

AIRSPACE ASSESSMENT REPORT

APPENDIX R





Sydney Metro City & South West

Victoria Cross Over Station

Development:

Airspace Assessment report

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Executive summary

AvLaw Pty Ltd (AvLaw) has conducted a preliminary assessment for Transport for NSW of the maximum building height envelope proposed in the concept State Significant Development Application against prescribed airspace limits which exist due to necessary safety clearances (mandated in legislation) that must be provided between an aircraft and an obstacle. AvLaw's assessment is based on the property boundaries at the subject site, Obstacle Limitation Surface (OLS) requirements, Procedures for Air Navigation Surfaces-Aircraft Operations (PANS-OPS) limitations, Radar Terrain Clearance Chart Height (RTCC) stipulations and satellite imagery.

AvLaw's assessment is that the current published OLS height across the site is 156m AHD being the Outer Horizontal Surface, PANS-OPS is 335.2m AHD (1100ft) and that the Radar Lowest Sector Altitude (RLSALT) or RTCC is 1100ft AHD (335m). AvLaw considers that aviation approval is required and is likely to be given for a proposed maximum permanent structure height of 230m AHD, which is below the respective restricting PANS-OPS and RTCC surfaces. Also, provided temporary construction cranes and the overall building envelope inclusive of towers, masts, building maintenance unit (BMU) and ancillary features remain below the PANS-OPS and RTCC surfaces, then aviation approval should be granted. No permanent building height is possible above the PANS-OPS and RTCC.

1.0 Introduction

1.1 Purpose of this report

This report supports a concept State Significant Development Application (concept SSD Application) submitted to the Department of Planning and Environment (DP&E) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The concept SSD Application is made under Section 4.22 of the EP&A Act.

Transport for NSW (TfNSW) is seeking to secure concept approval for a commercial office tower above the Victoria Cross Station, otherwise known as the over station development (OSD). The concept SSD Application seeks consent for a building envelope and its use as a commercial premises (office, business and retail), maximum building height, maximum gross floor area, pedestrian and vehicular access, circulation arrangements and associated car parking, future subdivision (if required) and the strategies and design parameters for the future detailed design of development.

TfNSW proposes to procure the construction of the OSD as part of an Integrated Station Development package, which would result in the combined delivery of the station, OSD and public domain improvements. The station and public domain elements form part of a separate planning approval for Critical State Significant Infrastructure (CSSI) approved by DP&E on 9 January 2017.

As the development is within a rail corridor, is associated with railway infrastructure and is for commercial premises with a Capital Investment Value of more than \$30 million, the project is identified as State Significant Development (SSD) pursuant to Schedule 1, 19(2)(a) of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

This report has been prepared to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSD Application for Victoria Cross OSD on 30th November 2017 which state that the Environmental Impact Statement (EIS) is to address any impacts of the proposal on the prescribed airspace for Sydney Airport and is to include an Airspace Assessment Report.

1.2 Overview of the Sydney Metro in its context

The New South Wales (NSW) Government is implementing *Sydney's Rail Future*, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future (Transport for NSW, 2012). Sydney Metro is a new standalone rail network identified in *Sydney's Rail Future*.

Sydney Metro is Australia's biggest public transport project, consisting of Sydney Metro Northwest (Stage 1), which is due for completion in 2019 and Sydney Metro City & Southwest (Stage 2), which is due for completion in 2024 (Refer to **Figure 1**).



Figure 1: Sydney Metro alignment map

Stage 2 of Sydney Metro includes the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and on to Bankstown through the conversion of the existing line to metro standards.

The project also involves the delivery of seven (7) new metro stations, including at North Sydney. Once completed, Sydney Metro will have the ultimate capacity for 30 trains an hour (one every two minutes) through the CBD in each direction - a level of service never seen before in Sydney.

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham application lodged by TfNSW as a Critical State Significant Infrastructure project (reference SSI 15_7400), hereafter referred to as the CSSI Approval.

