



BANKSTOWN CITY CENTRE AIRSPACE CONSTRAINTS STUDY

FOR THE CITY OF CANTERBURY-BANKSTOWN

March 2021



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Glossary

Term	Definition
AHD	Australian Height Datum
amsl	Above mean sea level
APARs	<i>Airports (Protection of Airspace) Regulations 1996</i>
BAL	Bankstown Airport Limited
BCC	Bankstown City Centre
CASA	Civil Aviation Safety Authority
CBD	Central Business District
Controlled activity	An activity defined under Section 182 of the <i>Airports Act 1996</i>
DITRDC	Commonwealth Department of Infrastructure, Transport, Regional Development and Communications
ICAO	International Civil Aviation Organisation
km	Kilometres
m	Metres
NASF	National Airports Safeguarding Framework
NM	Nautical Miles
MSA	Minimum Sector Altitude
OLS	Obstacle Limitation Surfaces
PANS-OPS	Procedures for Aircraft Navigation Services – Aircraft Operations
PANS-OPS airspace	Prescribed airspace that is above a PANS-OPS surface
PANS-OPS surface	A surface ascertained in accordance with the procedures in document number 8168 OPS-611 Procedures for Air Navigation Services, Aircraft Operations, published by ICAO
Prescribed airspace	The airspace above any part of the OLS or a PANS-OPS surface for an airport, or airspace declared under Regulation 5 of the APARs
Proponent	The person that proposes to carry out the controlled activity
RLSALT	Radar Lowest Sector Altitude
RTCC	Radar Terrain Clearance Chart
SACL	Sydney Airport Corporation Limited

1. INTRODUCTION

REHBEIN Airport Consulting was engaged by the City of Canterbury-Bankstown (Council) to undertake an Airspace Constraints Study for the Bankstown City Centre.

Council is currently preparing a comprehensive Bankstown City Centre Master Plan (BCC Masterplan), which will inform future amendments to the Local Environment Plan and a new Development Control Plan.

The Airspace Constraints Study will inform the maximum potential building heights and any relevant development considerations, objectives and controls for tall buildings to protect aircraft operations and safety over the BCC Masterplan Study Area. The intent of the study is to provide more certainty to Council and the market over the maximum potential building volumes of the City Centre, particularly during the planning proposal and development application stages. However, the Study must not be used as a mechanism to give either pre-approvals or final approvals to any proposed developments or crane activities.

This Study provides guidance only. The *Airports (Protection of Airspace) Regulations* 1996 and any requirements and approvals necessitated under the Regulations would take precedence over any guidance provided in this Study.

The relevant authorities including the Department of Infrastructure, Transport, Regional Development and Communications (DITRDC), Airservices Australia, and the Civil Aviation Safety Authority (CASA) must still see all requests for assessment for any obstacles which penetrate the lowest limit of prescribed airspace, regardless of what this Study indicates.

The Airspace Constraints Study comprises of the following sub-tasks outlined below.

SUB-TASK 1: MAXIMUM POTENTIAL AIRSPACE VOLUME ASSESSMENT

The Consultant is to undertake an analysis of the maximum airspace volume limits for buildings across the study area in relation to aircraft operations as informed by the Bankstown Airport Master Plan 2019, Sydney Airport Master Plan 2039, Western Sydney Airport Plan 2016 and any other relevant airspace safety and operational considerations.

The study is to include:

- A detailed PANS-OPS surfaces map over the Study Area indicating a range of different heights based on the most up-to-date and relevant aircraft operations information;
- A detailed Obstacle Surface Limitation (OLS) map over the Study Area;
- Consideration on if/how the National Airport Safeguarding Framework (NASF) could affect the proposed Study Area;
- Advice on maximum building heights (factoring in temporary structures for construction) that can be potentially achieved over the Study Area considering all the relevant prescribed and non-prescribed airspace factors to provide more certainty to Council and the market;
- Guidance on the best approval pathway and approach to obtain maximum height approvals and/or guidance in relation to airspace constraints at the strategic planning stage in collaboration with Sydney Metro Airports (Bankstown Airport) and associated aviation safety and regulatory authorities.

This sub-task includes engagement with the relevant stakeholders to obtain information to address this study, including: Bankstown Airport Limited (BAL); Sydney Airport Corporation Limited (SACL) the Department of Infrastructure, Transport, Regional Development and Communications (DITRDC), Airservices Australia, the Civil Aviation Safety Authority (CASA) and NSW PolAir.

The intent of Sub-task 1 is to understand the maximum building height limits that can be achieved over the Bankstown City Centre Study Area under the operational and safety constraints of aircraft.

SUB-TASK 2: PLANNING IMPLICATIONS FOR TALLER BUILDINGS

The study is to provide Council a list of any planning considerations and implications for taller buildings (other than height as detailed in Sub-task 1) to protect aircraft operations and safety. It is intended that these planning considerations and implications will inform Council's planning controls to give the market more certainty in the planning proposal and development application stages. The planning considerations should take into account any existing and proposed planning and policy frameworks/precedents for airspace and airports.

The intent of Sub-task 2 is to understand the planning considerations and constraints for taller buildings to protect aircraft operations and safety.

2. BACKGROUND

The Bankstown City Centre Study Area is within the operational airspace of the two (2) major civil airports (Bankstown Airport and Sydney International Airport), the proposed Western Sydney Airport, and additionally within the airspace of the RAAF Base Richmond and the small aerodrome used for training and recreation at Camden. However, the proximity of the study area to Bankstown Airport (3-4 km) means that the airspace is most affected by air traffic to and from Bankstown Airport.

An Airspace Constraints Study was undertaken on behalf of the City by Strategic Airspace in 2016. The Study analysed Obstacle Limitation Surface (OLS) height limits related to Bankstown Airport. It mapped OLS heights, which ranges from 51m to 71m Australian Height Datum (AHD) over the Bankstown City Centre.

The 2016 study analysed and mapped PANS-OPS surfaces in relation to the aircraft operations of Bankstown Airport. The Study mapped a maximum PANS-OPS height limit of 135.9m AHD in the northern part of the centre, which tapers down to 130m AHD toward the south. However, the Study argued that a maximum of 152.4m AHD could be potentially achieved through negotiation with Bankstown Airport, Airservices Australia and other relevant stakeholders.

However, since this 2016 study, Bankstown Airport has published a new Master Plan in 2019, which renders that study out-dated. The Bankstown Airport 2019 Master Plan takes account of PANS-OPS procedures which have since been amended. These amended procedures have reduced the height of the PANS-OPS airspace constraints over the BCC Study Area.

This Bankstown City Centre Airspace Constraints Study aims to provide an updated estimate of maximum height limits, based on current published airspace information relating to Bankstown, Sydney and Western Sydney airports.

2.1 BANKSTOWN AIRPORT

Bankstown Airport is located approximately 3.5 km west of the Bankstown City Centre and 26 km south west of the Sydney Central Business District. The Airport consists of three (3) parallel runways and hosts over 160 businesses within its 313 hectare site.

The Airport operates 24/7 and includes a substantial flight training sector as well as emergency services, air freight, general aviation, charter flights and aircraft sales and maintenance. Bankstown Airport is the third most active airport in Australia with over 270,000 total aircraft movements in 2019. Bankstown Airport services as a flying base for emergency services including the NSW Police Aviation Support Branch, the National Parks and Wildlife Service and SNW Ambulance. Major flying schools are located at the Airport and include the UNSW School of Aviation, TAFE NSW (Sydney Flight College), Soar Aviation and Basair Aviation College. Airport operations also include small to medium size air freight, charter and private business flights. Currently there are no Regular Public Transport Services (RPT) at the Airport however a passenger terminal capable of supporting passenger aircraft operations by both turbo prop and regional jet operators is provide for future opportunities.

3. REGULATORY AND APPROVAL FRAMEWORK

3.1 PRESCRIBED AIRSPACE AND CONTROLLED ACTIVITIES

The principal items of legislation affecting the height of buildings in the Bankstown City Centre Masterplan Study Area are Part 12 of the *Airports Act 1996* and the *Airports (Protection of Airspace) Regulations 1996* (APARs)¹ which are made under the Act.

