

# **Aeronautical Impact Assessment**

Version 1.0 8 May 2024

## strategic airspace

\*The alignment of the northern pedestrian bridge over the Georges River is subject to further discussions with affected landowners. The alignment of the pedestrian bridge is subject to change

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## **Document Control**

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#### Document Title: Moore Point, Liverpool NSW: Aeronautical Impact Assessment

Purpose / Abstract: This Aeronautical Impact Assessment has been prepared by Strategic Airspace (StratAir) on behalf of the Joint Landowner Group (JLG) to be lodged as part of the Revised Planning Proposal documentation for the Moore Point project at Moorebank, NSW (the site).

> Moore Point is located east of Liverpool CBD across the Georges River in the suburb of Moorebank. It is located within the Liverpool Collaboration Area (LCA) and comprises 31.4 hectares of the 38-hectare Georges River North Precinct.

Given the site location — approximately 5km to the west of Bankstown Airport — the site is subject to the Prescribed Airspace of the airport. It is located ~270m to the south of the Liverpool Hospital helipad.

The objective of this aeronautical impact assessment is to confirm that the building heights proposed would not adversely affect the safety of aircraft and helicopters operating to and from the airport and the hospital, and moreover that the development could ultimately be given airspace height approvals under the Commonwealth Airports (Protection of Airspace) Regulations 1996 (APAR).

The low-rise buildings will not infringe the prescribed airspace of the airport and would therefore not require any specific height approvals. The mid-rise and taller buildings infringe the airport's Obstacle Limitation Surface (OLS) heights and need to be referred for an airspace approval under the APAR prior to construction. Applications can be submitted at any time; and at the latest would be submitted at the time of DA submission and are usually a condition of DA approval.

Whilst applications are submitted to the airport, the authority responsible for making final determinations of such applications is the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA).

In summary, the maximum heights of building envelopes in the Planning Proposal do not exceed the PANS-OPS height limits, the maximum permissible building heights in the relevant areas, and so are considered technically approvable under the APAR.

Additionally, the proposed development does not interfere with helicopter routes to/from Bankstown Airport, nor does it prevent safe and flexible approaches and departures to/from the nearby Liverpool Hospital helipad, considered a Strategic Helicopter Landing Site because it services emergency management services.

Thus, from an aeronautical impact perspective, there is nothing that would preclude the Planning Proposal from rezoning and gazettal for residential / mixed use purposes based on the findings of this aeronautical impact assessment.

Contract: -

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### **Distribution Control**

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## **Executive Summary**

This Aeronautical Impact Assessment (AIA) has been prepared by Strategic Airspace (StratAir) on behalf of a Joint Landowner Group (JLG), which comprises Coronation Property Co and Leamac Property Group, to address the aviation-related airspace height constraints and impacts in relation to the updated Planning Proposal package for Moore Point, Liverpool (the site).

A Gateway Determination (reference PP-2022-1602) was issued in April 2023, based on an earlier Planning Proposal for the site. The updated Planning Proposal package responds to the various conditions of the Gateway Determination and includes an updated Master Plan and Urban Design Report (for more detail refer to section 2.2 Background, p5). This AIA is based on the updated Master Plan, and documents the assessment of the building layout and massing across the site as presented in the current Master Plan against airspace that must be protected for the current and ongoing safe operation of air traffic in the greater Bankstown region.

Moore Point is located east of Liverpool CBD across the Georges River in the suburb of Moorebank. It is located within the Liverpool Collaboration Area (LCA) and comprises 31.4 hectares of the 38-hectare Georges River North Precinct.

The site is defined by the Georges River along the western and northern edge and Lake Moore along the eastern edge. Part of the site contains heritage items including the Former MM Cables Factory and Cable Makers Australia Factory Pty Ltd Group, including inter-war administration building, factory and interiors.



\* The alignment of the northern pedestrian bridge over the Georges River is subject to further discussions with affected landowners

In relation to Bankstown Airport

Moore Point is the largest privately-led urban renewal project in Australia, led by a Joint Landowner Group (JLG) comprised of Coronation Property Co and Leamac Property Group.

The 31.4 hectares site, set within the Liverpool Collaboration Area (LCA), is a unique opportunity to deliver a model for urban renewal at a metropolitan scale consistent with the strategic priorities of Government, it will be a catalyst for Liverpool City Council (Council) to realise its objectives for the LCA and the Western Parkland City.

The site lies to the west of Bankstown Airport, approximately 4.95 km (2.67 Nautical Miles, NM) from the aerodrome reference point (ARP). In this location it is subject to the Prescribed Airspace of the airport, making any future building development subject to the maximum permissible height constraints of that airspace under the Airports (Protection of Airspace) Regulations 1996 (APAR), which are administered by the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA).

The Planning Proposal comprises a mix of low-rise, mid-rise and taller buildings, distributed across the site so as to satisfy planning objectives. The proposal has also been designed so that no building envelope would exceed the maximum permissible airspace height limits.

This report has been prepared having regard to Prescribed Airspace for Bankstown Airport. It examines the current and forecast regulated airspace height constraints overhead the site that are related to aviation airspace protection requirements which would:

- a) Trigger the requirement to apply for an airspace height approval the Obstacle Limitation Surfaces (OLS).
- b) Constrain the maximum permissible building envelope heights the PANS-OPS surfaces heights.
- c) Potentially constrain the maximum permissible heights for cranes that would be required to enable construction of the proposed development (although approvals for cranes are only necessary after DA and prior to construction).

## **1.1 Constraints Affecting the Precinct**

The relevant airspace constraints overhead the Planning Proposal study area are summarised in the following table.

Height Limits (AHD)	Height Limit Detail	Comment
<ul> <li>~75m –</li> <li>108m</li> <li>OLS Conical Surface</li> </ul>		The OLS Conical Surface, which slopes up across the site, defines the threshold heights for Airspace Height Applications — as depicted in Figure 4-1 (p21).
		Any development that would exceed the relevant limiting OLS height requires an 'airspace height' approval from the Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA) under the Airports (Protection of Airspace) Regulations (or APAR) prior to construction. Applications are usually made at the time of DA; and the airspace approval may be subject of a DA consent condition if the airspace application is still under evaluation at the time of DA approval.
		A height application can be made for each building separately, a block or lot containing a number of buildings to be developed at the same time, or a single application can be made for the entire Moore Point precinct.
		The mid-rise and tall buildings proposed would infringe the OLS and would thus require airspace approvals

Table 1-1 — Summar	v of Ke	v Airspace	Heiaht	Constraints
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For: JLG

Height Limits (AHD)	Height Limit Detail	Comment
123.36m 142.12m	PANS-OPS CIRCLING Surface for Category B Aircraft — Eastern portion of the study area for Category C Aircraft — Eastern portion of the study area	These constraints are the current maximum permissible building heights that would be approved today by the aviation authorities (see Figure 4-2, p22). None of the proposed building envelopes in the relative Circling coverage areas exceed these heights, and so could be considered technically approvable under the APARs. It is likely also to be the maximum height that would be considered approvable for cranes without necessarily requiring operating duration constraints (refer also section 4.5, p28)
152.4m	Radar Terrain Clearance Chart (RTCC) Surface — Entirety of the study area	This constraint is the likely maximum permissible height that may potentially be considered approvable for cranes. Where cranes are approved at heights that exceed the relevant PANS-OPS surface height as listed above, there would be strict operational conditions (refer also section 4.5, p28).

