Bankstown Airport
Birdwood Road Mixed-Use Project
Major Development Plan

Approved

Aeria Management Group

Bankstown Airport Birdwood Road Mixed-Use Project Major Development Plan

Approved 09 September 2025

DISCLAIMER:

This Major Development Plan (MDP) has been prepared by Bankstown Airport Pty Limited (BAPL) ACN [083 058 637], trading as Aeria Management Group for the purpose of satisfying the statutory requirements of the Airports Act 1996 (Cth).

The development concepts and projections presented in the MDP are based on information and assumptions which have been prepared, and adopted by BAPL, specifically to satisfy statutory requirements. These development concepts and projections should not be used or relied upon for any other purpose. Whilst all care has been taken in the preparation of the MDP, BAPL does not accept any liability whatsoever to any person who relies in any way on any information contained in this document.

GLOSSARY	
AAM	Advanced Air Mobility
ABC	Airport Building Controller
AEO	Airport Environment Officer
AEP	Annual Exceedance Probability
AEPR	Airports (Environment Protection) Regulations 1997
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Management System
Airports Act	Airports Act 1996 (Cth)
ALC	Airport Lessee Company
AMG	Aeria Management Group
ANAEER	Air Navigation (Aircraft Engine Emissions) Regulations 1995 (Cth)
ANEF	Australian Noise Exposure Forecast
BAPL	Bankstown Airport Proprietary Limited
BC Act	NSW Biodiversity Conservation Act 2016
BGL	Below Ground Level
BITRE	Bureau of Infrastructure and Transport Research Economics
CAPL	Camden Airport Proprietary Limited
CASA	Civil Aviation Safety Authority
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CSS	Compass Swing Site.
CTMP	Construction Traffic Management Plan
DCCEEW	Department of Climate Change, Energy, Environment and Water (Cth)
DCP	Development Control Plan
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Cth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
eVTOL	Electric Vehicle Take-off and Landing
GA	General Aviation
GFA	Gross Floor Area
GLA	Gross Leasable Area
HLS	Helicopter Landing Site
HMP	Heritage Management Plan
HRV	Heavy Rigid Vehicle
ILS	Instrument Landing System

GLOSSARY	
IWI	Illuminated Wind Indicator
LEP	Local Environmental Plan (LEP) 2023
LoS	Line of Sight
MDP	Major Development Plan
MRV	Medium Rigid Vehicles
NASF	National Airports Safeguarding Framework
NASAG	National Airports Safeguarding Group
NDB	Non-Directional Beacon
NOTAM	Notice to Airmen / Notice of Air Mission
NSW	New South Wales
OLS	Obstacle Limitation Surfaces
OMP	Operational Management Plan
OSD	Onsite Detention
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations
PAPI	Precision Approach Path Indicator
PFAS	Per-and Polyfluoroalkyl Substances
PROJECT	Birdwood Road Mixed-Use Project, alternatively known as Link Road Mixed-Use Project, Birdwood Rd/Link Rd Mixed-Use Project or Bankstown Airport Birdwood Road Mixed-Use Project
PSI	Preliminary Site Investigation
PolAir	NSW Police Aviation Command
RL	Relative Level
SAC	Site Assessment Criteria
SID	Standard Instrument Departure
SOHI	Statement of Heritage Impact
SPR	Source, Pathway, Receptor
TEC	Threatened Ecological Communities
TfNSW	Transport for New South Wales
TIA	Traffic Impact Assessment
TMP	Traffic Management Plan
Toll Aviation	Toll NSW Ambulance Aeromedical Service/Toll ACE Training Centre
WHMP	Bankstown Airport Wildlife Hazard Management Plan

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Executive Summary

This Major Development Plan (MDP) is for the development of a new community-based mixed-use project at Bankstown Airport that will include a childcare centre, shops, offices and warehouses.

The project will provide services to the local community and general aviation (GA) operators, along with employment and economic benefits to South West Sydney.

The MDP presents the site layout, building design and visual impressions of the proposed development.

The MDP was approved by the Minister for Infrastructure, Transport, Regional Development and Local Government on the 9th of September 2025.

Introduction

Bankstown Airport (Airport) is a uniquely positioned metropolitan General Aviation (GA) airport that is a significant economic and employment generator and home to most of the State's emergency and aeromedical services aviation operations, as well as multiple flight training schools, GA operators and large commercial and industrial precincts.

The Airport is operated by Bankstown Airport Pty Limited (BAPL), which trades under the name of Aeria Management Group (AMG). AMG has made substantial investments in new and enhanced facilities and infrastructure across the Airport in support of multiple sectors – such as GA, manufacturing and distribution – and broader economic and employment generation for the people and businesses of South West Sydney.

The Bankstown Airport Birdwood Road Mixed-Use Project (Project) aligns with the Bankstown Airport Master Plan 2019 (Master Plan 2019) Development Program, by delivering a significant community-based commercial precinct that will provide opportunities for new shops, cafes, offices, a childcare centre and light industry/warehouse customers.

The Project will enhance the Airport's contribution to meeting the needs of local and regional communities, while maintaining the Airport's primary role of supporting GA operations and services.

The Site

Located at the northern periphery of the Airport, the Project site faces Birdwood Road to the north and Link Road to the south and is approximately 3.1 hectares in area. The site is an undeveloped land parcel that has been identified under Master Plan 2019 for the development of a mixed-use commercial precinct.

The Project

The Project will provide opportunities for community- and retail-based uses and services on the northern portion of the site fronting Birdwood Road and medium-scale light industrial warehousing to support local businesses and trades on the southern portion of the site, which is separately accessed from Link Road (within the Airport precinct).

Figure 1 Indicative renders of the Project looking from Birdwood Road (left) and Link Road (right)

This arrangement has been developed in response to the contextual constraints of the Project site and aims to enhance the public offering along Birdwood Road, complement the land use characteristics of the area, respond to the retail and service needs of the community and make use of the industrial character of Link Road and wider Airport precinct.

Need and Justification

Master Plan 2019 includes a Development Program to help achieve its objectives and identifies 21 development sites at the Airport, including 13 aviation-related projects and 8 non-aviation projects.

The Project site is identified as Site NA-2 under the Development Program and is set aside for the development of a "community-based retail (neighbourhood shopping centre)" of around 20,000m^2 in area.

The Project will occupy the eastern (vacant) half of development site NA-2 and is consistent with the intended development of the site, by delivering around 22,000m^2 of mixed-use development.

The Project will create employment opportunities and make a significant contribution to local, regional and State economies, including:

- Supporting approximately 255 full-time jobs and adding approximately $44.54 million to NSW Gross State Product during the construction phase
- Supporting approximately 488 full-time jobs and adding approximately $110.5 million annually to NSW Gross State Product when operational.

Aviation Considerations and Support for GA

Detailed aviation impact assessments have been undertaken for the Project against the National Airports Safeguarding Framework (NASF).

The Project is located within the landside commercial area of the Airport, on a site specifically identified in Master Plan 2019 as suitable for commercial development. Given the significant distance of the Project site from the Airport runways (about 600 metres) and airport infrastructure, and the low heights of the proposed buildings, the Project will not impact aviation safety or flight paths at the Airport.

AMG is committed to the long-term sustainability of GA and broader economic and employment generation for the benefit of local, regional and State people and businesses. In respect of the Project, this includes offices and warehouses for use by aviation-related services and businesses.

AMG's commitment to GA includes complementary investments in aviation and non-aviation facilities and infrastructure at the Airport.

The Commonwealth Government's 2024 Aviation White Paper (Aviation White Paper) affirms the critical role of non-aviation developments in supporting the Australian aviation sector, stating that "non-aviation developments

have become an important revenue stream to help fund maintenance and improvement of airports". As further noted in the Aviation White Paper: "The [non-aviation] developments diversify revenue sources for airport operators to ensure they remain viable."

The Project is being progressed in parallel with significant investments by AMG in GA, led by an Aviation Hangar Project MDP located within the heart of the Airport's aviation precinct. The proposed development of two aircraft hangar buildings will support up to 10 separate GA operations, with associated offices, hangar aprons and parking for aircraft and cars.

The flexible design of the hangar buildings will cater for diverse GA operations, such as emergency services and emerging electric- and hydrogen-powered aircraft. In February 2025, the Draft MDP was submitted to the Minister for Infrastructure, Transport, Regional Development and Local Government (Minister) for approval.

AMG is undertaking several other significant investments in GA services, facilities and infrastructure at the Airport. Such projects include:

- Aviation Microsites Development Program, to deliver new or enhanced aircraft hangars and related facilities
- Major upgrades to Airport taxiways, runways and pavements
- Enhancements to aviation safety infrastructure, including an Automatic Weather Information Broadcast System and upgrades to airfield lighting and beacons
- Substantial upgrades to Airport roads, major intersections and stormwater infrastructure
- Support for not-for-profit GA services and groups, such as AMG's partnership with Little Wings, which enables additional free aeromedical transports for seriously ill children in regional and remote areas, across NSW, Queensland and the Australian Capital Territory (ACT).

Transport and Traffic Management

A Transport Impact Assessment (TIA) has been undertaken that considers the expected transport and traffic impacts of the Project, during construction and operation.

The TIA concludes that onsite car parking will be provided in accordance with, or in surplus to, the requirements prescribed in the City of Canterbury Bankstown Development Control Plan. The Project is also consistent with the Master Plan 2019 Ground Transport Plan, is designed in accordance with the relevant Australian Standards. The Project will have minimal impact on the surrounding road network.

Environmental Management, Sustainability, Climate Resilience and Decarbonisation

Key sustainability and environmental initiatives and considerations for the Project include:

- Sustainability – The Project aligns with AMG's Sustainability Framework/Strategy and decarbonisation targets. The Project includes multiple sustainability design initiatives to reduce environmental impacts, such as on-site solar renewable energy production, electric vehicle charging, energy efficient lighting and heat-pump hot water, water-use metering and monitoring and rainwater harvesting and reuse
- Flooding and stormwater management – Flooding and stormwater are broader than the Project site and the design has been considered within the wider Airport and Milperra Catchment. The building finished floor levels and civil works will address existing localised flooding and stormwater management issues for this part of the Airport precinct. The Project will not result in any off-site flooding or stormwater impacts
- Visual Impact/Building Massing – The Project has been designed to respond to the site context and has been effectively laid out in two separate areas. The northern component – containing shops, offices and the childcare centre – will complement the scale and character of off-airport development and operate as a typical local centre development

The warehouses, located to the south, respond to the industrial characteristics of the Airport environment and have been positioned and designed to minimise impacts on non-airport land uses.

- Noise and Vibration – Construction impacts will be managed through a project-specific Construction Environmental Management Plan (CEMP). Operational impacts will be effectively mitigated to ensure the Project complies with all relevant noise criteria
- Heritage – No sites of Aboriginal and Torres Strait Islander significance have been recorded on or near the Project site. The proposed development will not adversely impact statutorily listed heritage items at the Airport
- Contamination – A Preliminary Site Investigation has confirmed that there are no unacceptable contamination risks associated with the Project site
- Ecology – An Ecological Constraints Assessment has confirmed that there are no threatened ecological communities or threatened species recorded for the Project site.

A project-specific CEMP will be prepared by AMG and submitted for approval to the Airport Building Controller (ABC). The approved CEMP will form the basis for environmental management during the construction phase of the Project.

Consistency with Master Plan 2019 and State and Local Planning Instruments

The Project is located within the landside commercial area of the Airport, on a site that is specifically identified in Master Plan 2019 as suitable for mixed-use commercial development. As such, the Project is consistent with the objectives of Master Plan 2019 and will not compromise current or long-term aviation operations at the Airport.

The Project is consistent with NSW State and Local Government Planning Instruments, including the Greater Sydney Region Plan, South District Plan, Canterbury Bankstown Local Strategic Planning Statement and Canterbury-Bankstown Local Environmental Plan (LEP) 2023.

Consistency with the Airports Act 1996 and Airport Head Lease

The MDP is consistent with all legislative provisions and requirements under the *Airports Act 1996* (Airports Act), including those relating to environmental matters. The specific chapters of the MDP demonstrate consistency with the requirements under Section 91 (Contents of a major development plan) of the Airports Act and a summary of this consistency is provided in Appendix A.

Furthermore, the MDP has been prepared in accordance with Clause 13 of the Airport Head Lease between the Commonwealth of Australia and Bankstown Airport Proprietary Ltd (BAPL), as required under Section 91 (1A) b) of the Airports Act.

Disability Access

AMG is committed to ensuring equal access and opportunity for people with a disability at the Airport. This commitment includes relevant considerations raised in the Aviation White Paper and by the Minister – specifically, whether the Airport's disability access requirements comply with the *Disability Discrimination Act 1992* and relevant disability standards.

Key building features for the Project that may be used to accommodate people with a disability include:

- Provision of accessible car parking spaces
- Establishment of a continuous accessible path of travel from the car park to buildings, to facilitate accessibility
- Provision of ramps or lifts to navigate stairs where required
- Consideration of suitable accessways and exit path dimensions

- Provision of braille and tactile signage, along with tactile ground indicators where applicable to guide users
- Inclusion of accessible unisex sanitary compartments and ambulant facilities
- Evaluation of areas where access may pose health and safety risks for people with a disability, such as building services rooms, waste rooms, hazard storage and cleaning rooms
- Provision of a hearing augmentation system to support access to quality audio.

Community Consultation, including with First Nations people

AMG is a proud and active member of the communities within which it operates and actively and regularly engages with residents and community members, community groups and other community representatives about Airport operations and developments.

In respect of the Project, consultation to date has included:

- Briefings, presentations and discussions at multiple meetings of the Bankstown Airport Community Aviation Consultation Group (CACG), from 2023-25, which enabled community members and groups and Airport operators to share information and feedback
- Briefings to the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Department), Airservices Australia, CASA, City of Canterbury Bankstown and local business, tourism and industry groups
- Letter box drops to surrounding streets and suburbs advising residents of the proposed development and inviting initial feedback and door knocks of nearby homes
- Community pop-up stall outside the SUPA IGA Georges Hall and community information session at the Georges Hall Community Centre, to provide information about the Project and hear feedback.

AMG is similarly committed to authentic, open and respectful engagement and consultation with First Nations people. In respect of the Project, such engagement to date has included:

- Discussions with the City of Canterbury Bankstown First Peoples Advisory Committee
- Discussions with the Gandangara Local Aboriginal Land Council
- Engaging with First Nations' focused designers on the Project to potentially incorporate a Connecting to Country narrative and Indigenous knowledge and design.

Aviation White Paper

In August 2024, the Commonwealth Government published the Aviation White Paper, which sets out the Government's policies for the aviation sector towards 2050.

The Aviation White Paper includes new and proposed planning and development expectations for leased federal airports, including:

- Proposed changes to the *Airports Regulations 2024* (Airports Regulations) to require airport master plans and MDPs to include information on several specific factors; and
- Additional factors the Minister will have regard to when making decisions about future airport master plans and MDPs, as detailed in a letter from the Minister to Airport Lessee Companies (ALCs) at the time of release of the Aviation White Paper.

The table below sets out the factors that are relevant to the consideration and approval of this MDP and references the sections of the MDP that address each of those factors. This includes factors in the proposed changes to the Airports Regulations, despite the fact that such changes are not currently in force.

Table 1 Relevant factors raised by the Aviation White Paper

Factors	MDP consideration and response
The appropriateness of the airport's community consultation processes, including consultation with First Nations people (Minister's expectation)	Section 11.0 Consultation
How the airport will build and maintain resilience to climate impacts (Minister) How the airport's planning will address climate resilience (proposed Airport Regulations)	Section 8.0 Environment and Sustainability Section 8.2 Sustainability, Climate Resilience and Decarbonisation
The suitability of the airport's sustainability and decarbonisation initiatives (Minister) How the airport's planning will address decarbonisation (proposed Airport Regulations)	Section 8.0Environment and Sustainability Section 8.2 Sustainability, Climate Resilience and Decarbonisation
Whether the airport's disability access arrangements comply with the *Disability Discrimination Act 1992* and relevant disability standards (Minister) How the airport's planning will address disability access (proposed Airport Regulations)	Section 4.4 Built Form
The suitability of the airport's plans for noise mitigation (Minister)	Section 6.0 Aviation Operations Section 8.5 Noise and Vibration
Whether appropriate access to the airport site has been provided for GA users, consistent with the requirements of the Airports Act and the extent to which carrying out the plan would meet present and future requirements of civil aviation users of the airport for services and facilities relating to the airport (Minister)	Section 3.0 Need and Justification
How the airport's planning will address requirements of the NASF (proposed Airport Regulations)	Section 6.1 National Airports Safeguarding Framework

1.0

Introduction

Aeria Management Group

1.0 Introduction

The Bankstown Airport Mixed-Use Project Major Development Plan (MDP) is for the development of a new community-based mixed-use project that will include a childcare centre, shops, offices and warehouses.

The Birdwood Road Mixed-Use Project (Project) will provide services to the local community and businesses and the general aviation (GA) sector, along with broader employment and economic benefits to South West Sydney.

The MDP presents the site layout, building design and visual impressions of the proposed development. Future customer fit-outs and the detailed design of the buildings will be consistent with the concepts detailed in this MDP and subject to detailed assessment and approval by the Airport Building Controller (ABC).

1.1 Background

Bankstown Airport (Airport) was established in 1939 as a Royal Australian Air Force base and has since grown into Sydney's major GA airport.

The Airport is a uniquely positioned metropolitan GA airport that is a significant employer within the region and home to most of the State's emergency and aeromedical services aviation operations, flying schools, GA operators and large commercial and industrial precincts.

The Airport is located approximately 26 kilometres from the Sydney Central Business District, 17 kilometres from Sydney Airport and 26 kilometres from Western Sydney International Airport (currently under construction).

Figure 2 Bankstown Airport location map

The Airport is operated by Bankstown Airport Pty Limited (BAPL), which is the Airport Lessee Company (ALC) under the Head Lease from the Commonwealth Government, the owner of the Airport. BAPL trades under the name of Aeria Management Group (AMG).

In the past five years, the Airport has undergone significant commercial investment on the periphery of the Airport site, including the development of the Altitude Premium Logistics Estate (under the approved South West Precinct Site Works and Warehouse MDP 2019) and 430 Marion Road Industrial Park. These developments

are now thriving industrial estates that have attracted a range of employers into the region, who benefit from the connection to the Airport and the nearby strategic transport connections.

AMG is also progressing an MDP for the construction of a new aviation hangar facility to be located within the heart of the aviation precinct at the Airport. In February 2024, the Aviation Hangar Project MDP was submitted for approval to the Minister for Infrastructure, Transport, Regional Development & Local Government (Minister). The hangar project will be a significant and critical investment in the long-term viability of GA activities and growth at the Airport.

The Airport is estimated to support over 170 businesses, more than 8200 jobs and contribute over $1.7 billion a year to the NSW economy (see Figure 3 below).

Figure 3 Snapshot of Bankstown Airport Statistics

Source: AMG

Development of the Airport is undertaken in accordance with the current Bankstown Airport Master Plan 2019 (Master Plan 2019). The Development Program set out in Master Plan 2019 identifies the Project site as a future "community-based retail (neighbourhood shopping centre)", with potential envisaged uses being supermarkets, entertainment and clubs (subject to commercial demand).

This MDP is designed to align with the Master Plan 2019 Development Program and all other relevant objectives of Master Plan 2019, further enhancing the Airport's contribution to the local and regional community.

1.2 Project Summary

This MDP has been prepared for the development of the Project, located on vacant land adjacent to the north-west boundary of the Airport. The Project site has an approximate area of 31,200m^2 and is bounded by Birdwood Road to the north and Link Road to the south (see Figure 4).

Figure 4 Project site location

Source: Nearmap

Due to the location of the Project being on the periphery of the Airport and adjacent non-airport land uses, it has been designed to provide commercial land uses that will support and complement the local community and Airport users.

The Project has been laid out so that the smaller-scale, community-based activities (childcare centre, shops, offices) are located on the northern side of the Project site and adjacent to non-airport land. The medium-scale warehouse units are proposed to be located away from non-airport land on the southern side of the Project site and accessed separately via Link Road within the Airport precinct (see Figure 5).

Figure 5 MDP site boundary
Source: Nearmap

The Project site layout will effectively result in the northern and southern sections of the site operating independently of each other, thereby separating truck and car movements and distributing traffic volumes between Birdwood Road and Link Road.

As illustrated by Figure 6 and Figure 7, the proposed buildings have been carefully designed to respond to their contextual surroundings, with the northern commercial buildings complementing the scale and setbacks of surrounding non-airport related land uses and buildings and provided with significant landscaped areas and a mixed materials palette to soften the visual impact of the development.

The warehousing, in the southern section of the site, will have a uniform appearance and a relatively high degree of articulation and a mix of contemporary finishes and materials that will assist in minimising visual mass and reducing impacts on surrounding properties.

The Project has been designed to provide significant flexibility, with the internal arrangements of the individual buildings able to accommodate diverse future tenant requirements.

Figure 6 Indicative image of the Project viewed from Birdwood Road (community-based activities)

Figure 7 Indicative image of the Project viewed from the south (medium-scale warehouse units)

2.0

Statutory Background

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2.0 Statutory Background

2.1 Bankstown Airport Master Plan 2019

Master Plan 2019 was prepared in accordance with the requirements of the *Airports Act 1996* (Airports Act). The Airports Act requires BAPL to prepare an Airport Master Plan every eight years. The Airport Master Plan includes a 20-year strategic vision for the Airport, along with a detailed development strategy.

Master Plan 2019 was approved by the Minister on 7 November 2019 and guides future development, including in relation to aviation operations, environmental management and commercial development.

Any development that is proposed on a Commonwealth-leased airport must align with the approved Airport Master Plan.

2.2 MDP Approval Process

The Airports Act requires an MDP to be prepared for any development classified as a "major airport development" under section 89 of the Airports Act, with the MDP requiring approval by the Minister prior to commencement of works.

The Birdwood Road Mixed-Use Project triggers the requirements for an MDP pursuant to Section 89 (1)(e) of the Airports Act, as the construction costs exceed the $25 million financial trigger for new buildings.

Section 89 of the Airports Act also states that "sensitive development'" which includes a "school", is classified as "major airport development". For clarity, the *Airports Amendment Bill 2010 Explanatory Memorandum* specifies that a "childcare facility", as proposed by this MDP, is not considered a "school" for the purpose of the Airports Act.

