terrain Clearance Chart (RTCC) Height Constraint



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. The clearance margin above envelope is also considered sufficient space for cranes that would ultimately be required for construction.

## 5. Crane Considerations

This section is provided for advance information only.

As noted above, the primary purpose of this report is to demonstrate that the proposed building will not infringe PANS-OPS airspace and is beneath the overhead RTCC surface, and therefore it satisfies the requirements to be granted a height approval under the APAR.

When evaluating a height application for most tall buildings and those where the maximum proposed building height is close to the limiting height, it is now common practice by DITRDC to also evaluate the feasibility of construction by assessing whether or not the cranes needed for construction could also (in the future, at the time of separate application(s) for cranes) be considered approvable under the APAR.

Under the APAR, cranes which would exceed the PANS-OPS 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 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.

The case is slightly more complex where the RTCC surface height is lower than the PANS-OPS surface height limits. In such cases it is possible that cranes may be permitted to exceed the RTCC surface height, as long as it does not infringe the PANS-OPS height, noting that in such circumstances it is also probable that the cranes would be required to be lowered below the RTCC surface height at night and during times of low visibility.

Cranes which would not exceed the RTCC surface height (where it is lower than the limiting PANS-OPS surface height) may be permitted to operate longer than the 3-month period, subject to the agreement of Sydney Airport.

Analysis of the planning proposal shows that the clearance margin above the top of the proposed envelope that is more than sufficient for cranes to operate at heights which would not infringe the RTCC surface height. In this case, this means that:

- Approval under the APAR of height applications for cranes required for construction could be reasonably anticipated; and
- It is likely that such approvals would not be subject to the 3-month operating time limit conditions, subject to the agreement of Sydney Airport.

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.

## 6. Potential Conditions of Approval

In the event that an application for a development under the APAR is granted, the approval may include a number of conditions of approval. These may include items such as:

- The requirement to install and operate obstacle lights on the top of the building or new facilities, in accordance with the specifications of Manual of Standards (MOS) Part 139. Recommendations in this regard would be made by the Civil Aviation Safety Authority (CASA) to DITRDC.
- Provision of as-built survey coordinate and height data to Sydney Airport upon completion of the development.

An approval for temporary cranes may be granted subject to fairly standard crane marking and lighting conditions.

## 7. Conclusion

The OLS Outer Horizontal Surface, is lower than (ie, infringed by) the planned maximum top elevation of the planning envelope. As such, the tower would require approval as a Controlled Activity under the APAR from DITRDC prior to construction. However, as the maximum height of the proposed envelope is well below the most limiting of the PANS-OPS and Radar Terrain Clearance Chart surface heights, the planning proposal can be regarded as technically approvable under the APAR. Use of this report (or a future updated version) as an attachment to such an application for height approval would help to fulfil application requirements.

Given the location of the tower in the Sydney CBD, its proximity to the existing tower 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, there is no technical reason why an airspace approval for the proposed building, under the Airports (Protection of Airspace) Regulations, would not be granted. An approval for the development is likely to contain condition for installation of obstacle lights.

At the latest, an approval under APAR is required prior to intrusion into the prescribed airspace (ie, before the development infringes the OLS). However, most local councils now require such an approval prior to (or as a consent condition of) approval of a Development Application. It is typically not required for approval of a rezoning application. The NSW Department of Planning, Industry and Environment may not require a height approval until a Stage 2 DA is submitted.

Separate applications for cranes that would infringe the OLS would also be required in the future. The advantage of doing separate applications at a time closer to construction is that more final information on the actual crane requirements (including maximum heights, locations and staging) will be available as a result of more resolved construction planning.

**In summary, based on this preliminary 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:

<i>Abbreviation</i>	<i>Meaning</i>
AC	Advisory Circular (document supporting CAR 1998)
ACFT	Aircraft
AD	Aerodrome
ADS-B	Automatic Dependent Surveillance – Broadcast: an aircraft location identification and tracking service facilitated by satellite signals and ground tracking stations, similar to (but more accurate than) radar
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
APACL	Australia Pacific Airports Corporation Limited, owner of Melbourne and Launceston Airports
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)
BAC	Brisbane Airport Corporation
BAL	Bankstown Airport Limited
BCC	Brisbane City Council
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
CNS/ATM	Communications, Navigation, Surveillance / Air Traffic Management
CPA	Cairns Port Authority, Operators Of Cairns Airport
DA (Aviation)	Decision Altitude (Aviation)
DA (Planning)	Development Application or Development Approval (Planning)
DAH	Designated Airspace Handbook

