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20 March 2019

Mr David Krepp
Toplace Pty Ltd
Development Manager
121 Majors Bay Road
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PRELIMINARY AERONAUTICAL IMPACT ASSESSMENT:
146-154 O'RIORDAN STREET, MASCOT NSW

Dear Mr Krepp,

I refer to your request for advice in relation to potential aeronautical limitations associated with the proposed development located on the site at 146-154 O'Riordan Street, Mascot NSW, referred to herein as "the site". Avlaw Pty Ltd (AvLaw) notes that your proposal involves a staggered building development to a maximum height of 44m AHD abutting O'Riordan St and tapering down to 22m AHD to the east of the site, and maximum crane activity to 51m AHD. AvLaw has conducted a preliminary assessment of the maximum building height restrictions at the site 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, proposed building heights and proposed crane heights at the address provided by Toplace Pty Ltd (Toplace), Obstacle Limitation Surfaces (OLS) requirements, Procedures for Air Navigation Surfaces-Aircraft Operations (PANS-OPS) limitations, Radar Lowest Sector Altitude (RLSALT)/Radar Terrain Clearance Chart (RTCC) sector boundaries, Omni Direction Departure Surface limitations, visual and navigation aid clearance surfaces, transit/approach/take-off routes used by helicopters, Precision Approach Path Indicator (PAPI) protection surfaces and satellite imagery.

AvLaw's assessment is that the current published airspace protected surface heights for Sydney Airport across the site are as follows:

- the OLS Inner horizontal Surface at 51m AHD;
- the PANS-OPS surface at 56.5m to 71.3m AHD rising generally west to east;
- the RLSALT/RTCC horizontal surface at 152m AHD, though this is generally more relevant further away from the airport;,

- The PAPI protection surfaces splay to cover the site at heights similar to other nearby obstacles; and
- the Omni Direction Surface limitation at nominally 70m AHD.

AvLaw's assessment is that the critical surface is the OLS and that the proposed development height (inclusive of temporary construction cranes) does not penetrate this critical surface.

AvLaw has determined that the National Airport Safeguarding Framework (NASF) – Guideline H for strategically important helicopter landing sites does not apply with respect to the development. AvLaw could not identify any relevant helicopter landing sites within the guideline's referral trigger of 3,500m.

AvLaw notes that if proposed building heights penetrate the OLS, then they will be classified as a "controlled activity" and require detailed assessment by various aviation stakeholders, and that in this case the building and temporary construction cranes will remain below the OLS.

Provided temporary construction cranes and the overall building envelope inclusive of plant room, towers, masts, building maintenance unit (BMU) when in operation and ancillary features all remain below the OLS, then aviation approval is not strictly required but advice to Sydney Airport Corporation Limited (SACL) is preferred. No permanent structure is possible through the PANS-OPS, however if temporary crane activity is proposed to extend through the OLS or PANS-OPS, aviation approval is required.

Each item specified in the scope of AvLaw's proposal to Toplace is addressed from the following page.

1. Relevant stakeholders

Applications to carry out a controlled activity, defined as any permanent or temporary penetration of prescribed airspace, are to be made to the airport operator in writing. Where more than one airport may be affected, the application must be sent to each. The information required in the application must include:

- 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 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 may approve the application itself if there is no intrusion of the prescribed surfaces, however is required to invite the following organisations to assess or comment on an application if there is an intrusion which is not considered short-term (i.e. not expected to last more than three months):

- **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, Regional Development and Cities (DIRDC) as specified in the *Airports Act 1996* and the *Airports (Protection of Airspace) Regulations 1996*. In making its determination, the DIRDC 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 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.

2. 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 DIRDC or the airport operator to approve applications to carry out controlled activities, and to impose conditions on an approval.

With respect to Sydney Airport, OLS, PANS-OPS and RTCC surfaces have been "declared" by the Commonwealth DIRDC on 20 March 2015 and are therefore enshrined in legislation as its prescribed airspace. AvLaw has however obtained advanced extracts from the draft approved revised 2018 OLS and PANS-OPS drawings per Figure 1 and Figure 2 below.