Section 91(1) of the Airports Act specifies the contents of an MDP. The contents must cover the following items:

- The objectives of the proposed development
- An assessment of the extent to which the future needs of civil aviation users of the airport and other users of the airport will be met by the development
- A detailed outline of the proposed development
- Whether or not the proposed development is consistent with the airport lease
- Whether or not the proposed development is consistent with the final master plan
- Whether or not the proposed development could affect flight paths or noise exposure levels at the airport
- The likely effect of the proposed development on traffic flows at the airport and surrounding the airport
- The likely effect of the proposed development on employment levels at the airport
- The likely effect of the proposed development on the local and regional economy and community, including how the proposed development fits within the local planning schemes for commercial and retail developments in the adjacent area
- An assessment of environmental impacts and the plans for dealing with any such impacts.

A table summarising the consistency of the MDP with Section 91(1) of the Airports Act is provided in Appendix A.

The MDP process is described in detail below, with Figure 8 providing a simplified overview.

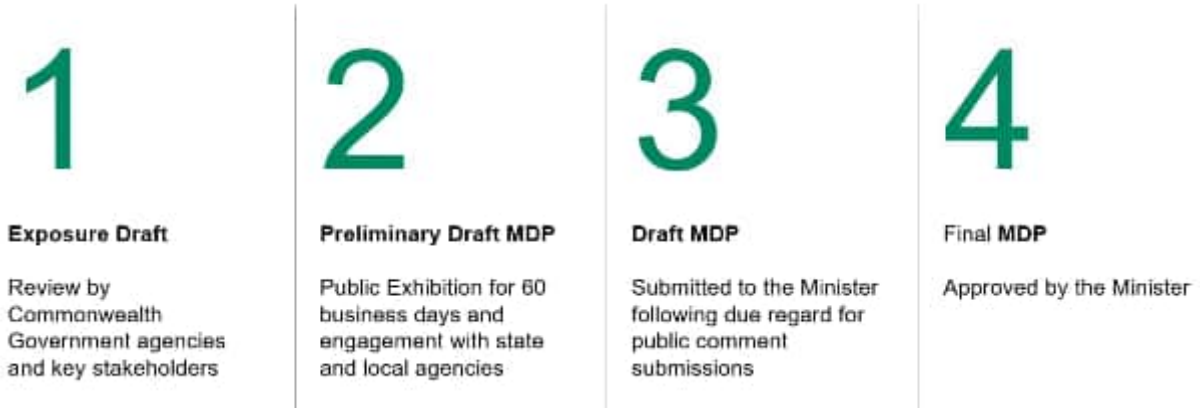


Figure 8 Major Development Plan process

The preparation of an MDP is an iterative process, with the first stage being the preparation of the Exposure Draft version, supported by relevant investigations and technical studies. Whilst not a statutory requirement, the Exposure Draft provides the Commonwealth Government and key stakeholders the opportunity to provide input to the process prior to the public exhibition of the Preliminary Draft MDP.

The Preliminary Draft MDP is the version used for public consultation. The public consultation requirements are described in Part 5, Division 4 of the Airports Act. Once the Preliminary Draft MDP has been prepared, it must be published and generally made available for public comment for a minimum period of 60 business days.

For the public consultation process, an advertisement must be placed in a newspaper circulating within the State, stating:

- A draft MDP has been prepared
- That copies are available for public inspection and purchase for a minimum period of 60 business days
- The place(s) where the copies are available, including the airport website
- The public is invited to make written comments on the draft MDP.

Once the public consultation period has concluded, AMG must submit to the Minister a summary of any comments received, together with the Draft MDP. This summary must contain the following:

- The names of persons or organisations that made comment
- A summary of the comments
- A statement declaring that AMG has given due regard to the comments received
- Any other information relating to the comments that may be required by the Regulations.

In addition to the public consultation requirements, Section 93 of the Airports Act places further requirements on AMG in respect to consultation with government agencies, the aviation industry and any other persons where consultation occurred prior to the period of public consultation. In this case, the Draft MDP submitted to the Minister must also include a summary of that consultation, including:

- The names of persons and organisations consulted
- A summary of the views expressed.

Prior to submitting the Draft MDP to the Minister for approval, AMG must provide written advice and a copy of the Draft MDP to the following:

- NSW Minister for Planning
- The senior authority for Planning in NSW
- The Chief Executive Officers of the surrounding local government area.

Once AMG submits the Draft MDP to the Minister, the Minister has up to 50 business days to decide whether to approve (or refuse to approve) the Draft MDP. The Minister may approve the Draft MDP subject to conditions.

In deciding to approve (or refuse) the Draft MDP, the Minister must consider:

- The extent to which the document achieves the purpose of an MDP
- The extent to which the Draft MDP meets the needs of airport users
- The effect of the Draft MDP on the future capacity of the airport
- The impact of the proposed development on the environment
- The views of the Civil Aviation Safety Authority (CASA) and Airservices Australia with respect to safety aspects and operational aspects
- The consistency of the Draft MDP with the Master Plan
- Any other matters considered relevant.

3.0

Need and Justification

Aeria Management Group

3.0 Need and Justification

Bankstown Airport Master Plan 2019 provides the vision for the development of the Airport, plans for continued aviation operations and new commercial development opportunities.

This MDP will be located on land identified by Master Plan 2019 as suitable for the development of a community-based commercial centre.

3.1 Bankstown Airport Master Plan 2019 Development Program

Master Plan 2019 sets out the expected development program to help achieve its objectives. Master Plan 2019 identifies 21 developments within the program, including 13 aviation-related projects and eight non-aviation projects.

The Project site is located within a portion of a non-aviation-related development site, identified as Site NA-2 under Master Plan 2019, as shown in Figure 9. Development Site NA-2 also contains Georges River Grammar to the west of the Project site and the existing IGA supermarket on Birdwood Road.

Master Plan 2019 identifies Site NA-2 for the future development of a "community-based retail (neighbourhood shopping centre)" of around 20,000m^2 in area.

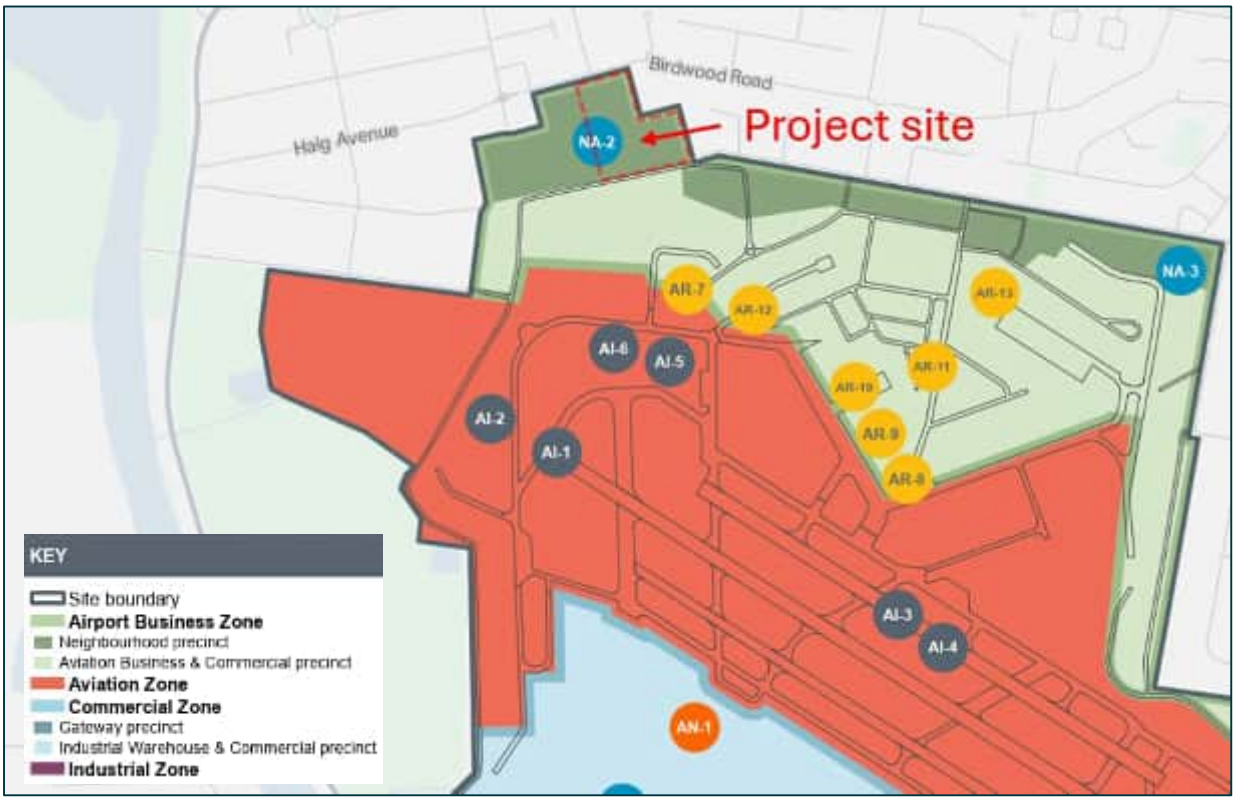


Figure 9 Master Plan 2019 Development Program Sites

Source: Bankstown Airport Master Plan 2019

The Project will occupy the eastern (vacant) half of development Site NA-2 and deliver around 22,000m^2 of mixed-use development. The Project is consistent with the envisaged development of Site NA-2 for the following reasons:

- The proposed retail units will enhance and complement the existing supermarket use directly abutting the site and within Site NA-2, along with the Georges Hall Local Centre (identified under the City of Canterbury Bankstown Local Environment Plan), located a short distance to the west
- The upper-level office spaces will accommodate employment-generating uses and provide opportunities for community-based services, such as medical consulting rooms, and aviation support services, such as an insurance broker
- The childcare facility located within the site's north-east corner will improve access to services within the local community, including servicing airport and non-airport uses
- The medium-scale warehouse units will provide opportunities for local/regional-scale businesses and local employment, including potential aviation support services, and, due to their positioning to the rear of the site and separately accessed from Link Road, will not compromise the functions of the proposed northern community-based activities.

3.2 Development Objective

The objective of the Project is to appropriately support and grow commercial development at the Airport by:

- Expanding non-aviation commercial opportunities at an appropriate scale
- Expanding employment opportunities at the Airport, further supporting the surrounding local and regional communities and economies
- Ensuring the commercial units are designed to allow internal flexibility and are easily adaptable to meet the needs of future tenants in response to commercial demands from airport and non-airport users
- Continuing to ensure that development at the Airport complements and integrates into the surrounding environment
- Providing an attractive, safe and appealing environment for the wider community
- Minimising impacts and disruption to aviation operations and surrounding land uses
- Aligning with the Airport's Sustainability Framework.

3.3 Economic Impact Assessment

Hudson Howells prepared an Economic Impact Assessment for the Project in December 2023. The assessment modelling was based on the proposed Gross Lettable Areas (GLA) for the intended land uses and identified the economic impacts at regional and State levels, including the impacts to the Canterbury Bankstown Local Government Area (LGA).

Construction Phase

The construction phase for the Project is anticipated to take approximately 18 months, with work commencing in 2025 (subject to obtaining all relevant approvals). The construction phase is expected to:

- Support approximately 255 full-time jobs in New South Wales, with around 182 of these jobs within the South West Sydney Region and 88 within the Canterbury-Bankstown LGA
- Add approximately:
  - $44.54 million to NSW Gross State Product
  - $31.39 million to the South West Sydney Region
  - $15.1 million within the Canterbury-Bankstown LGA.

Operational Phase:

It is expected that the Project will be fully operational (fully tenanted) approximately six to 12 months post-construction. Once fully operational, the Project is expected to:

- Support approximately 488 full-time jobs in NSW, with around 458 of these jobs within the South West Sydney Region and 435 within the Canterbury-Bankstown LGA
- Add approximately $110.5 million annually to NSW Gross State Product, with the majority of this (approximately $100 million) to be added within the Canterbury-Bankstown LGA.

The Economic Impact Assessment modelling demonstrates the potential of the Project to contribute significantly to the State and local economies, which will further enhance the importance of the Airport to the success of the South West Sydney Region.

3.4 Support for GA activities at the Airport

AMG is committed to the long-term sustainability of GA and broader economic and employment generation for the benefit of local, regional and State people and businesses. In respect of the Project, this includes offices and warehouses for use by aviation-related services and businesses.

AMG's commitment to GA includes complementary investments in aviation and non-aviation facilities and infrastructure at the Airport.

The Commonwealth Government's 2024 Aviation White Paper (Aviation White Paper) affirms the critical role of non-aviation developments in supporting the Australian aviation sector, stating that "non-aviation developments have become an important revenue stream to help fund maintenance and improvement of airports". As further noted in the Aviation White Paper: "The [non-aviation] developments diversify revenue sources for airport operators to ensure they remain viable."

The Project is being progressed in parallel with significant investments by AMG in GA, led by an Aviation Hangar Project MDP located within the heart of the Airport's aviation precinct. The proposed development of two aircraft hangar buildings will support up to 10 separate GA operations, with associated offices, hangar aprons and parking for aircraft and cars.

The flexible design of the hangar buildings will cater for diverse GA operations, such as emergency services and emerging electric and hydrogen-powered aircraft. In February 2025, the Draft MDP was submitted to the Minister for approval.

AMG is undertaking several other significant investments in GA services, facilities and infrastructure at the Airport. Such projects include:

- Aviation Microsites Development Program, to deliver new or enhanced aircraft hangars and related facilities
- Major upgrades to Airport taxiways, runways and pavements
- Enhancements to aviation safety infrastructure, including an Automatic Weather Information Broadcast System and upgrades to airfield lighting and beacons
- Substantial upgrades to Airport roads, major intersections and stormwater infrastructure
- Support for not-for-profit GA services and groups, such as AMG's partnership with Little Wings, which enables additional free aeromedical transports for seriously ill children in regional and remote areas, across NSW, Queensland and the Australian Capital Territory (ACT).

As such, the Project will achieve the commercial objectives of Master Plan 2019 while also enabling ongoing investments and support for GA operations and services.

4.0

Project Details

Aeria Management Group

4.0 Project Details

4.1 Site Location

The Project site is located in the northwestern part of the Airport and within the Airport Business Zone, as defined by Master Plan 2019.

The Project site has two road frontages, being Link Road to the south, which is a publicly accessible road located on the Airport site, and Birdwood Road to the north, which is a City of Canterbury Bankstown owned and maintained road (see Figure 10).

The land to the east and the north of the Project site is located outside of the Airport site and consists of residential and community land uses. Immediately to the west of the Project site is an IGA supermarket and Georges River Grammar. These properties are located within the Airport site.

Further to the west of the Project site, at the road intersection of Birdwood Road and Georges Crescent, is the Georges Hall shopping area, which is zoned under the Canterbury-Bankstown Local Environment Plan 2023 (LEP 2023) as a "Local Centre". This area comprises small scale shops and local services.

To the south of the Project site, on the opposite side of Link Road, is airside land consisting of helicopter training operations and aircraft hangars, including NSW Police Aviation Command (PolAir).

Figure 10 Project site location and context
Source: Aeria Management Group

4.2 Site Description

The Project site (see Figure 11) is a vacant parcel of land consisting of an open grassed area and a small unmade and informal car parking area adjacent to the Birdwood Road frontage, currently under an access licence by Bankstown Montessori Preschool. There are a small number of semi-mature trees located around the perimeter of the Project site, adjacent to the Birdwood Road frontage and eastern boundary.

The Project site has an approximate area of 3.1 hectares and the land has a fall from north to south of approximately 4.0 metres. The Project site is currently accessible by a single crossover from Link Road to the south and two crossovers from Birdwood Road to the north. There is an existing swale drain running along the southern boundary of the site, parallel to Link Road.

Figure 11 View of site looking south from Birdwood Road

Source: Google Streetview

4.3 Development Concept

The Project has been designed as a mixed-use precinct that will provide opportunities for community-based activities on the northern side of the site fronting Birdwood Road and medium-scale warehouses/light industrial development on the southern portion of the site (see Figure 12). This arrangement has been developed in response to the contextual constraints of the site. It aims to enhance the public realm along Birdwood Road, complement the land use characteristics of the area, respond to the retail needs of the local community and make use of the aviation/industrial nature of Link Road and the wider Airport site.

The buildings have been designed to provide a high degree of internal flexibility and adaptability to respond to the needs of future tenants, including aviation-related businesses and operations.

Figure 12 Project site plan

The Project will include the following elements:

- Two-storey commercial building facing Birdwood Road to the north and comprising a row of shops and office units
- Two-storey childcare facility fronting Birdwood Road, with an associated outdoor play area and drop-off area. The childcare facility will have a capacity of approximately 120 children.

- A northern shared car park comprising approximately 102 car parking spaces serving the commercial land uses. The car park will be accessed from Birdwood Road and will be integrated with the existing car park servicing the IGA supermarket to the west.
- An emergency vehicle access along the eastern boundary of the Project site
- Relocated IGA loading and receiving areas, with the existing loading and receiving areas fronting Birdwood Road proposed to be utilised as an additional shop tenancy (separate application to this MDP)
- Medium-scale warehouses and light industrial tenancies located to the rear (south) of the Project site and accessed from Link Road
- Car parking around the warehouse buildings (122 spaces)
- Associated service connections, landscaping, lighting, signage, fire services, retaining walls and acoustic boundary walls

4.4 Built Form

4.4.1 Site Layout and Access

The Project site has been laid out so that it will effectively operate as two separate sites, with the smaller-scale, community based childcare centre, shops and offices being located on the northern side of the Project site, adjacent to non-airport land, and presenting as a typical local centre commercial development.

The medium-scale warehouse units have been positioned to the rear (south) of the community-based land uses, away from non-airport land on the southern side of the Project site and accessed separately from Link Road within the Airport site.

The maximum Gross Lettable Areas for each of the proposed land uses are detailed in the table below.

Table 2 Gross Lettable Areas for each of the proposed land use.

Land Use	Gross Lettable Area (m2)
Warehouse	14,825
Warehouse offices	1,057
Offices	975
Childcare centre	743
Shop / food and drink premises	1,085*
Total	18,603*

** Includes IGA New Shop Tenancy (former IGA Loading Area)*

The Gross Floor Area for the development, including non-lettable areas, is 19,667 m^2.

All shops and offices will be contained within a single row building positioned on an east-west alignment and the childcare centre will be contained within a separate building positioned in the north-east corner of the Project site. These community-based land uses will be served by a large car park fronting Birdwood Road and accessed via two vehicle crossovers. The car park will also be linked with the existing IGA supermarket car park. Deliveries and waste collection for the shops will occur within a dedicated loading bay and waste storage area that will be accessed from Link Road to the south.

The warehouse development, located to the rear (south) of the site, will consist of three large warehouse buildings that will be divided into individual tenancies. These buildings will be served by a one-way internal road that will allow cars and trucks to enter from the west side of the Link Road frontage, circulate through the site and exit on the east side of the Link Road frontage. Car parking spaces will be provided along the building frontages and adjacent to the ancillary offices. The internal road has been designed to allow up to a maximum 12.5m Heavy Rigid Vehicle (HRV) to enter the site and reverse into the warehouse buildings and to exit in a forward direction. Figure 13 demonstrates the position of the warehouse buildings and internal access road.

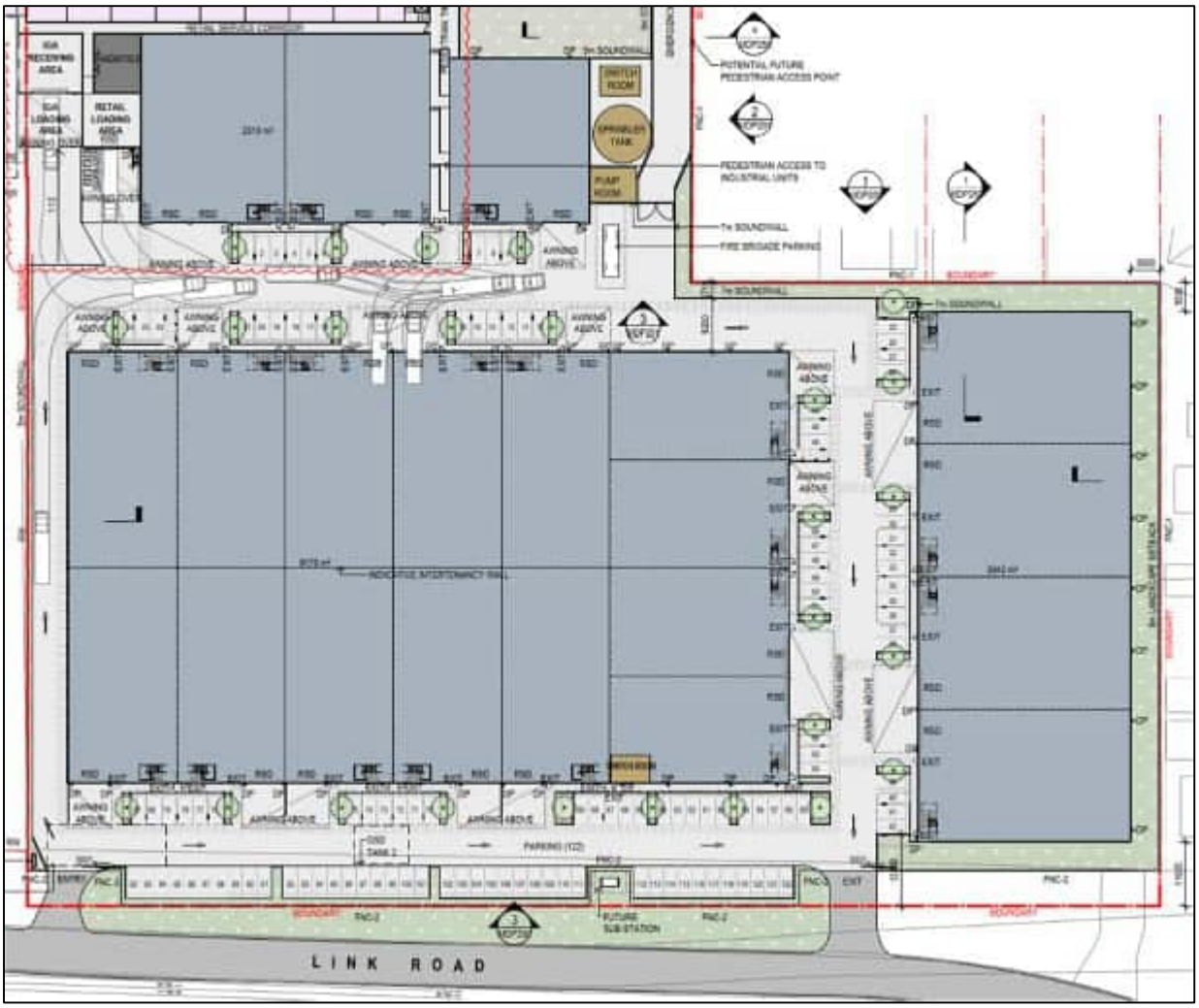


Figure 13 Warehouse arrangement and internal access road

Vehicle access between the northern and southern sections of the site will be limited to emergency vehicles only. There will be pedestrian access between these areas for the general public during normal working hours.