The CSSI Approval includes all physical work required to construct the CSSI, including the demolition of existing buildings and structures on each site. Importantly, the CSSI Approval also includes provision for the construction of below and above ground structures and other components of the future OSD (including building infrastructure and space for future lift cores, plant rooms, access, parking and building services, as relevant to each site). The rationale for this delivery approach, as identified within the CSSI application is to enable the OSD to be more efficiently built and appropriately integrated into the metro station structure.

The EIS for the Chatswood to Sydenham component of the City & Southwest project identified that the OSD would be subject to a separate assessment process.

Since the CSSI Approval was issued, Sydney Metro has lodged four modification applications with DP&E to amend the CSSI Approval as outlined below:

- Modification 1- Victoria Cross and Artarmon Substation which involves relocation of the Victoria Cross northern services building from 194-196A Miller Street to 50 McLaren Street together with inclusion of a new station entrance at this location referred to as Victoria Cross North. 52 McLaren Street would also be used to support construction of these works. The modification also involves the relocation of the substation at Artarmon from Butchers Lane to 98 – 104 Reserve Road. This modification application was approved on 18 October 2017.
- Modification 2- Central Walk which involves additional works at Central Railway Station including construction of a new eastern concourse, a new eastern entry, and upgrades to suburban platforms. This modification application was approved on 21 December 2017.
- Modification 3 - Martin Place Station which involves changes to the Sydney Metro Martin Place Station to align with the Unsolicited Proposal by Macquarie Group Limited (Macquarie) for the development of the station precinct. The proposed modification involves a larger reconfigured station layout, provision of a new unpaid concourse link and retention of the existing MLC pedestrian link and works to connect into the Sydney Metro Martin Place Station. It is noted that if the Macquarie proposal does not proceed, the original station design remains approved. This modification application was approved on 22 March 2018.
- Modification 4 - Sydenham Station and Sydney Metro Trains Facility South which incorporates Sydenham Station and precinct works, the Sydney Metro Trains Facility South, works to Sydney Water's Sydenham Pit and Drainage Pumping Station and ancillary infrastructure and track and signalling works into the approved project. This modification application was approved on 13 December 2017.

Given the modifications, the CSSI Approval is now approved to operate to Sydenham Station and also includes the upgrade of Sydenham Station.

The remainder of Stage 2 of the City & Southwest project (Sydenham to Bankstown) proposes the conversion of the existing heavy rail line and the upgrade of the existing railway stations along this alignment to metro standards. This part of the project, referred to as the Sydenham to Bankstown Upgrade, is the subject of a separate CSSI Application (Application No. SSI 17_8256) which is currently being assessed by the DP&E.

1.3 Planning relationship between Victoria Cross Station and the OSD

While the Victoria Cross Station and OSD will form an Integrated Station Development, the planning pathways defined under the *Environmental Planning & Assessment Act 1979* require separate approval for each component of the development. In this regard, the approved station works (CSSI Approval) are subject to the provisions of Part 5.1 of the EP&A Act (now referred to as Division 5.2) and the OSD component is subject to the provisions of Part 4 of the EP&A Act.

For clarity, the approved station works under the CSSI Approval include the construction of below and above ground structures necessary for delivering the station and also enabling construction of the integrated OSD. This includes but is not limited to:

- Demolition of existing development
- Excavation
- Station structure including concourse and platforms
- Lobbies
- Retail spaces within the station building
- Public domain improvements
- Pedestrian through-site link
- Access arrangements including vertical transport such as escalators and lifts
- Structural and service elements and the relevant space provisioning necessary for constructing OSD, such as columns and beams, space for lift cores, plant rooms, access, parking, retail and building services.

The vertical extent of the approved station works above ground level is defined by the 'transfer slab' level (which for Victoria Cross is defined by RL 82), above which would sit the OSD. This delineation is illustrated in **Figure 2**.