Legislation provides for some temporary (no more than 3 months) penetration of the PANS-OPS for construction cranes. It is preferable not to penetrate the PANS-OPS and any penetration must be supported by a detailed aeronautical impact assessment and equivalent safety argument.

3. 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**. AvLaw has identified the Sydney Airport airspace surfaces relevant to the site as the following:

- Obstacle Limitation Surface (OLS);
- Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) surfaces;
- Combined Radar Departure Assessment Surfaces (Omni Directional);
- Radar Terrain Clearance Chart (RTCC) or Radar Lowest Sector Altitude (RSALT) surfaces;
- PAPI Light Planes Protection Surfaces; and
- Navigational Aids Protection 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 DIRDC 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. 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 that is used to safely vector aircraft in instrument meteorological conditions (non-visual). Each proposal has to be checked for proximity to published procedures to ensure statutory tolerances and safety buffers are maintained. The tolerances vary according to the type of navigation or aid being utilised 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 proponents should allow seven (7) months for project planning purposes with respect to processing time with Sydney Airport, Airservices Australia, CASA and the DIRDC conducting their own assessments in succession. AvLaw recommends that applications for both building and crane height approval be made as early as possible.

4. Preliminary Aeronautical Impact Assessment

Based on the site location provided by Toplace, 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 (draft 2018 version) over the site is the Inner Horizontal Surface at 51m AHD (refer Figure 1 on following page)
- The PANS-OPS surface (draft 2018 version) over the site is a sloping surface generally rising west to east from 56.5m to 71.3m AHD (refer Figure 2 following page)
- The RTCC limitation (2015 version) over the site is nominally 152m AHD
- The Omni Direction Departure Surface (2015 declared version) is nominally 70m AHD
- The PAPI protection surface splays out to cover the site
- The Navigation Aids Protected Surfaces is nominally 45m AHD rising to the north (refer Figure 3)

Figure 1: Extract from draft OLS Chart Version 2018

Figure 2: Extract from draft PANS-OPS Chart Version 2018

The critical controlling operational surfaces over the site are the OLS, PANS-OPS and RTCC surfaces. None of these surfaces are proposed to be penetrated by the building structure or temporary construction cranes so will therefore not be considered a controlled activity and trigger detailed aviation assessment.

The PAPI protection surfaces are designed so that the pilot of an aircraft conducting a visual approach may see the red warning lights indicating that the aircraft is below the specified approach slope. The site is on the edge of the PAPI splay further from the extended centreline of the 16L approach than the existing Holiday Inn multi story building. Detailed assessment of this aspect will be conducted by Airservices Australia (Airservices) but AvLaw expects the proposed development will not introduce any additional limitations on the use of airspace or impact on safety detrimentally.

Navigational Aids Protection Surfaces provide an indication of limits that may be imposed so no interference is caused to the aids. Detailed assessment will be undertaken by Airservices, taking design clearances and local factors into account to determine the impact any encroachment may or may not have. AvLaw notes that the proposed development is on the limit identified in the 2015 protection surfaces but expects the proposed development will not introduce any additional limitations on the use of airspace or impact on safety detrimentally.