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<i>Abbreviation</i>	<i>Meaning</i>
DAP	Departure and Approach Procedures (published by AsA)
DEP	Departure
DER	Departure End (of the) Runway
DEVELMT	Development
DH	Decision Height
DITRDC / DITRDC / DITRDC	Department of Infrastructure, Transport, Regional Development & Communications (since Dec-2019) Formerly the Department of Infrastructure, Regional Development (& Cities) (sometimes also abbreviated as Infrastructure)
DME	Distance Measuring Equipment
Doc nn	ICAO Document Number nn
DoD	Department of Defence
DODPROPS	Dependent Opposite Direction Parallel Runway Operations
DPIE	NSW Department of Planning, Industry & Environment
EIS	Environmental Impact Study
ELEV	Elevation (above mean sea level)
ENE	East North East
ERSA	EnRoute Supplement Australia
ESE	East South East
FACS	NSW Family & Community Services — formerly part of LaHC, but since July 2019 part of the NSW Department of Communities & Justice (DCJ)
FAF	Final Approach Fix
FAP	Final Approach Point
Ft	Feet
GBAS	Ground-Based Augmentation System, a GNSS augmentation system to provide vertical guidance and additional precision to non-precision approaches — permits GLS Approaches
GDA94	GDA is the Geocentric Datum of Australia. It has been implemented as the standard datum since 1994.
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)
LaHC	NSW Land and Housing Corporation, part of the NSW DPIE
LAT	Latitude

<i>Abbreviation</i>	<i>Meaning</i>
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
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
NPR	New Parallel Runway (Project, Brisbane Airport)
OAR	Office of Airspace Regulation
OCA	Obstacle Clearance Altitude (in this case, in AMSL)
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
RAPAC	Regional Airspace users Advisory Committee
REF	Reference
RL	Relative Level
RNAV	aRea NAVigation
RNP	Required Navigation Performance
RPA	Rules and Practices for Aerodromes — replaced by the MOS Part 139 — Aerodromes

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<i>Abbreviation</i>	<i>Meaning</i>
RPT	Regular Public Transport
RTCC	Radar Terrain Clearance Chart (refer also MVA)
RWY	Runway
SACL	Sydney Airport Corporation Limited
SID	Standard Instrument Departure
SODPROPS	(Independent) Simultaneous Opposite Direction Parallel Runway Operations
SPP	State Planning Policy, Queensland (specifically SPP 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities)
SSDA	State Significant Development Application
SSP	State Significant Precinct
SSR	Secondary Surveillance Radar
STAR	STandard Arrival
STODA	Supplementary Take-Off Distance Available
TAR	Terminal Approach Radar
TAS	True Airspeed
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 <sub>n</sub>	Aircraft critical velocity reference
VNAV	Vertical Navigation
VOR	Very high frequency Omni-directional Range
VSS	Visual Segment Surface
WAC	Westralia Airports Corporation, operators of Perth Airport
WAM	Wide-Area Multilateration
WNW	West North West
WSW	West South West
WGS84	World Geodetic System 1984
WSA	Western Sydney Airport – the proposed second international airport for the Sydney Basin





## APPENDIX 2 — PANS-OPS PROCEDURES

The versions of the IFPs consulted were from the AIP Amendment 164, effective from 13-Aug-2020 to 04-Nov-2020, current 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 164 – Effective 13-Aug-2020 to 04-Nov-2020)**