In order to respond to market demands and tenant fit-out requirements, the internal arrangements of all the proposed buildings are conceptual only and have been designed to allow for internal flexibility in the number of tenancies and floor layouts. It is expected that the warehouse tenancies will be between 600m^2 and 1,400m^2. However, internal tenancy arrangements and any fit-out requirements will be determined at the detailed design stage and will be subject to approval by the Airport Building Controller (ABC).

4.4.2 Building design and heights

Shops, Offices and Childcare Centre

The community-based land uses to the north of the Project site will be a maximum of two storeys in height and complement the general height and position of adjacent non-airport related development, including the existing IGA supermarket to the west, the mix of one and two storey community services buildings on the northern side of Birdwood Road and the mix of one and two storey residential dwellings to the east (see Figure 14).

Figure 14 Indicative elevations of the retail and office units

The retail units, located on the ground floor, will consist of large, glazed shopfronts that will provide an attractive and active frontage to Birdwood Road, while the cantilevered canopies will provide articulation to the facades, shelter and opportunities for outdoor dining/seating. Figure 15 provides an indicative illustration of the retail and office facades.

The facades of the office units, to be located on the upper level, will have a high percentage of glazing, a mixed palette of solid finished materials and vertical elements that will provide articulation and delineate the individual units.

Figure 15 Indicative image of the retail and office facades

The childcare centre will be positioned closer to the Birdwood Road site boundary and will be the most prominent feature of the Project when viewed from Birdwood Road (see Figures 16-18).

The childcare centre building will be of a high-quality architectural finish, with a high degree of articulation, large areas of glazing and a mix of solid finished materials, enhancing the streetscape character in the area. The final design of the building will be determined by tenant requirements and will be submitted to the ABC for approval.

Figure 16 Indicative north elevation of the childcare centre

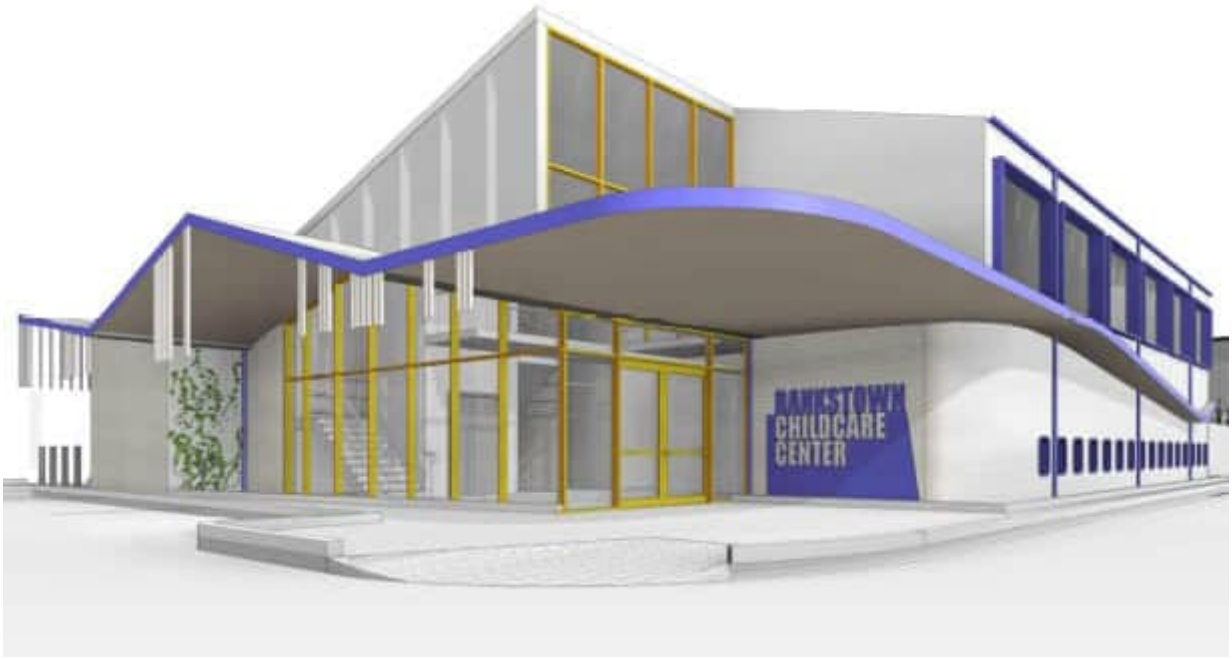


Figure 17 Indicative perspective of the childcare centre

Figure 18 Indicative image of the childcare centre

Warehouses

As demonstrated in Figure 13, the proposed warehouses have been laid out into three separate buildings that will have a uniform design and appearance.

The warehouses will be finished in a variety of external materials, including precast concrete panels, face brick, precoated metal cladding. Mezzanine level office areas with undercroft car parking will be symmetrically positioned along the elevations of the warehouses, finished with large areas of glazing, screening material and signage zones.

For the projecting mezzanine offices, the variety of materials and loading bay canopies will provide good articulation to the buildings and soften their visual impact when viewed from the surrounding land. An indicative image of a warehouse building is shown in Figure 19.

Additionally, warehouse elevations closest to the east and west side boundaries, which interface with neighbouring properties, will include sections of "timber look" screening and "green walls" to break up the mass of the buildings and complement the proposed adjacent landscaped areas. Indicative screening material and green walls are shown in Figure 20.

Sound walls will be positioned adjacent to sensitive receptors to appropriately mitigate acoustic impacts. This includes:

- A 5.0 metre wall surrounding the eastern side of the childcare centre play area, adjacent to the emergency access way
- A 7.0 metre wall to the northeast of the central warehouse building that will be positioned between 2.7 metres and 7.0 metres from the common boundary with 179A Birdwood Road, a City of Canterbury Bankstown site that is currently occupied by Bankstown Montessori Preschool.
- A 5.0 metre wall positioning on the common boundary with Georges River Grammar on the western side of the Project site.

Figure 19 Indicative image of warehouses and ancillary offices

Figure 20 Indicative screening material and green walls

The finished floor levels of the proposed warehouses will vary due to the natural fall of the land. However, the maximum height of the buildings will be typically around 10.3 metres from ground level to the ridge line, as shown in Figure 21.

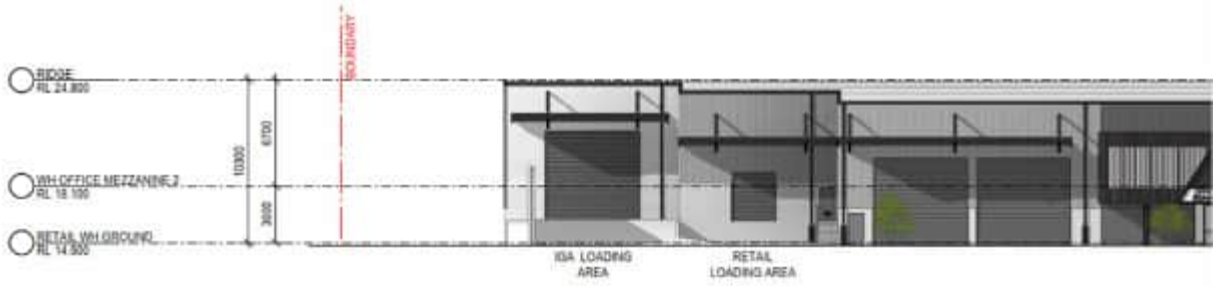


Figure 21 Indicative elevation of the warehouses and associated offices

4.4.3 Earthworks

The Project site falls approximately 4.0 metres from its highest point at the north-eastern boundary along Birdwood Road and the south-western corner of the site along Link Road.

The proposed childcare centre and commercial buildings facing Birdwood Road will have matching finished floor levels of approximately 16.0 metre RL. Retaining walls will be constructed through the middle of the site, as the site falls to the south. The majority of the warehouses will have a finished floor level of approximately 14.3 metre RL. Varying finished floor levels will be needed for the southeastern warehouses in order to minimise the extent of earthworks across the site.

4.4.4 Building Setbacks

Shops, Offices and Childcare Centre

The proposed row of two-storey shops and offices will face towards Birdwood Road and be set back approximately 41.0 metres from the front (north) boundary of the Project site, approximately in line with the adjacent supermarket to the west of the Project site. The row of shops and offices will be positioned on the western boundary and setback approximately 40.0 metres from the eastern (side) Project boundary.

The childcare centre will have a varied front boundary setback of between 9.0 and 16.0 metres, which is consistent with or greater than the residential properties located to the east. The east side boundary setback will be 7.3 metres.

Warehouses

Table 3 provides a summary of the boundary setbacks for the proposed warehouses.

Table 3 Warehouse boundary setbacks

Boundary	Setback distance
North (Birdwood Road)	Approximately 57.0 metres and set behind the retail/office building
East	5.0 metres
South	Between 5.0 and 15.0 metres
West	7.0 metres

4.4.5 Disability access

AMG is committed to ensuring equal access and opportunity for people with a disability at the Airport. This commitment includes relevant considerations raised in the Aviation White Paper and by the Minister, specifically whether the Airport's disability access arrangements comply with the *Disability Discrimination Act 1992* (Disability Discrimination Act) and relevant disability standards.

During the detailed design stage and at the time of submission to the ABC for design/construction approvals, an Access Report will be undertaken. This report will review the design in accordance with the latest National Construction Code (NCC), Disability Standards, relevant Australian Standards and the Disability Discrimination Act to ensure compliance with requirements.

Key building features that may be used to accommodate people with a disability at the Project include:

- Provision of accessible car parking spaces
- Establishment of a continuous accessible path of travel from the car park, to facilitate accessible access to and from the buildings
- Provision of ramps or lifts to navigate stairs where required
- Consideration of suitable accessways and exit path dimensions
- Provision of braille and tactile signage, along with tactile ground indicators where applicable to guide users
- Inclusion of accessible unisex sanitary compartments and ambulant facilities
- Evaluation of areas where access may pose health and safety risks for individuals with a disability, such as building services rooms, waste rooms, hazard storage and cleaning rooms
- Provision of hearing augmentation system to support access to quality audio.

4.5 Landscaping

Indicative landscaping details are included in the architectural drawings provided in Appendix B. The landscaping concept has been developed in accordance with the Bankstown Airport Landscape Master Plan and Guidelines 2022, which seek to create a consistent, high-quality and attractive airport environment.

The indicative landscaping design seeks to optimise the opportunity for tree canopy cover, use native species, provide visual relief that softens the proposed built form and provide amenity spaces for users of the Project. These objectives are balanced with the requirement to reduce wildlife attraction and minimise wildlife hazard risk to aviation operations at the Airport.

The proposed site plan sets out the following landscaping areas:

- A 2.4 to 3.2 metre wide landscape strip along the northern boundary to Birdwood Road, providing sufficient space for tree planting to complement existing street trees
- A north-south pedestrian access through the Birdwood Road car park, along with landscaped “islands” within the car park for tree planting, which will provide shading, cooling and soften the visual impact of the buildings and car park
- Large outdoor play area associated with the childcare centre that will allow for landscaping and tree planting, subject to the requirements of the operator
- A 5.0 metre wide landscape strip around the perimeter of the eastern warehouse building that will allow significant screen planting to improve the amenity of neighbouring properties outside the Airport site and soften the visual impact of the buildings
- A narrow landscaping strip along the southern boundary of the Project site, adjacent to Link Road. It should be noted that there is a large verge area between the Link Road kerb and the site, providing opportunities for more extensive landscaping.

A final landscaping plan will be developed during the detailed design stage and submitted for approval by the ABC.

4.6 Site Services

4.6.1 Electrical

AMG operates an embedded electricity network at the Airport and manages and supplies electricity to individual tenancies. The Airport also generates electricity from solar arrays located throughout the Airport, which feed into the embedded network.

The expected electrical maximum demand for the Project is 892kVA, 1,287Amps, which is proposed to be serviced from a new 1,000kVA kiosk style substation. The new substation is to be located adjacent the Link Road frontage of the site and connected into the existing Airport electrical High Voltage embedded network.

The Project will be electrically reticulated from the new 1,000kVA substation to the main switchrooms for each individual building. Each separate unit and tenancy will be metered from the local switchroom by the embedded network operator.

Each building will be provided with rooftop solar panels that will feed into the Airport’s embedded network. The concept plans currently demonstrate indicative areas for solar panel installation. The solar array design will be refined through the detailed design stage and a glint and glare assessment will be undertaken and provided to the ABC, CASA and Airservices Australia for approval.

4.6.2 Potable Water

The estimated potable water demand for the Project is 52.64kL per day and sufficient supply will be provided by a DN100 connection to the Sydney Water mains infrastructure located on Birdwood Road. All necessary approvals from Sydney Water and the ABC will be obtained once the detailed design has been completed.

4.6.3 Sewer

There are two existing sewer mains that pass through the site (DN600 and DN150 sized pipes) that must be realigned to allow the construction of the warehouses. The DN600 pressure sewer will be realigned around the perimeter of the Project site and positioned within the internal road alignment to meet the access requirements of Sydney Water (see Figure 22). A new DN150 gravity sewer will be constructed across the site. shows the existing sections of the DN600 and DN150 sewer pipes that will be removed and the new sewer alignments (see Figure 23).

The Project will be connected to the gravity sewer via a DN150 tap-in connection. All necessary approvals from Sydney Water and the ABC will be obtained once the detailed design has been completed.

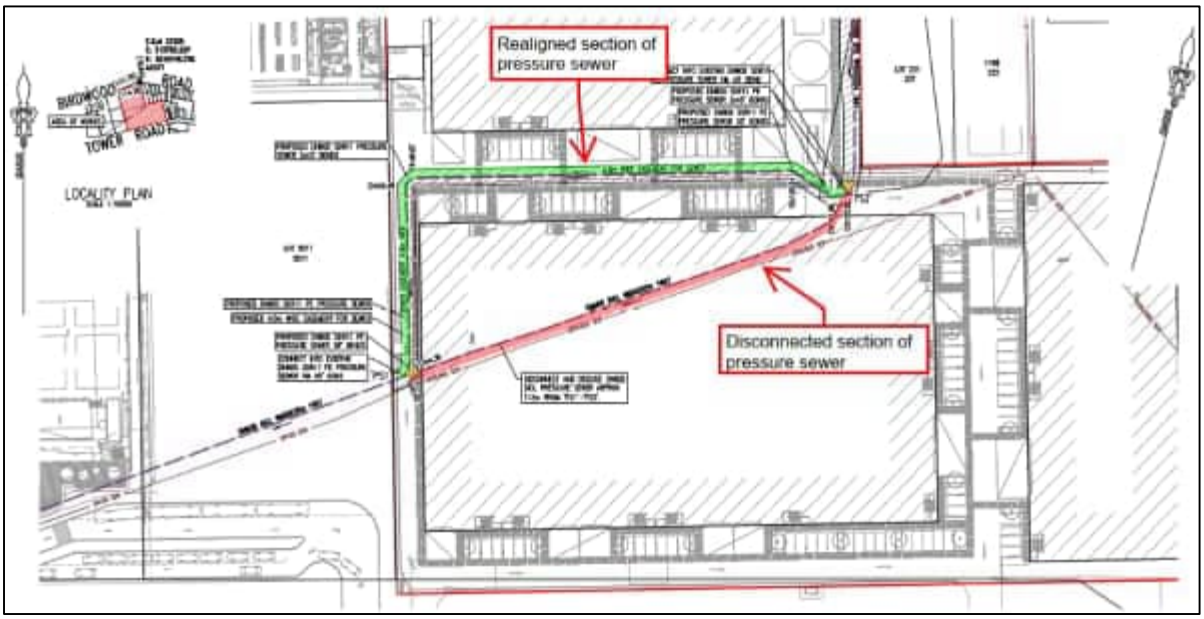


Figure 22 Pressure sewer alignment

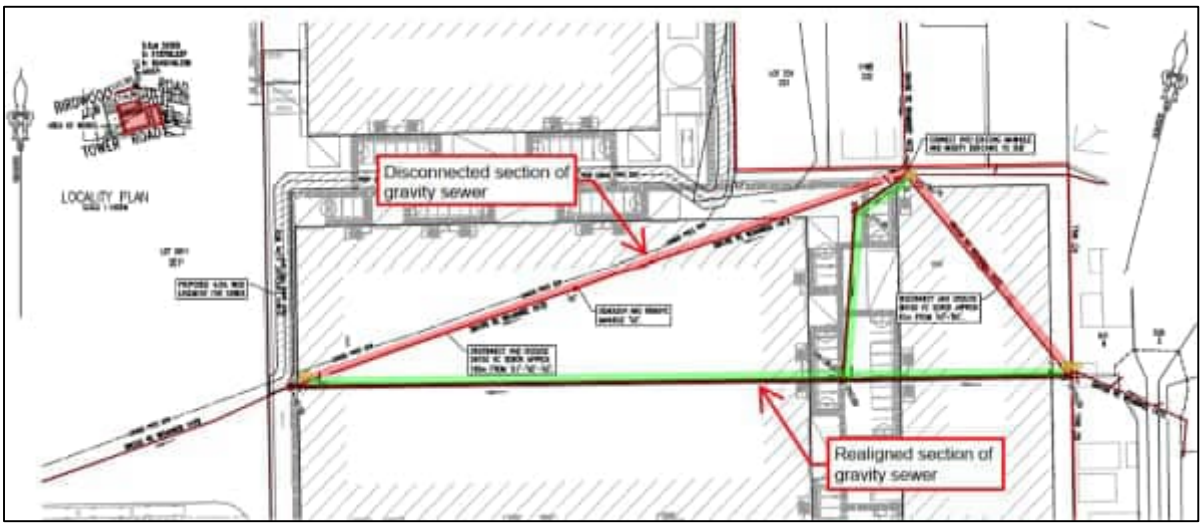


Figure 23 Gravity sewer alignment

4.6.4 Gas

The estimated gas load for the Project is 9,000 MJ / hr and will be supplied by an existing 210kPa gas main infrastructure located on Birdwood Road. Amplification for this gas main may be needed and will be confirmed with Jamena (service provider) once the detailed gas load has been established. All necessary approvals from Jemena and the ABC will be obtained once the detailed design has been completed.

4.6.5 Communications

There is an extensive existing telecommunications network (Telstra and NBN) currently servicing the northern area of the Airport.

This existing network provides an opportunity for the establishment of a telecommunications connection point for the Project.

4.6.6 Fire Safety

Investigations into site services have considered the required supply of water for site firefighting purposes, as well as access for emergency NSW Fire and Rescue vehicles. Internal fire protection and engineering for the Project will be developed at the detailed design stage and will require approval by the ABC.

On-site Water Storage Requirements

Hydrants and associated storage tanks are required on-site to address network-based fire safety requirements. The requirements for the Project have been determined using *AS2419 – Hydrant Installations* (clause 4.2 and tables 2.1 - 2.3).

Fire Emergency Vehicle Access Routes

The external fire safety provisions also include consideration of emergency vehicle access to the Project site. Based on the proposed building layout and security gate locations, the Project is accessible for emergency Fire Brigade vehicles from Birdwood Road to the north and Link Road to the south. The emergency accessway along the eastern boundary and the internal road within the warehouse component of the Project will provide the required access to all proposed buildings.

NSW Fire and Rescue will be consulted during the detailed design stage and the final fire access routes will require approval by the ABC.

5.0

Construction Works and Scheduling

Aeria Management Group

5.0 Construction Works and Scheduling

5.1 Construction Program

Construction is estimated to start in the first half of 2026 (subject to approvals) and be completed during 2027 (approximately 18 months).

5.2 Temporary Works

Temporary construction works are expected to include:

- Site access for trucks, plant and equipment
- Construction compound
- Parking areas for site staff
- Erosion and sediment control
- Foreign Object Debris (FOD) barrier
- Temporary parking for Bankstown Montessori Preschool.

The above works will be managed through the project-specific Construction Environmental Management Plan (CEMP) that will be submitted to the ABC for approval.

5.3 Construction Management

Construction Vehicles

A detailed Construction Traffic Management Plan (CTMP) will be prepared as part of the CEMP during the detailed design stage and once a contractor has been appointed.

The CTMP will include guidelines, general requirements and protocols for when activities or areas of work have a potential impact on existing traffic arrangements.

A construction staff parking area will be provided on or adjacent to the Project site prior to the commencement of works and will be included in the CEMP.

Vehicle access to the site will be prioritised through the Airport site via Link Road to the south of the Project site, to minimise impacts on local roads.

Plant and Equipment

Construction plant and equipment requirements will be detailed and managed through the CEMP. Any construction impacts will be managed through the NOTAM Protocols.

6.0

Aviation Operations

Aeria Management Group

6.0 Aviation Operations

An Aviation Safeguarding Assessment and a Wind Shear and Turbulence Impact Assessment have been prepared for the Project. A copy of these reports is included in Appendices D and E, respectively.

This section summarises the key aspects of these reports under the headings of the National Airports Safeguarding Framework (NASF) and concludes that the Project will have no impact on airport operations or flight paths at the Airport.

6.1 National Airports Safeguarding Framework

The National Airports Safeguarding Advisory Group (NASAG), comprising Commonwealth, State and Territory Government planning and transport officials, the Australian Department of Defence, CASA, Airservices Australia and the Australian Local Government Association (ALGA), has developed the NASF, a land use planning framework that aims to:

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

The NASF Guidelines are aimed at safeguarding airports and surrounding communities by implementing appropriate planning schemes around airports and providing guidance to decision-makers at all levels of government.