## 1.2 Assessment Conclusions

The airspace constraints affecting the site have been examined in relation to the maximum proposed building envelope heights, which are depicted in Figure 1-1 above.

The site is:

- Subject to Obstacle Limitation Surface (OLS) height limits which slope up from ~75m Australian Height Datum (AHD) at the north-eastern corner to around 108m AHD at the western edge of the study area.
   OLS heights can be considered threshold heights; any building or crane which would exceed the relevant height would need to gain airspace height approvals from the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA), under the Airports (Protection of Airspace) Regulations (APAR) prior to construction or erection.
  - The low-rise buildings will not require prior airspace approvals as they do not exceed the relevant OLS heights.
- Subject to maximum building heights where the constraints are defined by the PANS-OPS Circling surface heights: at the Category B surface height of 123.36m AHD in the east and at the Category C surface height of 142.12m in the west.

PANS-OPS surface heights are based on the heights related to the protection requirements of the various PANS-OPS Instrument Flight Procedures for Bankstown Airport. These define the maximum permissible heights for buildings (including all overruns) under the APAR, except where another aviation safety-related airspace constraint is lower.

- No building envelope in the Planning Proposal exceeds these heights, and so all could be considered technically approvable under the APAR. Cranes up to this height would be approved without operating duration constraints.
- Ultimately limited by the Radar Terrain Clearance Chart (RTCC) / surfaces, at a fixed altitude of 152.4m AHD, across the entire site. This will most likely be the absolute maximum height limit for future cranes. Any cranes which would be permitted to exceed the relevant PANS-OPS surface height limit would be subject to 3-month durations and may also be required to be lowered to the PANS-OPS heights at night. This is the general principle. Applications for buildings are usually submitted at the time of a DA, and for cranes prior to construction.

#### For: JLG

The structure of the lots and the distribution of the taller buildings in the Planning Proposal already take into account the maximum permissible building heights related to the PANS-OPS height constraints imposed by the circling surface heights. As such, all building envelopes would remain below the relevant PANS-OPS surface height limit overhead, and as such are considered technically approvable under the Airports (Protection of Airspace) Regulations.

Additionally, the proposed development does not interfere with helicopter routes to/from Bankstown Airport, nor does it prevent safe and flexible approaches and departures to/from the nearby Liverpool Hospital helipad, considered a Strategic Helicopter Landing Site because it services emergency management services.

It is considered that future applications for buildings in the Planning Proposal, 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, Communications and the Arts. That said, any future DA applications for buildings would require independent verification by a qualified aeronautical consultant that the final architectural designs of the relevant buildings will satisfy the airspace protection constraints in place at the time of DA lodgement.

Thus, from an aeronautical impact perspective, there is nothing that would preclude the updated Planning Proposal from rezoning and gazettal for residential/mixed use purposes based on the findings of this aeronautical impact assessment.

## 2 Introduction

This Aeronautical Impact Assessment (AIA) report has been prepared by Strategic Airspace (StratAir) on behalf of the Proponent, a Joint Landowner Group, to address the aviation-related airspace height constraints and impacts in relation to a Planning Proposal at Moore Point, Liverpool (the site).

## 2.1 The Moore Point Planning Proposal in Summary

Moore Point is the largest privately-led urban renewal project in Australia, led by a Joint Landowner Group (JLG) comprised of Coronation Property Co and Leamac Property Group.

The 31.4 hectares site, set within the Liverpool Collaboration Area (LCA), is a unique opportunity to deliver a model for urban renewal at a metropolitan scale consistent with the strategic priorities of Government, it will be a catalyst for Liverpool City Council (Council) to realise its objectives for the LCA and the Western Parkland City.

When delivered, Moore Point will consolidate Liverpool's role as Australia's a great river city, providing a high-quality living and working environment for future generations. It will deliver homes, jobs and open space up to 2060, in a highly accessible location with unparalleled recreational amenity along the Georges River and Lake Moore.

At a glance, Moore Point will deliver:

- Approximately 11,000 dwellings set within distance of Liverpool CBD and LCA,
- A significant contribution of employment generating floorspace and associated jobs to complement the expansion of Liverpool CBD, and
- Over 10 hectares of publicly accessible open space supported by bridge crossings from Liverpool CBD to a fully accessible Georges River foreshore and Haigh Park.

The site plays a critical role in fulfilling the connectivity, liveability, productivity and sustainability priorities of the LCA and support the vision to make Liverpool Australia's next great river city.

## 2.2 Background

Moore Point has been the subject of extensive strategic planning investigations over the past decade. These investigations have consistently advocated for Moore Point as a future expansion of the CBD. It has both State and local level endorsement that has commenced since 2008.

Following adoption of the Liverpool Collaboration Area Place Strategy (Place Strategy) by the Greater Sydney Commission (GSC) in September 2018, Council indicated to landowners in Moore Point that it was prepared to consider a rezoning of land in the precinct that would meet the intention expressed in the Liverpool Collaboration Area Place Strategy.

Council's Local Strategic Planning Statement (LSPS) also established support for the rezoning of the area, stating that Council would 'Investigate amendments to rezone River precinct north of Newbridge Road (Moore Point) as a mixed-use zone to support the Liverpool CBD and Innovation Precinct, with an extensive open space system and cross-river linkages' over the short-to-medium term.

Council indicated to landowners that had previously submitted planning proposals that a precinct-wide approach to development of Moore Point should be undertaken, including a structure plan for the entire precinct.

On this basis, a planning proposal was lodged with Council on 15 April 2020 for the consolidated Moore Point site. The planning proposal replaced RZ-6-2015 and withdrew all other previous site-specific planning proposals that were submitted.

The Planning Proposal was endorsed by Council on 25 November 2020, subject to the following:

- 1. Notes the advice of the Liverpool Local Planning Panel;
- 2. Endorses in principle the planning proposal request with the following amendments:
  - a. An additional 1.5 hectares of open space marked as 'Open Space Investigation' adjacent to Haigh Park;
  - b. A minimum 40m RE1 Public Recreation zone is provided along Lake Moore;
- 3. Endorses an Urban Design Study and Structure Plan for the Georges River North precinct, with the above amendments, to guide the assessment of future planning proposals in this area.

The Planning Proposal was then forwarded to DPE for Gateway in December 2020. At the same time, Council were finalising a Regional Flood Evacuation Analysis. Council wrote to DPE requesting the proposal be submitted once the analysis was completed and its findings could inform the proposal. The advice was to relodge the planning proposal once the findings of Council's Regional Flood Study were understood.

The Georges River Flood Evacuation Analysis was finalised in March 2022 and the planning proposal was relodged by Council for Gateway on 4 May 2022.

In March 2022, in response to the flooding of the Northern Rivers region, the NSW Government commissioned an independent expert inquiry into flooding. The inquiry recommended a review of planning rules for developing on flood-prone land. DPE reviewed current planning proposals in relation to the flood risk each proposal presented, to determine if proposals can proceed or whether further flood risk and mitigation measures and evacuation capacity was required.

Considering the recommendation of the NSW Flood Inquiry, DPE sought advice from a Flood Advisory Panel (the Panel) regarding the flood risk associated with Moore Point. The Panel found that there was sufficient case-specific merit to pursue the flood risk mitigation measures and allow the proposal to proceed to Gateway, subject to conditions that have been informed by the Technical Advisory Group (TAG) and other material before the Panel.