The CSSI Approval also establishes the general concept for the ground plane of Victoria Cross Station including access strategies for commuters, pedestrians and workers. In this regard, pedestrian access to the station would be from Miller and Denison Streets and the commercial lobby would be accessed from Miller Street. Retail uses (approved under the CSSI Approval) would be located on the ground floor of the development at both the Miller Street and Denison Street levels activating the through-site link. Separate consent would be sought in the future for the fit-out and specific use of this retail space.

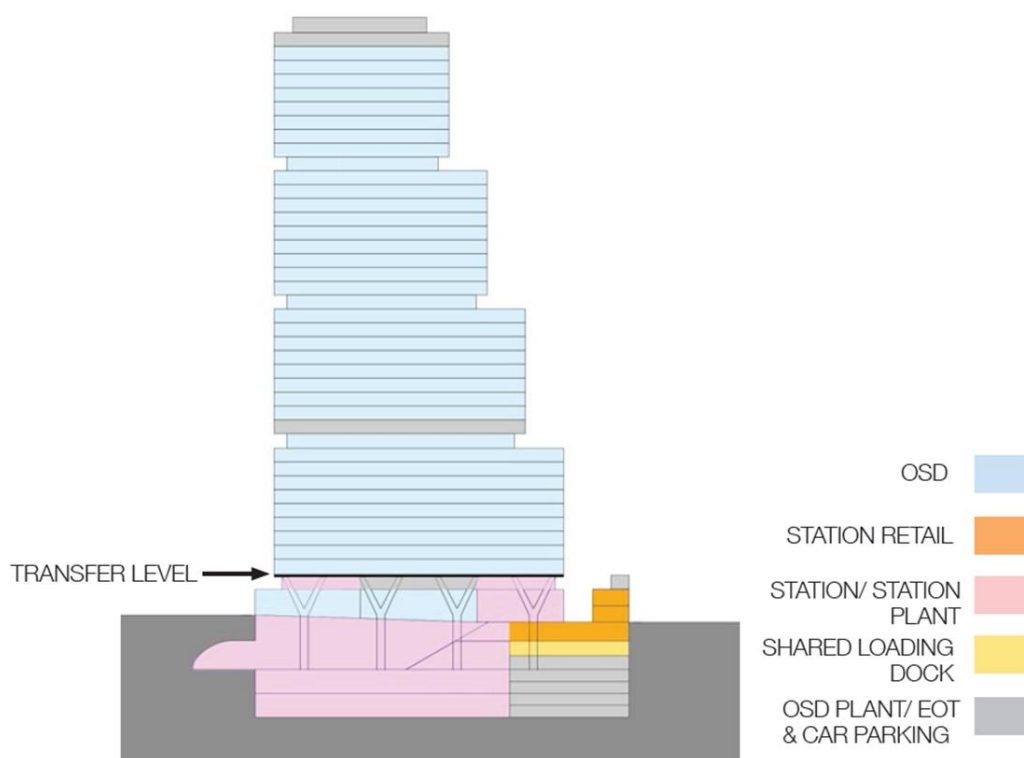


Figure 2: Delineation between the Metro station and OSD

Since the issue of the CSSI Approval, TfNSW has undertaken sufficient design work to determine the space planning and general layout for the station and identification of those spaces within the station area that would be available for the OSD. In addition, design work has been undertaken to determine the technical requirements for the structural integration of the OSD with the station. This level of design work has informed the concept proposal for the OSD. It is noted that ongoing design development of the works to be delivered under the CSSI Approval would continue with a view to developing an Interchange Access Plan (IAP) and Station Design Precinct Plan (SDPP) for Victoria Cross Station to satisfy Conditions E92 and E101 of the CSSI Approval.

The public domain improvement works around the site would be delivered as part of the CSSI Approval.

1.4 The Site

The Victoria Cross OSD site is located at the southeast corner of the intersection of Miller and Berry Streets, North Sydney, above the southern portal of the future Victoria Cross Station (refer to **Figure 3**). The site is located in North Sydney CBD, which is identified as part of Sydney's "Harbour CBD" (along with Sydney CBD) in the *Greater Sydney Region Plan (2018)*. It is the third largest office market in Sydney and is a key component of Sydney's Global Economic Corridor.