Under the APARs, prescribed airspace is defined as either:

- The airspace above any part of an OLS surface for an airport; or
- The airspace above any part of a PANS-OPS surface for an airport; or
- Airspace declared in a declaration under Regulation 5 of the APARs.

The APARs define that the OLS and PANS-OPS is ascertained in accordance with international standards as implemented in Australia. The OLS it is determined in accordance with the International Civil Aviation Organization (ICAO) International Standards and Recommended Practices for Aerodromes (Annex 14) document. OLS requirements, as implemented in Australia, are detailed in the Civil Aviation Safety Regulations 1998 – Part 139 (Aerodromes) Manual of Standards 2019 (the MOS). The PANS-OPS are determined in the ICAO Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) (Doc 8168), Volume II – construction of Visual Flight Procedures.

Any intrusion into prescribed airspace is termed a controlled activity. Although the most common intrusions relate to structures, Section 182 of the Act defines controlled activities as including all of the following:

- (a) constructing a building, or other structure, that intrudes into the prescribed airspace;
- (b) altering a building or other structure so as to cause the building or structure to intrude into the prescribed airspace;
- (c) any other activity that causes a thing attached to, or in physical contact with, the ground to intrude into the prescribed airspace (Note: This includes all additions on top of a building such as antennas, plant and equipment and architectural roof features);
- (d) operating a source of artificial light, where:
 - (i) the intensity of the light emitted exceeds the level ascertained in accordance with the regulations; and
 - (ii) the light is capable of blinding or confusing pilots of aircraft operating in the prescribed airspace;
- (e) operating prescribed plant, or a prescribed facility, that reflects sunlight, where:
 - (i) the intensity of the reflected sunlight exceeds the level ascertained in accordance with the regulations; and
 - (ii) the reflected sunlight is capable of blinding pilots of aircraft operating in the prescribed airspace;
- (f) an activity that results in air turbulence, where:
 - (i) the level of the turbulence exceeds the level ascertained in accordance with the regulations; and
 - (ii) the turbulence is capable of affecting the normal flight of aircraft operating in the prescribed airspace;
- (g) an activity that results in the emission of smoke, dust or other particulate matter, where:

¹ Latest versions available via: www.legislation.gov.au This study is based on Compilation No.5 of the APARs as at 29 July 2017 and current as of Sept 2020.

- (i) the emission exceeds the level ascertained in accordance with the regulations; and
- (ii) the smoke, dust or particulate matter is capable of affecting the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules;
- (h) an activity that results in the emission of steam or other gas, where:
 - (i) the emission exceeds the level ascertained in accordance with the regulations; and
 - (ii) the steam or gas is capable of affecting the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules.

All structures (whether permanent or temporary) which exceed the elevation of the Bankstown Airport Obstacle Limitation Surfaces (OLS) or PANS-OPS will require prior approval from the Secretary of the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) under the APARs.

3.2 APPROVAL PROCESS

Responsibility for obtaining a controlled activity approval prior to commencing any activity which could result in a controlled activity rests with the proponent. Failing to obtain an approval where required, or failing to comply with any conditions provided in an approval, is an offence of strict liability.

Applications for controlled activities under the APARs are made by the proponent to DITRDC, via the respective Airport-Operator Company, in this case Bankstown Airport Limited (BAL). In the case of Bankstown, DITRDC may also seek comment from Sydney Airport Corporation Limited (SACL) on any proposals which penetrate the Bankstown Airport prescribed airspace. Once the propose Western Sydney Airport (WSA) is operational, it is likely that DITRDC will also seek comment from the Airport-Operator Company for WSA on any controlled activities.

The APARs define controlled activities as either short-term (three (3) months or less) or long-term (longer than three (3) months). Subject to assessment, the following may be permissible:

- Short-term controlled activity penetrations of the OLS or PANS-OPS; and/or
- Long-term controlled activity penetrations of the OLS.

Under Regulation (9) of the APARs, long-term controlled activity penetrations of the PANS-OPS cannot be approved. This effectively imposes a limit of three (3) months for any intrusion in to PANS-OPS airspace. This limit applies in relation to all airports and airspace to which the APARs are applicable.

Upon submission of an application for a controlled activity, the airport-operator will seek comment from CASA and Airservices and provide this to DITRDC along with its own opinion. In order to be approved, all parties must support the activity and be satisfied that it will not affect the safety, efficiency or regularity of existing or future air transport operations. The APARs require the application to be submitted at least 28 days prior to commencement of the activity. However, if there is no determination from DITRDC after this period, the application is deemed to be refused. In reality, assessment timeframes by Airservices and CASA mean that the 28-day timeframe is rarely met, and a determination will eventuate once all assessments have been completed. Typically, in REHBEIN Airport Consulting's experience, timeframes for a determination range from 2 – 6 months depending on the complexity of the situation. For instance, PANS-OPS intrusions can require temporary changes to flight procedures which may require the airport-operator to consult with airport users in order to provide an opinion to enable a determination by DITRDC. Such consultation is often highly technical and lengthy.

3.3 CONSTRUCTION ACTIVITIES

Separate and distinct controlled activity approvals are required for crane operations. It should not be assumed or implied that approval for cranes is, or will be, provided purely on the basis that the associated building obtains approval. As such, is advisable that approval to operate construction equipment (i.e. cranes) be obtained prior to any commitment to construct the building.

Where buildings are proposed to be at a height which is very close to the PANS-OPS airspace limit, such that there is very limited freeboard to allow for construction equipment to operate above the building structure, it is likely that the approving authorities will seek clarification on how the building is to be

constructed before providing approval for the building. This may include requests for indicative crane strategies, sequencing and programmes of work (especially where it is foreseen there will be a request to intrude into the PANS-OPS) to provide assurance that this aspect has been considered and the building can feasibly be constructed within the permissions available under the APARs.

3.4 NUMBER OF CONTROLLED ACTIVITIES

The APARs do not place a limit on the number of concurrent controlled activities that may be approved in a given area. However, in assessing the acceptability of a controlled activity application, the airport-operator and CASA will take into consideration the cumulative impact of the proposed activity in combination with other ongoing or approved controlled activities.

4. MAXIMUM POTENTIAL AIRSPACE VOLUME ASSESSMENT

4.1 AIRSPACE CONSTRAINTS INVENTORY

REHBEIN Airport Consulting has developed an inventory of the various prescribed airspace limits which exist over the Bankstown City Centre Study Area. These are listed, along with their estimated elevations above the Australian Height Datum (AHD) in **Table 1**.

The pertinent surfaces relevant to expected building and crane height limits are described in detail in **Section 0** and **Section 4.3** respectively. This description is, by necessity, rather technical. The key conclusions and implications for the Bankstown City Centre Master Plan are summarised in **Section 4.4**.

Table 1: Bankstown City Centre Airspace Constraints

Airport	Surface	Estimated elevation (m AHD)	Source
Bankstown	OLS Inner Horizontal Surface	51.0 m AHD	BAL
Bankstown	OLS Conical Surface	51.0 – 75 m AHD approx	BAL
Bankstown	Circling CAT A+B PANS-OPS	108.2 m AHD	BAL
Bankstown	NDB-A Approach (Final segment) PANS-OPS	108.2 m AHD	BAL
Bankstown	Circling CAT C PANS=OPS	135.9m AHD	BAL
Bankstown	Standard Instrument Departure (SID) Runway 11 C PANS-OPS	110 – 185 m AHD	BAL
Bankstown	RNAV(GNSS) Approach Runway 11C (Missed Approach segment) PANS-OPS	Estimated Above SID	BAL
Bankstown	NDB Approach Runway 11C (Missed Approach segment) PANS-OPS	Estimated Above SID	BAL
Sydney	Radar Lowest Sector Altitude (RLSALT) Surfaces (declared)	152 m AHD	SACL
Sydney	OLS outer horizontal surface	156 m AHD	SACL
Sydney	10 NM MSA PANS-OPS	340 m AHD	SACL
Sydney	Omni-directional	Estimated Above 290 m AHD	SACL
Western Sydney	OLS outer horizontal	Outside lateral extents	DITRDC
Western Sydney	PANS-OPS	Will not be known until WSA airspace design is completed in approx. 2025. Unlikely to be lower than Sydney RLSALT or OLS	n/a

4.2 EXPECTED BUILDING HEIGHT LIMITS

4.2.1 OBSTACLE LIMITATION SURFACES

Any activity which exceeds the Bankstown Airport existing or future OLS elevation will require an approval under the APARs prior to the activity commencing. The OLS elevation over most of the Study Area is 51.0 m AHD. In the north-east corner it increases gradually towards the north-east. CASA and Bankstown Airport will assess each application to carry out a controlled activity which infringes the Bankstown Airport OLS. CASA has indicated that such applications will be required to include an aeronautical study and that CASA will need to consider the cumulative effect on aircraft safety.