To guide assessment of the Panel recommendations, DPE have appointed an independent peer reviewer to ensure the recommendations have been fulfilled as part of the assessment process. Council has also engaged a technical flood advisor to support Council's review of the revised planning proposal. These processes were funded by the JLG to support the progression of the proposal.

On 4 April 2023, DPE concluded the planning proposal could proceed subject to conditions. These conditions are addressed as part of the updated planning proposal package submitted to Council for assessment.



Figure 2-1 — Timeline Summary

### 2.2.1 The Gateway Determination & Conditions

The Gateway Determination, dated 3<sup>rd</sup> April 2023, references Planning Proposal (Department Ref: PP-2022-1602): Moore Point.

The Gateway Determination, issued under section 3.34(2) of the Environmental Planning and Assessment Act 1979 (the Act), stated that an amendment to the Liverpool Local Environmental Plan 2008 to rezone Moore Point should proceed subject to a range of conditions, including an updated Master Plan and an Urban Design Report that must be prepared for endorsement by the Department prior to exhibition.

<u>Note</u>: As part of the updating of the Master Plan and preparation of the Urban Design Report to comply with the Gateway conditions, the massing of the buildings (including building heights) in the Master Plan have changed since earlier proposals were presented.

As such, this report documents the assessment of the updated Master Plan and any previous AIAs prepared to earlier submissions are no longer relevant.

The only condition that specifically related to airspace and airports is Condition 13 as part of the Public Exhibition phase, where in Bankstown Airport is listed as one of the agencies which must be consulted with in accordance with section 3.34(2)(d) of the Act and/or to comply with the requirements of applicable directions of the Minister under section 9 of the EP&A Act.

As with the other authorities and agencies listed, Bankstown Airport is to be provided with a copy of the planning proposal and any relevant supporting material via the NSW Planning Portal and given at least 21 days to comment on the proposal.

This report forms part of the relevant supporting material that must be made available to the airport.

#### 2.2.2 Governance Framework

Following the issue of a Gateway Determination, the DPE established a governance framework to engage with the JLG, Council and stakeholders to inform preparation of the updated planning proposal. The aim was to establish the structure, forums, roles, responsibilities and mechanisms for collaboration including a Project Working Group (PWG) and Project Collaboration Group (PCG).

Planning Lead	<ul> <li>Plannning Proposal Authority (Council)</li> <li>Council appointed Project Manager</li> </ul>	
Oversight + Collaboration	<ul> <li>Project Working Group (PWG)</li> <li>Project Collaboration Group (PCG)</li> </ul>	
Membership	<ul> <li>DPE, Council, TfNSW and State agencies</li> <li>JLG representatives (Mecone and consultants)</li> </ul>	

Source: Mecone

Figure 2-2 — Governance Structure

#### For: JLG

## 2.3 The Site

Moore Point is located east of Liverpool CBD across the Georges River in the suburb of Moorebank. It is located within the LCA and comprises 31.4 hectares of the 38-hectare Georges River North Precinct.

The site is defined by the Georges River along the western and northern edge and Lake Moore along the eastern edge. Part of the site contains heritage items including the Former MM Cables Factory and Cable Makers Australia Factory Pty Ltd Group, including inter-war administration building, factory and interiors.

The land subject of the planning proposal relates to the land owned and under the control of the JLG, as defined in Figure 2-3 below.



Source: Mecone

Figure 2-3 — Land Application

## 2.4 The Vision

In preparing the planning proposal, the JLG have developed the following vision for Moore Point:

Liverpool has the ambition to be the next Great River City of the world. A city where the Georges River is its beating heart unifying both sides of the river into a pulsating riverfront experience.

The Moore Point vision will shape the city's eastern bank into an internationally renowned destination loved by locals and visitors alike. Reimagined riverfront parklands, river pools, creative heritage quarter and marketplace inspire our people and residents to be the most productive, most happy, and most healthy people on the planet.

The proposal will create the first truly integrated riverfront development at scale. At the heart of this attraction will be a revitalised riverbank which will undergo an ecological transformation and create a natural, healthy and vibrant river ecosystem.

The river will also offer a diverse range of recreational opportunities, providing activities that meet the needs of a diverse community, and which encourages an active outdoor lifestyle.

## 2.5 The Proposal

The planning proposal seeks to amend the Liverpool Local Environmental Plan 2008 (the LEP) to transform the zoning from industrial to mixed-use and public recreation, including changes to floor space ratio, height of buildings and site-specific provisions.

In response to the Gateway conditions, the planning proposal and supporting structure plan has been updated. The planning proposal has enhanced and improved many of the key elements of the originally endorsed Structure Plan and planning proposal by Council on 25 November 2020 meeting including:

- Celebrating Heritage Enhanced heritage response, including the retention of the heritage grid, Factory 1 and the Administration Building, with partial retention of Factory 2 and adaptive reuse of additional outbuildings along the Georges River foreshore.
- Foreshore Park Embellishment of a new 5.5-hectare linear foreshore park and completing the missing link between Lighthorse Park and Haigh Park.
- Bridges and Community Anchors Creation of new pedestrian bridges to Liverpool CBD and LCA, facilitating access from the wider area to a 1,000 capacity primary school, community facilities and retail amenity.
- Street Hierarchy and Boulevards A new movement and access network to facilitate active transport from Georges River to Lake Moore and a ring road to support vehicular movement.
- Pedestrian Lanes and Pocket Parks Creation of a diverse range of pocket parks, passive open space areas and pedestrian laneways between blocks to enhance access to open space, views and access to the waterfront.

The JLG engaged Yerrabingin in 2021 to prepare an Indigenous Narrative Report. The report establishes Connecting with Country themes for the revised masterplan and public domain. This includes bringing river ecology up and over into the foreshore, including restoration of endemic/native species through naturalised revetment treatment that will support habitat.

The revised planning proposal has been informed by a suite of interdisciplinary technical consultants through an iterative process to ensure the creation of a successful place that comprehensively addresses the Gateway conditions.

## 2.6 Structure Plan and Indicative Masterplan

The planning proposal is supported by a structure plan and indicative masterplan. Each plan serves a distinct purpose in supporting the outcome of the project.

#### 2.6.1 Structure Plan

The Structure Plan sets out the spatial parameters for Moore Point that will remain constant throughout the delivery of the project. This includes the open space network, primary school, foreshore, roads and streets, heritage items to be re-used and development blocks.

The Structure Plan informs the basis for masterplan development and the preparation of a future site-specific Development Control Plan (DCP) and will also allow Moore Point to respond flexibly to changing market demands and policy contexts.



Source: SJB (Rev 02, 15/04/2024)

#### Figure 2-4 — Moore Point Structure Plan

#### 2.6.2 Indicative Masterplan

The indicative masterplan depicts one of many potential land use and built form outcomes set within the development blocks. This includes potential residential and non-residential uses, typologies and built form configurations.

The level of information provided in the indicative masterplan has been prepared to address the issues raised by the Gateway determination including assessment against design standards and environmental considerations. The purpose of the masterplan, at this stage, is to both allow for technical testing (such as urban design, traffic, economics, flooding, evacuation) and to set a high-quality vision for the development of the site.