The NASF Guidelines are referenced in Master Plan 2019. Since then, the NASF Guidelines have been reviewed and further updated.

The NASF Guidelines include nine guidelines for the operation of airports and related land use planning measures associated with airports in Australia, as shown in Figure 24.

Figure 24 NASF Guidelines

Guideline A: Managing Aircraft Noise

The Australian Noise Exposure Forecast (ANEF) is a predictive tool used to assess and manage the potential impact of aircraft noise on communities surrounding airports. It calculates noise exposure levels over a specific period and presents them as contours on a map, indicating areas of varying noise exposure.

An ANEF considers factors such as aircraft types, flight paths, the frequency of flights and the time of day when estimating noise impacts. The ANEF informs land-use planning and design, land-use decisions and noise mitigation strategies to minimise the effects of aircraft noise on surrounding communities.

The Bankstown Airport ANEF was endorsed by Airservices Australia on 17 October 2018 and included in Master Plan 2019. The Bankstown Airport ANEF is for a 20-year planning horizon based on forecasts and assumptions on the type of aircraft likely to be using the Airport at that time.

As the Project is a non-aviation development, it will not increase aircraft noise at the Airport or surrounding area.

With regard to new land uses, Australian Standard *AS2021-2015 Acoustics – Aircraft Noise Intrusion – Building Siting and Construction* (AS2021-2015) provides details of building types and their acceptability (or otherwise) in various ANEF contours.

Table 4 below provides a summary of building types and their acceptability against the relevant ANEF Contours, as specified under AS2021-2015.

Table 4 Table of Land Use Acceptability Based on ANEF Contours

Land Use	ANEF Contour		
	Acceptable	Conditionally Acceptable	Unacceptable
Public Building (Childcare facility)	Less than 20 ANEF	20-30 ANEF	Greater than 30 ANEF
Commercial (shop and office)	Less than 25 ANEF	25-35 ANEF	Greater than 35 ANEF
Light industrial (warehouse)	Less than 30 ANEF	30-40 ANEF	Greater than 40 ANEF

As shown in Figure 25, the Project site falls within the 20-25 ANEF contour. As detailed above, the proposed childcare centre is Conditionally Acceptable, while shops, offices and warehouses are all Acceptable.

As described in Section 2.2, a childcare centre is not considered a “school” for the purposes of the Airports Act and would fall under the land use category of “Public Building” for the purpose of an assessment against AS2021-2015.

During the detailed design stage, the acoustic treatment of the Project’s proposed buildings will be considered to ensure they are fit for the use of the intended occupants. These details will be subject to assessment and approval by the ABC.

Figure 25 ANEF Contours map

Guideline B: Managing Building Generated Wind Shear and Turbulence

The purpose of Guideline B is to assist land use planners and airport operators in their planning and development processes to reduce the risk of building generated wind shear and turbulence at airports near runways.

Based on Guideline B, the Airport has identified wind shear assessment envelopes at the end of each runway where structures situated close to the runway may impact wind flow and cause the crosswind speed to vary along the runway. The proposed Project warehouses lie within the assessment trigger areas for Runways 11L, 11C and 11R.

For developments within the assessment trigger areas, Guideline B then refers to the mitigation of risk by use of a "height multiplier" (the 1:35 surface), confirming that if buildings do not exceed the 1:35 surface they will not create unsafe wind effects. That is, the distance from the runway centreline or extended centreline to the closest point of the building should be more than 35 times the height (above runway level) of the building.

The proposed building, at a maximum elevation of 24.8m AHD, would infringe the 1:35 surface for Runways 11L, 11C and 11R by a maximum of approximately 5.7m. Therefore, in accordance with Guideline B, further assessment is required.

SLR Consulting has been engaged to undertake this further assessment, including a Computational Fluid Dynamics (CFD) modelling assessment on the wind shear and wake turbulence effects of the Project. A copy of this report is included in Appendix E.

The SLR Consulting study concludes the following:

- The NASF Guideline B wind shear criterion would not be exceeded
- There would be a minor impact on the peak turbulence levels but the number of exceedances for the current and post development scenarios is similar taking into account all analysed wind directions.

The SLR Consulting study was referred to CASA, which advised that no additional operational risk mitigation measures were necessary.

Wind shear and turbulence impacts will be considered further should the Project progress in stages and will be continually reviewed through the detailed design stage.

Guideline C: Managing Wildlife Strike Risk

A key aspect of reducing the wildlife hazard risk around airports is building design, appropriate waste management strategies and ensuring that new landscaping is appropriately designed, including use of plant species that reduce the attractiveness of the Airport to wildlife and, in particular, birds.

The Project site is located within the 3-kilometre wildlife buffer zone of the Airport runways, as specified by Master Plan 2019.

AMG and CASA have well-established safety requirements for wildlife management on-airport. In collaboration with CASA, AMG has prepared a Wildlife Hazard Management Plan (WHMP) that has been approved by the Commonwealth-appointed Airport Environment Officer (AEO).

Planting, landscaping and waste storage within the Project site will be designed in accordance with the Bankstown Airport Development Guidelines 2019, the Bankstown Airport Landscape Guidelines and the Bankstown Airport WHMP. Detailed landscaping and waste management plans will be submitted to the ABC for approval.

Guideline D: Managing Wind Turbine Risk to Aircraft

Guideline D provides guidance on the development of wind farms to manage the risk to civil aviation. This guideline is not applicable to the Project.

Guideline E: Managing Pilot Lighting Distraction

Guideline E provides guidance on managing the risk of lighting or light fixtures near airports that may distract pilots. CASA Manual of Standards 139 sets out standards for the maximum intensity of light sources around airports.

The Project is partially within Light Control Zone C and the remainder is within Zone D. Any lighting associated with the proposed development should therefore meet the restrictions associated with Zone C. Zone C allows for 150 cd intensity of light sources measured 3 degrees above the horizontal.

The lighting design will be developed at the detailed design stage, privately certified for compliance with Guideline E, and will require approval by the ABC.

The Project includes the installation of roof top solar arrays. Therefore, a solar glare hazard analysis will be undertaken at the detailed design stage and will be subject to the satisfaction of CASA and Airservices Australia and approval by the ABC.

Guideline F: Managing Protected Airspace Intrusion

Guideline F is intended to address the issue of intrusions into the operational airspace of airports by tall structures, such as buildings, cranes or activities that could cause air turbulence affecting aircraft in flight in the prescribed airspace.

Prescribed Airspace is the airspace above either an Obstacle Limitation Surface (OLS) or Protocols for Air Navigational Services – Aircraft Operations (PANS-OPS) surface.

Existing and Proposed OLS

The Project lies within the extents of the existing and future OLS at the Airport.

The proposed development, at a maximum elevation of 24.8 metres AHD, will not infringe the existing OLS inner horizontal surface – set at 51.0 metres AHD.

The OLS inner horizontal surface remains the critical surface over the Project site, whether assessed with Runway 11R/29L strip width of 80 metres (as is published in Master Plan 2019) or a 90-metre runway strip (as currently marked on the ground).

Figure 26 Existing OLS

The Project is also within the extent of the Master Plan 2019 future OLS, which allows for Runway 11C/29C to be extended and provided with a precision instrument approach. The proposed development, at a maximum elevation of 24.8 metres AHD, will not infringe the Master Plan 2019 OLS inner horizontal surface – set at 51.0 metres AHD.

Existing and Proposed PANS-OPS

The Project lies within the extent of the existing Airport PANS-OPS Runway 11C and 29C Standard Instrument Departure (SID) turn area (Area 3). The proposed development's maximum elevation at 24.8 metres AHD should remain below the SID Area 3 protection surface, which is estimated to be a minimum of 88.5 metres AHD.

The future Airport prescribed airspace includes an ILS (precision) approach for Runway 11C. The Project, at a maximum 24.8 metres AHD, would remain below the future Runway 11C Basic ILS surface elevation – estimated at approximately 62.2 metres AHD.

Construction

It is not expected that construction activities for the Project, such as the use of cranes, will penetrate the prescribed airspace. However, any penetration into the Airport's prescribed airspace will be considered during the development of the construction methodology and approval will be sought in accordance with *Airports (Protection of Airspace) Regulations 1996*.

Guideline G: Communications, Navigation and Surveillance

Communication, navigation and surveillance (CNS) facilities are crucial to aviation safety and Airservices Australia relies on these to ensure the safety of aircraft operations.

NASF Guideline G provides land use planning guidance to better protect such facilities. These include the control tower and wind indicators.

The existing CNS facilities at the Airport include a Non-Directional Beacon (NDB) and a Precision Approach Path Indicator (PAPI). The Project has been assessed based on the guidance provided in NASF Guideline G for both facilities.

The Project is beyond the lateral limits of the obstacle assessment surfaces associated with Runway 11C/29C PAPI and the NDB.

The Project has been considered with respect to the guidance on Building Restricted Areas (BRA) for Instrument Landing System (ILS) installations provided in NASF Guideline G, for the scenario of a possible ILS installed on an extended Runway 11C/29C. The Project is outside the lateral extents of the BRAs associated with a possible future ILS.

Guideline H: Protecting Strategically Important Helicopter Landing Sites

Guideline H provides guidance on protecting strategically important HLS from proposed development. The guideline defines an HLS as *"... an area (not located on an aerodrome) wholly or partly used for the arrival or departure of helicopters."*

There are no strategically important HLS sites within the vicinity of the Airport that need to be considered.

Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways

Public Safety Areas (PSAs) are areas of land at the end of a runway within which development should be restricted, to control the number of people on the ground at risk of death or injury in the event of an aircraft accident on take-off or landing. These generally cover an area where the risk per year resulting from an aircraft crash to a representative individual ('individual risk') is of the order of 1 in 100,000 or greater.

The Project site is not located within the Airport's Public Safety Areas.

6.2 Aviation Security

The Project site is located on landside land and will not require any changes to the Airport's airside boundary during construction or operation.

Prior to construction, AMG will conduct a site-specific aviation security and safety risk assessment to ensure the construction accords with the International Civil Aviation Organization airport security guidelines and NSW work, health and safety regulations.

7.0

Transport and Traffic Management

Aeria Management Group

7.0 Transport and Traffic Management

A Traffic Impact Assessment (TIA) has been prepared for the Project that considers the site context, site access, active transport, car parking, traffic generation and impacts on the surrounding road network.

7.1 Ground Transport Plan

Master Plan 2019 is the principal planning document for the Airport and describes future aviation operations, land use, facilities and infrastructure and the management of environmental and noise impacts. Specific to traffic infrastructure, the Ground Transport Plan is a subsection of Master 2019 and has been prepared to support the aims and objectives of Master Plan 2019.

Importantly, the Project site was identified in the five-year Development Program set out in Master Plan 2019 and was included in traffic modelling undertaken to assess the traffic impacts of Airport development on the surrounding road network. The Ground Transport Plan indicates that the five-year Development Program for the Airport will result in minor increases in traffic on roads surrounding the Airport.

7.2 Surrounding Road Network

Birdwood Road

Birdwood Road functions as a collector road and is managed by the City of Canterbury Bankstown. The road is aligned in an east-west direction along the northern boundary of the Project site.

The road connects to the State road of Henry Lawson Drive to the west and provides connectivity to the Bankstown Railway Station to the east. Within the vicinity of the Project site, it is a two-way road with one lane configured in each direction, set within a carriageway of approximately 12 metres in width. Directly adjacent to the site, the road is designated as a school zone with a posted speed limit of 40 kilometres per hour during school zone hours (but otherwise has a posted speed limit of 50 kilometres per hour), with kerbside parking on both sides of the road subject to various restrictions.

Link Road

Link Road is a local road aligned in an east-west direction along the southern boundary of the Project site. The road is within the Airport site and serves as an airport perimeter road, providing connectivity between the north and south sides of the Airport. It is a two-way road with one lane configured in each direction, set within a carriageway of approximately eight metres in width. The road has a posted speed limit of 40 kilometres per hour, with no kerbside parking allowed.

Link Road at the Airport recently underwent a significant upgrade that included resurfacing, stormwater capacity improvements, landscaping, new vehicle crossovers and the introduction of a shared pedestrian and cycle path on the airfield (southern) side of the road.

7.3 Public Transport

One bus stop is located on Birdwood Road directly fronting the Project site, with another bus stop on the opposite side of Birdwood Road. These bus stops service the 905 bus route (see Figure 26).

Route 905 connects Fairfield to Bankstown, via Villawood, Chester Hill and the north of the Airport. This route connects the north of the Airport with Bankstown Railway Station and its train services. The bus service follows Marion Street, along the Airport's northern boundary. Route 905 runs every 30 minutes outside peak times and every 15 minutes during the morning and afternoon/early evening peak periods.

Figure 27 Bus Route Map

7.4 Active Transport

Pedestrians Infrastructure

A continuous pedestrian footpath is located on the northern side of Birdwood Road. On the southern side of Birdwood Road, in the locality of the Project site, the footpath is limited and only runs between the IGA supermarket to the west of the Project site and the Georges Hall local centre.

As part of the Project, the footpath on the southern side of Birdwood Road will be extended along the full width of the Project site, providing access to the site and the existing bus stop directly adjacent to the Project site.

The detailed design of the new footpath and verge adjacent to the Project site will be developed in consultation with the City of Canterbury Bankstown.

Within the Airport site, there has historically been limited pedestrian paths available. However, recent road and streetscape improvements by AMG have resulted in a new pedestrian spine on both sides of Airport Avenue, along with a new pedestrian/cycle network along the upgraded Tower Road/Link Road, completed in 2025.

In response to community comments, a north-south pedestrian path has been included within the Birdwood Road car park, along with a pedestrian corridor linking to the industrial units.

Cycling Infrastructure

A regional off-road cycleway runs along the western side of Henry Lawson Drive and can be accessed via Birdwood Road, as shown in Figure 28. The recent upgrade to Tower Road/Link Road provided a shared pedestrian cycle path that will improve access around the Airport site and a link between Birdwood Road in the north with Henry Lawson Drive in the southwest.

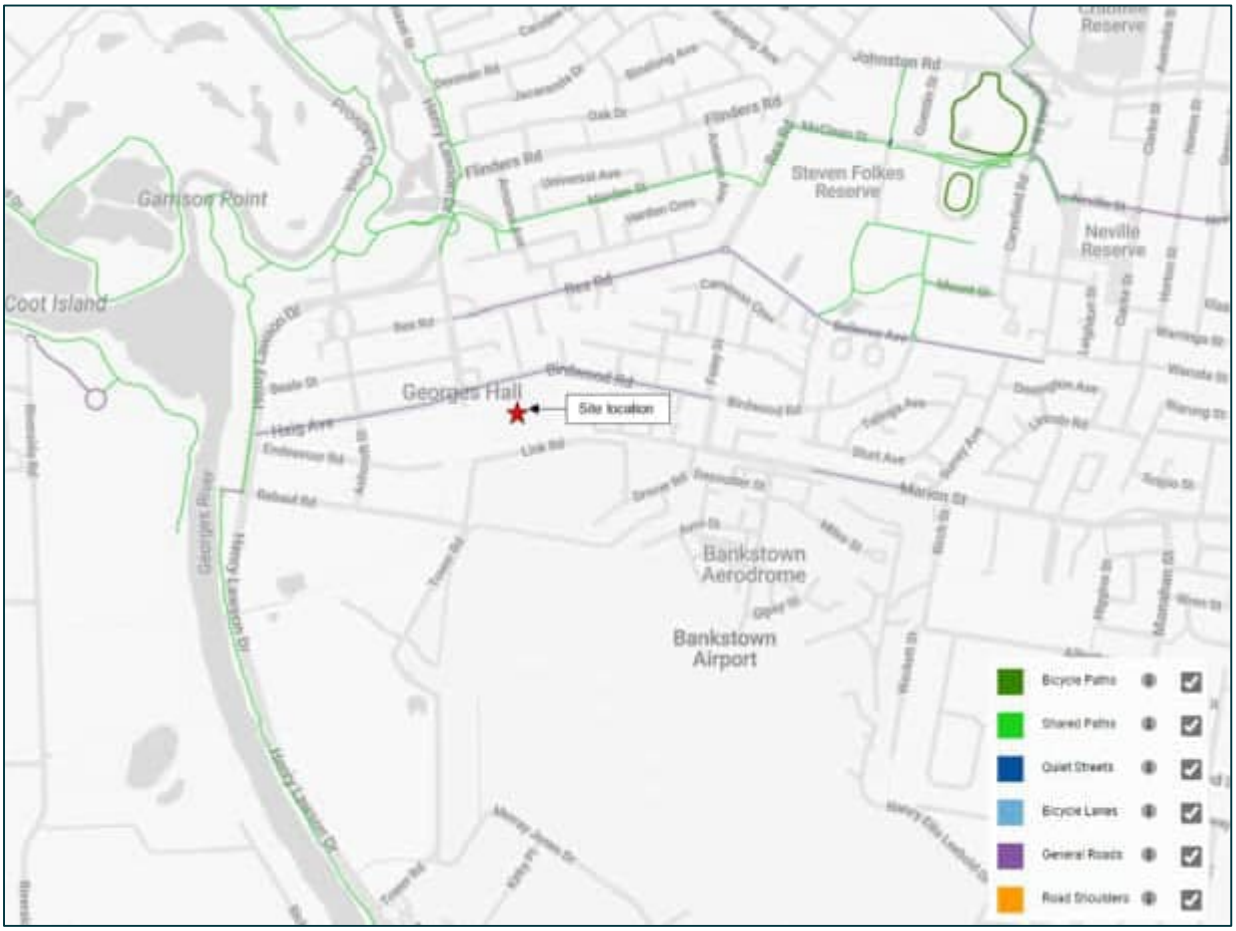


Figure 28 Cycleway Map

Base image source: Transport for NSW Cycleway Finder, accessed 23 November 2023

7.5 Site Layout and Access

Childcare Centre, Shops and Offices

The northern section of the Project site, containing the childcare centre, shops and offices will be accessed from two new crossovers from Birdwood Road and via the existing IGA supermarket car park. Such site access arrangements are described below:

- A new one-way vehicular crossover will be positioned in the northeastern corner of the site and will provide light vehicle access to the childcare centre drop-off area, as well as providing access for emergency vehicles accessing the eastern boundary service road
- A new two-way vehicular crossover will be centrally positioned and provide entry and exit to the site for light vehicles to the shared car park
- Additional internal access will be provided from the existing IGA car park, which will improve circulation and connect to existing infrastructure.

It is anticipated that most delivery vehicles (vans or smaller) accessing the Project site in association with the childcare centre, shops and offices will occur via the Birdwood Road crossovers and shared car park. However, a service corridor, loading bay and waste storage area have been provided to the rear of the row of shops and offices to allow up to 12.5 metre Heavy Rigid Vehicles (HRV) to service the site. This area will be accessed from Link Road via the internal road within the warehouse area.

The existing IGA loading and receiving area fronting Birdwood Road is also proposed to be relocated adjacent to the loading bay and waste storage for the shops and offices, accessed from Link Road.

Warehouses

The southern section of the Project site containing the warehouses will be accessed from two new one-way crossovers that will allow vehicles to enter from the western side of the Link Road frontage, circulate through the site in a one-way direction using the internal road network and exit the site at the eastern end of the Link Road frontage.

The accesses and internal roads have been designed to accommodate up to a maximum 12.5 metre HRV. The internal road and warehouses have been designed to allow trucks to reverse into the warehouses and exit in a forward direction.

The TIA in Appendix C provides further detail of the proposed access arrangement and swept paths and demonstrates that the Project will achieve compliance with relevant standards, achieving the safe movement of vehicles and pedestrians accessing the Project site.

7.6 Car Parking

An assessment of the required car parking for the Project has been undertaken, having regard to the City of Canterbury Bankstown Development Control Plan 2023 (DCP 2023), which sets out the recommended number of car parks for each intended land use. Table 5 and Table 6 provide a summary of the car parking requirements for the Project, for each intended land use. Note that for this assessment it has been assumed a small amount of food and beverage offerings (café) will be provided within the ground floor shops.

Table 5 Northern Car Park

Proposed Land Use	Gross Floor Area (m^2)	DCP Car Parking Rate	Recommended Number of Car Parks
Office	999	1 space per 40 m^2 gross floor area of the premises	25
Childcare	120 children	1 space per 4 children	30
Café	298	0.15 car space per square metre in excess of 100m^2	30
Retail Shop	694	1 space per 40 m^2 gross floor area of the premises	17
Total			102

The northern car park will provide a total of 102 car parking spaces, therefore aligning with the requirements of the DCP 2023 and meeting the car parking needs of the proposed development.

To support the operation of the Bankstown Montessori Preschool, four parking spaces will be signposted for their exclusive use during pick-up and drop-off peak periods. The provision of these spaces and related agreements are separate to the approval process of this MDP.

Table 6 Southern Car Parking Area

Proposed Land Use	Gross Floor Area (m^2)	DCP Car Parking Rate	Recommended Number of Car Parks
Warehouse (including ancillary offices)	16,301 140 estimated staff	1 car space per 300 m^2 GFA or 1 space for 2 staff	54 (based on GFA) Or 70 (based on staff)
Total			54 (based on GFA) Or 70 (based on staff)

The southern car park off Link Road will provide 125 spaces, which, as detailed in Table 6, is a maximum surplus of 55 spaces above the recommended DCP car parking rate. Sufficient on-site car parking is therefore proposed to meet the needs of the Project.

Disability Access

Accessible parking will be provided by the rates determined by the *Building Code of Australia* (BCA). The northern portion of the Project site will require three accessible parking spaces and the southern portion two parking spaces. The BCA requirements align with DCP 2023.

7.7 Operational Traffic

Traffic generating rates for the Project site were developed in accordance with *Transport for NSW (TfNSW) Guide to Traffic Generating Developments 2002.* Estimates of peak hour traffic volumes resulting from the Project are detailed below.

Table 7 Traffic Generation

Land Use	Gross Floor Area (m^2)	AM peak Hour	PM Peak Hour
Birdwood Road			
Office	999	16	12
Childcare	120 children	96	84
Retail Shop	694	16	32
Café	298	15	7
Total		143	135
Link Road			
Warehouse (including office)		82	82
Total		82	82

Master Plan 2019 assumed a total of 20,000 m^2 of commercial land use (neighbourhood shopping centre) development on the Project site. When developing Master Plan 2019, detailed modelling using VISSIM microsimulation software was undertaken to assess the implications of the potential development of the Airport. The Project is expected to have no additional impacts on the findings of the Master Plan 2019 traffic and transport assessment.