The Bankstown Airport OLS as prescribed under the APARs is shown in **Figure A** below and also included as a full size attachment at **Appendix A**.

Figure A: Bankstown Airport OLS over the Study Area



4.2.2 PANS-OPS AIRSPACE

4.2.2.1 Bankstown Airport Approach Procedures

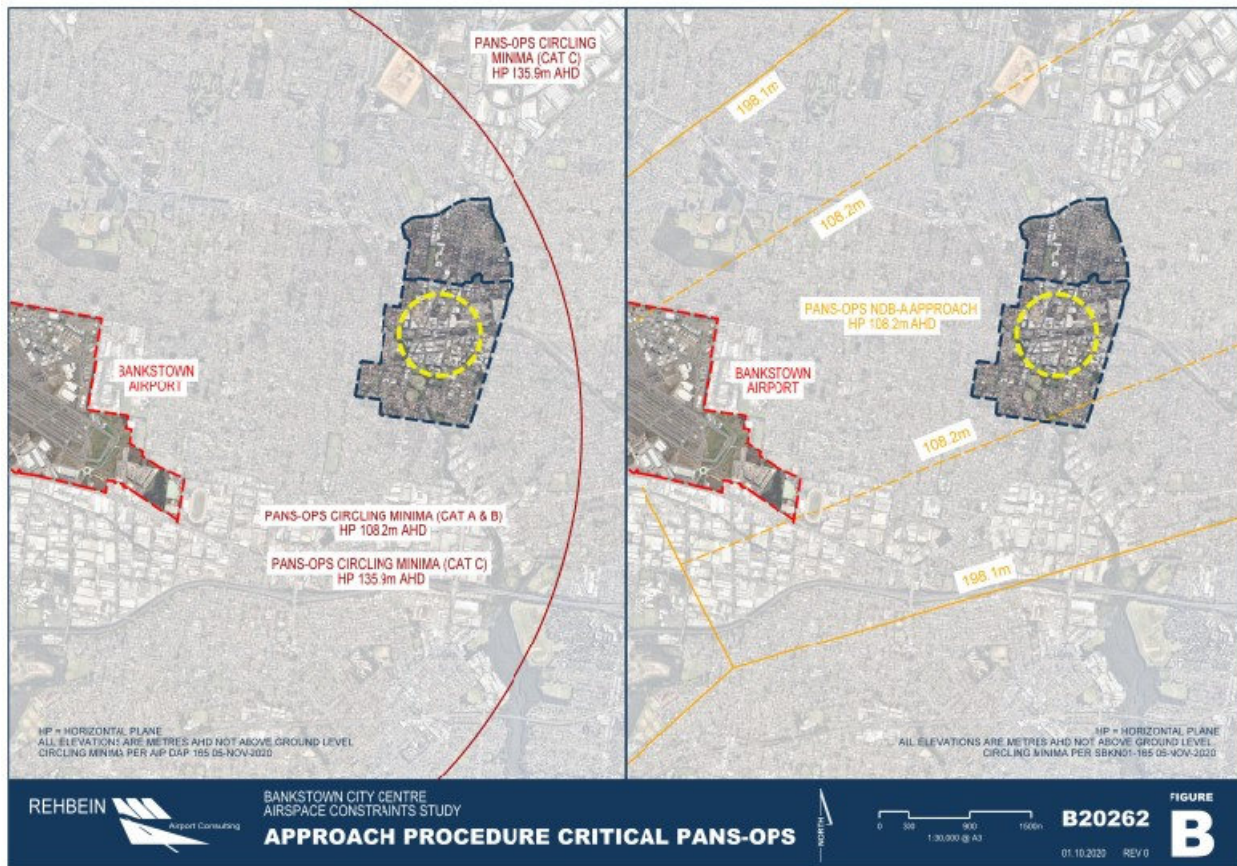
The next lowest limit over the site, above the OLS, is estimated to be that associated with several instrument approach procedures. These include:

- NDB-A approach (final segment); and
- Category A/B circling, which forms an element of all of the instrument approach procedures to Bankstown (NDB-A, NDB RWY 11C, RNAV (GNSS) RWY 11C).

The circling minima for these approaches is at 750 feet above mean sea level (amsl). By applying the minimum obstacle clearance requirement for these segments of the approach procedures, the limiting obstacle elevation of **108.2 m AHD** over the Bankstown City Centre Study Area can be derived. These

PANS-OPS surfaces are illustrated on **Figure B** below and also included as a full size attachment at **Appendix A**.

Figure B: Bankstown Airport Approach Procedure Critical PANS-OPS Surface over the City Centre Study Area



Recent building controlled activity approvals for the Compass Centre (83-99 North Terrace and 62 The Mall) to a maximum of 105.3 m AHD² and for Western Sydney University (74 Rickard Road) to a maximum of 106.78 m AHD³ while consistent with the estimated limiting elevation of 108.2 m AHD do not guarantee future building approvals of comparable height. The impacts of each application on safety, efficiency and regularity of existing or future air transport are unique. In addition the PANS-OPS may vary over the subject site depending on the location and the PANS-OPS procedures in place at that current point in time. Each development must be evaluated at the time and follow the approval process for due review by the authorities.

Any permanent penetration of the PANS-OPS airspace protecting the existing Bankstown Airport instrument approach procedures would require a permanent change to the published procedures, increasing the associated meteorological minima and reducing the amount of time these procedures can safely deliver an aeroplane to land. It must be considered, therefore, that this limit represents the maximum elevation for which any building would be approved over the Bankstown City Centre Study Area.

² Decision under the Airports (Protection of Airspace) Regulations 1996 File Ref: F17/968/19 28 September 2018

³ Decision under the Airports (Protection of Airspace) Regulations 1996 File Ref: F17/968/58 18 November 2019

4.3 EXPECTED CRANE HEIGHT LIMITS

4.3.1.1 PANS-OPS AIRSPACE

4.3.1.2 Bankstown Airport Departures

The Standard Instrument Departure (SID) procedure for Bankstown Airport Runway 11C involves a left turn once the aircraft reaches 500 feet amsl, to a bearing of 290 degrees. This immediate turn once the aircraft is safely above the surrounding terrain and other obstacles is required due to the presence of the Sydney Airport controlled airspace boundary two (2) nautical miles (3.5 km) south-east of Bankstown Airport. The Runway 11C SID is illustrated indicatively on **Figure C** below.

Limiting surfaces associated with SIDs of the type published at Bankstown are complex but can be estimated with reference to ICAO PANS-OPS obstacle identification and limiting elevation requirements for omnidirectional departures. REHBEIN Airport Consulting has completed a preliminary assessment with reference to these requirements.

Figure D below and also included as a full size attachment at **Appendix A** shows the estimated elevations against which obstacles must be identified over the Study Area, derived according to ICAO PANS-OPS Doc 8168/611-OPS. These range from approximately 110 m AHD at the southern boundary to approximately 165 m AHD in the north-east corner of the Study Area. Figure D also shows the estimated maximum permitted obstacle elevations within the Study Area, also derived from ICAO Doc 8168/611-OPS. These range from approximately 110 m AHD at the southern boundary to approximately 185 m AHD in the north-east corner of the Study Area.

It is not possible to be definitive about the elevation at which cranes would impact on the Bankstown SID and all cranes will need to be assessed by Airservices Australia as part of the controlled activity approval process to determine their acceptability. The maximum permissible elevation is likely to be affected by the location of the crane within the Study Area, due to the sloping nature of the SID surfaces.

It is noted that cranes for the Compass Centre and WSU developments have been indicated as being acceptable at approximately 123-125 m AHD⁴ in these locations, which is consistent with the above elevations.