Figure 3: Victoria Cross Station location plan

The site is located in the North Sydney Local Government Area approximately 3km north of Sydney CBD, 5km southeast of Chatswood and 2km southeast of St Leonards.

The site (refer to **Figure 4**) is irregular in shape, has a total area of approximately 4,815 square metres and has street frontages of approximately 37 metres to Berry Street, 34 metres to Denison Street and 102 metres to Miller Street.

The site comprises the following properties:

- | | |
|---------------------------------|--|
| • 155–167 Miller Street | SP 35644 (formerly Tower Square) |
| • 181 Miller Street | Lot 15 in DP 69345, Lot 1 & Lot 2 DP 123056 and Lot 10 in DP 70667 |
| • 187 Miller Street | Lot A in DP 160018 |
| • 189 Miller Street | Lot 1 in DP 633088 |
| • Formerly part 65 Berry Street | Lot 1 in DP 1230458 |

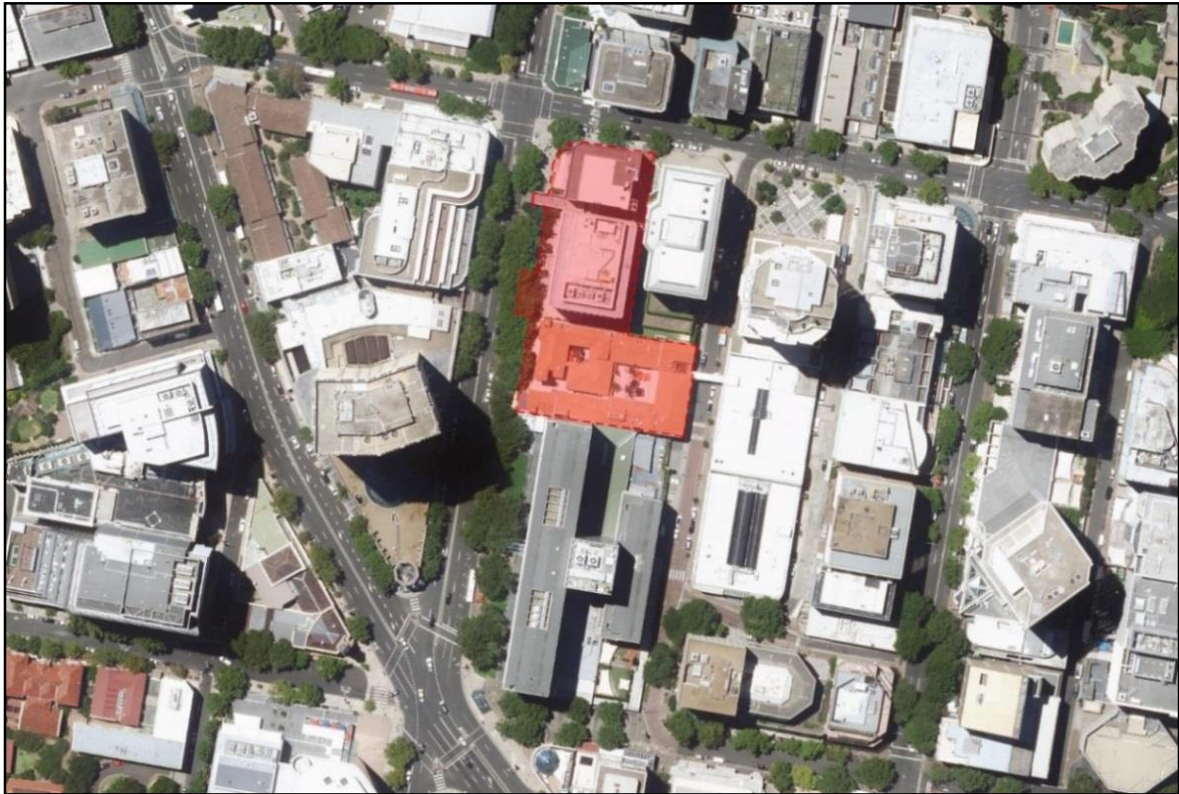


Figure 4: The Site

1.5 Overview of the proposed development

This concept SSD Application comprises the first stage of the Victoria Cross OSD project. It will be followed by a detailed SSD Application for the design and construction of the OSD to be lodged by the successful contractor who is awarded the contract to deliver the Integrated Station Development.

