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4 March 2020

Mr Peter Jones
Greaton Development Pty Ltd
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PRELIMINARY AERONAUTICAL IMPACT ASSESSMENT: 187 THOMAS ST, HAYMARKET

Dear Mr Jones,

I refer to a request from Greaton Development Pty Ltd (Greaton) for advice in relation to identifying airspace height constraints associated with a proposed development located at 187 Thomas St in Haymarket, referred to herein as “the site”.

Avlaw Pty Ltd, trading as Avlaw Aviation Consulting (Avlaw), conducted two preliminary aeronautical impact assessments of the maximum building height restrictions at the site against prescribed airspace limits in 2018 and then again in 2019. These limits exist due to necessary safety clearances (mandated in legislation) that must be provided between an aircraft and an obstacle, such as buildings and cranes. This letter provides details of the current airspace protection surfaces that cover the site which have been assessed following provision of a revised maximum building height of RL209.80m. The table below summarises the findings of the 2018, 2019 and most recent assessments:

Airspace Surface	August 2018	October 2019	March 2020
Obstacle Limitation Surfaces (OLS) – Conical Surface	150-156m AHD	152-156m AHD	152-156m AHD
Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS)	290-300m AHD	290-297m AHD	291-296m AHD
Radar Terrain Clearance Chart (RTCC)	1100ft/335.28m AHD	1100ft/335.28m AHD	1100ft/335.28m AHD
Omni Directional	260m AHD	N/A	N/A

The critical (i.e. lowest) airspace protection surface for operations at Sydney Airport which cover the site is the Conical Surface of the OLS. As this surface will be penetrated both permanently by the building and temporarily by crane(s), each will require aeronautical assessment and be classified as a “controlled activity” which will need to be approved by aviation authorities to be carried out. Avlaw has determined that the OLS penetration in this instance should not be problematic because the site is clear of the approach and take-off areas for all runway at Sydney Airport.

Above the OLS, the next lowest airspace protection surface is the Combined Radar Departure Assessment Surfaces for Sydney Airport which is nominally 260m AHD. This airspace protection surface however will not limit proposed building or crane heights as Sydney Airport have advised Avlaw (with respect to another development) that despite forming part of its prescribed airspace, that the published chart is no longer relevant. This is because these surfaces have been incorporated into the PANS-OPS chart and can therefore be disregarded. In any case, Avlaw's assessment prior to being informed of this latest development by Sydney Airport was that these airspace protection surfaces should not limit the heights because Noise Abatement Procedures (NAP) must be followed by all aircraft operating to and from Sydney Airport. These dictate that there will be no random aircraft departures deviating from Standard Instrument Departures (SIDs) and as was ultimately confirmed by Sydney Airport, the required safety clearances for these procedures are accounted for in the PANS-OPS surfaces.

Above the Sydney Airport Combined Radar Departure Assessment Surfaces, the next lowest airspace protection surface is the PANS-OPS which rises from 291m-296m AHD (NW to NE). The vertical distance between the proposed maximum building height (RL209.80m) and the PANS-OPS ranges from 81.2m-86.2m and as such, a generous vertical buffer exists for temporary crane activity to facilitate completion of construction without other surfaces being penetrated.

With respect to helicopter operations, Avlaw has determined that the airspace protected under National Airport Safeguarding Framework (NASF) – Guideline H for strategically important helicopter landing sites does not limit the currently proposed building height. This is due to the fact the site is laterally clear of the airspace protected under the guideline and in any case, approaches and departures at the nearest helipad (Royal Prince Alfred Hospital) are clear of the site. Other relevant helicopter operations including defined routes to and from Sydney Airport have also been assessed and do not introduce any additional more restrictive limitations than those already identified.

In summary, provided temporary construction cranes and the overall building height inclusive of plant room and ancillary features (e.g. towers, masts, building maintenance unit (BMU) when in operation etc.) all remain below the PANS-OPS, then aviation approval should be granted.

1. Airspace Height Controls

As a signatory to the *Chicago Convention 1944*, Australia adopts International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs) with respect to airspace which define sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's **prescribed airspace**. With respect to Sydney Airport, the following airspace protection surfaces have been “declared” by the **Department of Infrastructure, Transport, Cities and Regional Development** (Department) on 20 March 2015 and are therefore enshrined in legislation as its prescribed airspace:

- Precision Approach Path Indicator (PAPI) system protection surfaces;
- OLS;
- PANS-OPS;
- Navigation Aid Protected Surfaces;
- High Intensity Light Protected Surfaces;
- RTCC or Radar Lowest Sector Altitude (RLSALT) surfaces; and
- Combined Radar Departure Assessment surfaces.

2. Airspace Approval Process

Part 12 of the *Airports Act 1996* (Act) and the *Airports (Protection of Airspace) Regulations 1996* (Regulations) establish a framework for the protection of airspace at and around airports. The Act defines any activity resulting in an intrusion into an airport's Prescribed Airspace to be a “controlled activity” and requires that controlled activities cannot be carried out without approval. Controlled activities include the following:

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

The Regulations differentiate between short-term (not expected to continue longer than 3 months) and long-term controlled activities. The Regulations allow for the airport operator to approve short-term penetrations of the OLS under delegation from the **Department of Infrastructure, Transport, Cities and Regional Development** (Department) following consultation with the Civil Aviation Safety Authority (CASA) and Airservices Australia.