⁴ Decisions under the Airports (Protection of Airspace) Regulations 1996 File Refs F17/968/19 and F17/968/58

Figure C: Bankstown Airport Standard Instrument Departure (SID) Procedures

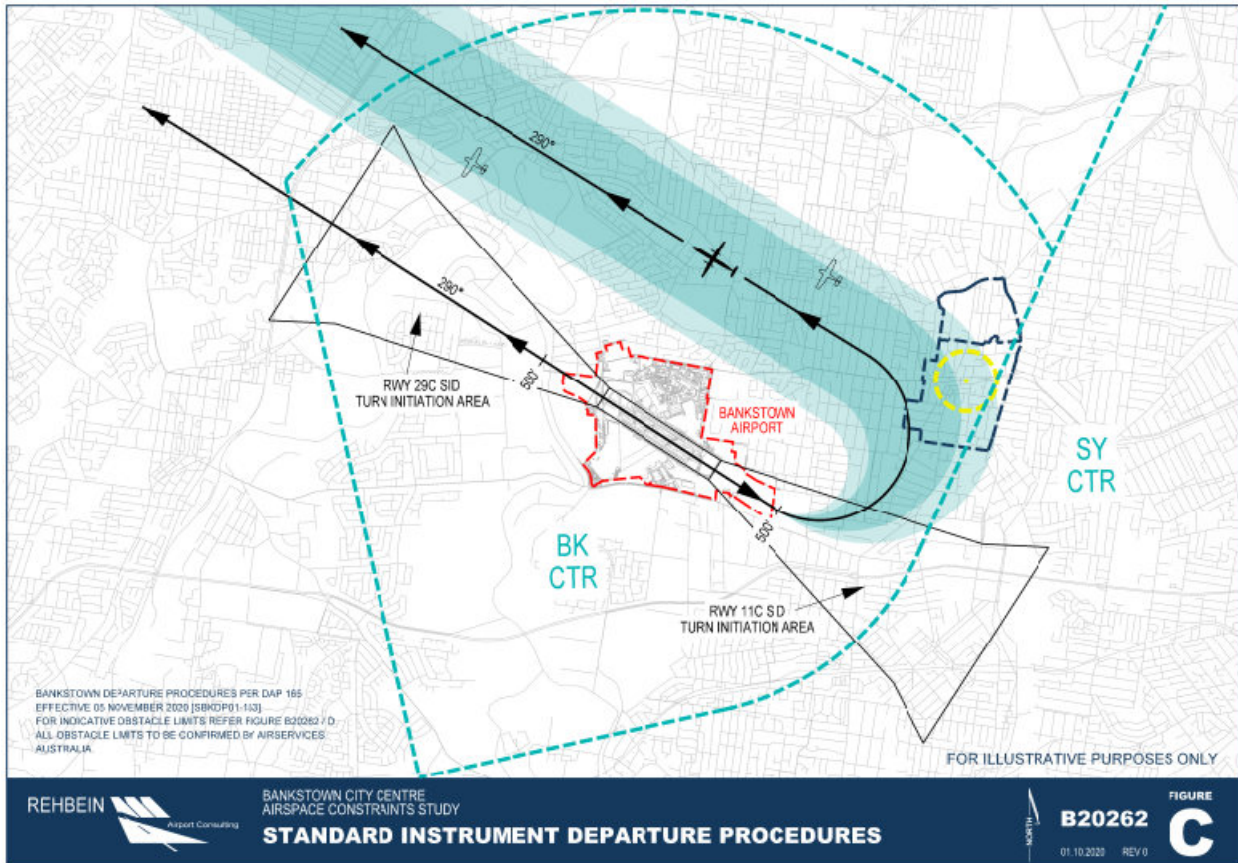
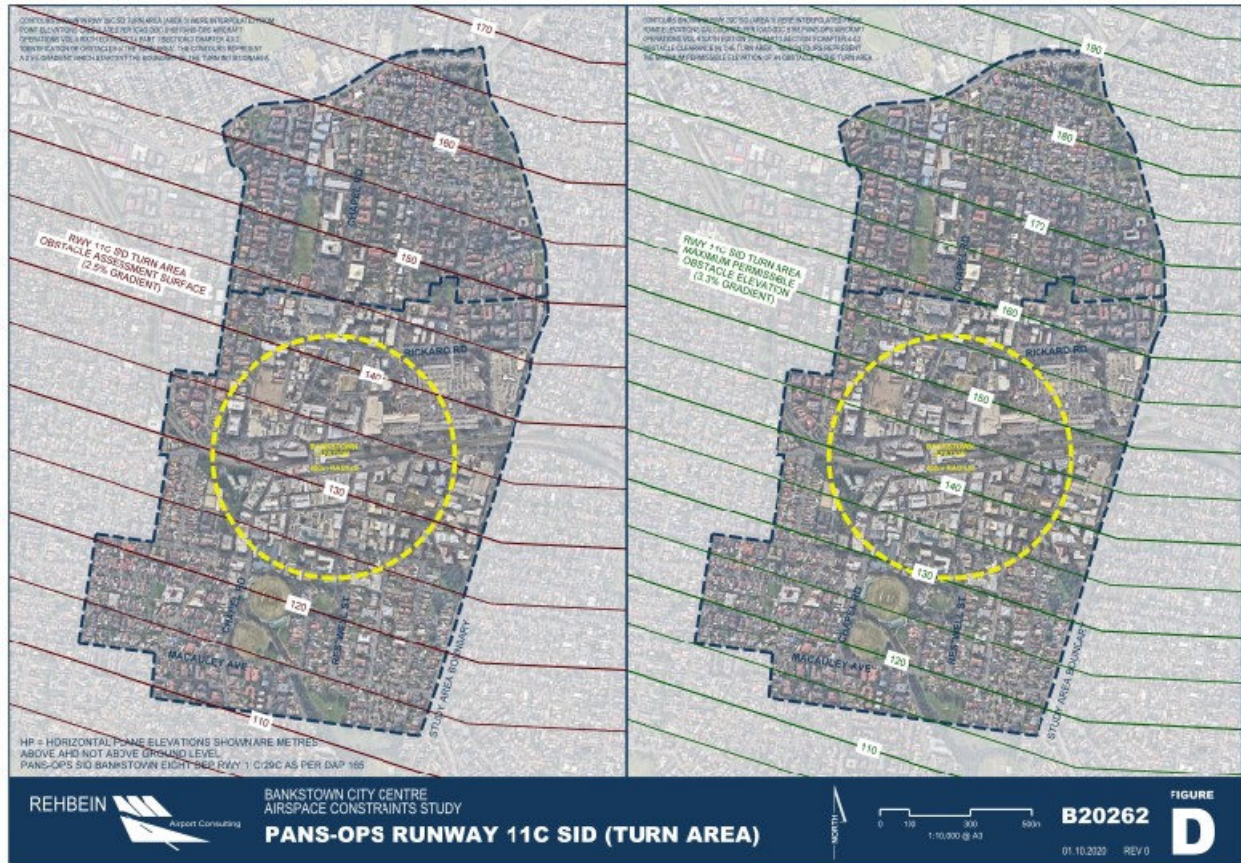


Figure D: Bankstown Runway 11C SID (Turn Area) Obstacle Limits over the City Centre Study Area



4.3.2 OTHER PRESCRIBED AIRSPACE

4.3.2.1 Sydney Airport Prescribed Airspace

The limiting elevation of the Radar Lowest Sector Altitude (RLSALT) Surfaces (also known as Radar Terrain Clearance Chart or RTCC surfaces) over the Bankstown City Centre is 152 m AHD, as shown on SACL drawing No FSS 6934 Sheet 7 (B1) available on the SACL website⁵. This appears to be the lowest elevation of any of the Sydney Airport prescribed airspace.

The RTCC is a critical tool for air traffic control to use when vectoring aircraft by radar, which is regular practice for routine operations at Sydney Airport. REHBEIN Airport Consulting understands from involvement with previous development proposals in the Sydney Basin that SACL is unlikely to support any penetration, even short-term, on the basis of the impact it would have on the ability of air traffic control to process aircraft safely and efficiently.