This concept SSD Application seeks approval for the planning and development framework and strategies to inform the future detailed design of the OSD. It specifically seeks approval for the following:

- A building envelope as illustrated in **Figure 5**
- A maximum building height of RL 230 or 168 metres (approximately 42 storeys, comprising 40 commercial storeys and 2 additional storeys for the roof top plant) for the high rise portion of building envelope and RL 118 or 55 metres (approximately 13 storeys) for the lower rise eastern portion of the building envelope
- A maximum gross floor area (GFA) of 60,000 square metres for the OSD component, which is equivalent to a floor space ratio of 12.46:1
- Use of the building envelope area for commercial premises including commercial office, retail and business premises

- Use of the conceptual OSD space provisioning within the footprint of the CSSI Approval (both above and below ground), including the OSD lobby and associated retail space, basement parking, end-of-trip facilities, services and back-of-house facilities
- Car parking for a maximum of 150 parking spaces over four basement levels with an additional 11 parking spaces allocated to the station retail approved under the terms of the CSSI Approval
- Loading, vehicle and pedestrian access arrangements from Denison Street
- Strategies for utility and services provision
- Strategies for the management of stormwater and drainage
- A strategy for the achievement of ecologically sustainable development
- Indicative signage zones
- A strategy for public art
- A design excellence framework
- The future subdivision of parts of the OSD footprint (if required)

The total GFA for the Integrated Station Development including the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA is 67,000 square metres and is equivalent to a FSR of 13.9:1.

A drawing illustrating the proposed building envelope is provided in **Figure 5**. The concept SSD Application includes an indicative design for the OSD to demonstrate one potential design solution within the proposed building envelope (refer to **Figure 6**).

Victoria Cross Station is to be a key station on the future Sydney Metro network, providing access to the growing North Sydney Central Business District (CBD). The proposal combines the Metro station with a significant commercial office tower, contributing to the North Sydney skyline. The OSD would assist in strengthening the role of North Sydney as a key component of Sydney's global economic arc and would contribute to the diversity, amenity and commercial sustainability of the CBD.

It is noted that Victoria Cross services building and new station entrance at Victoria Cross North do not form part of the concept SSD Application.