A detailed Operational Traffic Management Plan will be developed during the design stage of the Project that will consider the movement of vehicles accessing the site and any interactions with surrounding land uses, including the TfNSW bus depot on the south side of Link Road and the proposed school bus drop off area at Georges River Grammar to the west of the Project site.

7.8 Construction Traffic

Site Access

Construction vehicle access is anticipated to be from Link Road and all loading is expected to take place within the bounds of the Project site. Some construction traffic access may be required from Birdwood Road and, in these instances, any traffic management measures will be undertaken in accordance with the requirements of the City of Canterbury Bankstown.

As part of the detailed CTMP, Traffic Guidance Schemes will be prepared in accordance with the principles of the Traffic Control at Work Sites manual (TfNSW, 2022). The Traffic Guidance Schemes primarily show where construction signs will be located at specific locations (such as uncontrolled intersections) along the approved truck routes to warn other road users of the increase in construction vehicle movements.

Parking

It is expected that there will be up to 50 workers on-site at any given time during peak activities. Parking for workers will be generally provided on site. Workers will be strongly encouraged to use public transport or carpool. During site induction, workers will be informed of the existing bus network servicing the site. Any overflow car parking will be contained within the Airport site and controlled through the CTMP.

Traffic Generation

There will be various types of construction vehicles accessing the site during construction. The largest of these vehicles will include:

- Concrete trucks
- Concrete pump and boom vehicles
- Mobile cranes
- Excavators and bulldozers
- Rigid trucks, truck and dog combinations and articulated vehicles.

Most construction traffic will be associated with the removal of spoil, concrete pours and general delivery of materials and equipment. These activities will occur within the designated construction zone during each stage.

It is expected that works could generate up to five construction vehicle movements per hour during any peak period. This equates to one vehicle every 12 minutes. Construction vehicle movements will be minimised/avoided during peak hours where possible.

Given the expected low construction traffic volumes and the proximity of the Project site to the arterial road network, it is anticipated that the construction traffic will not have a significant impact on the surrounding road network.

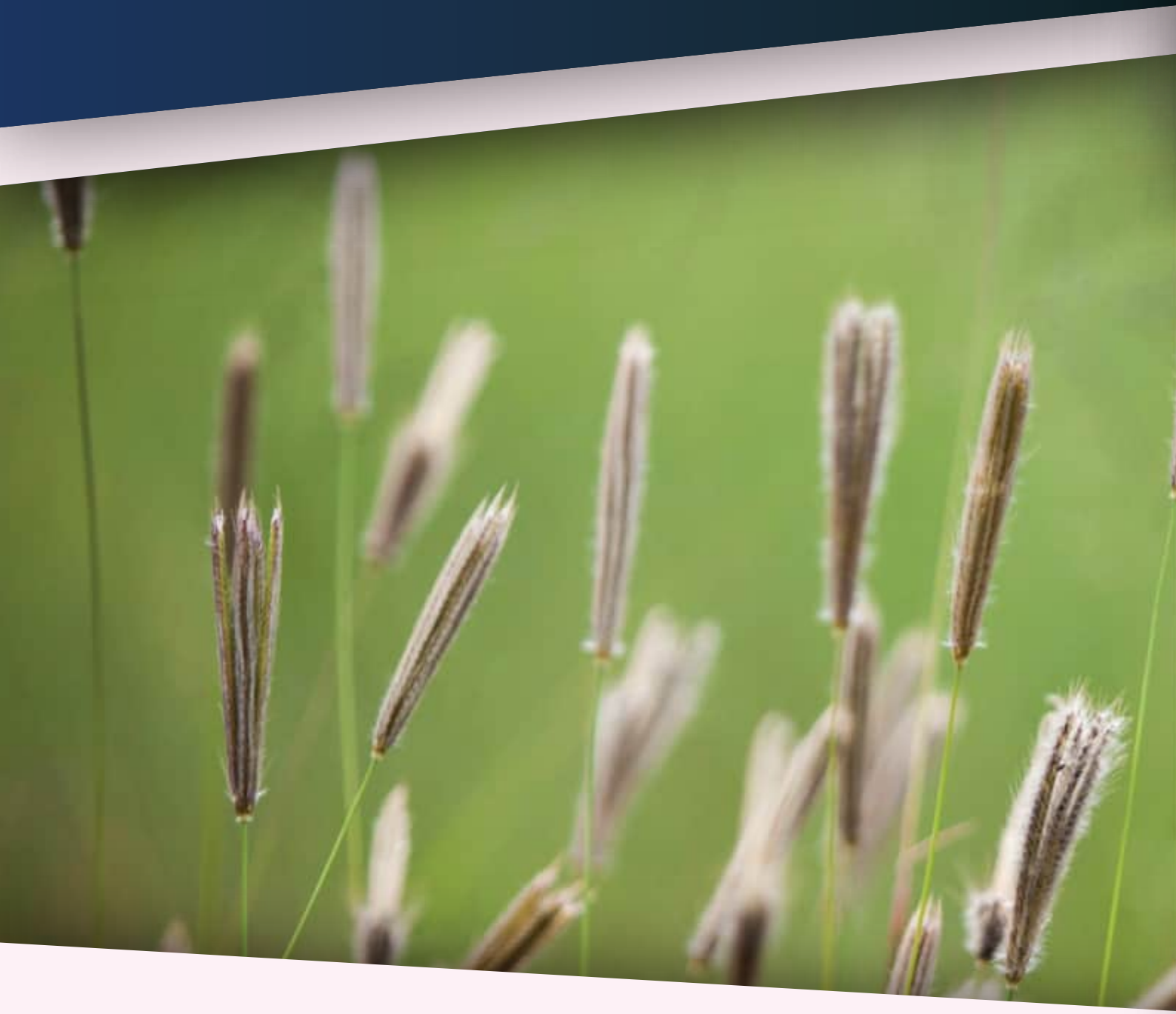
7.9 Summary

The TIA concludes that:

- The northern car park will provide the recommended number of car parking spaces to align with the requirements of the DCP 2023 and meet the car parking needs of the Project
- The warehouses will be provided with sufficient car parking to exceed the requirements of the DCP 2023 and meet the car parking needs of the Project
- All internal roads and parking bays are designed in accordance with the relevant Australian Standards (AS2890.1-6) and to accommodate the relevant largest vehicles
- The Birdwood Road access associated tenancies are anticipated to generate up to 143 vehicle trips in the morning peak and 135 vehicle trips in the afternoon peak. The Link Road Access associated tenancies are anticipated to generate up to 82 vehicle trips in the morning and afternoon peak.
- Master Plan 2019 assumed a total of 20,000 m^2 of commercial land use (neighbourhood shopping centre) development on the Project site. The Master Plan 2019 assessment included detailed traffic modelling using VISSIM microsimulation software to assess the implications of the potential development of the Airport. Based on the TIA, it is considered that the Project will operate within the Master Plan 2019 traffic and transport assessment.
- Overall, the Project is well-considered and can be supported from a transport and parking perspective.

8.0

Environment and Sustainability



Aeria Management Group

8.0 Environment and Sustainability

8.1 Environmental Management Overview

Environmental compliance at the Airport is governed by the Airports Act and the *Airports (Environment Protection) Regulations 1997* (AEPR), which provide the central legislation that enables AMG to manage all environmental matters arising from the operation and ongoing development of the Airport.

In accordance with the Airports Act and the AEPR, AMG prepared the Bankstown Airport Environment Strategy (AES), forming part of Master Plan 2019, as the management framework to ensure that Airport operations and new development are managed to avoid or appropriately mitigate impacts on the Airport environment and its surrounds. Figure 29 illustrates the Bankstown Airport Environmental Management Framework.

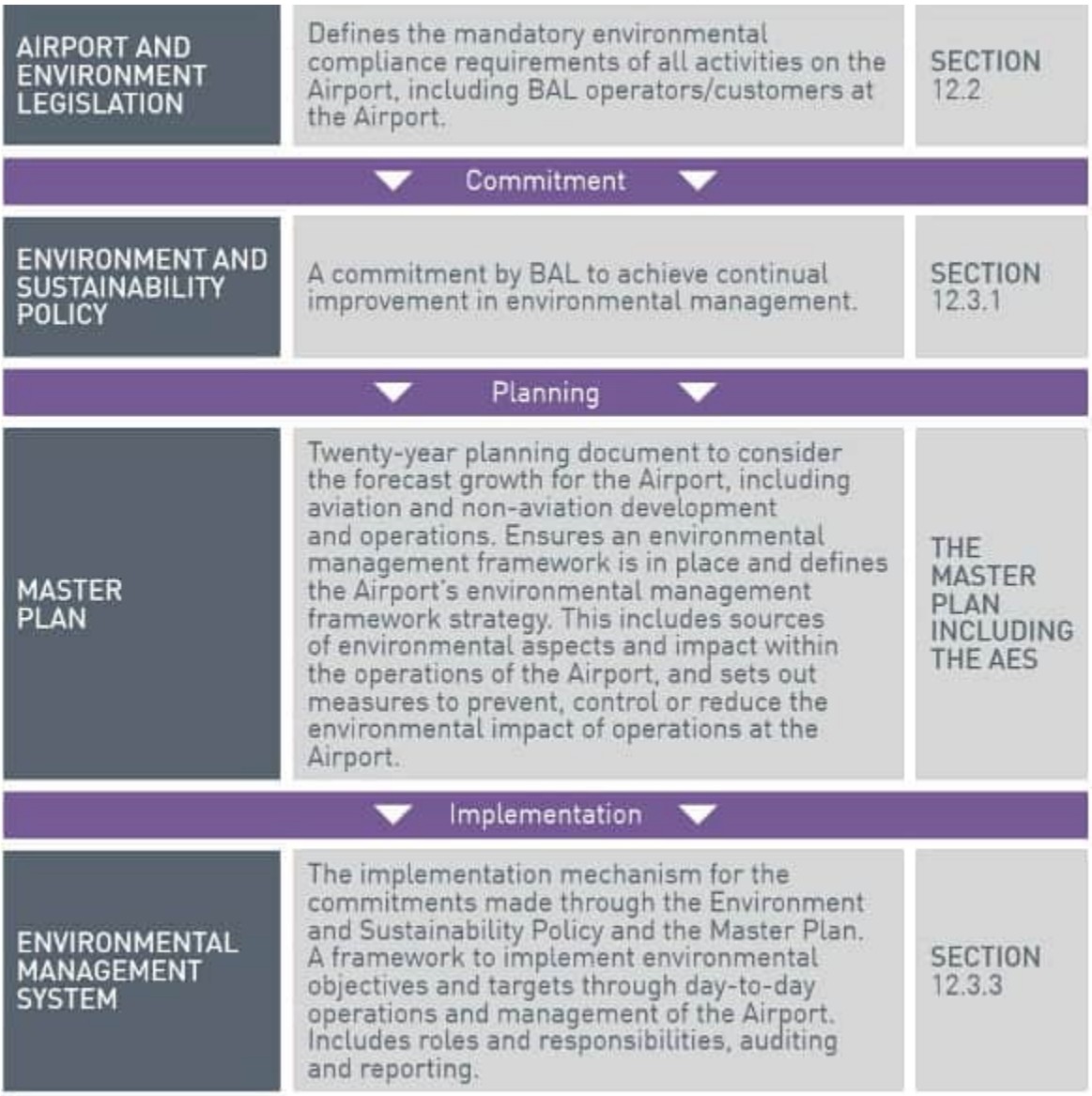


Figure 29 Bankstown Airport Environmental Management Framework

Source: Bankstown Airport Master Plan 2019

Potential environmental impacts associated with the Project have been considered and a strategy will be put in place to mitigate any identified impacts. Environmental impacts are assessed in relation to stormwater and

hydrology, visual impact and massing, sustainability, noise and vibration, heritage, geology, hydrogeology and soil contamination, air quality, ecology and waste management.

Assessment of environmental matters will continue through the detailed design stages of the Project, and any mitigation measures will be documented as part of submissions to the ABC.

Any environmental mitigation measures related to the construction phase of the Project will be identified and managed through a project-specific CEMP.

As part of the MDP approval process, the Airports Act requires the Minister to have regard to *"… the impact that carrying out the plan would be likely to have on the environment"*. To inform this decision, the draft MDP will be referred to the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW) for advice under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Under Section 160 of the EPBC Act, the Minister must consider advice from the Minister for the Environment and Water.

8.2 Sustainability, Climate Resilience and Decarbonisation

AMG has developed a Sustainability Framework for the Airport that focuses on environmental, social and governance criteria. Figure 30 below sets out the three pillars of the framework and eight key factors to be considered.

Environmental Stewardship	
01 Climate Risk, Energy Consumption and Efficiency	02 Biodiversity
Achieve net zero emissions and strengthen resilience to climate related impacts.	Protect and restore natural environments and biodiversity.

Community & Wellbeing	
03 Customer & Community engagement	02 Health and Wellbeing
Engage and consult with stakeholders.	Build and strengthen an engaged and diverse workplace.

Resilient Operations	
05 Safety and Environmental Management	0n Governance
Ensure safe and environmentally compliant precincts.	An ethical, sustainable and secure business.

Figure 30 AMG's Sustainability Framework Pillars and Factors

Aviation White Paper

The Sustainability Framework will guide the design, community engagement, construction and operation of the Project. This includes factors, detailed in the Aviation White Paper, that the Minister will have regard to when making decisions about future airport master plans and MDPs:

- How the Airport will build and maintain resilience to climate impacts; and
- The suitability of the Airport's sustainability and decarbonisation initiatives.

Sustainability, Climate Resilience and Decarbonisation Achievements at the Airport

AMG's Sustainability Framework guides decision making across the Airport and has resulted in measurable achievements, as reported in AMG's 2023 and 2024 Sustainability Reports, including:

- Achieving 4 and 5 Star Green Star ratings for 11 buildings
- Commencing installation of 4.5MW of rooftop solar
- Installing 10 EV charging stations with new electrical infrastructure catering for future EV chargers
- Upgrading hangars and the airfield to LED lighting
- Planting over 130,000 trees, shrubs and groundcovers
- Developing the vision for AMG's first "Reflect" Reconciliation Action Plan (RAP)
- Supporting and partnering with community groups, including: AMG's sponsorship of a Little Wings aircraft to enable an extra 65 missions a year for seriously ill children in regional and remote areas; support for the Little Wings Return and Earn program; and support for the Camp Quality Camden Classic Cruise
- Embedding sustainability into procurement and aligning with human rights and anti-modern slavery commitments
- Mapping AMG's carbon footprint for Scope 1 and 2 emissions and baselining Scope 3 emissions.

Such achievements align with AMG's vision to be a leader in the sustainable growth of GA. In support of that vision, AMG is on track to deliver ongoing sustainability, decarbonisation and climate resilience initiatives, including:

- Achieve net zero Scope 1 and 2 emissions by 2030 and Scope 3 by 2050
- Source 100% renewable energy for AMG
- Increase solar infrastructure by 60% by 2030
- Develop AMG's Reflect RAP
- Demonstrate leadership in providing a physically and mentally safe work environment
- Become an Employer of Choice for staff through a broad range of employee support initiatives
- Achieve zero environmental fines, prosecutions and incidents
- Ongoing support and incubation of emerging aviation technologies, including net-zero electric- and hydrogen-powered aircraft.

The Project's Sustainability, Climate Resilience and Decarbonisation Features

Consistent with recent developments at the Airport, the Project design allows for the incorporation of sustainable design, climate change resilience and decarbonisation features and initiatives.

The Project aims to deliver the following initiatives, subject to detailed design, consultation and approvals by the ABC, CASA and Airservices Australia:

- The Project's as-built environmental performance is expected to be equivalent to an appropriate Green Star project, based on the Green Star Buildings tool or similar
- On-site Solar Renewable Energy Production will be designed to minimise the utilisation of energy from the grid system and operational carbon footprint. The system will be designed so that renewable energy is prioritised for use. The implementation of the solar system will be subject to a Glint and Glare Assessment, to be approved by CASA and Airservices Australia
- Electric vehicle charging infrastructure and charging bays will be included within the Project to encourage the use of low-emissions vehicles
- Energy-efficient and controlled lighting systems will be used to reduce electrical consumption, maintenance and waste
- Where required, the building envelope thermal performance will be designed to comply with the Section J requirements applicable at the time (conditioned spaces). This will reduce reliance on mechanical cooling and heating and reduce energy consumption
- Energy-efficient heat-pump hot water will be used to reduce energy consumption
- Water use metering and monitoring are proposed, along with rainwater harvesting and reuse
- Embodied energy reduction will be achieved through construction material selection
- Pollution management equipment will be used to capture and treat stormwater runoff from apron areas
- Enhanced resilience to climate-related flooding through measures such as on-site water detention and connection of the Project to the Airport's comprehensive network of pipes, box culverts, open drains, drainage channels and channelling runoff
- A waste generation, recovery and diversion monitoring process will be established for the Project.

8.3 Stormwater/Hydrology

Civil engineering concept plans have been developed to verify the current architectural concept proposed by this MDP. Detailed engineering plans and reports will be developed through the detailed design stage and submitted for approval to the ABC.

8.3.1 Site Drainage

The piped stormwater drainage (minor) system concept design for the Project has been designed to accommodate the 20-year ARI storm event (Q20).

Overland flow paths (major), which will convey all stormwater runoff up to and including the Q100 event, have also been provided, which will limit major property damage and any risk to the public in the event of a piped system failure. Overland flows are directed to roadways, open drains and basins generally, as set out in the South West Precinct stormwater management strategy.

The stormwater runoff from the Project site is proposed to be collected via pits and pipes and discharge into one of two onsite OSD tanks, prior to being discharged into the Tower Road infrastructure.

The drainage system will be designed to adequately protect buildings, public areas and neighbouring properties from stormwater runoff.

The detailed stormwater management design will be submitted to the ABC for approval.

8.3.2 Stormwater Quantity

The majority of the Airport is managed as part of the Precinct Stormwater Management Strategy. Management of local runoff (to limit post-development flows to pre-development) and regional considerations (flood storage in Georges River flooding) have been included in the Precinct Stormwater Management Strategy.

The Project site was excluded from the Management Strategy and, therefore, a site-specific on-site detention (OSD) solution is proposed and includes the provision of one or two OSD tanks located on the boundary of the site with Link Road, near the two proposed discharge points. Storage capacity will be sufficient to ensure that post-development flows do not exceed pre-development flows.

8.3.3 Stormwater Quality

Similar to water quantity management, water quality management has been excluded from the precinct infrastructure works – therefore, an on-site solution is proposed. This solution will align with the Bankstown Airport Site-Wide Flood and Stormwater Management Strategy, which was developed in consultation with the City of Canterbury Bankstown and includes meeting the following pollutant load reduction targets for new development:

- Gross pollutants 90%
- Total suspended solids 80%
- Total phosphorus 55%
- Total nitrogen 40%

The components of the on-site treatment strategy to achieve the above targets are expected to include:

- Primary treatment to the grated surface inlet pits is to be performed via two Ocean Protect Offline GPTs and one supplementary Ocean Protect Pit Basket. Pre-treatment of stormwater will assist in mitigating the potential for early onset sedimentation of the two OSD tank systems
- Tertiary treatment of roof water via rainwater reuse and settling within a rainwater tank
- Tertiary treatment of the stormwater run-off via filtration located in the two OSD tanks.

A detailed stormwater management strategy will be developed through the detailed design stage and submitted to the ABC for approval.

8.3.4 Flooding

The finished floor levels of the Project's proposed buildings, as shown on the concept plan, will achieve a 300mm freeboard above the 1% AEP to provide appropriate flood immunity.

Flood modelling and mitigation design of the Project will be refined through the detailed design stages and a Flood Impact Assessment Report that demonstrates there will be no offsite flood impacts as a result of the Project, which will be submitted to the ABC for approval.

8.4 Visual Impact/Building Massing

8.4.1 Existing Environment

The Project is located on the northern extent of Airport land and adjoins non-airport land to the north and east (see Figure 30).

Figure 31 Site context plan

The Project site is currently a vacant parcel of land bound by the following development:

- Residential properties to the east that are located off the Airport site and consist of a mix of detached single and two-storey dwellings of relatively uniform size and consistent boundary setbacks
- Community and residential properties to the north, on the opposite site of Birdwood Road, which consist of single and two-storey buildings. These properties are less uniform and of a greater density than the properties to the east of the Project site
- Educational and commercial properties to the west, comprising generally taller and larger buildings associated with Georges River Grammar and the IGA supermarket
- Aviation-related development to the south, consisting of open airfield (runways, taxiways and aprons) and aircraft hangars.

8.4.2 Building Scale and Form

The Project has been designed to respond to the site context. It has been effectively laid out in two separate areas, with the childcare centre, shops and offices located to the north – and appearing and operating as a typical local centre development. The warehouses located to the south are designed to respond to the more industrial character of the Airport environment. Section 4.4 provides a detailed description of the built form and design of the proposed buildings.

Childcare Centre, Shops and Offices

The proposed built form within the northern section of the Project site, containing the childcare centre, shops and offices, will complement the general height, form and position of buildings within the locality and will present as a contemporary, well designed local shopping centre that is typically located within a suburban context.

The buildings will be a maximum of two storeys in height and positioned away from neighbouring properties outside the Airport site, so that they will not be visually intrusive. The visual impact of the built form will be further softened by the well positioned and large landscaping areas located within the shared car park and adjacent to the road verge.

Figure 32 Indicative image of the childcare centre, shops, offices, car park and landscaping

The buildings will provide a high degree of articulation and architectural interest that will enhance the streetscape character in the area and will not result in any detrimental impact on the visual amenity of the area.

Warehouses

The proposed Project warehouses, within the southern section of the Project site, are of a conventional shape and size. However, they have been carefully designed and positioned to minimise visual impacts on surrounding properties.

The warehouses will be finished in a variety of external materials, including precast concrete panels, face brick and precoated metal cladding. Mezzanine level office areas with undercroft car parking will be symmetrically positioned along the elevations of the warehouses and finished with large areas of glazing, screening material and signage zones.

The projecting mezzanine offices and the variety of materials and loading bay canopies will provide good articulation to the buildings and soften their visual impact, when viewed from surrounding land.