With respect to long-term penetrations, the airport operator is required to invite the following stakeholders to assess or comment on an application if there is an intrusion into Prescribed Airspace:

- **CASA** for an assessment of the impact on aviation safety
- **Airservices Australia** for assessments of proposals resulting in a penetration of surfaces including PAPI, PANS-OPS etc.
- **the local council authority** responsible for building approvals
- **the Department of Defence** in the case of joint-user airports.

The final approving authority for all short-term penetrations of the PANS-OPS and long-term penetrations of the OLS is the Department as specified in the Act and the Regulations. In making its determination, the Department is required to assess the respective assessments of the airport operator, Airservices Australia and CASA. The Department cannot approve short-term penetrations of the PANS-OPS without the support of the airport operator (in this instance, Sydney Airport) and also cannot approve long-term penetrations of the OLS in the event CASA's assessment is not supportive of the application. It should be noted that long term intrusions of the PANS-OPS surface are prohibited.

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

Each penetration of Prescribed Airspace 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 criteria.

The approval process requires separate assessments of the permanent building structure and temporary construction crane(s), although approvals for permanent structures (even if assessed favourably) will not be issued until the all aviation stakeholders have completed their assessment of temporary structures (e.g. cranes). Applications can be made in advance of planning approval for both, however CASA has advised Avlaw on other tall building projects that it does require detailed architectural drawings to be provided prior to completing its assessment.

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 at least five months for BAL, Airservices Australia, CASA and the Department to conduct their own assessments in succession. Avlaw recommends that applications for both building and temporary structures be made as early as possible. Avlaw notes that one proposed reform contained in the [Modernising Airspace Protection](#) Public Consultation Paper (Paper) refers to a submission timeframe of 90 days prior to lodgement of a DA for controlled activity.

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

3. Preliminary Aeronautical Impact Assessment

Based on the site location provided, 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 and the respective clearance or penetrations of each by the proposed building (RL209.80m) are tabulated below:

Sydney Airport			
Airspace Surface	Height (m AHD)	Clearance/Penetration (building)	Clearance/Penetration (crane)
OLS	152-156	64.14m-68.14m	TBA
PANS-OPS	291-296	81.2m-86.2m	TBA
RTCC	335.28	115.14m	TBA



Figure 1: Extract from draft OLS Chart

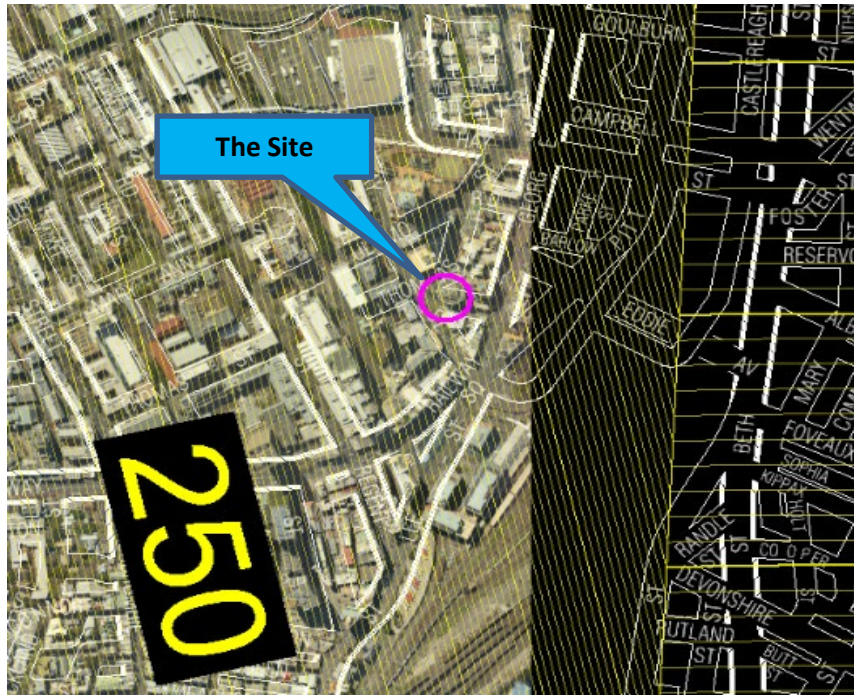


Figure 2: Extract from draft PANS-OPS Chart (2019)



Figure 3: Extract from draft RTCC (2019)

(Note: the reference to 2100ft is the lowest altitude ATC can vector aircraft whilst maintaining 1000ft vertical separation from obstacles)

The critical (i.e. lowest) airspace protection surface over the site is the Conical Surface of the Sydney Airport OLS and since it will be penetrated by the building and cranes, each will be considered a controlled activity and trigger detailed aviation assessment. Given the generous vertical buffer between the proposed building height and the PANS-OPS, currently published flight operation surfaces should not be affected at any stage of construction by the proposed development at the site.