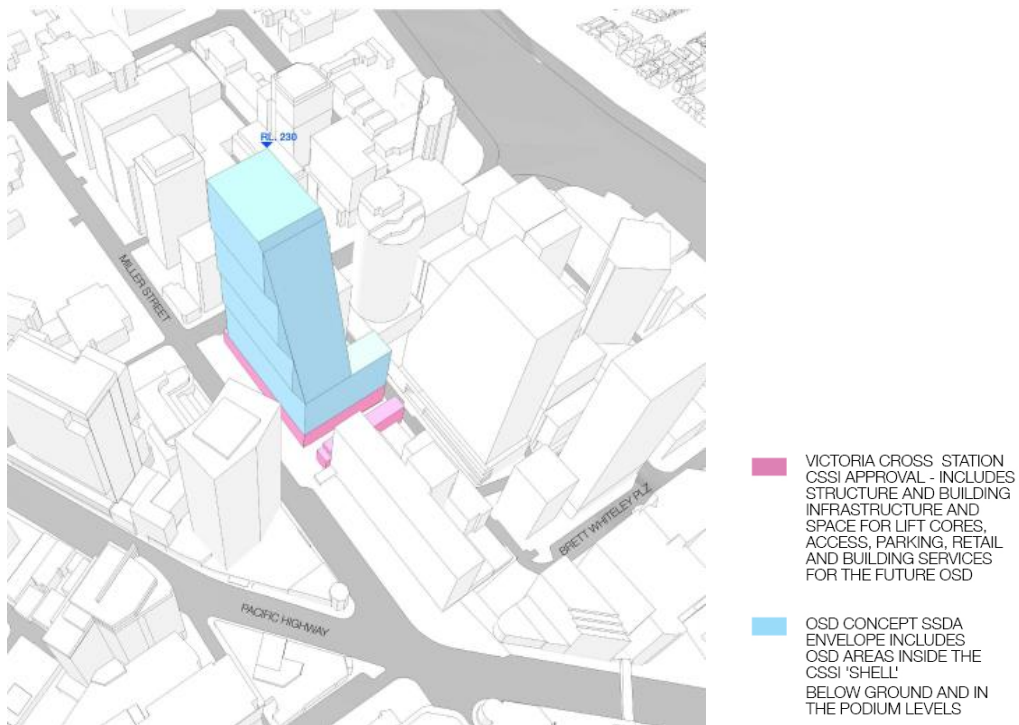


Figure 5: Proposed Victoria Cross OSD building envelope

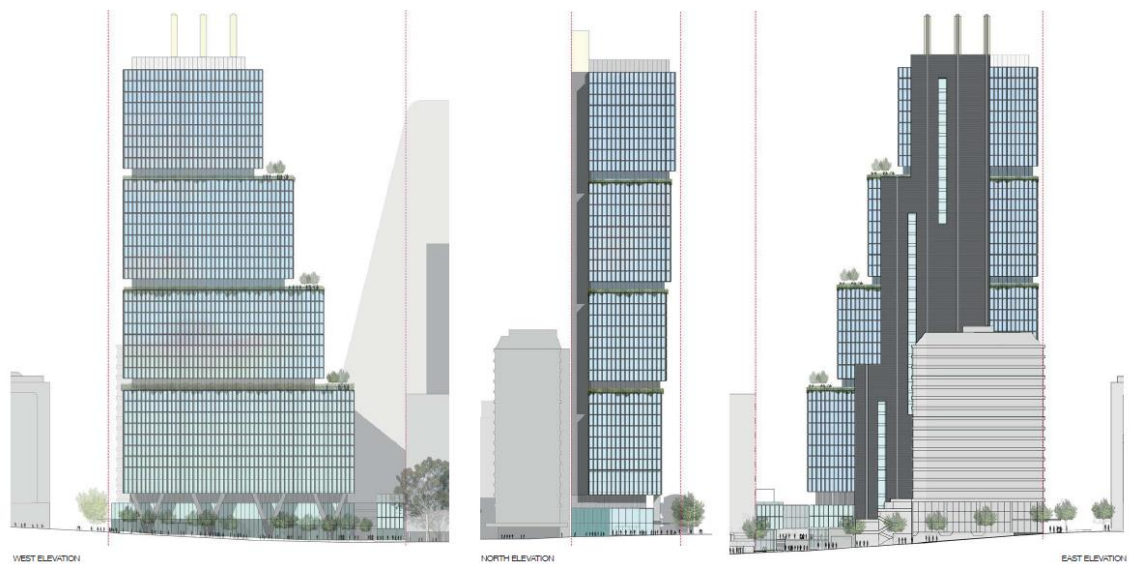


Figure 6: Victoria Cross indicative OSD design

2.0 Relevant stakeholders

Applications to carry out a controlled activity, which is defined as any permanent or temporary penetration of prescribed airspace, are to be made to the airport operator in writing. The information required in the application includes:

- A description of the proposed controlled activity (building construction, crane operation etc.)
- Its precise location (street address and grid reference)
- If the controlled activity consists of the erection of a building or structure:
 - The proposed maximum height of the structure above the Australian Height Datum (including any antennae, towers, BMU etc.), and
 - The proposed maximum height of any temporary structure or equipment (e.g. cranes) intended to be used in the erection of the structure
- The purpose of the controlled activity.

