AERONAUTICAL IMPACT ASSESSMENT

Illoura Place

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Aeronautical Impact Assessment: Illoura Place

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1

Executive Summary

Executive Summary

This Aeronautical Impact Assessment (AIA) has been prepared by Avlaw Pty Ltd, trading as Avlaw Aviation Consulting (Avlaw), for Altis Bulky Retail Pty Ltd as trustee for Altis ARET Sub Trust 20 ("Altis") to assess the aeronautical impacts associated with the proposed construction of a 34-story building development as well as one hammerhead tower crane that will be used during construction.

Altis proposes an office suite development at 28 Elizabeth Street in Liverpool ("the site"). The development will consist of one multi-story tower with a proposed maximum building height of 128.275m AHD with all plant and ancillary features captured within this height. Temporary crane activity which will consist of one hammerhead crane will reach a maximum height of 135.671m AHD.

Avlaw's assessment has found that the critical (i.e. lowest) prescribed airspace protection surface covering the site is the Conical Surface of the Bankstown Airport Obstacle Limitation Surfaces (OLS) at a height of 120m AHD. This surface will be penetrated permanently by the tower and temporarily by the construction crane, meaning each will be considered obstacles from an aviation perspective and therefore require controlled activity approval by the Department of Infrastructure, Transport, Regional Development and Communications (Department) to be carried out.

Above the OLS, the next lowest airspace protection surface over the site is the Bankstown Airport Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS). This surface rises across the site towards the south-west from a height of 128.48m AHD at the north-eastern edge of the building footprint (i.e. the closest point to the airport) meaning the building will not penetrate the PANS-OPS. In relation to the crane activity, the PANS-OPS at the tip of the crane jib when it is closest to the airport (i.e. north-eastern edge of movement arc) is 128.20m AHD meaning the crane will penetrate this surface. PANS-OPS penetrations are permitted in some circumstances and are limited to a period of three (3) months.

The site is 450m west-southwest of Liverpool Hospital which currently has one active rooftop helipad. An assessment of the proposed development and crane activity against the flight paths to and from the helipad has concluded that the site is clear of the lateral and vertical extremities of the airspace protected under Guideline H of the National Airports Safeguarding Framework which protects development activities such as buildings and cranes from protruding into airspace that needs to remain clear of obstacles to ensure safe aircraft operations.

The conclusion of this AIA is that the building and one hammerhead crane will require approval from aviation authorities. As the building is only penetrating the OLS, this should be assessed favourably. With regards to crane activity, a detailed construction management plan will need to be developed to minimise the impact on aircraft operations and limit the period the crane is penetrating the PANS-OPS by a maximum of three (3) months.

2

Regulatory Framework

Regulatory Framework

2.1 Airspace Height Controls

Protection of airspace surrounding an airport is a critical component of maintaining requisite safety standards that facilitate the efficient use of runways, whilst also managing the associated impacts of their use on other critical infrastructure (e.g. taxiways), the environment and the general public. 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 defines a set of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's prescribed airspace.

With respect to Bankstown Airport, the following airspace protection surfaces have been "declared" by the Department and are therefore enshrined in legislation as the airport's prescribed airspace:

- OLS; and
- PANS-OPS surfaces.

2.2 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 the approval of aviation authorities. 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 following consultation with the Civil Aviation Safety Authority (CASA) and Airservices Australia (Airservices).

With respect to long-term penetrations (e.g. a building penetrating the OLS), the airport operator is required to invite the following stakeholders to assess or comment on an application:

- CASA for an assessment of the impact on aviation safety;
- Airservices for assessments of proposals resulting in a penetration of surfaces including the PANS-OPS;

- the local council authority responsible for building approvals; and
- 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 (as will be the case with this development) is the Department as specified in the Act and the Regulations, with PANS-OPS penetrations permissible for a maximum period of three (3) months.

Each penetration of prescribed airspace has to be assessed against the effect on published departure and approach procedures and other matters relating to the management and use of airspace surrounding airports. These include published survey data and Air Traffic Control (ATC) procedures and practices, including compatibility with the promulgated ATC Radar Terrain Clearance Chart (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 by aircraft and cover vertical, lateral and longitudinal criteria.

The approval process requires applications for the permanent building structure and temporary construction cranes. It is encouraged that applications for both permanent (i.e. building) and temporary (i.e. cranes) obstacles to be lodged concurrently to expedite the approval process.

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

Proposed Development

Proposed Development

3.1 Location

The site is located 5,810 metres (3.14 NM) west of Bankstown Airport Aerodrome Reference Point (ARP) in the Liverpool CBD. The coordinates at the centre of the site are 308247.56 m E, 6244699.32 m S.