## 2.7 Purpose of This Report

This report relates to the Moore Point Planning Proposal and the updated Master Plan, with the report being focussed on the proposal's height impact in relation to the airspace required for the current and continuing safe operation of air traffic to and from Bankstown Airport in particular (as the closest airport), other airports in the greater Sydney Basin, and any strategic helicopter landing sites.

In particular, the report documents the assessment of the planning proposal in relation to the Prescribed Airspace, as defined in the Commonwealth Airports (Protection of Airspace) Regulations 1996 (APAR), of Bankstown Airport. In this regard it provides the information required by the planning authority to provide for consultation and review by the airport, as

stipulated in Local Planning Direction 5.3 Development Near Regulated Airports and Defence Airfields and section 9 of the EP&A Act.

This report does not address potential aircraft noise impact on the planning proposal: that is to be attended to in a separate report by a specialist acoustic consultant.

# 2.8 Maximum Planned Building Envelope Heights & Assessment Elevations

The maximum heights of each building in the Planning Proposal have been designed to remain below the maximum permissible building heights defined by the PANS-OPS protection surfaces related to Bankstown Airport.

The relative levels (RLs) of the top of each building envelope are the equivalent of elevation in metres Australian Height Datum (AHD). Table 2-1 below includes the maximum envelope elevations for the tallest building envelopes in each lot (which are shown in Figure 2-5).



Source: SJB Figure 2-5 — Moore Point Structure Plan (with Lot References shown)

Lot*	Maximum Elevation (m AHD)	Potentially Subject to Height Assessment
1	127.25	Y
2	110.45	Y
3	100.40	Y
4	109.84	Y
5	108.35	Y
6	133.35	Y
7	30.90	-
8	106.80	Y
9	132.45	Y
10	108.25	Y
11	116.92	Y
12	62.25	-
13	106.66	Y
14	136.40	Y
15	26.30	-
16	18.60	-
17	137.10	Y
18	137.00	Y
19	26.67	-
20	134.20	Y
21	135.65	Y
22	131.40	Y

Table 2-1 — Planned Maximum Heights of the Proposed Building Envelopes as per the Structure Plan

 $^{\ast}$  For lot references, refer to Figure 2-5 — Moore Point Structure Plan (with Lot References shown) above

## 3 Aeronautical Impact Context

## 3.1 Location of the Proposed Development

#### 3.1.1 Location in relation to Bankstown Airport

The site lies to the west of Bankstown Airport, approximately 4.94 km (2.67 Nautical Miles, NM) from the aerodrome reference point (ARP) at a bearing of 259° Magnetic (M) or 271.6° True (T) — as indicated in Figure 5 below.

The measurement point used is the edge of the closest tall building to the airport — the northeastern edge of the tower building proposed for Lot 4 (see Figure 2-5 above). The coordinates of the measurement point are:

WGS84 Latitude & Longitude	33° 55' 23.49" S	150° 56' 05.59" E
MGA94 Easting & Northing (Z56)	309104.08 E	6244439.86 N

The western border of the precinct is ~5.5 km (~3 NM) from the ARP.



Figure 3-1 — Site in relation to Bankstown Airport

There are three runways at the airport:

- The Northern runway (RWY) 11L/29R the main (most used) runway, servicing flying training and general aviation arrivals and departures.
- The centre runway, RWY 11C/29C the longest (and the only Code C) runway. This takes overflow traffic from the northern runway and is used for larger aircraft and those departing into controlled airspace. This runway and the instrument flight procedures for the airport are the primary basis of the PANS-OPS surfaces which define the maximum permissible development heights at the site.

The Southern runway, RWY11R/29L — the least used runway, typically used for flying circuit training.

In relation to the central runway, RWY 11C/29C, the closest end of the runway is the northern end, the landing threshold identified as RWY 11C. The measurement point is ~4.65 km (2.5 NM) at 253°M (266.2°T) from the threshold of RWY 11C.

Although not under the direct flight paths in and out of the airport, the precinct still lies under the protection surfaces which define the height limits of the airport's Prescribed Airspace.

#### 3.1.2 Location in relation to Other Airports in the Sydney Basin

The other airports in the Sydney Basin are too distant from the study area to have any impact on the airspace above it — with the exception of the minimum vector altitude (MVA) sectors used by the air traffic controllers, which are charted on Sydney Airport's Radar Terrain Clearance Chart (RTCC) surfaces plan.

# 3.1.3 Location in relation to Helicopter Landing Sites & Defined Chopper Flight Routes

The proximity of the site to nearby Liverpool Hospital's helicopter landing facilities, which are used for Emergency Medical Services (EMS) helicopter traffic, is also worth noting.

Whilst helicopter routes are not part of the prescribed airspace, there is an accepted requirement that new developments do not interfere with helicopter emergency management services (HEMS) flights to/from hospital helipads — which are defined as Strategic Helicopter Landing Sites (SHLSs) in Guideline H of the National Airports Safeguarding Framework (NASF). As such, the potential impact of new developments is now included as part of the set of key factors to be considered when evaluating airspace approvability under the APAR.

The north-west corner of the precinct is approximately 270m from the helipads at Liverpool Hospital and so needs assessment.

The site is too far from the Westmead Hospital Strategic Helicopter Landing Site (SHLS) — approximately 14 km (7.6 NM) 189°M ( $202^{\circ}T$ ) — to have any impact on the helicopter EMS (HEMS) traffic to/from that site.

## 3.2 Methodology

The methodology used to determine the maximum permissible building heights is based on an orderly assessment of the potential impact against the various elements described in this section.

#### 3.2.1 Airspace Regulations

The proposed development site is subject to the Airports (Protection of Airspace) Regulations (APAR), under the Commonwealth's Airports Act, 1996), because of its proximity to Bankstown 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.

#### For: **JLG**

### 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, Communications & the Arts (DITRDCA) 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 that the proposed building development does not penetrate or adversely affect surfaces protecting: instrument flight procedures (PANS-OPS surfaces); radar vectoring; navigation infrastructure; and anything else that might affect the safety, efficiency or regularity of current and future air transport 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 is the abbreviation of the international regulations related to the design to instrument flight procedures, a document published by the International Civil Aviation Organisation (ICAO), Doc 8168, Vol 2, Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS). In Australia, PANS OPS rules are adopted and codified in the Civil Aviation Safety Regulations Manual of Standards (CASR MOS) Part 173, which is maintained by the Civil Aviation Safety Authority (CASA).
- 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

- > Bankstown & Sydney Airport's Declared Airspace Plans additionally include:
  - Sydney Airport's Radar Terrain Clearance Charts (RTCC), which depict the areas and height limits related to the Minimum Vector Altitudes (MVAs) 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.
- > Other Factors
  - Protection for other Instrument Flight Procedure surfaces, where the procedures are not classified as PANS-OPS and/or have been omitted from Bankstown Airport's declared PANS-OPS surfaces charts.
  - 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.
  - 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. This may also include protection of critical airspace for visual

flight procedures used for emergency management service (EMS) helicopter landing sites (HLS).

*Note*: Airspace that is approved by the Department of Infrastructure, Transport, Regional Development, Communications & the Arts (DITRDCA) 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>.

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, etc).

For the purposes of this Planning Proposal it is assumed that the building envelopes in the indicative masterplan are inclusive of such overruns.