The airport operator will conduct the initial assessment of the application in terms of:

- Whether the activity results in an intrusion into its prescribed airspace and is therefore a controlled activity,
- The extent of the intrusion, and
- The precise location of the development or activity.

The airport operator, in this case Sydney Airport Corporation Limited (SACL), may approve the application itself if there is no intrusion of the prescribed surfaces, however it is required to invite the following organisations to assess or comment on an application if there is an intrusion:

- **The Civil Aviation Safety Authority (CASA)** for an assessment of the impact on aviation safety
- **Airservices Australia** for assessments of proposals resulting in a penetration of the PANS-OPS surface or temporary redirection of flight paths
- **The local council authority** responsible for building approvals
- **The Department of Defence** in the case of joint-user airports.

The final approving authority for penetration of prescribed surfaces is the Department of Infrastructure and Regional Development as specified in the *Airports Act 1996* and the *Airports (Protection of Airspace) Regulations 1996*. In making its determination, the Department is required to assess the respective assessments of the airport operator, Airservices Australia and CASA, however cannot issue an approval in the event CASA's assessment is not supportive of the application.

The approval process, which would commence at the future detailed SSDA stage, requires separate assessments of the permanent building structure and temporary construction crane(s). Applications can be made in advance of planning approval for both. CASA however does require detailed architectural drawings to be provided prior to completing its assessment.

3.0 Aviation legislation governing building and crane heights

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

With respect to Sydney Airport, PANS-OPS surfaces, OLS surfaces, and RTCC clearances have been “declared” by the Commonwealth Department of Infrastructure and Regional Development on 20 March 2015 and are therefore enshrined in legislation as the prescribed airspace.

4.0 Controlled activity approval process

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

- permanent structures, such as buildings, intruding into the prescribed airspace
- temporary structures such as cranes intruding into the prescribed airspace
- any activities causing intrusions into the prescribed airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter.

Carrying out a controlled activity without approval is an offence under Section 183 of the *Airports Act 1996* and is punishable by a fine of up to 250 penalty units. It is an offence under Section 185 of the Act to contravene any conditions imposed on an approval. Under Section 186 of the Act, it is an offence not to give information to the airport operator that is relevant to a proposed controlled activity.

International standards have been adopted which define sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's **prescribed airspace**. These surfaces for Sydney Airport are the:

- Obstacle Limitation Surface (OLS),
- Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) surfaces;
- Omni Direction Departure surface; and the
- Radar Terrain Clearance Chart (RTCC) or Radar Lowest Sector Altitude (RSALT) surfaces.

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

The heights advised in the application for approval must include all towers, masts, BMU, construction crane(s), and ancillary features. An application will be considered in two elements, one being for the building itself (inclusive of all features) and one for construction crane(s). Each penetration of the OLS, PANS-OPS or RTCC has to be assessed against the effect on published Departure and Approach procedures and other matters. These include published survey data and Air Traffic Control (ATC) procedures and practices, including compatibility with the promulgated ATC RTCC used for safe vectoring of aircraft in instrument

meteorological conditions (non-visual). Each proposal has to be checked for proximity to published procedures to ensure statutory tolerances and safety buffers are maintained. The tolerances vary according to the type of navigation or aid being utilised and cover vertical, lateral and longitudinal aspects.

Timing to assess applications varies depending on the complexity of the assessment and the workload within the respective agencies at the time of receipt. AvLaw's experience suggests Proponent's should allow seven (7) months for project planning purposes with respect to processing time with SACL, Airservices Australia, CASA and the Department of Infrastructure and Regional Development conducting their own assessments in succession. AvLaw recommends that applications for both building and crane height approval be made as early as possible.