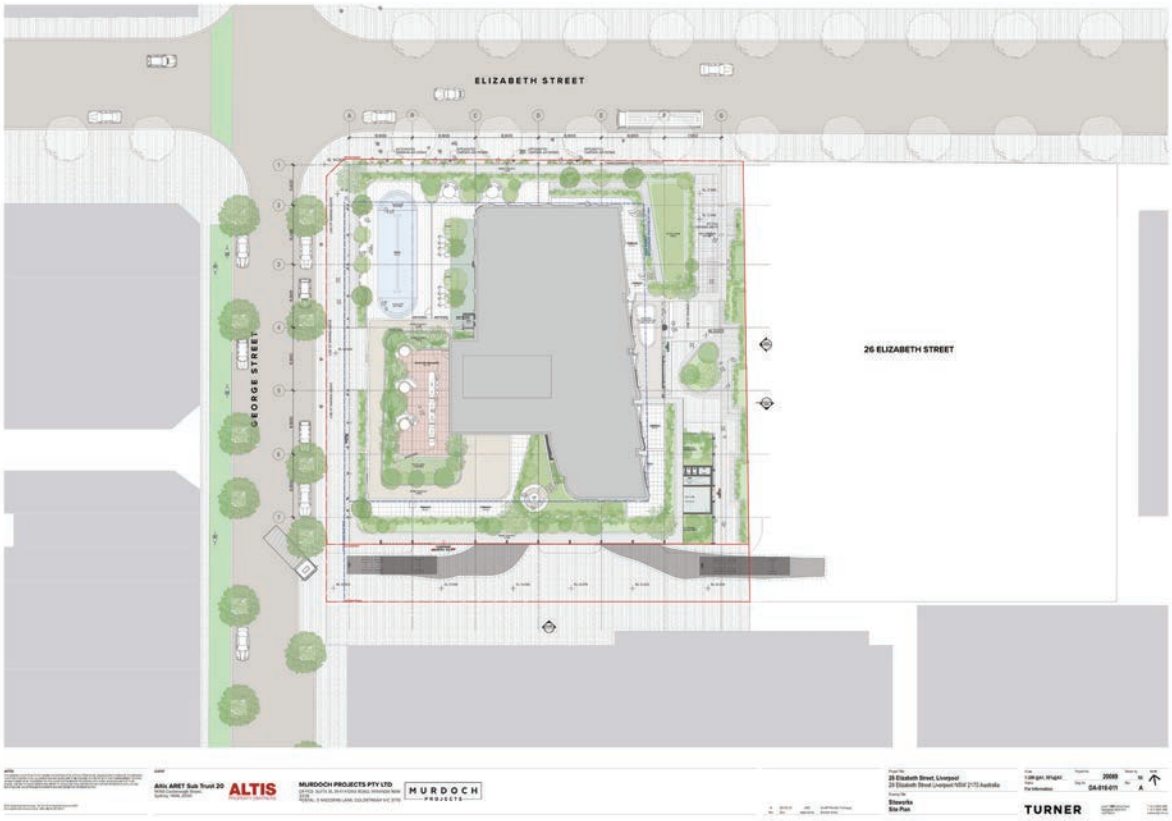

Figure 1: Site boundary indicated by the outer red line

Figure 2: Site location in relation to Bankstown Airport

3.2 Permanent Structure

The proposed maximum building height is 128.275m AHD, with all plant and ancillary features captured within this envelope. An elevation view image of the proposed development indicating its height is provided on the following page at Figure 3.

Figure 3: Elevation view of the proposed development (maximum height 128.275m AHD)

3.3 Crane Activity

One hammerhead tower crane will be used to complete construction of the proposed development. Temporary crane activity will reach a maximum height of 135.671m AHD.

Figures 4 and 5 illustrate the height of the crane as well as their movement arc during construction.