The proposed eastern most warehouse will share a boundary with single storey dwellings located outside the Airport site, at 533 and 531 Marion Street and 171A, 173A and 175A Birdwood Road.

To mitigate noise impacts on the sensitive receptors within the locality, a 7.0 metre high sound wall is proposed to be installed approximately 2.7 metres from the shared boundary with 179A-179B Birdwood Road. This City of Canterbury Bankstown property is outside the Airport site and is occupied by Bankstown Montessori Preschool.

A new 2.1 metre high fence will be constructed along the boundaries with 533 and 531 Marion Street and 171A, 173A, 175A and 179A-179B Birdwood Road (see Figures 32-33).

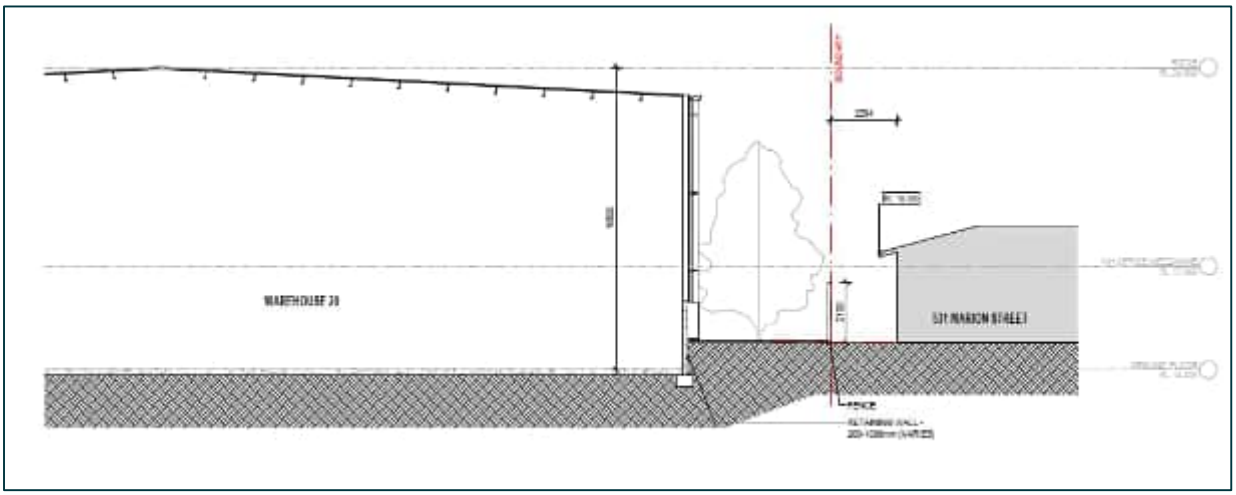


Figure 33 Interface between the eastern warehouse and 531 Marion Street (east-west section)

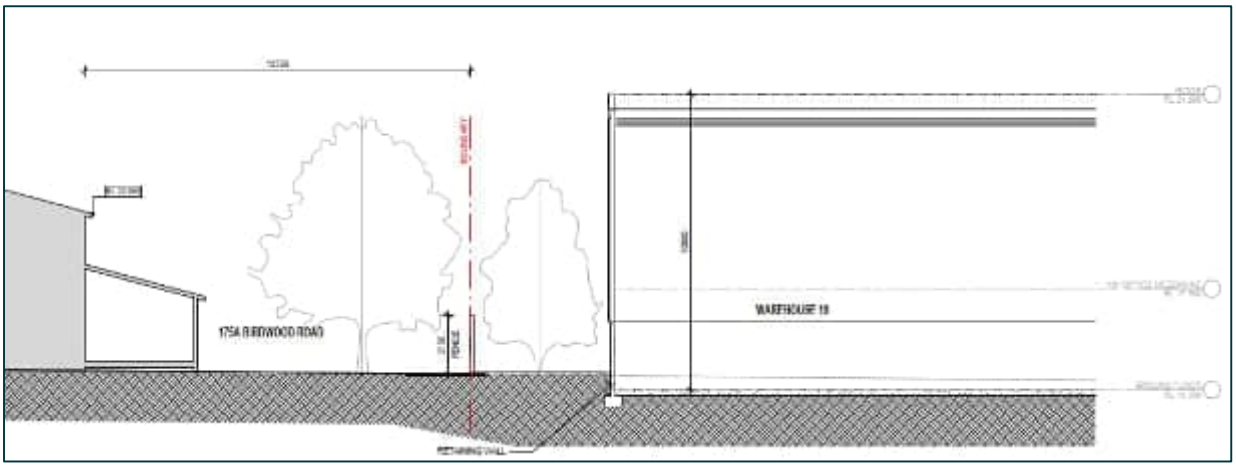


Figure 34 Interface between eastern warehouse and 175A Birdwood Road (north-south section)

To appropriately mitigate the visual impact of the proposed eastern warehouse on nearby properties, the following measures have been included:

- The eastern warehouse has been set back a minimum distance of 5.0 metres from the boundaries of all adjoining properties outside the Airport site
- A landscaped area ranging between 2.71 metres and 5.0 metres in width will be provided at the interface with all properties outside the Airport site. Semi-mature trees will be planted within such landscaped areas to provide screening and soften the appearance of the warehouse building

- A mixed palette of materials will be used to break up the appearance of the building
- "Timber look" screens and "green walls" will be positioned along the western and northern elevations of the eastern warehouse
- The finished floor level of the eastern warehouse has been set approximately 1.0 metre lower than the ground level of the adjoining properties outside the Airport site, which will assist in reducing the overall height of the building when viewed from these properties
- Shadow diagrams have been prepared and provided in Appendix B that demonstrate there will be minimal shadowing impacts on adjoining properties outside the Airport site throughout most of the year.

With respect to the interface with Georges River Grammar, located to the west of the Project site and within the Airport site, the centrally positioned warehouse will be set back approximately 7.0 metres from the common boundary with the school and will adjoin a sports field within the school grounds.

To mitigate operational noise impacts from the Project, a 5.0 metre high sound wall will be constructed on the boundary with the school. Given the use of a sports field within the school grounds, the construction of the wall will assist with containing sports activities and provide an effective visual and acoustic barrier between the two land uses.

8.5 Noise Management

A Construction and Operational Noise and Vibration Impact Assessment was undertaken by AECOM and the findings of the assessment are summarised below. The report is provided in Appendix F.

Construction Noise Management

Construction scenarios for the Project were developed and three distinct construction stages were used in a computer-based noise model, to determine potential construction noise generation. Construction impacts were then assessed at all receivers at various locations across the Project site. The Interim Construction Guidelines 2009 (ICG) noise management levels (NMLs) are more stringent than the construction noise criteria outlined in the *Airports (Environment Protection) Regulations 1997*, therefore, ICNG's NMLs have been utilised as the design criteria for the Project.

A conservative assessment predicts that 49 receivers within Georges Hall will experience noise levels above the NML for the Foundations construction scenario. Of these receivers, eight are expected to be highly affected. For the Site Establishment scenario, 28 receivers are expected to experience noise levels above the NML, with six of these expected to be highly affected. For the Frame and Façade construction scenario, 32 receivers are expected to experience noise levels above the NML, with eight of these expected to be highly affected.

Fourteen non-residential receivers are expected to exceed the construction NMLs for the highest impact construction scenario (Foundations). These receivers include Bankstown Montessori Preschool, Georges River Grammar, IGA Georges Hall, Georges Hall Community Centre and St Martin's Anglican Church.

An assessment of the likely construction traffic movements cannot be conducted at this stage as existing traffic volumes along access routes are not yet available. A construction traffic assessment will be conducted at the detailed design stage and form details for approval by the ABC.

The main source of vibration during construction is likely to be the use of piling rigs during earthworks and structural works. Minimum working distances for vibration intensive construction work have been presented. Equipment size would be selected by the construction contractor accounting for the minimum working distances and the distance between the area of construction and the most affected sensitive receiver. If work needs to be carried out within minimum working distances, vibration monitoring would be carried out to manage potential structural damage.

A project-specific CEMP will be developed and submitted for approval by the ABC, which will seek to minimise construction noise and vibration impacts.

Operational Noise Management

An operational noise assessment was carried out in accordance with the NSW Environment Protection Authority (EPA) *Noise Policy for Industry, 2017*, as required under the Bankstown Airport Noise and Vibration Management Plan (NVMP). Likely operational scenarios during the daytime, evening and night-time were assessed at representative receiver locations near the Project site, against the project noise trigger levels. In addition, likely maximum noise events from operational activities within the proposed warehouse area were used to assess sleep disturbance at all nearby residential assessment receivers.

Results show predicted operational noise emissions from the Project site are compliant with the project noise trigger levels, provided that the maximum equipment noise levels, traffic movements, noise barriers (sound walls) and plans of management detailed in the architectural drawings and Construction and Operational Noise and Vibration Impact Assessment are implemented. The noise mitigation strategies detailed in the Construction and Operational Noise and Vibration Impact Assessment, including the proposed sound walls, should be verified at the detailed design stage and form part of the detailed design submitted to the ABC for approval.

A noise assessment of likely operational road traffic was not conducted at this stage, as existing traffic counts along access routes are not yet available. This operational road traffic noise assessment should be conducted at the detailed design stage in accordance with the EPA's Road Noise Policy.

Operation of the Project is not predicted to generate any adverse vibration to nearby sensitive receivers.

Aircraft Noise Management

Based on the location of the Project site with respect to the most up-to-date Bankstown Airport 2039 ANEF chart, the light industrial (warehouses) would be an "acceptable" use and the childcare centre, shops and offices would be "conditionally acceptable" uses, in accordance with the Australian Standard *AS2021-2015 Acoustics – Aircraft Noise Intrusion – Building Siting and Construction* (AS2021-2015)

A maximum aircraft noise level of LAsmax 72 dB has been predicted from GA aircraft to the Project site. Indicative sound reduction values and construction detail have been recommended in the Construction and Operational Noise and Vibration Impact Assessment for the proposed childcare centre, to ensure compliance with AS2021-2015. These recommendations will be verified during the detailed design stage and submitted to the ABC for approval.

8.6 Heritage

Heritage is generally regulated through State legislation and planning instruments at a Local Government level. However, the Airport is located on Commonwealth land and is therefore subject to Commonwealth legislation.

The Airports Act requires AMG to take all reasonable measures to ensure there are no adverse consequences for existing heritage items and to consult with a suitably qualified person in regard to these items, particularly in relation to significance and conservation.

Natural, Aboriginal and non-Aboriginal heritage values at the Airport are protected under the EPBC Act. Further, the Commonwealth *Australian Heritage Council Act 2003* requires airports to conserve structures listed on the National and Commonwealth Heritage Lists.

The *Bankstown Airport Heritage Management Plan 2018* (2018 HMP) provides the basis for decision-making in relation to non-Aboriginal heritage values of the Airport site. Policies for appropriate development of the Airport site are outlined, along with conservation measures for individual items.

As the Project site borders non-airport land regulated under State Planning Legislation, a review has also been undertaken of the *Canterbury-Bankstown LEP 2023* and DCP 2023.

Potential impacts to Aboriginal and non-Aboriginal heritage values as a result of the Project have been assessed. The following section provides a summary of the findings of the assessment.

8.6.1 Aboriginal Heritage

As stated in Master Plan 2019, *"… the Airport has been extensively modified since initial preparations in 1940 and the potential for Aboriginal sites and artefacts to be located on the site is considered low".*

The Project site is located within the northern extent of the Airport Business Zone. A search of the Aboriginal Heritage Management System (AHIMS) database has shown that no sites of Aboriginal significance have been recorded in or near the Project site. The potential for Aboriginal heritage items to be located in or near the Project Site is considered low.

Notwithstanding such minimal risk, AMG has implemented an "Unexpected Finds Protocol" that is required to be followed for all developments at the Airport.

8.6.2 Non-Aboriginal Heritage

The Airport has historical significance as the location of a Royal Australian Air Force (RAAF) Base from the 1940s to 1960s. The Airport has transitioned through several significant phases, including:

- Military period (1940-1948)
- Department of Civil Aviation (1948-1988)
- Federal Airports Corporation (1988-1998)
- Sydney Airports Corporation Limited (1998-2001)
- Privatisation from 2001 to the present day.

The Airport is a Statutory Listed Heritage Item of local significance (Item No. I18) under the Canterbury-Bankstown LEP 2023. However, this listing is of no statutory relevance as the Airport is located on Commonwealth land and not subject to local planning systems.

The Airport Control Tower is a Commonwealth Heritage Listed Place (Place ID: #106118) that consists of an operating control tower dating from the first phase of World War II. There are no other statutory listed items on or near the Project Site.

The Project will not have any material impact on the heritage significance of the Airport, given the proposed development will occupy a relatively small area of the Airport on its periphery. The Project will also not have any discernible impact on the visual form or character of the wider Airport.

With respect to the Commonwealth-listed Airport Control Tower, the Project is located approximately 1.0 kilometres from the Airport Control Tower and will not be readily visible within the context of the tower or obscure any view from inside or outside the Airport. Because of this, the Project will not impact on the heritage importance of the Airport Control Tower.

8.6.3 Heritage Management Plan 2018

The 2018 HMP for the Airport was prepared in accordance with the Commonwealth heritage management principles of the EPBC Act and Regulations. The HMP complements and updates the Heritage Management Strategy prepared by Godden Mackay Logan in 2005 and a HMP completed by Dawbin Architects in 2016.

The 2018 HMP defines the built, landscape and archaeological elements at the Airport that are considered to contribute to the overall heritage values of the Airport site. None of these elements are located within the Project site or in the immediate vicinity and, therefore, are unaffected by the proposed development.

8.6.4 Canterbury Bankstown Local Environment Plan 2023

As the Project site is located on the periphery of the Airport site and adjoins land within the City of Canterbury Bankstown, a review of the *Canterbury-Bankstown LEP 2023* was undertaken and concluded that the Project site is not within the setting of any state or local heritage items.

8.7 Soil Contamination and Geotechnical

Soil contamination and geotechnical investigations were undertaken in 2023 and the following sections provide a summary of these investigations and findings.

8.7.1 Soil Contamination

The soil contamination works consisted of a site inspection and intrusive investigation (test pits) at 22 locations across the Project site. During the works, several small stockpiles and mounds were encountered on the surface of the site. An elongated mound in the northern portion of the site was identified to include visible asbestos containing materials (ACM) and an undulating area in the eastern portion of the site was observed to contain ACM beneath grass cover. All laboratory analysis results were reported within the site adopted criteria, with the exception of asbestos identified in the northern and eastern area of the site, discussed above.

The following is a summary of the soil contamination investigations and assessment:

- No gross or significant contamination was identified during the investigations that would preclude the Project site from being developed for commercial/industrial purposes, including associated landscaped areas and childcare
- Mounded materials identified to be impacted with asbestos should be removed from the Project site prior to development works occurring. Until such time as the asbestos risks are removed, asbestos impacts should be managed consistent with WHS Regulations
- Due to the presence of general rubbish and building rubble in small mounds and stockpiles within the site, removal of these materials should also be considered prior to development works
- An unexpected finds (asbestos) management plan, including unexpected find protocol, and asbestos management procedures, should be developed for the Project site for implementation during development works.

Subject to the removal of the general rubbish and stockpiles, the Project site is suitable for the proposed development.

8.7.2 Geotechnical

Geotechnical Investigations included the excavation of seven test pits and associated assessment and laboratory analysis. The report provided design advice based on the proposed mixed-use commercial/industrial development, including on grade car parking and potential warehouses. The works included advice on foundations, slabs, pavements, slopes and excavation support. A bulk earthworks specification appropriate for the Airport was also provided.

8.8 Air Quality

8.8.1 Construction Impacts

A project-specific CEMP will be developed prior to construction that will provide the management approach and requirements (including environmental mitigation measures, controls, monitoring and reporting) for managing air quality during the construction of the Project. The project-specific CEMP will be developed in line with *Bankstown Airport Air Quality Management Plan 2023*.

8.8.2 Operational Impacts

The following legislative framework relates to potential air quality impacts:

Air quality impacts associated with ground-based operations – on Airport	*Airports (Environment Protection) Regulations 1997 (AEPR)*
Air quality impacts on land outside the Airport site	*NSW Environment Protection Authority Air Quality Framework*

The precise air quality and odour impacts associated with the operation of the Project are not known at this stage, as tenants have not been secured for the buildings and any related operational requirements considered. However, future tenant fit outs will be subject to approval by the ABC and will include compliance with the relevant standards and legislation (detailed above), to ensure air quality and odour impacts are appropriately mitigated.

8.9 Ecology

A flora and fauna assessment of the Project site was completed in January 2024 and included a field survey undertaken in December 2023.

The conclusions of the assessment are summarised below:

- The report assessed the potential impacts of the proposed works on flora and fauna species listed under the Commonwealth EPBC Act
- No threatened flora or fauna species were recorded within the study area during the field survey. However, the proposed works have the potential to impact upon small patches of Cumberland Red Gum Riverflat Forest (Plant Community Type (PCT) ID 4025), which is listed as a threatened ecological community (TEC). This TEC may also provide potential foraging habitat for some highly mobile threatened fauna species, such as the Grey-headed Flying-fox
- The PCT exists in two small, highly degraded patches with some connectivity with a larger patch immediately north of the Airport northern boundary fence, along the roadside
- An Assessment of Significance was not undertaken as this species did not meet the definition of a TEC under the EPBC Act, due to the patch size threshold and the biotic threshold (vegetation condition) being low. Therefore, the Project is unlikely to result in a significant impact on the existing PCT 4025 within the study area
- It was determined that the habitat proposed for removal within the Project site is unlikely to provide significant foraging habitat for Grey-headed Flying-fox. The affected vegetation amounts to less than 0.01 ha and is unlikely to cause significant impact to this species, given the similar foraging resources in proximity to the study area, including vegetation immediately north of the boundary that will remain
- The impacts of the Project will not trigger entry into the Biodiversity Offset Scheme (BOS) and the preparation of a Biodiversity Development Assessment Report (BDAR) or Species Impact Statement (SIS) is not recommended
- The mitigation measures and recommendations as detailed in the report will be adopted.

8.10 Waste Management

A Construction and Demolition Waste Management Plan (CDWMP) has been prepared for the Project. The initiatives set out in the CDWMP will be implemented where practicable and will be used to guide the detailed design of the Project and the construction and operational phases.

The development of the CDWMP has been guided by local, state and federal policy and frameworks, including:

- Canterbury Bankstown Development Control Plan 2023 - Chapter 3: General Requirements
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities. *Construction and Demolition Waste Guide - Recycling and Re-use Across the Supply Chain*. (2014, November).
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

Where possible, the construction and operational phases of the Project will implement the following waste management initiatives:

- Reuse of excavated material on-site and disposal of any excess to an approved site
- Green waste mulched and reused on-site as appropriate, or recycled off-site
- Bricks, tiles and concrete reused on-site as appropriate, or recycled off-site
- Plasterboard waste returned to supplier for recycling
- Framing timber reused on site or recycled off-site
- Windows, doors and joinery recycled off-site
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements. Plumbing, fittings and metal elements will be recycled off site
- Ordering accurate quantities of materials and prefabrication of materials where possible
- Reuse of formwork
- Careful source separation of off-cuts to facilitate reuse, resale or recycling.

A final CDWMP will be submitted to the ABC for approval and any future fit outs of individual tenancies will have regard to the approved CDWMP.

8.11 Consistency with Airports Act

As demonstrated in Section 8 above, the MDP has been prepared in accordance with the requirements of the Airports Act, including the following requirements under Section 91 (1) relating to environmental matters:

(1) A major development plan, or a draft of such a plan, must set out:

(h) the airport - lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development; and

(j) the airport - lessee company's plans for dealing with the environmental impacts mentioned in paragraph (h) (including plans for ameliorating or preventing environmental impacts).

9.0

Consistency with Bankstown Airport Master Plan

Aeria Management Group

9.0 Consistency with Bankstown Airport Master Plan and Head Lease

Part 4 Section 91 of the Airports Act prescribes the contents of an MDP, with subsection (1)(d) requiring an assessment that considers whether the development is consistent with the Master Plan for the airport.

This section of the MDP provides an assessment of the Project against the current Master Plan 2019, which was approved by the Minister on 7 November 2019. The Airports Act requires AMG to prepare a Master Plan every eight years and the next Master Plan for the Airport must be submitted to the Minister for approval by no later than 7 November 2027.

9.1 Airport Master Plan Objectives

Master Plan 2019 provides objectives relating to aviation operations, infrastructure, land use planning, commercial development, ground transport and the environment.

Table 8 details the key objectives of Master Plan 2019 and describes how the Project responds to these objectives.

Table 8 Key Master Plan Objectives

Objective	How the project relates
Airport Forecasts Maintain Bankstown Airport's standing as the State's pre-eminent GA airport	The Project is located on land within the landside commercial area of the Airport, on a site specifically identified in Master Plan 2019 as suitable for commercial development. The Project will provide shops and services to the local community and airport users and will provide opportunities for aviation-related commercial users to occupy the proposed office and warehouse spaces. The proposal has been designed with regard to the NASF Guidelines and will not compromise aviation safety or operations at the Airport.
Aircraft Noise Actively work with airport users, government agencies and community representatives to manage noise impacts for aircraft operations.	The Project is a non-aviation related development that will not impact aircraft noise.
Airport Safeguarding Long-term and effective protection and safeguarding of the Airport to ensure its ongoing operation and potential to grow for changing aviation needs and to deliver social and economic benefits to the wider community.	The Project is located on land within the landside commercial area of the Airport, on a site specifically identified in Master Plan 2019 as suitable for commercial development. The proposal has been designed with regard to the NASF Guidelines and will not compromise aviation safety or operations at the airport. The Project will make a significant contribution to local, regional and State economies, including adding approximately $44.54 million to NSW Gross State Product during the construction phase and $110.5 million annually when operational.