#### 3.2.4 The Application Pathway for Airspace Height Approvals

All applications for permanent structures (called *controlled activities*) and temporary structures (*short-term controlled activities*) under APAR must be submitted to DITRDCA, at the appropriate time, through the closest relevant airport. At the latest, approvals for buildings must be gained prior to construction, but are usually required as a condition of approval of Development Applications by most Councils, including the Liverpool City Council.

Note that prior airspace approval is not required for rezoning.

Applications should include aeronautical impact assessment reports that are based on the most current plans for the proposed development available at the time. For major developments, such reports should include consideration of cranes that will be required for construction: this information will be used for assessment of the feasibility of constructing the buildings if approved at the maximum heights sought. Separate applications for cranes will also be required at the appropriate times during the construction period, prior to their erection.

There are a number of factors and considerations that would influence a decision on when to make an APAR application for a building. Common decision criteria are outlined below.

- The need for early certainty of approval, versus the effort entailed in preparing documentation and supporting details required to prepare and justify an APAR application that can be approved.
- Application assessment lead time: under the APAR, the minimum processing time for evaluation is 49 days, but it may be substantially longer before a determination is made if additional information and/or clarifications are required.
- Approvals are sometimes not required prior to submitting a development application (DA) but in other cases planning assessment requires a level of certainty that an APAR application would be approved in the event that the Planning Proposal or DA is approved.
  - Some DAs are granted with the requirement to secure an airspace height approval as a consent condition.

- Bankstown Airport, CASA and DITRDCA prefer to process applications that already have DA approval for several reasons:
  - Because applications based on advanced development plans and designs (eg, to DA level or beyond) will have enough associated information — eg, a Construction Management Plan which includes preliminary crane plans — that will help to support and justify the feasibility of construction in the event of an APAR approval; and
  - To reduce the likelihood that they will have to re-evaluate the sites for amended applications in the future due to changed designs (for example, following DA resolution).
  - That said, the airport has a formal process for applications as a result of DA referrals by councils, and applications will be accepted at any time even well before submissions of applications for DAs or similar.
- In the event that changes to a design or construction events are likely to exceed an approval already granted for the site, an application for an amendment to the pre-existing approval would need to be made. The documentation requirements and assessment periods for amendments are usually the same as for an initial application.

### 3.2.5 Applications for Buildings

For proposed developments that would penetrate the OLS, the airport would seek consultation from Airservices Australia, CASA and other key stakeholders (such as major airlines), and then within 3 weeks from the date of receipt forward the application to DITRDCA. Upon final receipt of technical calculations and agency and stakeholder feedback, DITRDCA would make a determination and advise the referring airport and the applicant. Whilst the APAR provide a 4-week response timeframe for the DITRDCA response, there are provisions whereby this timeframe can be extended, especially where DITRDCA seeks clarification or further information to help in the assessment of complex cases.

A successful application would be given approval under Regulation 14 of the APAR as a controlled activity.

### 3.2.6 Applications for Cranes

For proposed cranes and temporary structures that would penetrate the OLS but not infringe the PANS-OPS constraint overhead, the airport may grant approval of applications under delegation. If an application seeks approval for cranes that would penetrate the PANS-OPS height constraint, permission may be granted by DITRDCA subject to operational and safety assessments, as well as the agreement of the airport. In such cases, a crane which infringes the PANS-OPS would be approved for a maximum duration of 3 contiguous months as a short-term controlled activity under Regulation 14(5) of the APAR.

See also section 4.5 (p28) regarding future crane implications for buildings in the Planning Proposal.

## 3.3 Airport Plans & Aeronautical Data References for the Study

#### 3.3.1 Bankstown Airport Master Plan 2019

The current plan in effect, the Bankstown Airport Master Plan 2019, has two planning timeframes: a shorter-term planning period to 2024 and a longer-term forecast period from 2024 to 2039.

The master plan continues the provision for an extension of the main instrument flight runway, RWY 11C/29C. This will have no adverse effect on

the existing airspace constraints overhead the site because the planned extension is at the RWY29C (south-eastern) end of the runway. The master plan does not forecast any other potential changes to the aerodrome infrastructure or flight paths which would cause any additional impact on the airspace protection constraints overhead the site.

Similarly, the master plan indicates that even up to 2039 there would be no effective change in the ANEF noise contour overhead the site.

#### 3.3.2 Bankstown Airport Prescribed Airspace Plans

The currently available plans comprise the OLS and PANS-OPS surfaces charts. The 2013 OLS chart (Declared 2016) is based on the planned extension to the east of the centre runway RWY 11C/29C. The OLS contours over the site are the same as those shown in section 4.2 below (p20).

The Bankstown Airport PANS-OPS surfaces chart, titled the Critical Surfaces (2018), was last updated in 2020: this 12-Mar-2020 update includes some updates to take into account changes to PANS-OPS instrument flight procedures current at that time, but in parts is now outdated because of subsequent changes to the PANS-OPS procedures. This report assessed the most current PANS-OPS flight procedures as documented in section 4.3 (p21).

#### 3.3.3 Procedure & Airspace Charts published by Airservices Australia

These charts are regularly updated every three months and the updates are published on Airservices Australia's website six weeks prior to implementation. These charts reflect changes in the international standards for PANS-OPS procedures, changes in the navigation infrastructure used and other changes implemented as a result of air traffic management demands and practices from time to time.

The PANS-OPS instrument flight procedures published in these charts are the procedures pilots are obliged to follow. Hence, they are the best source of information in deriving current airspace restrictions. The height limitations identified in this report are based on the most recent version of these and other relevant charts published by Airservices Australia. The charts referenced are listed in Appendix 2 — PANS-OPS Procedures.

## 4 Analysis

## 4.1 Analysis Summary

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

Height Limits (AHD)	Height Limit Detail	Comment	
~75m – 108m	OLS Conical Surface	The OLS Conical Surface, which slopes up across the site, defines the threshold heights for Airspace Height Applications — as depicted in Figure 4-1 (p21).	
		Any development that would exceed the relevant limiting OLS height would require an 'airspace height' approval from the Department of Infrastructure, Transport, Regional Development. Communications & the Arts (DITRDCA) under the Airports (Protection of Airspace) Regulations (or APAR) prior to construction. Applications are usually made at the time of DA; building airspace height approvals are usually a prerequisite to DA consent.	
		A height application can be made for each building separately, a block or Superlot containing a number of buildings to be developed at the same time, or a single application can be made for the entire Moore Point precinct. The mid-rise and tall buildings proposed would infringe the OLS and would thus require airspace approvals.	
123.36m	PANS-OPS CIRCLING Surface for Category B Aircraft — Eastern portion of the study area	This constraint is the current maximum permissible building height for buildings under this coverage area that would be approved today by the aviation authorities (see Figure 4-2, p22). Building envelopes in the Planning Proposal which are under the coverage area of this surface can be considered technically approvable under the APARs in so far that they do not exceed this limiting height. It is likely also to be the maximum height that would be considered approvable for cranes without necessarily requiring operating duration constraints (refer also section 4.5, p28)	
142.12m	PANS-OPS CIRCLING Surface for Category C Aircraft — Western portion of the study area	This constraint is the current maximum permissible building height for buildings under this coverage area (west of the Cat B circling area) that would be approved today by the aviation authorities (see Figure 4-2, p22). None of the proposed building envelopes exceed this height, and so could be considered technically approvable under the APARs. It is likely also to be the maximum height that would be considered approvable for cranes without necessarily requiring operating duration constraints (refer also section 4.5, p28)	