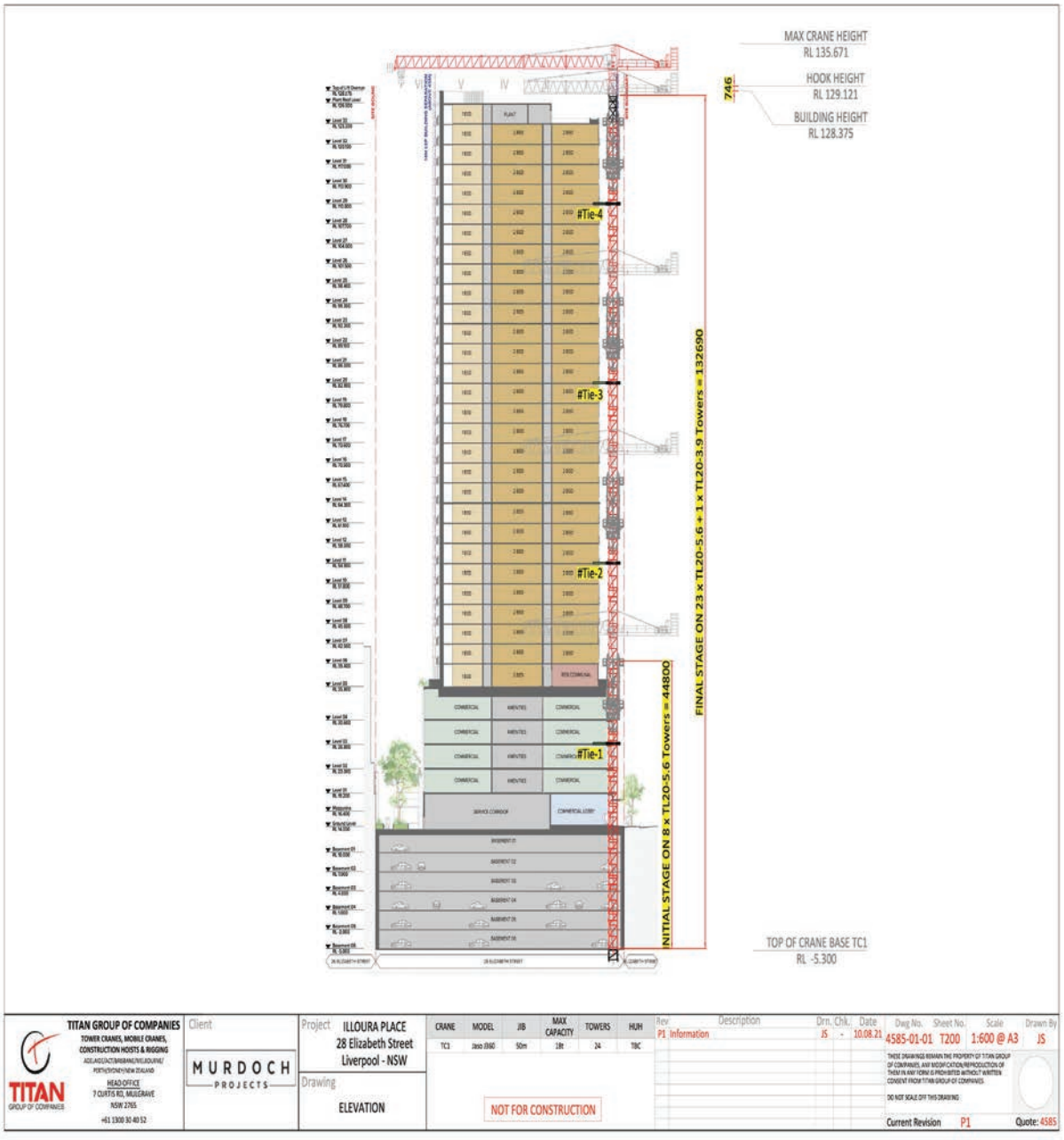

Figure 4: Elevation view image showing crane at its highest point of 135.671m AHD