5.0 Preliminary aeronautical impact assessment

Based on the site location provided by TfNSW, interrogation of satellite imagery, OLS requirements, PANS-OPS limitations and RTCC stipulations, AvLaw's assessment of the heights above which an aviation approval is required has determined the following:

- The OLS over the site is the Outer Horizontal Surface at 156m AHD
- The PANS-OPS surface over the site is a horizontal plane at 335.2m AHD (1100ft)
- The RTCC limitation over the site is 1100ft AHD (335m)
- The Omni Direction Departure Surface is nominally 385m AHD

The controlling operational surfaces over the site are the OLS, PANS-OPS and RTCC surfaces with the OLS as the lowest, hence triggering detailed aviation assessment.

A maximum building envelope including any protrusions from a building must be included in the final height of the building itself for aviation approval, as does temporary construction crane activity.

TfNSW propose a concept building envelope which would allow a multi-story high rise development. Based on current advice at 230m AHD, the building envelope will remain below the PANS-OPS and RTCC of nominally 335m AHD. Provided that temporary construction crane(s) remain below the PANS-OPS and RTCC, then flight operation surfaces will not be affected by the proposed development at the site.

6.0 Impact on helicopter operations

The TfNSW site is located approximately 12,335m NNE of Sydney Airport. There are a number of prescribed helicopter transit routes published in Aeronautical Information Publication (AIP) En Route Supplement Australia (ERSA) for helicopter operations in the Sydney Control Zone. These are included in the Coded Clearances and Operating Requirements for Sydney Airport. These coded clearances contain the specific routes to be flown and prescribed altitudes to be flown.

The development site is in the vicinity of other tall buildings and is clear of helicopter transit routes and is consistent with building heights proposed in the North Sydney Centre Planning Proposal which includes significant height increases in the CBD. The western edge of the “North Shore Lane” for helicopter access between Sydney Harbour and the Royal North Shore Hospital is approximately 350 metres to the east of the proposed development site and is behind and amongst other tall buildings.

Even though the concept proposed will result in a tall permanent building structure that may be classified as an obstacle, the helicopter operations are all conducted under Visual Flight Rules (VFR) whereby the pilot in command (PIC) is solely responsible for safe navigation clear of any obstacles. Therefore, in AvLaw’s assessment, the proposed development will pose no increased safety risk to those that might already exist due to other obstacles in the area.

7.0 Rationale for obtaining approval

The Regulations require any decision by the Department of Infrastructure and Regional Development to be made in the interests of the safety, efficiency or regularity of existing or future air transport operations into or out of the airport. An approval may be subject to specific conditions, which may concern how the controlled activity is carried out (e.g. hours of operation of a crane) or may require the building or structure to be marked or lit in a certain way as detailed in Manual of Standards (MOS) 139. These conditions must also be in the interests of the safety, efficiency or regularity of existing or future air transport operations.

AvLaw notes that penetration of the OLS for Sydney Airport over the site at 156m AHD will trigger aviation safety assessment by CASA and Airservices Australia. However with the proposed development including crane activity remaining below the RTCC and PANS-OPS, then aviation regulatory approval should be readily given.

8.0 SEARs (Pre- application consultation with SACL and CASA)

In response to a request by TfNSW for the conduct of pre-application consultation with both SACL and CASA to satisfy a SEAR relating to airspace impacts associated with the proposed concept building envelope, contact was established by AvLaw on 29 November 2016 with Peter Bleasdale (SACL) and David Alder (CASA).

AvLaw explained the advice on heights that AvLaw has provided in this report and both SACL and CASA were interested in the final building and crane heights and not duplicating the approval process which refers back to AvLaw's understanding of the controlled activity approval process as explained in detail in **Section 4.0** of this report i.e. once final building heights have been confirmed and the proposal has progressed to DA, the requisite information will be available for assessment by each of the relevant stakeholders specified in **Section 2.0** of this report.

9.0 Next steps and associated deliverables

The proposed building envelope will result in penetration of the OLS, which in this case, AvLaw considers will trigger detailed aviation assessment but will not prevent approval being given. The final actual maximum building heights including all ancillary features and crane activity will be confirmed at the detailed SSDA stage, at which time, application for requisite approvals can be made.