Objective	How the project relates
	The Project will respond to the retail and social needs of the wider community, including for childcare places.
Aviation Infrastructure Investment in aviation facilities to support continued growth in air traffic.	The Project is located on land within the landside commercial area of the Airport, on a site specifically identified in Master Plan 2019 as suitable for commercial development. The Project will provide opportunities for aviation-related commercial users to occupy the proposed office and warehouse spaces. The Project is being progressed in parallel with a significant new aviation hangar development at the Airport located within the heart of the aviation precinct (subject to MDP approval). The Aviation Hangar Project is a significant investment in aviation facilities that will support future aviation operations and growth in air traffic.
Land Use Planning Provide the overall planning intent for the Airport and provide consistency with the NSW State planning system.	The Project is located on land within the landside commercial area of the Airport, on a site specifically identified in Master Plan 2019 as suitable for commercial development. The Project has been designed with regard to the NSW State planning system, as detailed in Section 10. Significant effort has been made to integrate the Project into the local environment, complement the streetscape and land use characteristics of Birdwood Road and minimise amenity impacts to properties outside the Airport site that interface with the Project.
Development Program Consider a development program that will increase the level of economic activity and employment generated by the Airport and meet the forecast aviation and non-aviation demand.	The Project is located on a development site specifically identified in the five-year Development Program within Master Plan 2019. The site is identified as suitable for commercial development and the Land Use and Ground Transport chapters of Master Plan 2019 anticipate the development of the site. The Project will provide shops and services to the local community and airport users and will provide

Objective	How the project relates
	opportunities for aviation-related commercial users to occupy the proposed office and warehouse spaces. The Project will create employment opportunities and make a significant contribution to local, regional and State economies, including: • Supporting approximately 255 full-time jobs and adding approximately $44.54 million to NSW Gross State Product during the construction phase • Supporting approximately 488 full-time jobs and adding approximately $110.5 million annually to NSW Gross State Product when operational.
Ground Transport Optimise existing transport infrastructure and services and consider the impacts on traffic on roads surrounding the Airport.	The development of the Project site was included in traffic modelling that informed the Ground Transport Plan and no detrimental increase in traffic on the surrounding road network is anticipated. The site benefits from two road frontages and traffic movement associated with the Project site has been split so that light vehicles will access the site from Birdwood Road, which is controlled by the City of Canterbury Bankstown, and trucks associated with warehouses will use Link Road within the Airport site.
Services and Infrastructure Invest in services infrastructure that improves reliability and redundancy in utility networks, improves sustainability and supports growth at the Airport.	A utility supply study has been undertaken and the Project will be accommodated within the existing services networks without compromising the future growth of the Airport. Electrical supply upgrades will be required to support the Project, as detailed in Section 5.0. The Airport has an established embedded electrical network and significant investment has been made in solar power generation to support Airport users.
Environment Continually improve environmental management in all areas of Airport operations.	Section 8.0 considers relevant environmental matters and demonstrates that the Project will not result in any detrimental environmental impacts and that the construction and operation of the proposed development will be appropriately managed. Section 8.0 also sets out environmentally sustainable design initiatives that will be incorporated as part of the Project.

9.2 Land Use Planning

Master Plan 2019 divides the Airport into four land use zones, being the Airport Business, Aviation, Commercial and Industrial Zones. These zones have been divided further into precincts that provide detailed guidance on envisaged development.

Each zone sets out relevant objectives and a desired character statement to reflect land use differences across the Airport. The spatial locations of the different Airport zones influence the types of land uses that are suitable and possible, based on characteristics such as established airport infrastructure and proximity to surrounding uses.

9.2.1 Airport Business Zone and Neighbourhood Precinct

The Project site is located within the Airport Business Zone and Neighbourhood Precinct, as shown in Figure 35.

The Airport Business Zone classifies the following land uses as "permissible" with consent:

- Childcare facilities
- Community facilities
- Recreation facilities
- Business premises
- Retail premises
- Office premises
- Warehouse or distribution centres
- Specialised retail premises (in Neighbourhood Precinct only)
- Light industries.

Figure 35 Site location within the Airport Business Zone and Neighbourhood Precinct
Source: Bankstown Airport Master Plan 2019

Airport Business Zone Future Character

As stated in Master Plan 2019, the desired future character of the Airport Business Zone is:

> *The Airport Business Zone will continue to develop as the 'heart' of activities at the Airport, providing the interface between airside and landside development, accommodating aviation operations, and related services, commercial and business activities.*
>
> *This zone will include buffer activities between the aviation/commercial development and the residential areas to the north of the Airport.*
>
> *Development in the zone will consist of a high level of amenity and quality built form.*

The Project aligns with the desired future character of the Airport Business Zone, as it will provide opportunities for services, commercial and business activities to be located within the site. The design of the Project also responds well to its interface location adjacent to non-Airport land, by providing local centre type commercial uses facing Birdwood Road that will service the local community and airport users.

The Project also presents a high quality built form that will integrate well with surrounding properties and enhance the level of services and amenity within the locality.

Airport Business Zone Objectives

Table 9 sets out the objectives of the Airport Business Zone and Neighbourhood Precinct and how the Project meets each of these objectives.

Table 9 Objectives of the Airport Business Zone

Airport Business Zone	
Objective	**Assessment**
Provide primarily for the accommodation of aviation operations and aviation-related activities.	The Project site is not required for aviation operations or aviation-related activities. However, the Project will create a mixed-use commercial precinct that will provide opportunities for aviation-related uses, particularly within warehouses accessible from Link Road within the Airport site. The proposed offices within the northern section of the Project will also provide opportunities for aviation-related support services.
Provide neighbourhood uses in areas of the Zone that interface with land surrounding the Airport.	The Project has been specifically designed to respond to its location at the interface with non-airport land and will improve access to shops, offices and services for the local community and Airport users.
Provide for commercial and business uses.	The Project will provide opportunities for commercial and business uses.
Enhance the amenity of the zone by improving built form and landscaping, and creating a gateway and boulevard to the zone along Airport Avenue.	The Project will present a high quality built form that will integrate well and complement the surrounding built form and enhance the level of services and amenity within the locality. The Project site is not located within the locality of Airport Avenue.

Airport Business Zone	
Objective	Assessment
Ensure safe and convenient pedestrian access and car parking throughout the zone.	The Project has been laid out to be highly accessible and will provide safe access for pedestrians and vehicles. The number of car parks provided accords with the recommendations of the City of Canterbury Bankstown DCP and has been designed in accordance with the relevant Australian Standards.
Neighbourhood Precinct	
Objective	Assessment
Provide an area accommodating neighbourhood uses, including education, retail and entertainment services, particularly in locations that interface with the surrounding community.	The Project has been specifically designed to respond to its location at the interface with non-airport land and will improve access to shops, offices and services for the local community and Airport users.
Provide for a range of commercial, light industry and aviation-related activities.	The Project will create a mixed-use commercial precinct that will support commercial, light industry and aviation-related activities, subject to demand.
Deliver an integrated landscape theme throughout the precinct.	Large areas of landscaping have been integrated into the Project, particularly at the interface with non-Airport land. Detailed landscaping plans will be developed through the detailed design stage of the Project that will accord with the Bankstown Airport Landscape Master Plan and Guidelines 2022. These details will be submitted to the ABC for approval.

9.3 Development Program

Section 9.0 of Master Plan 2019 provides a development program to guide the growth of aviation operations and deliver property development opportunities at the Airport. Section 9.2 identifies several possible projects to be undertaken within the five-year planning horizon. This includes aviation infrastructure development, non-aviation development and infrastructure improvements (road transport, flooding and stormwater management).

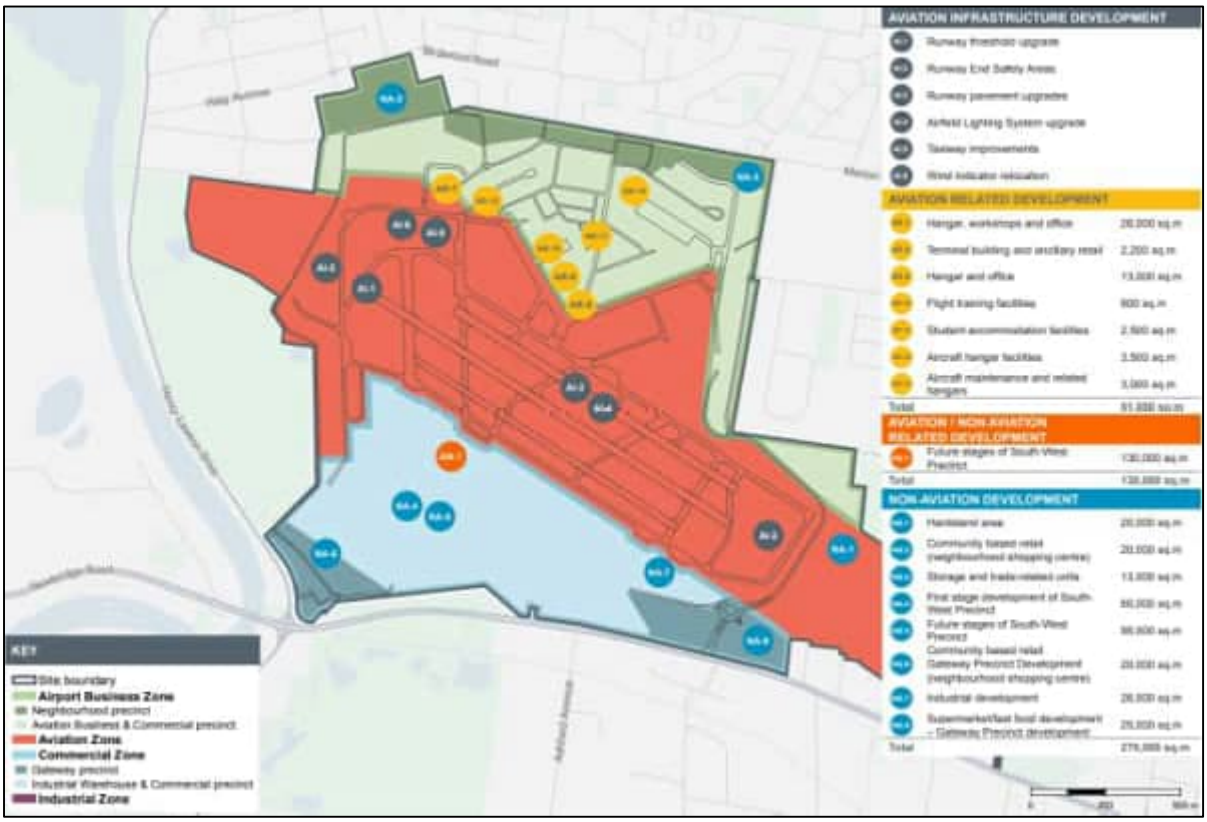


Figure 36 Bankstown Airport five-year development program
Source: Bankstown Airport Master Plan 2019

The Project site is identified as Site NA-2 in the Development Program set out in Master Plan 2019, as detailed in Figure 36. Site NA-2 is identified as a "non-aviation" development site that is suitable for "community-based retail (neighbourhood shopping centre)", with potential envisaged uses being supermarkets, entertainment and clubs, subject to approvals and commercial demand.

The Project will deliver a mixed-use commercial precinct that will present to Birdwood Road as a typical neighbourhood shopping centre, providing shops and services to the local community and airport users.

9.4 Consistency with Head Lease

The MDP has been prepared in accordance with Clause 13 of the Airport Head Lease between the Commonwealth of Australia and BAPL, as required under Section 91 (1A) b) of the Airports Act.

Specifically, the Project aligns with the requirement in Clause 13.1 of the Head Lease for AMG to develop the Airport, having regard to the quality standards reasonably expected of such an airport in Australia and "good business practice" – including the requirement to provide "appropriate facilities for the comfort, ease of access, expeditious movement and efficient use of the Airport site by passengers and other users".

9.5 Conclusion

The Project is consistent with the objectives of Master Plan 2019 and aligns with the objectives and desired future character of the Airport Business Zone and Neighbourhood Precinct and is consistent with the development of Site NA-2 as set out in the five-year Development Program.

The Project is also consistent with the requirements and objectives of the Head Lease.

10.0

Consistency with State and Local Planning Instruments

Aeria Management Group

10.0 Consistency with Airports Act and State and Local Planning Instruments

The Airport is located on Commonwealth land and subject to the planning and approvals framework set by the Airports Act and associated Regulations. As such, State and local government planning policy and approval systems do not apply. Despite this, Section 91(1) of the Airports Act requires an MDP to be generally consistent with State and local planning systems.

The following section describes the relevant NSW State and local government strategic planning policies and how the Project is consistent with such policies.

10.1 Airports Act

The MDP is consistent with all legislative provisions and requirements under the *Airports Act 1996* (Airports Act), including those relating to environmental matters. The specific chapters of the MDP demonstrate consistency with the requirements under Section 91 (Contents of a major development plan) of the Airports Act and a summary of this consistency is provided in Appendix A.

10.2 NSW State Government Strategic Planning Instruments

In undertaking strategic planning processes and/or preparing and considering planning proposals to amend Local Environment Plans (LEP), planning authorities must give effect to the Greater Sydney Region Plan and the South District Plan.

Greater Sydney Region Plan – A Metropolis of Three Cities

The Greater Sydney Region Plan "A Metropolis of Three Cities" (the Region Plan) is the overarching strategic plan for growth and change in Sydney. The Region Plan sets out a 40-year vision (to 2056) for Greater Sydney and creates a metropolis of three cities: the Western Parkland City, Central River City and Eastern Harbour City. The Airport is located within the Central River City (see Figure 37).

Figure 37 Vision of a Metropolis of Three Cities
Source: *Greater Sydney Commission: Greater Sydney Region Plan*

The Region Plan includes objectives relating to infrastructure and collaboration, liveability, productivity and sustainability. The table below details how the Project aligns with those objectives.

Table 10 Greater Sydney Regional Plan Objectives

Objective	Assessment
Objective 3 Designing infrastructure to be adaptable – future proofing assets.	The Project has been designed to be adaptable and respond to future commercial and business needs for the local community and Airport users. The internal arrangements of the Project buildings are flexible and will support a range of large and small tenancies. The Project will be appropriately serviced to support current user requirements and, if necessary, can support upgrades to services to support new technologies and requirements.
Objective 4 Asset management of infrastructure – getting more out of existing assets.	The Project will make efficient use of vacant land at the Airport that is zoned for commercial non-aviation and aviation-related uses.

Objective	Assessment
	The Project will enhance the Airport, which is an important infrastructure asset for South West Sydney, without compromising aviation operations or safety.
Objective 16 Freight and logistics network is competitive and efficient. *'Bankstown Airport currently caters for fixed wing and helicopter flight training, charter flights, air freight and emergency services. The airport is also the location of significant aviation and non-aviation related businesses within its 313 hectares. Up to 130 hectares of the site are occupied by a mix of industrial, commercial and retail tenancies, vacant sites, or have been identified as suitable for release for development. Protecting the site's operational activities is important.'*	The Project will align with this objective by providing new opportunities for light industrial, commercial and retail tenancies within vacant Airport land that has been identified for such development. The Project has been carefully designed to accord with the NASF Guidelines and will not compromise aviation operations and safety at the Airport.
Objective 22 Investment and business activity in centres. Objective 22 provides direction for the development of local centres and states: *'Local centres are important for access to day-to-day goods and services. These centres create a strong sense of place within the local community. Local centres are collections of shops and health, civic or commercial services. Larger local centres, such as those anchored by a supermarket, can form the focus of a neighbourhood. Supermarket-based centres also provide local employment, accounting for close to 18 per cent of all Greater Sydney's jobs. While local centres are diverse and vary in size (as measured by floor space), they play an important role in providing access to goods and services close to where people live. Increasing the level of residential development within walking distance of centres with a supermarket is a desirable liveability outcome.'*	The Project will complement its contextual surroundings and present as a typical local centre to Birdwood Road. The northern component will provide tenancies for future retail, office, childcare and other local services within walking distance of the local population. The Project will provide significant employment opportunities to South West Sydney and local community. The Project will create employment opportunities and make a significant contribution to local, regional and State economies, including: • Supporting approximately 255 full-time jobs and adding approximately $44.54 million to NSW Gross State Product during the construction phase • Supporting approximately 488 full-time jobs and adding approximately $110.5 million annually to NSW Gross State Product when operational.

Our Greater Sydney 2056: South District Plan

The South District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters. The South District Plan includes objectives relating to infrastructure and collaboration, liveability, productivity and sustainability and is a guide to implementing the Region Plan at a district level.

The South District Plan identifies the Airport as a trade gateway that fulfils a significant State-wide role. It also identifies that the Airport has great potential to further benefit the economies of the District and the State.

It notes that the Airport's future must be strategically planned in the context of the Western Sydney International Airport and Badgerys Creek Aerotropolis and the need to manage airspace and the future distribution of regional and freight aviation services.

To achieve these aims, the South District Plan sets out 20 strategic *Planning Priorities*. Table 11 considers the Project against the relevant strategic Planning Priorities.

Table 11 Greater Sydney South District Plan – Planning Priorities

Planning Priorities	Assessment
Planning Priority S1 Planning for a city supported by infrastructure.	The Project will make efficient use of existing infrastructure and will be a significant investment in the long-term viability of the Airport, which will continue to contribute to the economic prosperity of the South District.
Planning Priority S3 Providing services and social infrastructure to meet people's changing needs.	The northern component of the Project will provide tenancies for future retail, office, childcare and other local services within walking distance of the local population, in line with the growing population of South West Sydney. The buildings have been designed to allow significant flexibility with the internal tenancy arrangements and infrastructure services can be upgraded to meet future market demands.
Planning Priority S6 Creating and renewing great places and local centres, and respecting the District's heritage	The Project will enhance the visual amenity of Birdwood Road and will complement the general form, character and position of existing development within the locality. The Project will activate this area of Birdwood Road and present as an inviting and attractive local centre.
Planning Priority S8 Growing and investing in health and education precincts and Bankstown Airport trade gateway as economic catalysts for the District.	The Project is a significant commercial investment in the Airport and region that will support this Planning Priority to grow the Airport's importance as a trade gateway and economic catalyst for the District.
Planning Priority S9 Growing investment, business opportunities and jobs in strategic centres.	The Project will provide significant employment opportunities to the District and local community.

Planning Priorities	Assessment
	The Project will create employment opportunities and make a significant contribution to local, regional and State economies, including: • Supporting approximately 255 full-time jobs and adding approximately $44.54 million to NSW Gross State Product during the construction phase • Supporting approximately 488 full-time jobs and adding approximately $110.5 million annually to NSW Gross State Product when operational.

10.3 Local Government Strategic Planning Instruments

The Airport is located within the City of Canterbury Bankstown. The following section provides an assessment of the project against the Strategic Planning Statement and Local Environmental Plan for the City of Canterbury Bankstown.

Canterbury Bankstown Local Strategic Planning Statement

Connective City 2036: Canterbury Bankstown Local Strategic Planning Statement (CB LSPS) is a 20-year vision and framework to guide land use planning and decision-making for the future of the Canterbury Bankstown LGA.

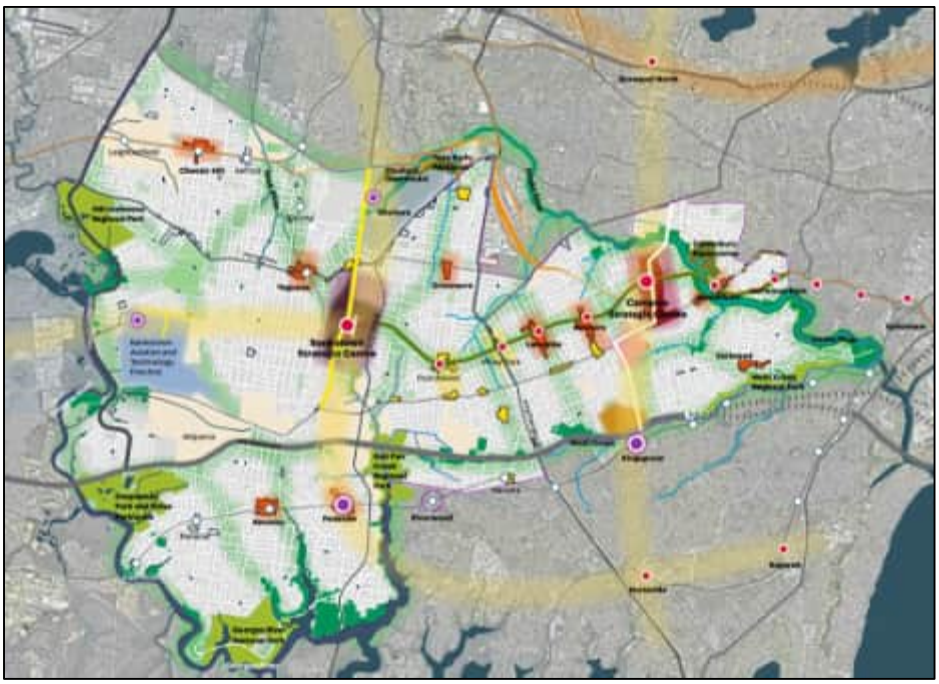


Figure 38 Strategically important sites identified by Connective City 3036

Source: Connective City 2036: Canterbury Bankstown Local Strategic Planning Statement

As illustrated in Figure 38, the Airport is identified as the Bankstown Aviation and Technology Precinct, which seeks to:

- Retain, manage and optimise assets and industrial land around the Airport
- Build on the specialised aviation, advanced manufacturing and emergency services role of the Airport.

The Project will optimise the Airport's assets by developing vacant land that has been strategically identified as suitable for commercial development, which supports the strategic importance of the Airport and provides commercial and business opportunities for the region and local communities.

The buildings within the Project will allow for a variety of shops, offices and services to meet market demands and the needs of the local community.

Canterbury-Bankstown Local Environmental Plan 2023

The Canterbury-Bankstown LEP 2023 sets out planning zones that guide the expected form of development within the zone and identifies specific designations and matters that must be considered when proposing development on land within the LGA.

Under the Canterbury-Bankstown LEP, the entire Airport site is located within the SP2 Infrastructure (Air Transport Facility) Zone. The Airport is also listed as a local heritage item (I18 Bankstown Aerodrome) for its regional strategic importance during WWII.

Figure 39 LEP Zone map

Source: NSW Planning Portal Spatial Viewer

The objectives of the SP2 Infrastructure (Air Transport Facility) Zone are to:

- Provide for infrastructure and related uses
- Prevent development that is not compatible with or that may detract from the provision of the infrastructure zone.

The Project will complement surrounding development and properties and will be in accordance with NASF guidelines, so that it will not compromise aviation operations and safety at the Airport. As such, the Project is consistent with the objectives of the SP2 Infrastructure (Air Transport Facility) Zone.