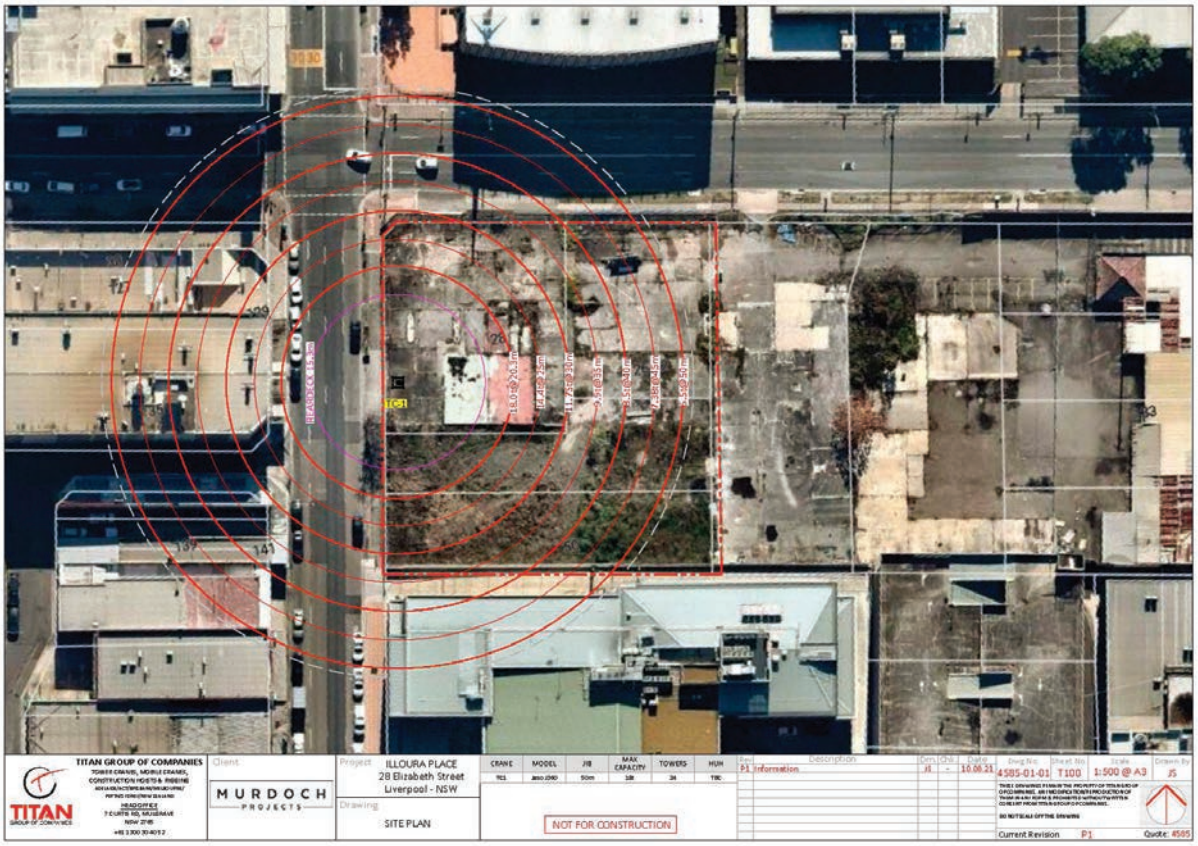

Figure 5: Indicative movement arc of hammerhead crane

One hammerhead crane will be used during construction and penetrate Bankstown Airport's prescribed airspace. At the time of writing, a detailed construction management plan is being developed to determine at what point during construction the penetration will occur and how long the crane will remain an obstacle from an aviation perspective. The details of said construction management plan will be included in a formal application to Bankstown Airport prior to construction commencing. This construction management plan will demonstrate that the penetration of the PANS-OPS is not planned to exceed three (3) months.

4

Prescribed Airspace Assessment

Prescribed Airspace Assessment

A review of the airspace charts which form Bankstown Airport's prescribed airspace and are made available through their 2019 Master Plan provides the basis upon which the aeronautical impact of any proposed development activity will have on the safety, efficiency and regulatory of aircraft operations. An independent analysis by Avlaw has found that the published PANS-OPS chart contained in the Bankstown Airport Master Plan does not reflect the current ICAO requirements that are adopted by Australia, specifically the November 2020 amendment to the PANS-OPS document in relation to turns during SIDs.

With respect to the proposed development at the site, Avlaw has determined that the OLS and PANS-OPS as the most critical volumes of airspace for which further analysis would be required to achieve requisite approvals. The summary of Avlaw's findings are listed below:

- The height of the OLS at the north-eastern corner of the site is nominally 120m AHD and rises towards to west. Therefore, both the building (128.275m AHD) and the crane (135.671m AHD) both penetrate this surface;
- The height of the PANS-OPS at the north-eastern edge of the building footprint is 128.48m AHD and rises towards the south-west. Therefore, the building (128.275m AHD) does not penetrate the PANS-OPS;
- The height of the PANS-OPS at the tip of the jib (133.871m AHD) when it is closest to the airport is 128.20m AHD and rises towards the south-west. Therefore, when in this position, the PANS-OPS is penetrated by the crane jib tip by 5.671m.

4.1 Obstacle Limitation Surfaces

The site is clear of the approach and take-off surfaces for Bankstown Airport and lies under the Conical Surface of the OLS which rises east to west. It is indicated by the marker on Figure 7 and is nominally 120m AHD at the north-eastern corner of the site and rises towards the west. The proposed building height of 128.275m AHD will penetrate the OLS by 8.275 metres. One temporary hammerhead crane reaching a height of 135.671m AHD will penetrate the OLS by 15.671 metres. Since the building and temporary crane activity will penetrate the prescribed airspace for Bankstown Airport, they will be considered controlled activities and require aeronautical assessment and approval by aviation stakeholders before being allowed to proceed.