Height Limits (AHD)	Height Limit Detail	Comment
152.4m	Radar Terrain Clearance Chart (RTCC) Surface — Entirety of the study area	This constraint is the likely maximum permissible height that may potentially be considered approvable for cranes. Where cranes are approved at heights that exceed the relevant PANS-OPS surface height, there would be strict operational conditions (refer also section 4.5, p28). Note that applications for cranes are only required prior to construction, typically not until after approval of DA.
N/A	PANS-OPS Approach Surfaces	The study area is outside the extent of the protection areas of PANS-OPS all Approach Surfaces for Bankstown Airport except the surfaces for the NDB approach to RWY 11C. Though overlapping the site, the protection surface for the NDB approach is higher than the RTCC surface.
N/A	PANS-OPS Departure Surfaces	The protection surfaces for PANS-OPS departures over the site are significantly higher than the other surfaces listed above.
NA	Other Surfaces	The study area is outside any airspace protection requirements related to Bankstown Airport's Navigation and Airport Lighting and Visual Guidance facilities. It is also clear of the primary flight paths used by emergency services helicopters to and from the nearest hospital (Liverpool Hospital).

## 4.2 OLS Analysis

The precinct is under Bankstown Airport's OLS Conical Surface, which rises at a gradient of 5%. As illustrated in Figure 4-1 below, the OLS height limits range:

- from approximately 75m AHD above the north-eastern corner of the site;
- to approximately 108m AHD at the south-western corner of the precinct.

Any of the buildings in the precinct, as well as cranes used for construction (when applicable), where their maximum heights would penetrate the relevant OLS height constraint overhead would need to be included in 'airspace height' applications under the Airports (Protection of Airspace) Regulations, for consideration and explicit approval prior to construction. APAR height applications for buildings would not be required until the submission of DAs at the earliest.

Proposed buildings with maximum heights that would be lower than the relevant OLS height constraint do not need such 'airspace height' approvals.

For: JLG



Figure 4-1 — Indicative OLS Conical Surface Height Contours over the Site

Buildings that ultimately gain height approvals may be required (as part of the approval conditions) to install and operate obstacle lights on the sides and/or tops of the buildings, subject to recommendations made by CASA during their assessment of a height application and based on the specifications in the Civil Aviation Safety Regulations (CASR) Manual of Standards (MOS) Part 139.

## 4.3 PANS-OPS Analysis

None of the proposed buildings in the precinct would penetrate the limiting PANS-OPS surfaces shown in Bankstown Airport's Prescribed Airspace. Therefore, all such buildings could be considered approvable under the Airports (Protection of Airspace) Regulations — subject to other safety considerations that CASA might consider relevant.

In this particular case, all such buildings would normally be granted 'airspace height' approvals by DITRDCA. The taller buildings may be approved with conditions such as need to install obstacle lighting.

We reviewed the PANS-OPS Surfaces chart of Bankstown Airport's PANS-OPS Critical Surfaces (part of the 2019 Airport Master Plan) plan and noted that it appeared to be outdated as changes to the PANS-OPS procedures for the airport have been made since that time.

Thus, assessment was conducted of the following instrument (non-visual) procedure types for Bankstown Airport, as published by Airservices Australia in the Australian Aeronautical Information Publication (AIP) Departure and Approach Procedures (DAP), up to the pending Amendment 179 (effective 13-Jun-2024 to 04-Sep-2024). The list of procedures can be found in Appendix 2 — PANS-OPS Procedures.

- The Circling Minima and Minimum Sector Altitudes (MSAs) for existing PANS-OPS procedures "Area" procedures, which provide protection for aircraft manoeuvring or circling within defined areas above the airport and surrounds
- 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)

When assessing the PANS-OPS procedures based on the published minima we take into account the use of the procedures with remote QNH (when local pressure data is not available to pilots). As indicated by grey shadowing in the minima box on the approach charts, the published minima for such procedures includes an additional 100ft buffer, meaning the protection surfaces for those procedures are 100ft lower than they would be for procedures without such allowance.

Analysis of these procedures confirms that the precinct is constrained by the circling minima for Category B and Category C aircraft — as depicted in the figure below.



Model Source: SJB. Annotated by StratAir

Figure 4-2 — PANS-OPS Cat B & Cat C Constraining Surfaces over the Site

#### Table 4-2 — PANS-OPS Height Limit Summary

Procedure	Height Limit (m AHD)	Description	
Circling — Cat B	123.36	<b>Category B Circling</b> — The 123.36m Cat B circling surface height constraint covers the area closer to the airport and extends out to approximately 40% of the eastern portion of the site. Refer Figure 4-2 above.	
		The calculated height limit of 123.36142.12m (which is higher than the 108.2m height published on the Bankstown Airport PANS-OPS chart) results from applying the standards in the ICAO PANS-OPS document to the current published circling minima.	
		This height is considered the maximum permissible building height over the coverage area.	
		Building envelopes in the Planning Proposal which are under the coverage area of this surface can be considered technically approvable under the APARs in so far that they do not exceed this limiting height	
Circling — Cat C	142.12	Category C Circling — Covers the area over the site outside of the area already covered by the Cat B circling. Refer Figure 4-2 above.	
		The calculated height limit of 142.12m (which is higher than the 135.9m height published on the Bankstown Airport PANS-OPS chart) results from applying the standards in the ICAO PANS-OPS document to the current published circling minima.	
		This height is considered the maximum permissible building height over the coverage area.	
		None of the building envelopes in the Planning Proposal which are under the coverage area of this surface exceed this limiting height, and so can be considered technically approvable under the APARs.	
Approaches and Missed Approaches to all Runways	> 163	Outside the lateral protection areas of many procedures. The protection surface for the RWY11C NDB non-precision procedure partially overlays the site (half of the northern part of the site), rising from ~163m AHD at the building at the northeastern corner of the site, to ~182.9m AHD (600ft Altitude) at the south-western edge of the surface. The protection surface for the NDB procedure is significantly higher than the circling area height constraints.	
Departures	N/A	Where protection surfaces overlay the study area, the lowest limit is significantly higher than the circling surface height constraints.	
Minimum Sector Altitude (MSA)	457.2	10NM Inner MSA of 2500ft.	

Further details are provided in the following sections.

### 4.3.1 "Area" Procedures

#### A Minimum Sector Altitudes (MSAs)

The height restrictions imposed by Minimum Sector Altitudes are higher than the limits imposed by other procedures.

### B Circling Minima

These are areas that define where and how low aircraft are allowed to circle the airport before landing. They apply to the published landing procedures: the Cat B minima for smaller category A and B aircraft; and the Cat C minima for the larger and/or faster category C aircraft.

For the purpose of this assessment the ICAO definition of the lateral extent of the circling area was applied, using SI values to determine the applicable radius from each of the airport runways' thresholds. The AIP as published by Airservices Australia prescribes fixed radii to be used for defining circling areas based on an "example" table in ICAO documentation. The radii defined in the AIP do not take into account local situations at aerodromes which might necessitate larger or allow for smaller radii to be used. The use of the ICAO defined formulae in this assessment is as specified in the regulations (Airports (Protection of Airspace) Regulations — Part 1, Section 4, Item 2), and is demonstrated to have been used in determining prescribed airspace charts which were approved and circulated as official criteria.