The limiting elevation of the OLS for Sydney Airport over the Study Area is 156 m AHD.

All other prescribed airspace surfaces published by Sydney Airport are either higher than the RLSALT and the OLS outer horizontal surface, or do not extend across the Study Area.

⁵ <https://www.sydneyairport.com.au/corporate/planning-and-projects/airspace-protection-tile>

Given the limiting elevations for the Bankstown Airport PANS-OPS airspace are much lower than either the Sydney Airport OLS or RLSALT elevations it is unlikely that there would be any potential for intrusions into Sydney Airport prescribed airspace. Nonetheless, it should be noted that any such intrusion would be very unlikely to be approved due to the impacts on Sydney Airport air transport operations.

4.3.2.2 Western Sydney Airport

The OLS for Western Sydney Airport is published in the Western Sydney Airport Plan⁶. The WSA OLS does not extend over the Bankstown City Centre Study Area.

The design of a full set of PANS-OPS surfaces for WSA will be required following the formal flight path design for WSA, before the start of operations. Whilst it is possible that the WSA PANS-OPS may extend over Bankstown, based on the greater distance of the CBD from WSA (29 km) compared to Sydney Airport (13 km) it is unlikely that the PANS-OPS for WSA would be more restrictive than the PANS-OPS for Bankstown Airport or the RLSALT for Sydney Airport.

4.4 EXPECTED MAXIMUM HEIGHT LIMIT SUMMARY

Table 2 summarises the various expected maximum height limits for buildings and cranes within the Study Area and focussing on the area most suited to tall buildings per the Tall Buildings Study⁷, within 400 m radius of Bankstown Station.

Table 2: Expected Maximum Height Limits over the Study Area

Activity	Expected Maximum Height (m AHD)
Buildings (including all lift overruns, vents, chimneys, aerials, antennas, lighting rods, any roof top garden plantings, exhaust flues etc)	108 m AHD
Crane operations for longer than three (3) months	108 m AHD
Expected acceptable crane height (duration limited to three (3) months (requires support from BAL ⁽¹⁾ to modify CAT A/B and NDB-A approach)	120 - 135 m AHD approx. (within Tall Building core – may be lower along southern edge of Study Area)
Expected absolute maximum crane height (duration limited to three (3) months and requires support from BAL ⁽¹⁾ to modify CAT C Circling and confirmation no impacts on Runway 11 SID)	152 m AHD
(1) In order to provide support to modify the PANS-OPS to accommodate crane operations, BAL is required to consult with all of its aircraft operators to ensure the proposed modification/s to published flight procedures will not adversely impact operations. Such an approval would only be provided if the proposed temporary change to a PANS-OPS procedure has no impact on the safety, efficiency and regularity of air transport operations into or out of the airport. This process is generally quite lengthy and can take several months, and may not result in an approval.	

⁶ Western Sydney Airport Airport Plan December 2016, Australian Government Department of Infrastructure and Regional Development

⁷ Canterbury Bankstown Tall Building Design Study, BatesSmart Document No AA S12429/00, Draft Issue 01, 08 Jul 2020

5. PLANNING IMPLICATIONS FOR TALLER BUILDINGS

5.1 NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK

The National Airports Safeguarding Framework (NASF) is a national land use planning framework that aims to:

- Improve community amenity by minimising aircraft noise-sensitive developments near airports including through the use of additional noise metrics and improved noise-disclosure mechanisms; and
- Improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions through guidelines being adopted by jurisdictions on various safety related issues.

The National Airports Safeguarding Advisory Group (NASAG), comprising of Commonwealth, State and Territory Government planning and transport officials, the Australian Government Department of Defence, the Civil Aviation Safety Authority (CASA), Airservices Australia and the Australian Local Government Association (ALGA), has developed the National Airports Safeguarding Framework (the Framework).

Commonwealth, State and Territory Ministers considered the Framework at the Standing Council on Transport and Infrastructure meeting on 18 May 2012. Ministers agreed to the NASF, noting reservations from New South Wales on the format of Guideline A on measures for managing impacts of aircraft noise. The agreement represents a collective commitment from Governments to ensure that an appropriate balance is maintained between the social, economic and environmental needs of the community and the effective use of airport sites⁸.

It is the responsibility of local and state planning jurisdictions to apply this framework and not the Commonwealth Government. However, it can be expected that any controlled activities referred to Bankstown Airport for approval will be scrutinised against all relevant safety considerations, including relevant NASF Guidelines.

The NASF currently consists of nine (9) Guidelines⁹, each of which has been summarised for its relevance to the potential development of tall buildings in the Bankstown City Centre Study Area.

Table 3: NASF Guideline Summary and Implications for Tall Buildings

Guideline	Assessment	Implications
Guideline A: Measures for Managing Impacts of Aircraft Noise	Outside the significant ANEF contours Partially within the N70 >20 events	Give consideration to Guideline A in any zoning decisions
Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports	Closest point on study area is > 1,200 m from Runway 11L/29C extended centreline and > 900m prior to threshold. Outside assessment trigger areas	Nil
Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports	Outside 3 km buffer zone (Area A) Within 8 km buffer zone (Area B) Likely land uses (residential/commercial) are Low or Very low wildlife attraction Risk per Attachment 1 of Guideline C.	Monitor any warehouse (food storage), Shopping centre or fast food, drive-in or outdoor restaurant land uses This might include, for instance, rooftop gardens, open air dining areas, bars, increasing tree canopy cover etc

⁸ https://www.transportinfrastructurecouncil.gov.au/sites/default/files/SCOTI_2nd_Communique_FINAL.pdf

⁹ All NASF Guidelines can be found at www.infrastructure.gov.au

Guideline	Assessment	Implications
Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation	Not applicable	Nil
Guideline E: Managing the Risk of Distraction to Pilots from Lighting in the Vicinity of Airports	Outside light control zones. Within 6 km Primary Area radius	Lighting projects within this area should be closely examined to ensure that they do not infringe the provisions of regulation 94 of the <i>Civil Aviation Regulations 1988</i> .
Guideline F: Managing the Risk of Intrusions into the Protected Operational Airspace of Airports	As per Section 4	Entirely applicable
Guideline G: Protecting Aviation Facilities - Communication, Navigation and Surveillance (CNS)	All applications will be assessed by Airservices for impacts on CNS facilities as part of the controlled activity approval process	Nil
Guideline H: Protecting Strategically Important Helicopter Landing Sites	Not applicable to airport helipads. Monitor any aeromedical/hospital impacts and have regard to relevant consultation submissions.	Further reference information on airspace protection requirements for hospital helipads can be found at: https://www.infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/files/8.1.1-Guideline-H-Helicopters.pdf https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/GL2020_014.pdf
Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways	Not within Bankstown Airport Public Safety Areas	Nil

5.2 OTHER SAFETY REQUIREMENTS

In addition to the NASF safeguarding requirements, it can be expected that any approvals for controlled activities will include some or all of the following mitigation requirements as conditions of the approval:

- Structures must not exceed the maximum height stipulated in the approval. This height is to include all lift over-runs, vents, chimneys, aerials, antennas, lighting rods, roof top garden planting, exhaust flues architectural roof features and other protuberances;
- Any rooftop exhausts with an upward velocity of more than 4.3 m/s are likely to require an operational assessment by CASA to ensure the gaseous plume does not present any hazard to aircraft operations;
- Buildings can be expected to require obstacle lighting in accordance with the Civil Aviation Safety Regulations Part 139 and the applicable Manual of Standards. As a minimum this is likely to involve medium intensity steady red lighting during the hours of darkness, observable in a 360 degree radius. Lighting will need to be maintained by the proponent in a serviceable condition and have a remote monitoring capability to alert Bankstown Airport staff of any outage; and
- Construction equipment (i.e. cranes) will be treated as a separate and distinct activity requiring its own approval under the APARs. As such, it is recommended that approval for the operation of all construction equipment required be obtained prior to any commitment to construction of the building.