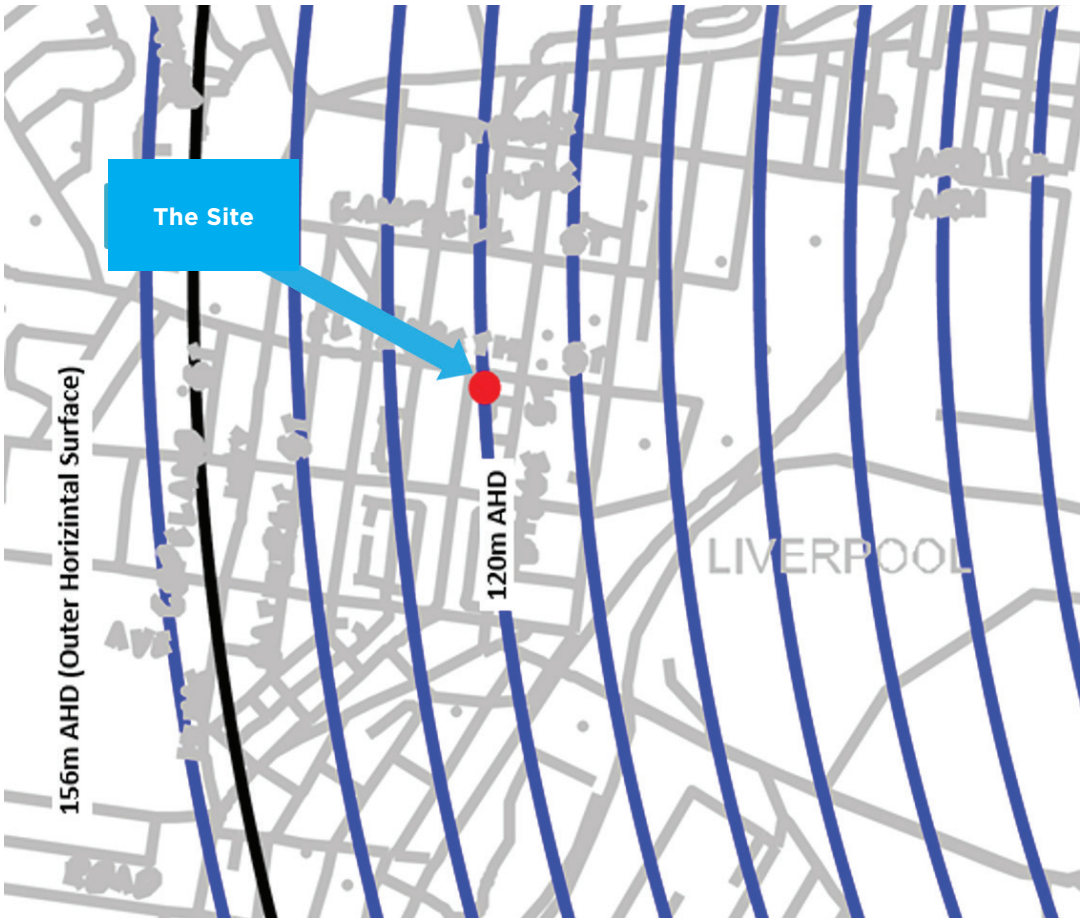

Figure 7: Location with respect to the Bankstown Airport OLS (2013 Prescribed Airspace)

4.2 Procedures for Air Navigation Services – Aircraft Operations Surfaces

Bankstown Airport's PANS-OPS covers the site and rises from the north-east towards the south-west. The proposed building to a maximum height of 128.275m AHD will not penetrate this surface, however one hammerhead crane that will be used during construction will. Figures 8a, 8b, 9a and 9b show extracts from various PANS-OPS charts referenced as well as a 3D model of the building envelope and as the movement arc of the crane.

Figure 8a: The site plotted in red on the Bankstown Airport PANS-OPS Chart (2019 Master Plan)

Figure 8b: The site plotted on the Bankstown Airport PANS-OPS Chart (provided by Bankstown Airport) Note: HP = Horizontal Plane