As noted in Table 4-2 above and as illustrated in the figures above, the eastern portion of the site is constrained by the Cat B circling surface height and the western portion of the site is constrained by the higher height related to the Cat C circling surface.

The assessment of the surface boundary in this report is based on digitised locations for the relevant thresholds. Note that future detailed architectural design of tall buildings close to the Cat B surface boundary (eg, those in lots 6 and 9) will have to carefully consider the extent and height limits of the Cat B surface to ensure that the designs are clear of this limiting surface. A detailed assessment of the surface boundary and height approval implications for the building(s) should be conducted by a qualified aeronautical consultant whilst preparing DA plans, and such assessment should be made based on surveyed runway threshold locations to be provided by the airport authorities.

# 4.3.2 Instrument Approaches & Missed Approaches, and Standard Instrument Departures (SIDs)

The site is outside the lateral extent of the protection surface for the RNP RWY11C approach procedure. The most restrictive of the PANS-OPS approach and departure protection surfaces over the site is related to the RWY11C NDB approach.

With respect to the RWY11C NDB approach, the site lies under the procedure's secondary protection surface, a sloping surface along the edge of the primary protection surface. Considering the minimum altitude to which aircraft are allowed to fly the procedure, the secondary protection surface that overlaps the site slopes up from 107.88m AHD at its northern edge well north of the site, to 182.88m AHD at its southern edge which ends roughly halfway across the site (see Figure 4-3 below), The lowest height of the surface over the site is approximately 163m AHD as measured at the north-eastern corner of the tallest building on lot 4.

While the protection surfaces for the NDB A missed approach and RWY29C departure procedure also overlap the site, those surfaces are higher and therefore less restrictive.

For: JLG



Figure 4-3 — NDB RWY11C PANS-OPS Approach & the Circling Surfaces over the Site

## 4.4 Other Assessment Considerations

The following table provides a brief assessment of other considerations.

Procedure	Height Limit (m AHD)	Description
Radar Terrain Clearance Chart (RTCC)	152.4	This height constraint is applicable over the entire site. This is the limit related to the Minimum Vectoring Altitude (MVA), which is used by air traffic controllers. This information is sourced from the RTCC published as part of Sydney Airport's Prescribed Airspace Plans.
		This would be regarded as the absolute maximum permissible height for cranes, noting that the preference of the airport and aviation agencies would be for cranes to operate at maximum heights which would not infringe the relevant PANS-OPS surface height constraints.

Table 4-3 — Other Assessable Height Limitations —	including the RTCC Surface Limit
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Procedure	Height Limit (m AHD)	Description	
Navigation Infrastructure	N/A	Based on the site location and maximum height, we believe that the proposed development will not adversely affect the NDB navigation aid at Bankstown Airport, and it will not adversely affect the radars used for monitoring aircraft operations in the Sydney Basin.	
Airlines Engine Out Procedures	N/A	The location of the proposed development is outside any areas that would be assessed for impact or required for use under One-Engine Inoperative operations by relevant passenger transport aircraft operators that use Bankstown Airport.	
Strategic Helicopter Landing Sites (SHLS)	N/A	The precinct location lies just to the south of the main final approach and initial take-off/departure flight path for EMS helicopter traffic to and from the Liverpool Hospital helipads.	
		Further, even if helicopter traffic were to fly over the Georges River along the northern border of the precinct, the proposed buildings are buffered firstly by green space and then by lower buildings which would be well below the critical height of the helicopters at those locations.	
		The precinct is also well clear of the published arrival and departure routes required to be used by helicopters using the helipad at Bankstown Airport.	
		Refer also to section 3.1.3 (p14) and Figure 4-4 (p27).	

There are no other known considerations that are considered relevant, and which would constrain the maximum height of the proposed development.

#### 4.4.1 SHLS & Helicopter Route Assessment

As noted above, the north-west corner of the precinct is approximately 270m from the helipads<sup>1</sup> at Liverpool Hospital. However, the normal final approach and initial take-off flight paths for the hospital's helicopter landing pads do not cross the precinct area: they are north of and almost parallel to the section of the Georges River which defines the northern border of the precinct, as highlighted in the inset to Figure 4-4 below. The elevation of the HLS is published as being at 135 ft (41.1m AHD)<sup>2</sup>, which is approximately 32m higher than the ground level at the northwestern corner of the project site, and flights to/from the HLS would start/end at hover heights above that. Furthermore, all flights to/from the HLS must be made using Visual Flight Rules (VFR<sup>3</sup>), which means that the pilots must visually scan to stay clear of obstacles on the ground as well as other air traffic. The proposed development would not prevent helicopters from manoeuvring safely as they fly in/out of the helipad - there is ample manoeuvring space available along Georges River for pilots to remain clear of the proposed buildings. During construction works at the hospital the approach/departure paths were temporarily defined as north and south-east, which were reportedly in effect up until Jan 2024. The normal approach/departure paths for the helipad are defined as north-west and east, which would preclude any approach from the direction of the project site. It is also noted that the helipad marking includes arrows and lights embedded in the helipad to guide pilots for the normal north-west and eastern approach/departure paths, confirming the temporary nature of the southeastern path.

<sup>1</sup> Only the primary helipad (helipad East) is in operation. The old circular helipad (helipad West, the secondary helipad) at Liverpool Hospital closed in Q3 2019 and is not expected to be operational again until upgraded (date uncertain).

<sup>2</sup> Source: https://www.ozrunways.com/helipads/view/helipad.jsp?code=YXLL

<sup>3</sup> There are no PANS-OPS instrument flight procedures (IFR) to the Liverpool Hospital primary helipad.

For: JLG

The precinct is well away from the standard northern and southern 'Chopper' routes to be used for helicopter arrivals to and departures from Bankstown Airport (which are defined by fixed arrival/departure locations in the Australian Aeronautical Information Publication (AIP), published by Airservices Australia). These are also depicted in Figure 4-4 below.



Figure 4-4 — Site in relation to Liverpool Hospital and Standard Helicopter Routes

## 4.5 Considerations re Max Building Heights & Future Cranes

As previously noted in section 3.2.4 The Application Pathway for Airspace Height Approvals and section 3.2.6 Applications for Cranes (p17), height applications for cranes are usually made only when required, prior to construction.

All buildings in this Planning Proposal which have maximum RLs less than say 90m AHD in the Cat B circling area of coverage and those less than say 110m AHD under the Cat C circling area height constraint would most likely be able to be constructed using cranes that would not infringe the relevant PANS-OPS height constraints (assuming ~30m over the top of a building for crane deployment). Not only does this mean that height applications for the buildings themselves would be simpler to process, it also means that cranes for such buildings could be approved without operating duration restrictions.

For the taller buildings, airspace height applications may require supporting information to confirm that cranes which would exceed the PANS-OPS height limit could be safely operated at heights that would be below the RTCC surface height limit. For example, this may prove challenging for some of the taller buildings where there is limited vertical clearance between buildings of 130+m AHD and the limiting RTCC height of 152.4m AHD. Applicants must be aware that any associated crane approvals of cranes which would be permitted to exceed the PANS-OPS surface would be subject to strict conditions. Such approval conditions would include a strict 3-month operating duration, and other operating conditions.