5.3 DEVELOPMENT HEIGHT CONTROL IMPLICATIONS

It should be emphasised that height limits associated with prescribed airspace are absolute. Exceeding the allowable or approved limits, intentionally or unintentionally, has serious implications for aviation safety and attracts penalties as set out in the legislation. Regardless of the conditions or exemptions in the Development Control Plan (DCP) these limits remain 'hard'. Therefore, Council should consider the provisions of the DCP carefully to ensure that proponents are aware of the limitations associated with prescribed airspace, the legislative framework, and the implications for development.

In particular, it is recommended that the DCP include specific provisions around:

- An appropriate buffer within the DCP height limits to allow for rooftop items such as aerials and roof features which are exempt from or allowable in addition to the stipulated maximum DCP building height;
- Advice that proponents are responsible to satisfy themselves of the specific restrictions associated with airspace constraints over the particular site; and
- The requirement for the proponent to obtain approval for buildings and construction equipment intrusions into prescribed airspace through the separate APARs process, for which the proponent is responsible, irrespective of Council's development approval.

APPENDIX A: AIRSPACE CONSTRAINT MAPS

FIGURE A:

Obstacle Limitation Surfaces

FIGURE B:

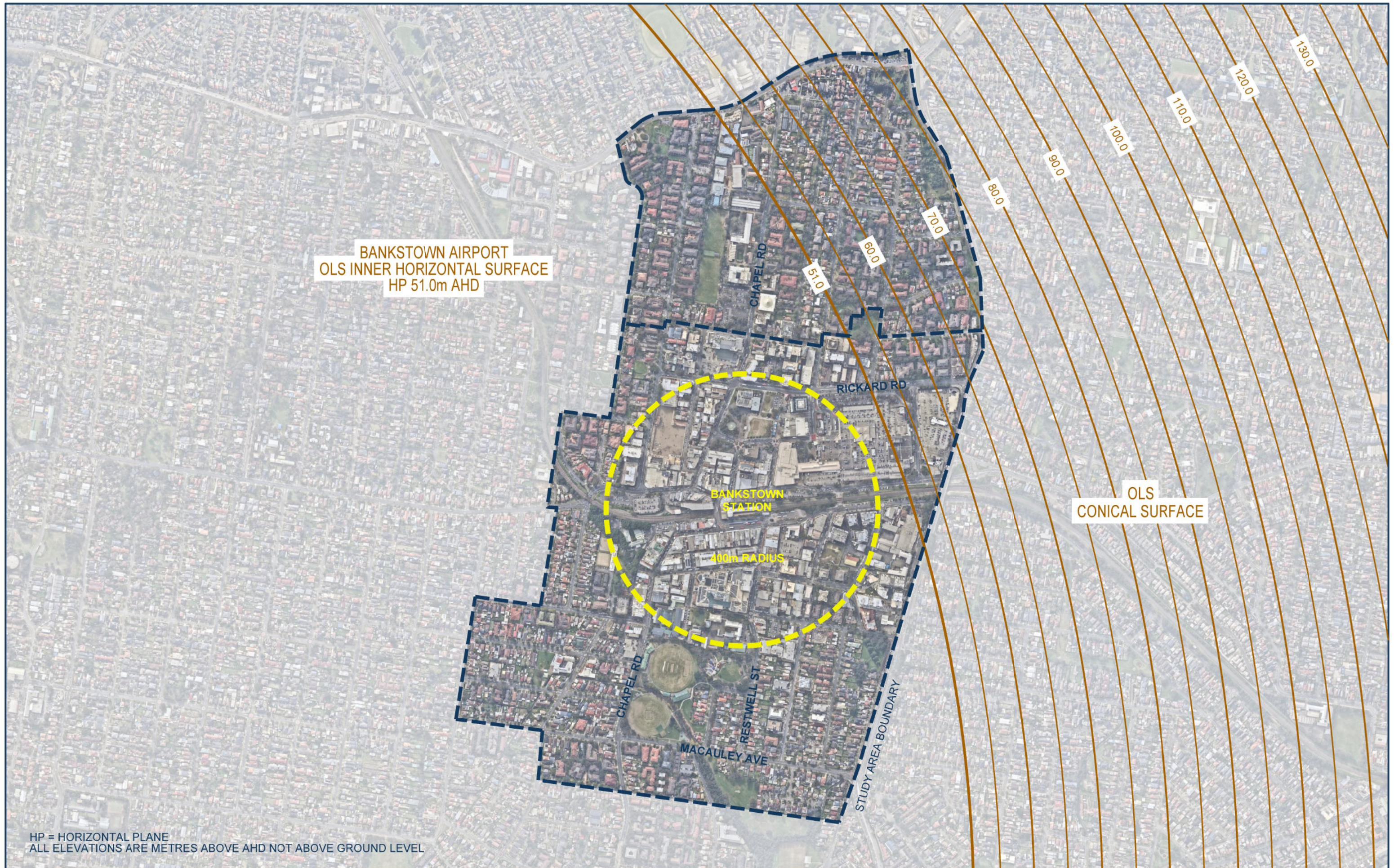
Approach Procedure Critical PANS-OPS Surfaces

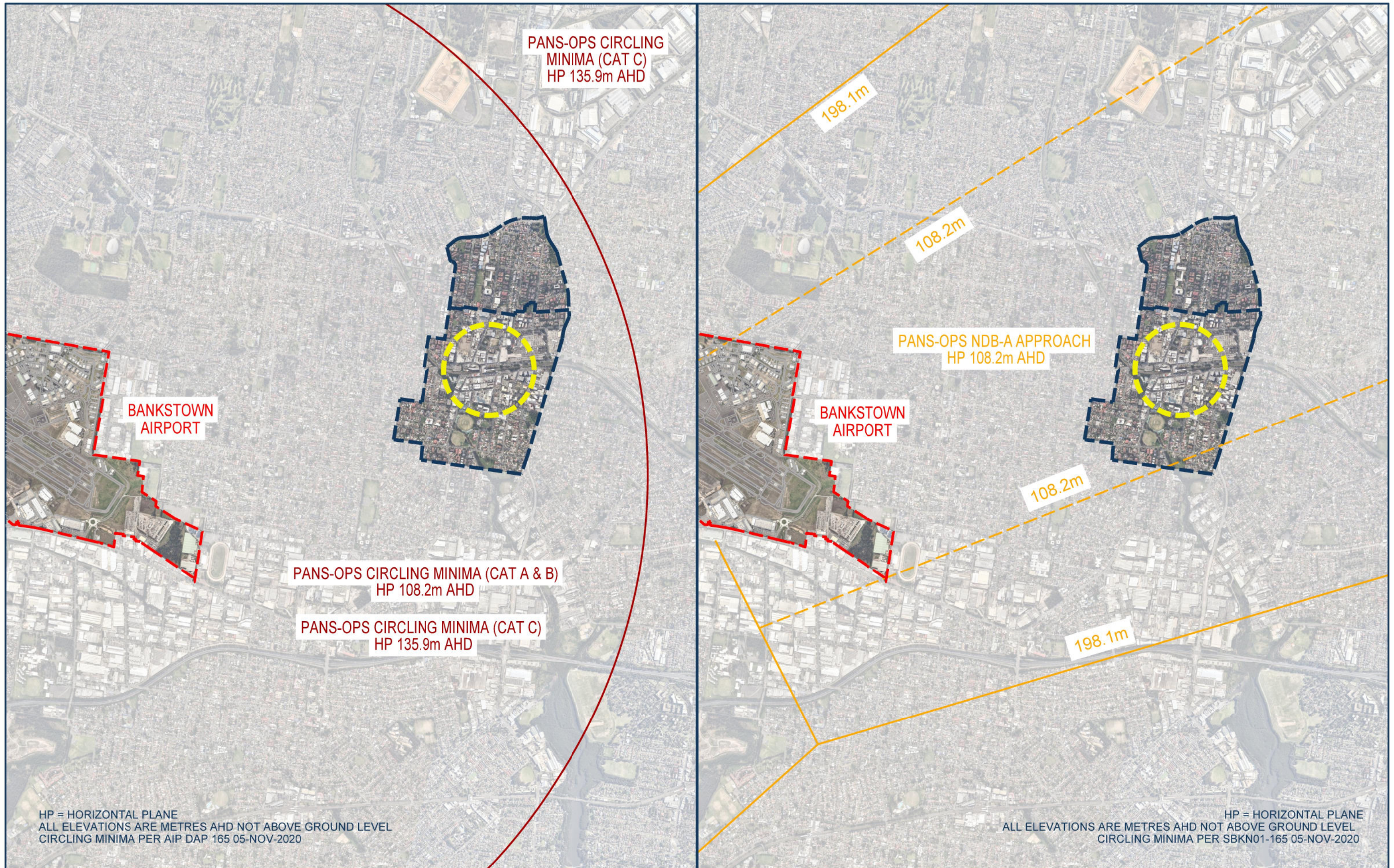
FIGURE C:

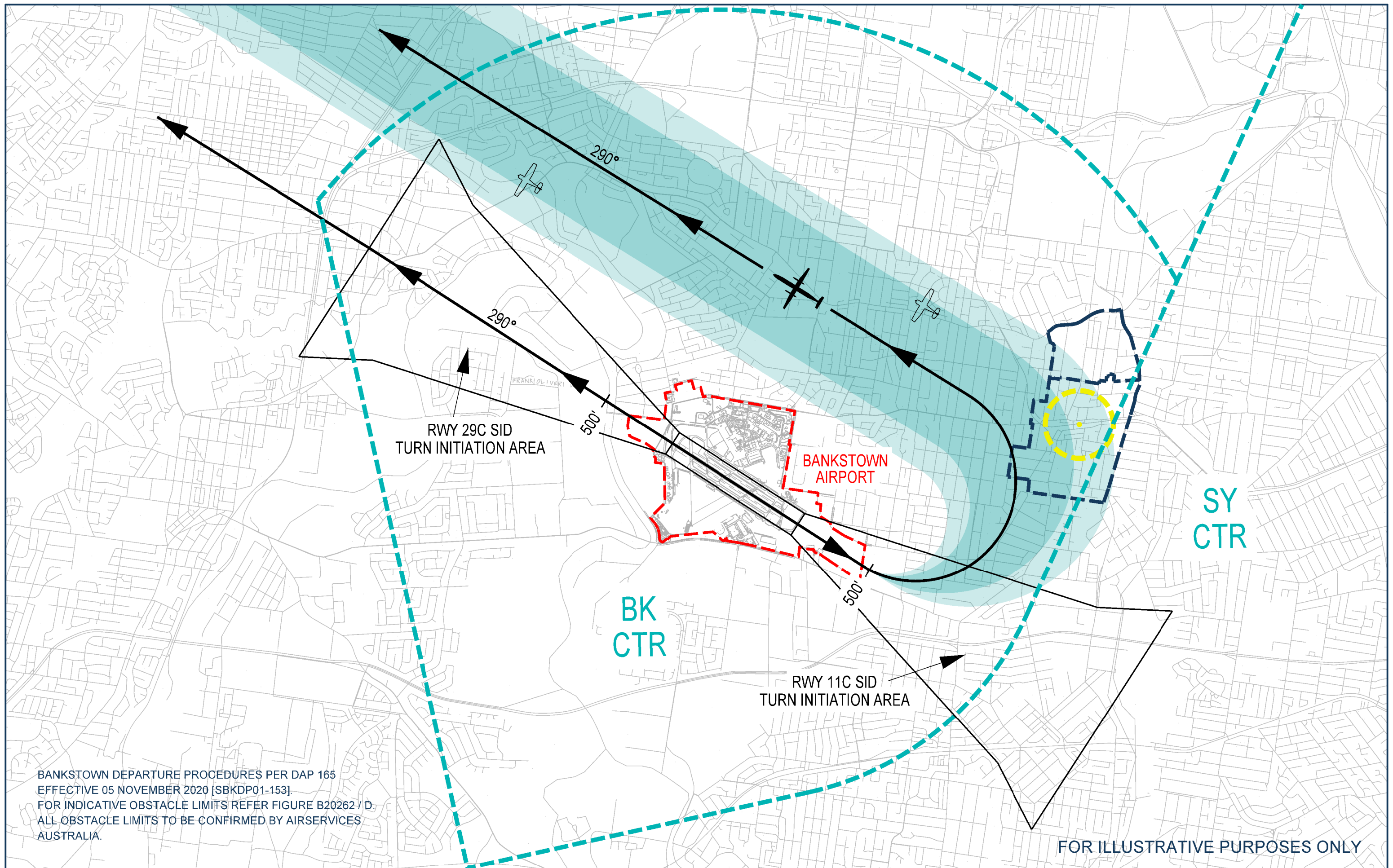
Standard Instrument Departure Procedures

FIGURE D:

PANS-OPS Runway 11C SID (Turn Area)

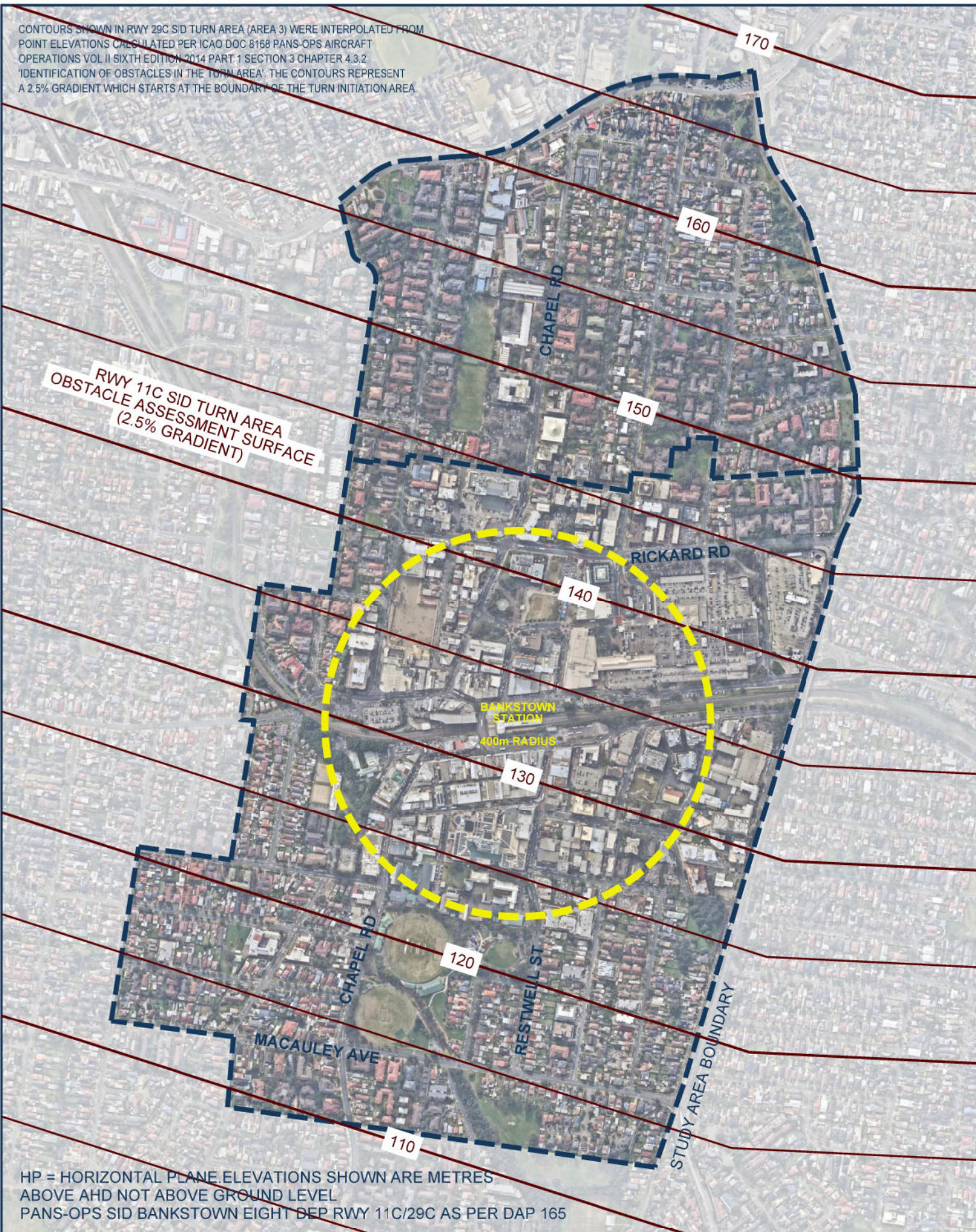






CONTOURS SHOWN IN RWY 29C SID TURN AREA (AREA 3) WERE INTERPOLATED FROM POINT ELEVATIONS CALCULATED PER ICAO DOC 8168 PANS-OPS AIRCRAFT OPERATIONS VOL II SIXTH EDITION 2014 PART 1 SECTION 3 CHAPTER 4.3.2 'IDENTIFICATION OF OBSTACLES IN THE TURN AREA'. THE CONTOURS REPRESENT A 2.5% GRADIENT WHICH STARTS AT THE BOUNDARY OF THE TURN INITIATION AREA.