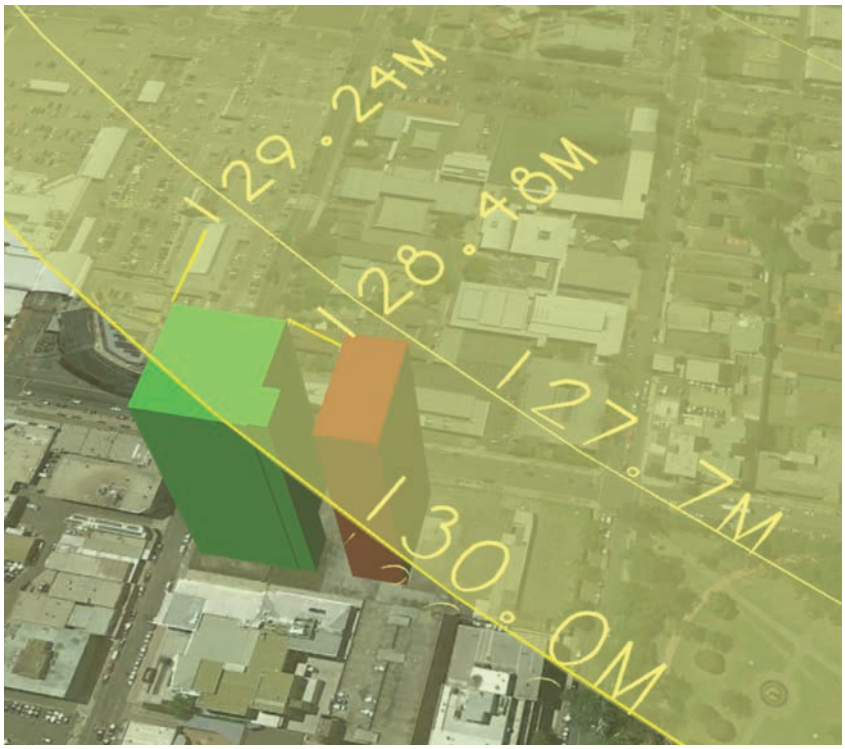

Figure 9a: PANS-OPS surface heights above the site shown in relation to the building envelope (modelled by Avlaw based on Nov 2020 ICAO update).

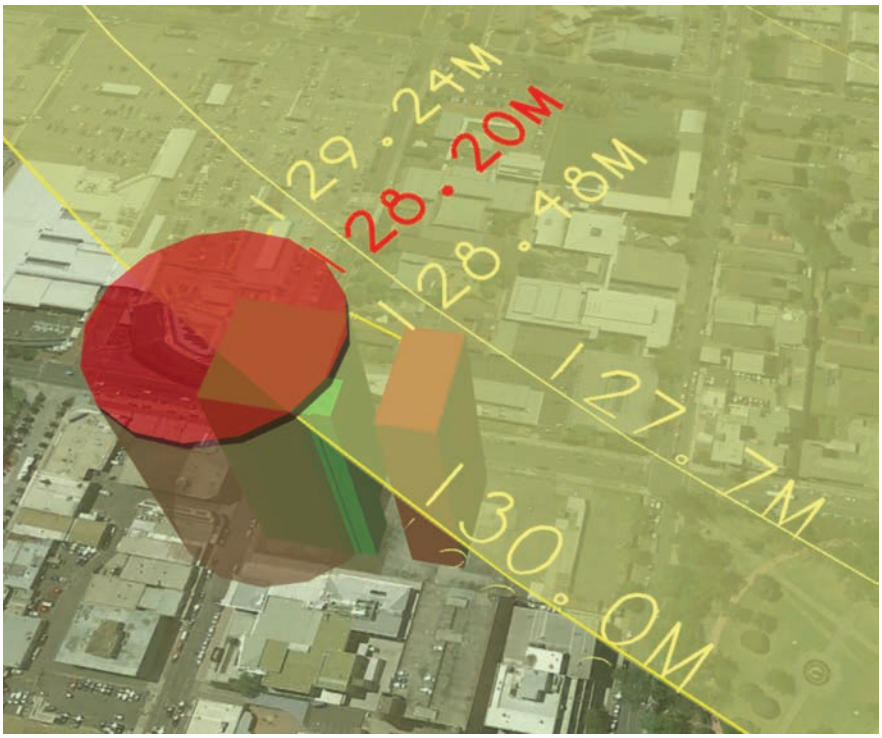

Figure 9b: PANS-OPS surface heights above the site shown in relation to the building envelope (green) (modelled by Avlaw based on latest Nov 2020 ICAO update). Indicative movement arc of crane shown in red.

5

Assessment of Flight Procedures

Assessment of Instrument Flight Procedures

5.1 Instrument Flight Procedures

A review of all published approach and departure procedures as described in Aeronautical Information Publication/Departure and Approach Procedures (AIP/DAP) for Bankstown Airport has been undertaken. A summary of these procedures is tabulated below.

Name	Effective Date	Amendment List
AERODROME CHART PAGE 1	27-Feb-2020	(Am 162)
AERODROME CHART PAGE 2	9-Sep-2021	(Am 168)
SID BANKSTOWN EIGHT DEP - RWY 11C/29C	9-Nov-2017	(Am 153)
NDB RWY 11C	5-Nov-2020	(Am 165)
NDB-A	5-Nov-2020	(Am 165)
RNP RWY 11C	9-Sep-2021	(Am 168)

Figure 10: Published procedures for Bankstown Airport as of Aug 2021

Our assessment confirms that the proposed building height of 128.275m AHD will not impact on any instrument flight procedures. However, the one hammerhead crane that will be used during construction up to a maximum height of 135.671m AHD will penetrate the PANS-OPS for Bankstown Airport, specifically impacting the Standard Instrument Departure (SID) Bankstown Eight Departure for runway 11C/29C.