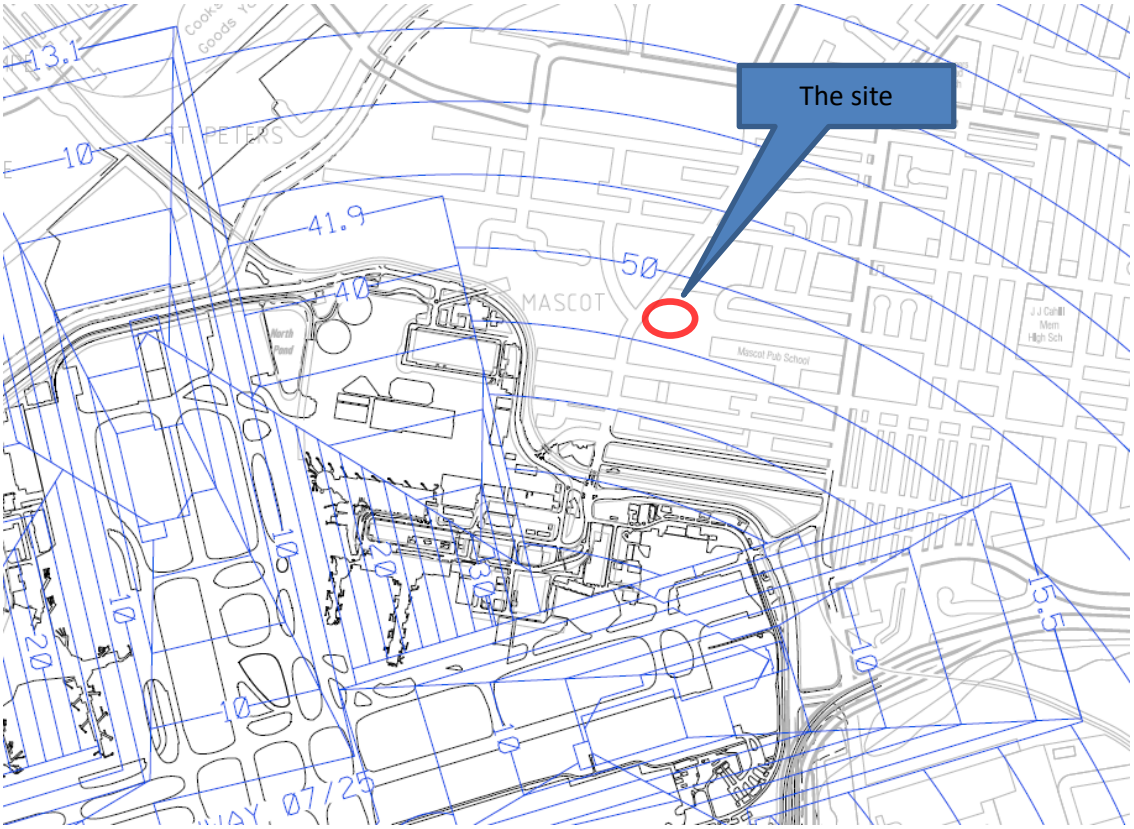

Figure 3: Extract from Navigation Aids Protection Chart Version 2015

A maximum building envelope including any protrusions from a building (e.g. masts, BMU etc.) must be included in the final height of the building itself for aviation approval, as does temporary construction crane activity. AvLaw notes that there is a small buffer above the maximum building height and below the OLS to provide for temporary construction crane(s).

Toplace propose a multi-story building development. Providing the buildings and temporary construction crane(s) remain below the OLS, PANS-OPS and RTCC, then current published flight operation surfaces will not be affected by the proposed development at the site.

5. Impact on helicopter operations

The nearest corner of site is located approximately 2,385m NE of Sydney Airport aerodrome reference point. There are a number of prescribed helicopter transit routes published in Aeronautical Information Publication (AIP) En-Route Supplement Australia (ERSA) for helicopter operations in the Sydney Control Zone. These are included in the Coded Clearances and Operating Requirements for Sydney Airport, with the coded clearances containing the specific routes and prescribed altitudes to be flown.

Legislation requires the pilot of a helicopter to determine the safe take-off and landing approach taking into account all factors including aircraft performance, wind direction, obstacles, and emergency landing in the event of engine failure. The proposed development is clear of specific helicopter transit routes. The helicopter operations assessed are all conducted under Visual Flight Rules (VFR) whereby the pilot in command (PIC) is solely responsible for safe navigation clear of any obstacles.