4. Helicopter Operations

Legislation requires the pilot of a helicopter to determine the safe take-off and landing approach taking into account all factors including aircraft performance, wind direction, obstacles, and emergency landing in the event of engine failure. The helicopter operations relevant to development at the site have been assessed, the findings of which are summarised below.

4.1 Coded Clearances

The nearest corner of the site is located approximately 7,547m NE of Sydney Airport Aerodrome Reference Point (ARP). 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.

The coded clearances published in AIP ERSA for helicopter transit lanes to and from Sydney Airport are clear of the site. Even though the proposed development will result in a multi-story building structure that will be classified as an obstacle, the helicopter operations relevant to the site are all conducted under Visual Flight Rules (VFR) whereby the pilot in command (PIC) is solely responsible for safe navigation clear of any obstacles.

4.2 Hospital Helipads

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 assessment is triggered.

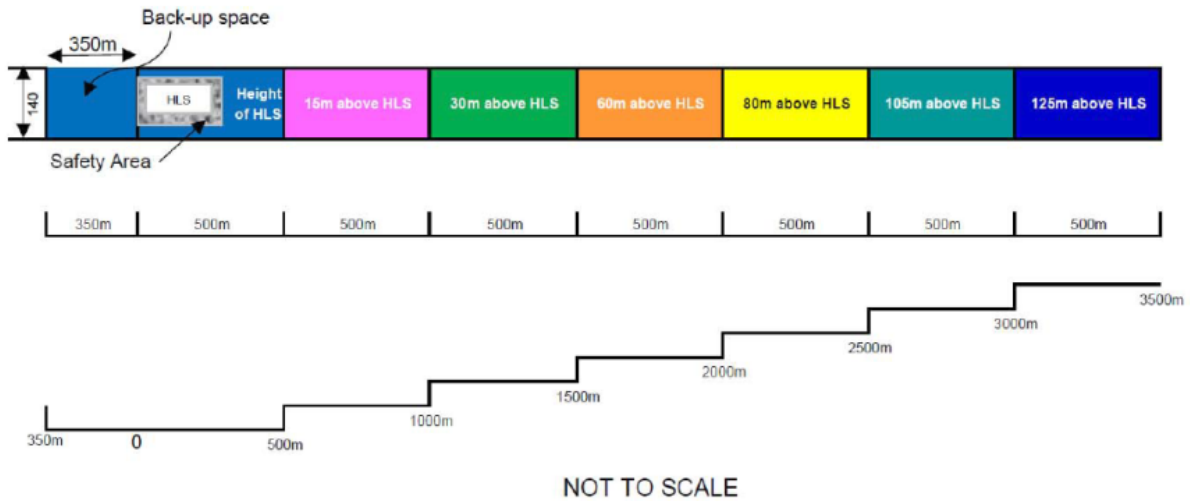


Figure 4: Referral trigger for SHLS

The Royal Prince Alfred Hospital Helipad is approximately 2,007 metres to the SW of the development. Even though development at the site will result in a tall permanent building structure that will be classified as an obstacle, the proposed Greaton development is not in the direction of approach/take-off area for the Royal Prince Alfred Hospital Helipad. Therefore, the proposed development at the site will not penetrate airspace protected by the guideline.

A review of the ERSA entry for the Royal Prince Alfred Hospital specifies the following with respect to approach and departure headings:

- a) 165DEG M in/345DEG M out
- b. 330DEG M in/320DEG M out

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

5. Rationale for obtaining approval

The Regulations require any decision by the Department 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. The proposed development at the site will involve penetration of the OLS which in this case, Avlaw considers as not being problematic because it is not in the approach or take-off areas and will not penetrate safety clearances for instrument flight procedures or visual helicopter operations. 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 considers that aviation approval should be given because no flight operation surfaces will be affected by the proposed permanent building structure and there is a sufficient allowance for temporary construction cranes to also not affect flight operational surfaces.

6. Future controlled activity approval requirements

The proposed development at the site will require two separate controlled activity applications because of the penetration of the OLS by the building and crane(s). With respect to development at the site, maximum building and crane heights that may be considered acceptable to aviation regulatory authorities must not penetrate the PANS-OPS.

As mentioned in section two (2), Avlaw's experience suggests proponents should allow a minimum of five (5) months for project planning purposes with respect to processing time with Sydney Airport, Airservices Australia, CASA and the Department conducting their own assessments. Avlaw notes that one proposed reform contained in the [Modernising Airspace Protection](#) Public Consultation Paper (December 2016) refers to a submission timeframe of 90 days prior to lodgement of a DA (in this instance, Stage 2 DA) for controlled activity applications. The preparation of a complete Aeronautical Impact Assessment (i.e. Phase 2 of Avlaw's proposed methodology detailed in the proposal dated 15 August 2018) should supplement the controlled activity applications submitted by Greaton in preparation for its Stage 2 DA submission.

Yours sincerely,



Amin Hamzavian
Managing Director