These are not conditions that are applicable to approval of a rezoning application per se; they are however mentioned here as information that would pertain to developers at the time of preparation of DAs and height applications for buildings.

## 5 Conclusion

The Planning Proposal contains a number of buildings which would infringe the OLS conical surface which rises across the site — from approximately 75m AHD in the east to 108m AHD at the western edge. The masterplan contains buildings of different types and heights dispersed across the site, following the planning concepts and objective. The low-rise buildings would not infringe the OLS and so would not require any aviation-related airspace height approvals. Those buildings that ultimately would infringe the relevant OLS height constraint would require airspace height approvals under the APAR prior to construction (and most likely at the time of a DA).

The structure of the lots and the distribution of the taller buildings in the Planning Proposal already takes into account the maximum permissible building heights related to the PANS-OPS height constraints imposed by the circling surface heights. As such, the building envelopes in the indicative masterplan would remain below the relevant PANS-OPS surface height limit overhead, and as such are considered technically approvable under the Airports (Protection of Airspace) Regulations. That said, any future DA applications for buildings would require independent verification by a qualified aeronautical consultant that the final architectural designs of the relevant buildings will satisfy the airspace protection constraints in place at the time of DA lodgement.

In summary:

- It is considered that future applications for buildings in the Planning Proposal, 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, Communications and the Arts.
- Additionally, the proposed development does not interfere with helicopter routes to/from Bankstown Airport, nor does it prevent safe and flexible approaches and departures to/from the nearby Liverpool Hospital helipad which is considered a Strategic Helicopter Landing Site.
- Therefore, from the aeronautical impact perspective, there is no technical impediment to approval of the Moore Point Planning Proposal for rezoning.

## 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:

Abbreviation	Meaning		
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		
APCH	Approach		
APAR / APARs	Airports (Protection of Airspace) Regulations, 1996 as amended		
ARP	Aerodrome Reference Point		
AsA	Airservices Australia		
ASDA	Accelerated Stop Distance Available		
ATC	Air Traffic Control(leer)		
ATM	Air Traffic Management		
BA (Planning)	Building Application or Building Approval (Planning)		
BAC	Brisbane Airport Corporation		
BCC	Brisbane City Council		
CAAP	Civil Aviation Advisory Publication		
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		
CMP	Construction Management Plan		
CNS/ATM	Communications, Navigation, Surveillance / Air Traffic Management		
CoS	City of Sydney (Council)		
DA (Aviation)	Decision Altitude (Aviation)		
DA (Planning)	Development Application or Development Approval (Planning)		
DAH	Designated Airspace Handbook		
DAP	Departure and Approach Procedures (published by AsA)		

Abbreviation	Meaning	
DCP (Planning)	Development Control Plan	
DEP	Departure	
DER	Departure End (of the) Runway	
DEVELMT	Development	
DH	Decision Height	
DITRDCA	Department of Infrastructure, Transport, Regional Development,	
	(former abbreviations & the Arts (Commonwealth)	
DME	Distance Measuring Equipment	
Doc nn	ICAO Document Number nn	
DoD	Department of Defence	
DODPROPS	Dependent Opposite Direction Parallel Runway OPerations	
DPE	Department of Planning & Environment (NSW). now DPHI	
DPHI	Department of Planning, Housing & Infrastructure (NSW), formerly DPE & DPIE (Department of Planning, Industry & Environment)	
EIS	Environmental Impact Study	
ELEV	Elevation (above mean sea level)	
ENE	East North East	
EP&A (Planning)	NSW Environmental Planning & Assessment Act 1979 (as amended)	
ERSA	EnRoute Supplement Australia	
ESE	East South East	
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	
GDA2020	Geocentric Datum of Australia 2020	
GDA94	Geocentric Datum of Australia 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	
GSC	Greater Sydney Commission	
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)	

Abbreviation	Meaning	
LAT	Latitude	
LCA	Liverpool Collaboration Area	
LDA	Landing Distance Available	
LEP (Planning)	Local Environment Plan	
LLZ	Localizer	
LNAV	Lateral Navigation	
LOC	Localizer	
LONG	Longitude	
LSALT	Lowest Safe ALTitude	
LSPS (Planning)	Local Strategic Planning Statement	
М	Metres	
MAPt	Missed Approach Point	
MDA	Minimum Descent Altitude	
MDH	Minimum Descent Height	
MDP	Major Development Plan	
MGA2020	Map Grid Australia 2020, based on GDA2020	
MGA94	Map Grid Australia 1994, based on GDA94	
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)	
ОСН	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)	
PCG (Planning)	Project Collaboration Group	
PBN	Performance Based Navigation	
PRM	Precision Runway Monitor	
PWG (Planning)	Project Working Group	

Abbreviation	Meaning	
RAAF	Royal Australian Air Force	
RAPAC	Regional AirsPace users Advisory Committee	
REF	Reference	
RL	Relative Level	
RNAV	aRea NAVigation	
RNP	Required Navigation Performance	
RNP AR	Required Navigation Performance – Authorisation Required	
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	
SSD	State Significant Development	
SSDA	State Significant Development Application	
SSP	State Significant Precinct	
SSR	Secondary Surveillance Radar	
STAR	STandard Arrival	
STODA	Supplementary Take-Off Distance Available	
TAG (Planning)	Technical Advisory Group	
TAR	Terminal Approach Radar	
TAS	True Airspeed	
TC	Tower Crane	
TfNSW	Transport for NSW	
THR	THReshold (of Runway)	
ТМА	TerMinal Area	
TNA	Turn Altitude	
TODA	Take-off Distance Available	
TORA	Take-Off Runway Available	
VFR	Visual Flight Rules	
VGSI	Visual Glide Slope Indicator	
VIS	Visual	
VMC	Visual Meteorological Conditions	
V <sub>n</sub>	Aircraft critical velocity reference	
VNAV	Vertical Navigation	
VNC	Visual Navigation Chart	
VOR	Very high frequency Omni-directional Range	
VSS	Visual Segment Surface	
WAM	Wide-Area Multilateration	
WNW	West North West	
WSW	West South West	
WGS84	World Geodetic System 1984	
WSA	Western Sydney Airport	
WSI	Western Sydney International Airport	

## **APPENDIX 2 — PANS-OPS PROCEDURES**

The latest versions of the IFPs consulted were from the pending AIP Amendment 179 (effective from 13-Jun-2024 to 04-Sep-2024) — as indicated in Table 5-1 below.

## Table 5-1 — All PANS-OPS Instrument Flight Procedure Charts for Sydney Airport (AIP Amendment 179 – WEF 20240613 – 20240904)

#### SYDNEY/BANKSTOWN (YSBK)

Name of Chart	Effective Date	(Amendment No)
AERODROME CHART PAGE 2	13-Jun-2024	(Am 179)
AERODROME CHART PAGE 1	13-Jun-2024	(Am 179)
SID BANKSTOWN NINE DEPARTURE RWY 11C/29C	13-Jun-2024	(Am 179)
RNP RWY 11C	13-Jun-2024	(Am 179)
NDB RWY 11C	13-Jun-2024	(Am 179)
NDB-A	13-Jun-2024	(Am 179)

Source: AIP Book (29-Apr-2024) via http://www.airservicesaustralia.com/aip/aip.asp?pg=10