CONTOURS SHOWN IN RWY 29C SID (AREA 3) WERE INTERPOLATED FROM POINT ELEVATIONS CALCULATED PER ICAO DOC 8168 PANS-OPS AIRCRAFT OPERATIONS VOL II SIXTH EDITION 2014 PART 1 SECTION 3 CHAPTER 4.4.2 'OBSTACLE CLEARANCE IN THE TURN AREA'. THE CONTOURS REPRESENT THE MAXIMUM PERMISSIBLE ELEVATION OF AN OBSTACLE IN THE TURN AREA.



HP = HORIZONTAL PLANE ELEVATIONS SHOWN ARE METRES ABOVE AHD NOT ABOVE GROUND LEVEL
PANS-OPS SID BANKSTOWN EIGHT DEP RWY 11C/29C AS PER DAP 165

APPENDIX B: CONSULTATION FEEDBACK

AGENCY	DATE RECEIVED	COMMENTS	ACTION
Airservices Australia	15 Jan 2021	Airservices have no concerns with the Study being used by the Council for planning purpose only, but reiterate that it should not be used as a mechanism to give either pre-approvals or final approvals to proposed developments. Airservices still expects to see requests for assessments for those obstacles which penetrate the airport's OLS, regardless of what the Study may indicate.	Reinforced in the Introduction section.
	12 Feb 2021	Following discussions with Airservices on the phone a follow up email clarified: Airservices confirms that if the values represented in the Study table were taken from the data that was used to create the prescribed airspace protection surfaces in 2016, remain valid.	We confirm 2016 procedures information surfaces formed the basis of the values represented in the Study. Area 3 surfaces were interpolated from point elevations calculated per ICAO DOC 8168 PANS-OPS Aircraft Operations Vol II (6 th Ed 2014) Part 1 Section 3 Chapter 4.3.2 and 4.4.2
DITRDC / Flysafe	22 Jan 2021	We suggest some commentary could be included outlining that the Airports (Protection of Airspace) Regulations 1996 (APAR) define that the OLS and PANS-OPS is ascertained in accordance with international standards as implemented in Australia – in the case of the OLS it is determined in accordance with the ICAO International Standards and Recommended Practices for Aerodromes (Annex 14) document. OLS requirements, as implemented in Australia, are detailed in the Civil Aviation Safety Regulations 1998 – Part 139 (Aerodromes) Manual of Standards 2019 (the MOS). For PANS-OPS, in the International Civil Aviation Organization (ICAO) Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) (Doc 8168), Volume II – construction of Visual Flight Procedures.	Clarification inserted into section 3.1
		We assume that information on the PANS-OPS surfaces has been confirmed by Airservices Australia, if not we would recommend you seek confirmation	We have sought comment from Airservices – see above
		We request the first paragraph on page 10 be reworded. It is speculative that the previous APAR approvals confirm the maximum building height in the area and that such future buildings of comparable height, would “stand a good chance of approval”. As the impacts of each application on safety, efficiency and regularity of existing or future air transport is unique and as the heights of PANS-OPS may vary over the site depending on the location and the PANS-OPS procedures in place at that current point in time, the assumption made may not hold true in every case.	Paragraph reworded
		Page 13, section 4.4, table 2- in relation to the expected crane height for a short term (less than 3 months), we suggest the footnote be expanded to reflect that such an approval would only be provided if the proposed temporary change to a PANS-OPS procedure has no impact on the safety, efficiency and regularity of air transport operations into or out of the airport.	Included footnote
		We'd also recommend you bring to the reader's attention that the APAR and any requirements and decisions necessitated by it would take precedence over any advice provided in the report.	Included in Introduction
CASA	24 Feb 2021	CASA assesses each potential infringement of prescribed airspace on its merits and does not yet assess high rise suburbs or aggregations of buildings. CASA does not 'support' infringements of the Obstacle Limitation Surface (OLS) although it is acknowledged that some infringements may be inevitable. An increase in the number of tall buildings in the Bankstown CBD may, to some extent, increase the risk and severity of an aircraft accident because the CBD is relatively close to Bankstown Airport. The air traffic mix there comprises mostly small aircraft with limited instrumentation and some inexperienced pilots.	Noted
		The Study would be enhanced by the inclusion of a comment on the possible increase in likelihood of an aircraft accident resulting from the study area being built up with tall buildings.	Insert into Section 4.2.1 that CASA has indicated that such applications will be required to include an aeronautical study and that CASA will need to

AGENCY	DATE RECEIVED	COMMENTS	ACTION
			consider the cumulative effect on aircraft safety.
		It is emphasised that there is still residual risk, even with appropriate mitigations. The Study would be enhanced by the inclusion of comment on whether there is increased risk from temporary PANS-OPS adjustments and, if possible, quantify the increase.	Clarification included in Footnote Table 2 in as per DITRDC comment
		CASA recommends that PANS-OPS infringements by cranes are minimised and that each crane infringes PANS-OPS for the shortest time possible. CASA will advise that buildings exceeding 108.2 m AHD and cranes exceeding 108.2 m AHD for more than 3 months will be an unacceptable risk to existing and future air transport operations at Bankstown Airport and aviation safety respectively.	Clarification 4.2.2.1 that recent approvals do not guarantee future building approvals of comparable height and that each development must be evaluated at the time and follow the approval process for due review by the authorities.
		As recommended by ICAO Annex 14 Volume 1, an Aeronautical Study should accompany each application for a proposed unshielded infringement (crane or building) of the OLS. The BCC Masterplan would be enhanced by reference to Aviation Safety and incorporation of the appropriate aspects of an Aeronautical Study.	Included statement in Section 4.2.1 that CASA has indicated applications will be required to include an aeronautical study and that CASA will need to consider the cumulative effect on aircraft safety.
		Under 'Noise Abatement Procedures', AIP ERSAs advise that between 2130 - 2300 Monday-Friday aircraft departing runway 11 must turn left. The Study describes the standard instrument departure (SID). The study could elaborate on whether there is scope, including the circumstances, for aircraft departing runway 11 to turn right, thus avoiding the CBD.	Comment was discussed with Bankstown Airport and operational procedures are a matter for Airservices and Bankstown Airport.
		The Study Sub-Task 1 lists stakeholders. It is recommended the POLAIR is included in the list of stakeholders.	Included
		It is possible that there could be low Police Helicopter operations near the study area (as indicated in AIP ERSAs). The Study could comment on whether increased building heights will have implications for helicopter operations in general.	A phone call discussion was held with PolAir on the 4 March 2021. PolAir have been provided the report along with CASA's comments. At the time of writing no comments have been provided.
		The study could comment on possible mitigations available, and their effectiveness, if the Study Area being built up with tail buildings. Such mitigations could include a map in AIP ERSAs clearly showing the CBD relative to the aerodrome. (The current ERSAs includes two tower cranes under 'Aerodrome Obstacles').	Noted and discussed with Bankstown Airport
		It is acknowledged that the Study is not a Safety Case or Obstacle Assessment as such, however, the Study could be enhanced by the inclusion the following 'background' information: <ul style="list-style-type: none"> • The types of aircraft predominantly operating at Bankstown. • A description of visual circling approaches including proximity to the study area. • A description or map of the existing overall obstacle environment for the aerodrome including Black Charlie's Hill (not only the CBD). 	Context of airport operations included in Section 2 Background. Noted
		CASA does not normally comment on draft studies. CASA anticipates providing more comprehensive or revised comments to the planning authorities in future.	Noted