A National Airport Safeguarding Framework (NASF) Guideline H has been issued regarding protection of what are being termed *Strategic Helicopter Landing Sites (SHLS)*. Under the guideline, hospital helipads would be considered as SHLS and therefore protected from obstacles being erected in close proximity to it. The guideline provides for 140m wide rectangular steps in the direction of approach/take-off in 500m increments until reaching 125m above the SHLS which would be protected from obstacles such as buildings and cranes. The figure below has been sourced from the guideline and illustrates this proposed protection of SHLS and the heights above which it is triggered.

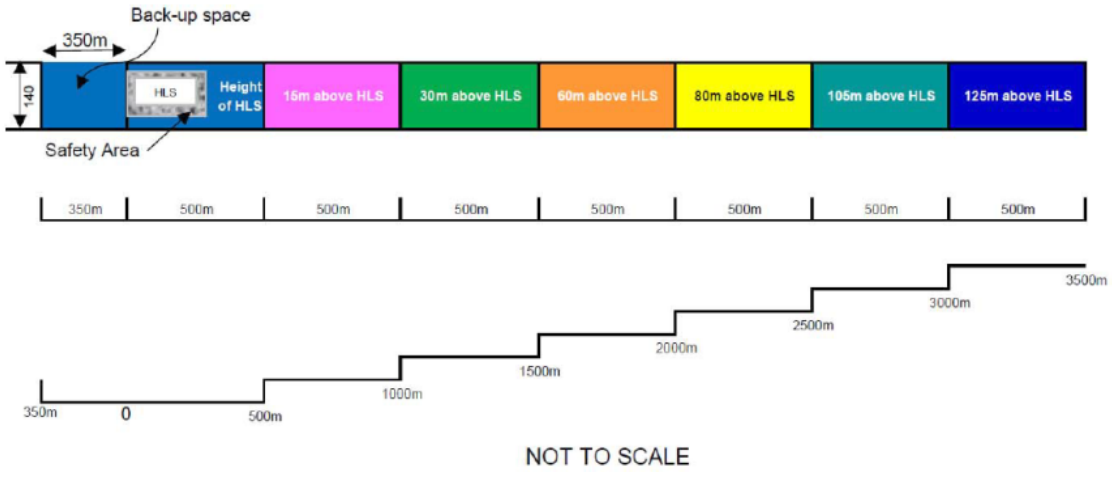

Figure 4: Referral trigger for SHLS

AvLaw has not identified any relevant helicopter landing sites within the extremity of the 3,500 metre Guideline H defined area. The Prince of Wales Hospital is approximately 4,800m to the ENE, the Royal Prince Alfred Hospital approximately 4,230m to the N, and the St George Hospital approximately 6,750m to the SW.

The Sydney Airport helicopter area adjacent to the threshold of runway 25 is approximately 1,320m to the S of the site. Any approach or take-off in the direction of the site will also be over the existing Holiday Inn at a similar height to the proposed development so will not cause additional safety impact than currently exists.

6. Rationale for obtaining approval

The Regulations require any decision by the DIRDC 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 and regularity of existing or future air transport operations.

AvLaw notes that there is no penetration of the OLS for Sydney Airport over the site to trigger aviation safety assessment by CASA and Airservices Australia, however, AvLaw recommends that SACL is notified of the development and SACL will refer the proposal to Airservices with respect to protection of aids in the vicinity of the airport as appropriate.

7. Future controlled activity approval requirements

The proposed Toplace development at the site will not involve penetration of the OLS, PANS-OPS, Omni Direction or RTCC surfaces. The preparation of a complete aeronautical impact assessment with detailed analysis of these surfaces and others is usually required to support an application for necessary aviation approvals to be given in circumstances where any surfaces defining the prescribed airspace are penetrated. AvLaw therefore considers that no detailed aeronautical impact is required, however, AvLaw recommends Toplace advise SACL of the development through the SACL approval process for their information and also for consideration of aid clearances assessment by Airservices.

Yours sincerely,

Amin Hamzavian
Managing Director