Mitigation for penetration of the PANS-OPS is possible by way of the following:

- Increase to the take-off climb gradient for SID Bankstown Eight Departure for runway 11C/29C; or
- A change to the commencement point of turns when aircraft are given clearance to use
- the SID Bankstown Eight Departure for runway 11C/29C.

Figure 11: Avlaw's model of Bankstown Airspace

5.2 Circuit Operations

The Aeronautical Information Publication (AIP) En-Route Supplement Australia (ERSA) requires circuit operations to be conducted within 2NM of the ARP. The nearest edge of the site is 3.14NM from the ARP therefore the building and temporary construction crane will pose no conflict with circuit operations.

6

Helicopter Operations

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.

6.1 Bankstown Airport

The nearest corner of site is located approximately 5,810 metres west of the Bankstown Airport ARP. There are a number of prescribed helicopter transit routes published in AIP ERSA for helicopter operations at Bankstown Airport. These are included in the Coded Clearances and Operating Requirements, with the coded clearances containing the specific routes and prescribed altitudes to be flown. Avlaw's assessment has found that the proposed development site is clear of specific helicopter transit routes:

- CHOPPERS NORTH;
- CHOPPERS WEST and;
- CHOPPERS SOUTH.

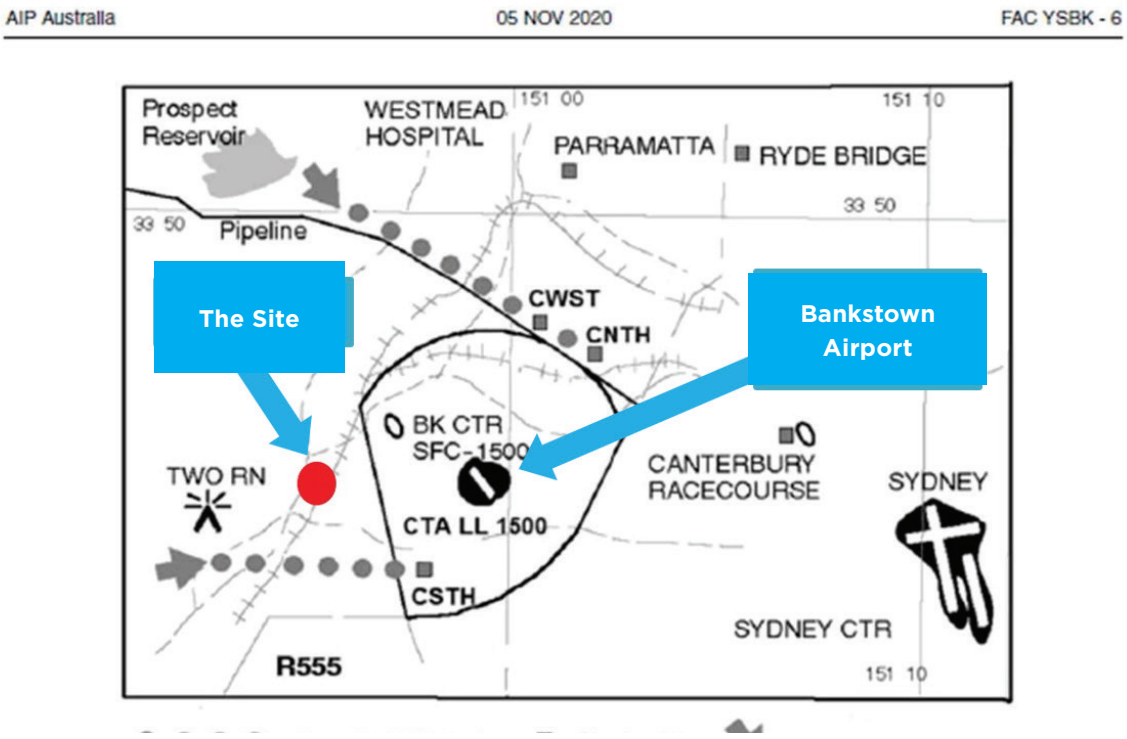

Figure 12: AIP ERSA extract showing CHOPPERS NORTH (CNTH), CHOPPERS WEST (CWST) and CHOPPERS SOUTH (CSTH) transit routes

6.2 Hospital Helipads

The NASF Guideline H has been developed with regards to the protection of what are being termed Strategically Important Helicopter Landing Sites (SHLSs). Under the guideline, hospital helipads would be considered as SHLSs and therefore protected from obstacles being erected in close proximity to it. The guideline defines 140m wide rectangular steps in the direction of the approach/take-off area in 500m long increments until reaching 125m above the SHLS. The steps, rising in 15m increments, are shown in Figure 10 below that has been sourced from Guideline H and illustrates the protection of SHLS and the heights above which further assessment is triggered.