## SYDNEY (YSSY)

Name of Chart	Effective Date	(Amdt No)
<a href="#">AERODROME CHART PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">AERODROME CHART PAGE 2</a>	13-Aug-2020	(Am 164)
<a href="#">APRON CHART - INTERNATIONAL PAGE 1</a>	21-May-2020	(Am 163)
<a href="#">APRON CHART - INTERNATIONAL PAGE 2</a>	13-Aug-2020	(Am 164)
<a href="#">APRON CHART - DOMESTIC PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">APRON CHART - DOMESTIC PAGE 2</a>	13-Aug-2020	(Am 164)
<a href="#">APRON CHART - DOMESTIC PAGE 3</a>	13-Aug-2020	(Am 164)
<a href="#">STANDARD DOMESTIC TAXI ROUTES - ARRIVALS</a>	7-Nov-2019	(Am 161)
<a href="#">STANDARD DOMESTIC TAXI ROUTES - DEPARTURES</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 2</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 3</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 4</a>	21-May-2020	(Am 163)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 5</a>	21-May-2020	(Am 163)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 6</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 7</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 8</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 9</a>	7-Nov-2019	(Am 161)
<a href="#">NOISE ABATEMENT PROCEDURE PAGE 10</a>	7-Nov-2019	(Am 161)
<a href="#">AIRPORT EFFICIENCY PROCEDURES</a>	7-Nov-2019	(Am 161)
<a href="#">IVA USER GUIDE PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">IVA USER GUIDE PAGE 2</a>	7-Nov-2019	(Am 161)
<a href="#">PRM USER INSTRUCTIONS</a>	21-May-2020	(Am 163)
<a href="#">SID SYDNEY TWO DEPARTURE (RADAR)</a>	21-May-2020	(Am 163)
<a href="#">SID RWY 34L SOUTH WEST DEP (JET)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 16R DEENA SEVEN (JET) (RNAV)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 34R ENTRA FIVE (JET) (RNAV)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 07 FISHA EIGHT (JET) (RNAV)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 16R KAMPI FIVE (RNAV)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 16L KEVIN SIX (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">SID RWY 16L ABBEY THREE (JET) (RNAV)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 34R MARUB SIX (JET) (RNAV)</a>	7-Nov-2019	(Am 161)
<a href="#">SID RWY 34L RICHMOND FIVE DEP (JET)</a>	7-Nov-2019	(Am 161)
<a href="#">STAR BOREE TWO A ARRIVAL (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">STAR BOREE TWO P ARRIVAL (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">STAR MEPIL THREE ARRIVAL (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">STAR MARLN FIVE ARRIVAL (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">STAR ODALE SEVEN ARRIVAL (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">STAR RIVET THREE ARRIVAL (RNAV)</a>	21-May-2020	(Am 163)
<a href="#">ILS OR LOC RWY 07</a>	7-Nov-2019	(Am 161)
<a href="#">ILS OR LOC RWY 16L PAGE 1</a>	7-Nov-2019	(Am 161)

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<i>Name of Chart</i>	<i>Effective Date</i>	<i>(Amdt No)</i>
<a href="#">ILS RWY 16L PAGE 2</a>	7-Nov-2019	(Am 161)
<a href="#">ILS OR LOC RWY 16R PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">ILS RWY 16R PAGE 2</a>	7-Nov-2019	(Am 161)
<a href="#">ILS OR LOC RWY 25</a>	7-Nov-2019	(Am 161)
<a href="#">ILS OR LOC RWY 34L PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">ILS RWY 34L PAGE 2</a>	7-Nov-2019	(Am 161)
<a href="#">ILS OR LOC RWY 34R PAGE 1</a>	7-Nov-2019	(Am 161)
<a href="#">ILS RWY 34R PAGE 2</a>	7-Nov-2019	(Am 161)
<a href="#">RNAV-Z (GNSS) RWY 07</a>	7-Nov-2019	(Am 161)
<a href="#">RNAV-Z (GNSS) RWY 16L</a>	7-Nov-2019	(Am 161)
<a href="#">RNAV-Z (GNSS) RWY 16R</a>	7-Nov-2019	(Am 161)
<a href="#">RNAV-Z (GNSS) RWY 25</a>	7-Nov-2019	(Am 161)
<a href="#">RNAV-Z (GNSS) RWY 34L</a>	7-Nov-2019	(Am 161)
<a href="#">RNAV-Z (GNSS) RWY 34R</a>	7-Nov-2019	(Am 161)
<a href="#">GLS RWY 07</a>	7-Nov-2019	(Am 161)
<a href="#">GLS RWY 16L</a>	21-May-2020	(Am 163)
<a href="#">GLS RWY 16R</a>	21-May-2020	(Am 163)
<a href="#">GLS RWY 25</a>	7-Nov-2019	(Am 161)
<a href="#">GLS RWY 34L</a>	21-May-2020	(Am 163)
<a href="#">GLS RWY 34R</a>	21-May-2020	(Am 163)

Source: AIP Book (13-Aug-2020 to 04-Nov-2020) via <http://www.airservicesaustralia.com/aip/aip.asp?pg=10>