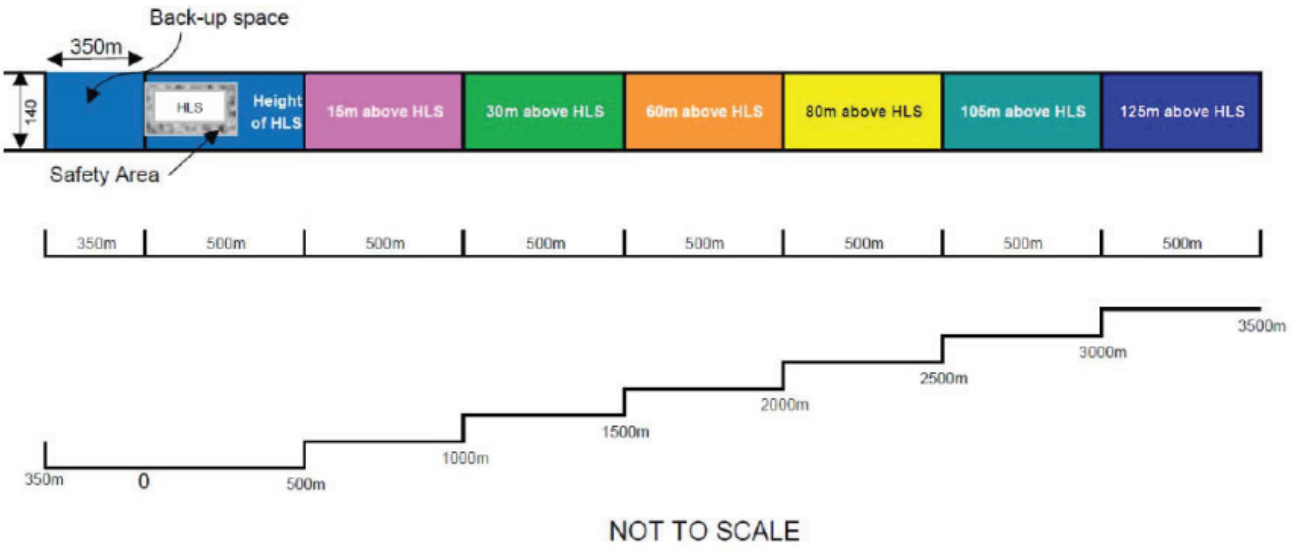

Figure 13: Referral trigger for SHLS

The site is 450 metres to the west-southwest of the Liverpool Hospital helipad. An assessment of flightpaths conducted in 2020 by Avlaw involving Liverpool Hospital and other key stakeholders resulted in the rotation of the western flight path further north to facilitate the construction of another development. Figure 11 shows the old and new flight paths in relation to other nearby developments and as can be seen, approaches and departures are not in the direction of the site and therefore the referral trigger (Figure 10) contained in NASF guideline H is not enacted.

Figure 14: Old Western Flight Path (red) and updated Western Flight Path (purple) for Liverpool Hospital Helipad. The Altis site is indicated by the red marker.

Therefore, Avlaw's assessment of current operations in the vicinity of the site concludes the proposed development (i.e. buildings and crane) will pose no increased safety risk to those that already exist due to other obstacles in the area.

7

Conclusions

Conclusions

The permanent building development at the site is proposed to reach a maximum height of 128.275m AHD, with all plant and ancillary features captured within this envelope. The building will penetrate the Conical Surface of the Bankstown Airport OLS but not the PANS-OPS. The site is not aligned with the runway approach/departure path and no defined flight operational clearance surfaces for aeroplanes and helicopters are affected by the building. Penetration of the OLS by the building should be permitted in this instance as it will not adversely impact the safety, efficiency or regularity of aircraft operations.

The one hammerhead crane that will be used during construction will reach a maximum height of 135.671m AHD and will therefore penetrate both the OLS as well as the Bankstown Airport PANS-OPS surfaces which cover the site. A detailed construction management plan is currently being developed to determine the period for which the crane will be above the PANS-OPS which will be for no longer than three (3) months. Mitigation for penetration of the PANS-OPS can be provided by Airservices Australia and may include:

- Increase to the take-off climb gradient for SID Bankstown Eight Departure for runway 11C/29C; or
- A change to the commencement point of turns when aircraft are given clearance to use
- the SID Bankstown Eight Departure for runway 11C/29C.

Helicopter activities in associated with Bankstown Airport as well as those which service Liverpool Hospital have been assessed and will not be adversely impacted by either the permanent building structure of crane activity if approved.

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