The Project site adjoins land to the east and north that is within the R2 Low Density Residential Zone. The objectives for this zone are:

- To provide for the housing needs of the community within a low-density residential environment
- To enable other land uses that provide facilities or services to meet the day-to-day needs of residents
- To allow for certain non-residential uses that are compatible with residential uses and do not adversely affect the living environment or amenity of the area
- To ensure suitable landscaping in the low density residential environment
- To minimise and manage traffic and parking impacts
- To minimise conflict between land uses within this zone and land uses within adjoining zones
- To promote a high standard of urban design and local amenity.

The scale, position, building height and composition and intended land uses of the Project will complement the residential nature of the adjoining properties with the R2 Low Density Zone.

The buildings have been set back and provided with wide landscaped buffers, green walls and a mix of finished materials to minimise impacts on non-Airport land uses.

The intended land uses fronting Birdwood Road will provide facilities and services that meet the day-to-day needs of residents within the R2 Zone.

Sufficient car parking provision will be provided so that car parking conditions on surrounding roads and car parks within the locality will not be detrimentally impacted.

The Project will deliver high-quality landscaping surrounding the site that will enhance the streetscape appearance of Birdwood Road, provide shading and amenity to users of the site and soften the visual impact of the buildings.

The Project will not have a material impact on the heritage significance of the Airport. See Section 8.6 of this MDP for further details.

10.4 Conclusion

As demonstrated above, the Project will protect and enhance the strategic importance of the Airport, provide significant opportunities for local and regional communities and be consistent with local planning policies, including complementing adjoining land uses. For these reasons, the Project is consistent with State and local planning systems.

11.0

Consultation

Aeria Management Group

11.0 Consultation

Genuine and authentic engagement and consultation with stakeholders is fundamental to AMG's management of the Airport and the delivery and success of the Project.

AMG actively and regularly engages with the community, aviation operators and other stakeholders regarding Airport operations and development. This approach and commitment to consultation applies equally to the Project. Engagement and consultation on the Project commenced in 2023 and is ongoing, including briefings and discussions with multiple stakeholder groups, community information sessions, newsletters, detailed website information and updates, community pop-up sessions and letter box drops.

To date, AMG has engaged and consulted with stakeholders about the Project for more than 12 months, including representatives of the Bankstown Airport Community Aviation Consultation Group (CACG) and Airport operators.

Additional briefings and discussions have been held with representatives of the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA), CASA, Airservices Australia, City of Canterbury Bankstown, Canterbury Bankstown Chamber of Commerce, South West Sydney Tourism Taskforce and Members of Parliament (MPs) at the State and Commonwealth levels.

AMG has also consulted directly with residents and the community, including via the letter-box drop of a newsletter about the Project and a community pop-up stall outside a local supermarket.

AMG is committed to ongoing, extensive and authentic engagement and consultation throughout the MDP process and development of the Project.

AMG is also committed to actively considering and responding to community and stakeholder feedback about the Project, including relevant and practicable measures to mitigate any potentially adverse impacts and to maximise positive impacts during the planning, construction and operational phases of the Project.

11.1 Airports Act Consultation Requirements

Section 92 of the Airports Act specifies the consultation process that must be undertaken in relation to a Draft MDP.

Specifically, the ALC must publish in a newspaper circulating within the State and on the airport's website a notice stating:

- A Preliminary Draft MDP has been prepared
- The consultation period
- Where copies of the Preliminary Draft MDP are available for inspection during this consultation period
- Where copies are available for purchase and inspection and that copies are available free of charge on the airport's website throughout the consultation period.

As part of the consultation process on the Preliminary Draft MDP, the ALC has advised the following persons of its intention to undertake an MDP:

- The Minister of the State in which the airport is situated, with responsibility for town planning or use of land
- The authority of that State with responsibility for town planning or use of land
- Each local government body with responsibility for an area surrounding the airport.

The Airports Act specifies a minimum consultation period of 60 business days after the publication of the notice. The Preliminary Draft MDP was on public exhibition for 63 business days.

11.2 Objectives of Consultation

The key objectives of AMG's consultation for the Project were to:

- Meet all statutory obligations under the Airports Act, as well as factors relating to consultation in the Aviation White Paper
- Undertake early and ongoing engagement with stakeholders, Airport operators, the GA sector and broader community that goes beyond the requirements of the Airports Act
- Provide stakeholders, Airport operators, the GA sector and broader community with accurate and consistent information about the Project
- Present information in a clear and consistent manner to ensure stakeholders, Airport operators, the GA sector and broader community have a clear understanding of the Project
- Provide stakeholders, Airport operators, the GA sector and broader community with opportunities to engage and provide feedback on the Project
- Ensure responses and feedback from stakeholders, Airport operators, the GA sector and broader community are documented, considered and, where practicable, responded to and acted upon.

All consultation on the Project has adhered to these objectives to ensure proactive, meaningful and authentic engagement with the community, Airport operators, the GA sector and other stakeholders.

11.3 Approach to Consultation

The consultation approach adopted by AMG for the Project met all statutory requirements under the Airports Act and other relevant requirements and expectations. This included relevant considerations in the Aviation White Paper, specifically the appropriateness of community consultation processes, including consultation with First Nations people.

AMG has also delivered additional activities and initiatives to ensure authentic and open engagement and to facilitate discussion, engagement and genuine consultation with all stakeholders.

Airport operators and GA sector

Engagement with Airport operators and GA representatives has been critical to the delivery and operations of new developments at the Airport in recent years. AMG's ongoing commitment to engagement and consultation is embedded in the consideration and delivery of the Project.

Consultation initiatives through the various iterations of the MDP are detailed in Tables 12-15 below.

Community Consultation

AMG is a proud and active member of the communities within which it operates and actively and regularly engages with residents and surrounding community members, community groups and other community representatives about Airport operations and developments.

In respect of the Project, such consultation has included:

- Publication of public notice in metropolitan and local newspapers
- Briefings, presentations and discussions at multiple meetings of the Bankstown Airport CACG, which has enabled community members and stakeholders to share information and feedback
- The letter-box drop of a community newsletter to residents in surrounding suburbs, to provide initial information about the Project and invite feedback
- Community pop-up information and feedback stall outside the SUPA IGA Georges Hall, adjoining the Project site.

- Briefings about the project to City of Canterbury Bankstown, State MPs and local business, tourism and retail industry groups.

Consultation with First Nations people

AMG is committed to authentic, open and respectful engagement and consultation with First Nations people, Elders and communities. In practice, this commitment includes the targets under the AMG Sustainability Framework to engage and develop partnerships with local Indigenous communities through investment and in-kind contributions and to collaborate with local Indigenous leaders and communities on the development of AMG's Reflect Reconciliation Action Plan by 2025.

In respect of the Project, such engagement included:

- Discussions with the City of Canterbury Bankstown First Peoples Advisory Committee
- Discussions with the Gandangara Local Aboriginal Land Council
- Engaging with First Nations' focused designers on the Project to potentially incorporate a Connecting to Country narrative and Indigenous knowledge and design.

Engagement and consultation activities and initiatives

Table 12 to Table 15 describe the consultation and engagement activities that have been undertaken by AMG through the various iterations of the MDP, across multiple stakeholder groups.

Pre-Exposure Draft MDP consultation and engagement

Table 12 Pre-Exposure Draft MDP consultation activities

Stakeholder	Consultation/Engagement/Communications	Platform
Airport customers, GA sector, community members, business groups, aviation regulators, DITRDCA representatives, City of Canterbury Bankstown representatives and State and Commonwealth MP representatives	Discussions, briefings and feedback on the Project at several Bankstown Airport CACG meetings – including March 2023, August 2023, December 2023, March 2024 and November 2024	In person and online
Federal Government & Regulators	Detailed briefings to DITRDCA, CASA and Airservices Australia	In person
Local Government	Detailed briefings to City of Canterbury Bankstown Executive Leadership team representatives	In person
Aviation industry	Briefings to the General Aviation Advisory Network (GAAN) and Regional Aviation Association of Australia (RAAA)	In person
General community	Publication of Project webpage on AMG website with detailed information and updates, including a contact email address and phone number	Digital

Exposure Draft MDP consultation and engagement

Table 13 Exposure Draft MDP consultation activities

Stakeholder	Consultation /Engagement/Communications	Platform
First Nations groups	Early engagement with the City of Canterbury Bankstown First Peoples Advisory Committee, Gandangara Local Aboriginal Land Council and Indigenous designers	Digital and phone
Federal Government and aviation regulators, Local Council	Provision of Exposure Draft MDP to: • DITRDCA • DCCEEW • CASA • Airservices Australia • City of Canterbury Bankstown	Digital letter and Exposure Draft MDP
Local Governament and Members of Parliament	Engagement with: • City of Canterbury Bankstown • Kylie Wilkinson MP, Member for East Hills • Jihad Dib MP, Member for Bankstown and Minister for Emergency Services	In-person meetings and briefings

Preliminary Draft MDP

Table 14 Preliminary Draft MDP consultation plan

Stakeholder	Consultation / Communications	Platform
General	Update of Project webpage on AMG website with detailed information and documents, including PDF of Preliminary Draft MDP	Digital
Community	• Publication of public notice in metropolitan and local newspapers (in English, Vietnamese and Arabic languages), including *The Sydney Morning Herald* • Copies of Preliminary Draft MDP made available online and for viewing at: - The Airport Terminal - Bankstown Library and Knowledge Centre - Panania Library and Knowledge Centre - Moorebank Library • Community newsletter letter box drop to 6,800 homes around the Airport, with Project features and details of upcoming information and feedback events • Doorknock of homes in proximity to the Project site to provide individual briefings to residents • Community pop-up information session in prominent location • Drop-in information and engagement session at the Georges Hall Community Centre • Meeting of the Bankstown Airport CACG on 17 March 2025	• Newspaper notice and digital / printed copies of Preliminary Draft MDP • Printed community newsletter • In person community pop-up session • In person community drop-in information session
Airport operators and GA sector	• Details published in AMG e-newsletter to Airport operators	• Digital newsletter

Stakeholder	Consultation / Communications	Platform
	• Information/briefing session for Airport precinct customers (aviation and non-aviation)	• In person information and feedback session
First Nations groups	Provision of Preliminary Draft MDP to: • City of Canterbury Bankstown First Peoples Advisory Committee • Gandangara Local Aboriginal Land Council Engaging with First Nations' focused designers on the Project to potentially incorporate a Connecting to Country narrative and Indigenous knowledge and design.	Digital letter and Preliminary Draft MDP, plus in-person briefings
Federal Government & Regulators	Provision of Preliminary Draft MDP and offer of further detailed briefing to: • DITRDCA • CASA • Airservices Australia	Digital letter and Preliminary Draft MDP, plus proposed in-person briefings
NSW Government	Provision of Preliminary Draft MDP and offer of detailed briefing to: • NSW Minister for Planning and Public Spaces • NSW Department of Planning & Environment • NSW Minister for Transport • NSW Minister for Western Sydney • TfNSW	Digital letter and Preliminary Draft MDP, plus proposed in-person briefings
Local Government	Provision of Preliminary Draft MDP and offer of detailed briefing to: • City of Canterbury Bankstown • Liverpool City Council • Fairfield City Council	Digital letter and Preliminary Draft MDP, plus proposed in-person briefings
Members of Parliament	Provision of Preliminary Draft MDP and offer of detailed or further briefing to: • Federal MP Jason Clare (Blaxland) • NSW MP Kylie Wilkinson (East Hills) • NSW MP Jihad Dib (Bankstown) • Mayor Bilal El Hayek (City of Canterbury Bankstown)	Digital letter and Preliminary Draft MDP, plus proposed in-person briefings
Local Education and Childcare Providers	Provision of Preliminary Draft MDP and offer of detailed or further briefing to: • Bankstown Montessori Preschool • Bankstown South Infants School • Busy Bees at Georges Hall • Georges Hall Public School • Georges River Grammar School • HopePoint Christian School • Kindy Patch Condell Park • KU Georges Hall • Learning Corner Academy at Georges Hall	Digital letter and Preliminary Draft MDP, plus proposed in-person briefings

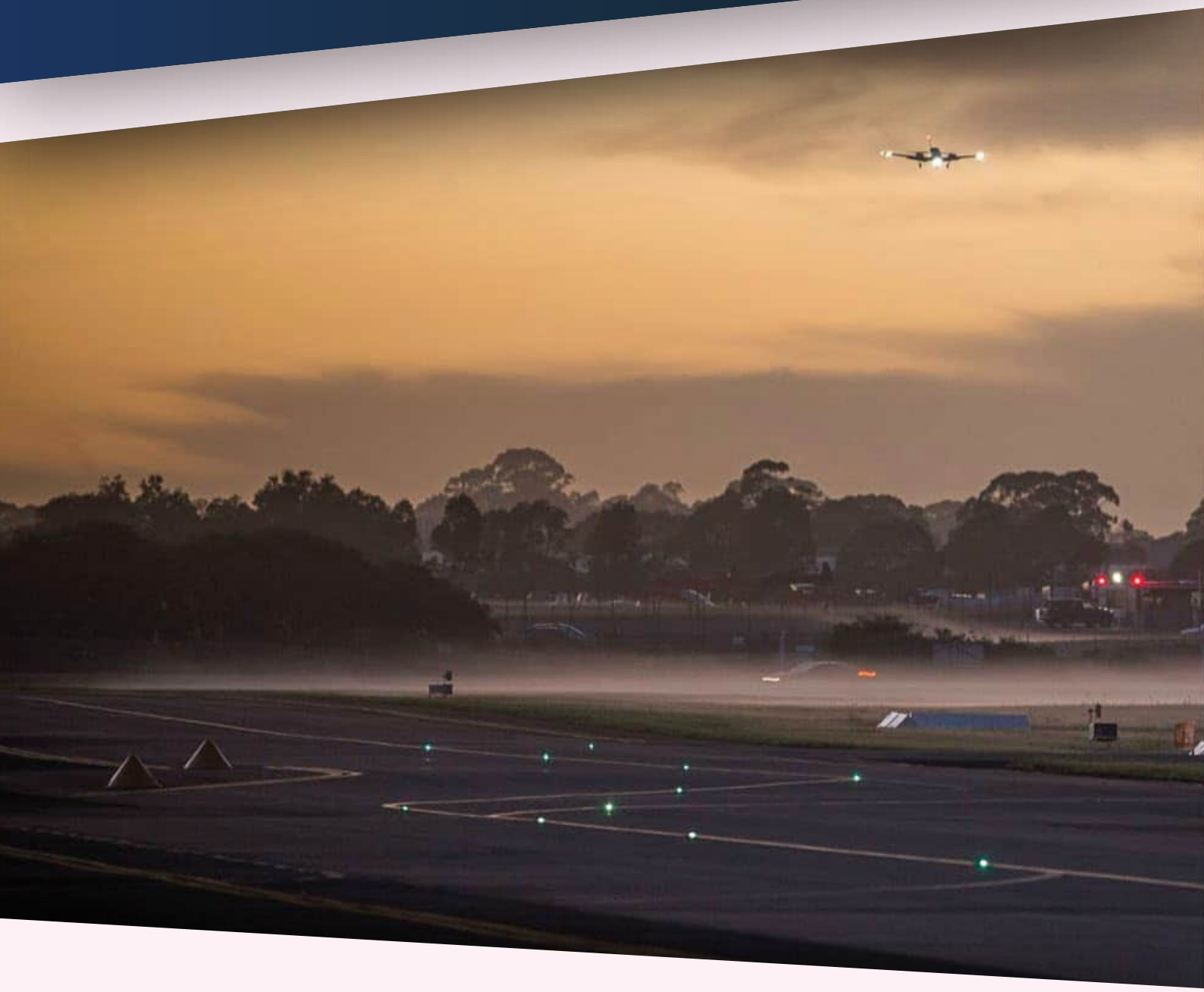
Stakeholder	Consultation / Communications	Platform
	• Little Pilots Long Day Care • Milieu Early Education and Care • St Marys Catholic Primary School • YMCA Georges Hall	
Industry and business groups	Provision of Preliminary Draft MDP and offer of detailed or further briefing to: • Canterbury Bankstown Chamber of Commerce • Business Western Sydney • Western Sydney Leadership Dialogue	Digital letter and Preliminary Draft MDP, plus proposed in-person briefings

Draft and Final MDP

Table 15 Draft and Final MDP consultation plan

Stakeholder	Consultation / Communications	Platform
General	• Updated webpage copy and information about Project and MDP process • Preparation of Supplementary Report on Preliminary Draft MDP feedback and responses	Digital
Community	Distribution of updated community newsletter, detailing feedback received to date and any related changes to Project design	Distribution of community newsletter
Federal Government and aviation regulators	Provision of Draft MDP and Supplementary Report to Department and Minister for review and approval	Digital letter and Draft MDP
Airport customers, GA sector, community members, business groups, aviation regulators, Department representatives and local, state and federal government representatives	Discussion and update at Bankstown Airport CACG meetings	In person

Appendices



Aeria Management Group

Appendix A

Consistency with Airports Act 1996

Appendix A – Consistency with the *Airports Act 1996*

Appendix A provides an overview of the Birdwood Road Mixed-Use Project MDP in relation to the relevant sections of the Airports Act – specifically Section 91 of the *Airports Act 1996*.

Section 91 of *Airports Act 1996* - Requirements		**Relevance to the Birdwood Road Mixed-Use Project MDP**
(1A)	The purpose of a major development plan in relation to an airport is to establish the details of a major airport development that:	
	a) relates to the airport; and	Executive Summary and Sections 1, 2, 3 and 4
	b) is consistent with the airport lease for the airport and the final Master Plan for the airport.	Executive Summary, Sections 1.1 and 9 (Assessment against the Airport Master Plan)
(1)	A major development plan, or a draft of such a plan, must set out:	
	a) the airport lessee company's objectives for the development; and	Section 3.2
	b) future needs of civil aviation users of the airport, and other users of the airport, will be met by the development; and	Section 3
	c) a detailed outline of the development; and	Section 4
	ca) whether or not the development is consistent with the airport lease for the airport; and	Executive Summary and Section 1.1
	d) if a final Master Plan for the airport is in force, whether or not the development is consistent with the final Master Plan; and	Section 9 (Assessment against the Airport Master Plan)
	e) if the development could affect noise exposure levels at the airport, the effect that the development would be likely to have on those levels; and	Sections 6 and 8.5
	ea) if the development could affect flight paths at the airport, the effect that the development would be likely to have on those flight paths; and	Executive Summary Sections 6.0
	f) the airport lessee company's plans developed following consultations with the airlines that use the airport, local government bodies in the vicinity of the airport and – if the airport is a joint user airport – the Defence Department for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant Australian noise exposure forecast (ANEF) levels; and	Sections 6 and 12
	g) an outline of the approvals that the airport lessee company, or any other person, has sought, is seeking, or proposes to seek under Division 5 or Part 12 in respect of elements of the development; and	Division 5 – Sections 1, 2 and 3 Part 12 – Sections 6
(1)	ga) the likely effect of the proposed developments that are set out in the major development plan, or the draft of the major development plan, on:	N/A The Project site is not within or near to an area of the Airport that is subject to a Major Development Plan.
	i) traffic flows at the airport and surrounding the airport; and	Section 7
	ii) employment levels at the airport; and	See Section 3
	iii) the local and regional economy and community, including an analysis of how the proposed developments fit within the local planning schemes for commercial and retail development in the adjacent area; and	See Sections 3
	h) the airport lessee company's assessment of the environmental impacts that might	Section 8

Appendix A – Consistency with the *Airports Act 1996*

Section 91 of *Airports Act 1996* - Requirements		Relevance to the Birdwood Road Mixed-Use Project MDP
	reasonably be expected to be associated with the development; and	
	j) the airport lessee company's plans for dealing with the environmental impacts mentioned in paragraph (h) (including plans for ameliorating or preventing environmental impacts); and	Section 8
	k) if the plan relates to a sensitive development, the exceptional circumstances that the airport lessee company claims will justify the development of the sensitive development at the airport; and	Not applicable
	l) such other matters (if any) as are specified in the regulations.	None
(2)	Paragraphs (1)(a) to (k) (inclusive) do not, by implication, limit paragraph (1)(l).	Noted
(3)	The regulations may provide that, in specifying a particular objective, assessment, outline or other matter covered by Subsection (1), a major development plan, or a draft of such a plan, must address such things as are specified in the regulations.	Noted
(4)	In specifying a particular objective or proposal covered by paragraph (1)(a), (c) or (ga), a major development plan, or a draft of a major development plan, must address: a) the extent (if any) of consistency with planning schemes in force under a law of the state in which the airport is located; and b) if the major development plan is not consistent with those planning schemes, the justification for the inconsistencies.	Section 10 Not applicable
(5)	Subsection (4) does not, by implication, limit Subsection (3).	Noted
(6)	In developing plans referred to in Paragraph (l)(f), an airport lessee company must have regard *to Australian Standard AS 2021-2000 (Acoustics – Aircraft noise intrusion – Building Siting and Construction)* as in force or existing at that time.	Section 6 and 8.4
(7)	Subsection (6) does not, by implication, limit the matters to which regard may be had.	Noted

Appendix A – Consistency with the *Airports Act 1996*

Major Airport Development triggers (Section 89(1) of the *Airports Act 1996*)		**Relevance to the Birdwood Road Mixed-Use Project MDP Elements**
(a)	Constructing a new runway	Not applicable
(b)	Extending the length of a runway	Not applicable
(ba)	Altering a runway (other than in the course of maintenance works) in any way that significantly changes: i. flight paths; or ii. the patterns or levels of aircraft noise	Not applicable
(c)	Constructing a new building wholly or principally for use as a passenger terminal, where the building's gross floor space is greater than 500 square metres	Not applicable
(d)	Extending a building that is wholly or principally for use as a passenger terminal, where the extension increases the building's gross floor space by more than 10%	Not applicable
(e)	Constructing a new building, where: i. the building is not wholly or principally for use as a passenger terminal; and ii. the cost of construction exceeds $25 million or such higher amount as is prescribed	Yes – the development costs for the Link Road Mixed Use Project is exceeds $25 million.
(f)	Constructing a new taxiway, where: i. the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and ii. the cost of construction exceeds $20 million or such higher amount as is prescribed	Not applicable
(g)	Extending a taxiway, where: i. the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and ii. the cost of construction exceeds $20 million or such higher amount as is prescribed	Not applicable
(h)	Constructing a new road or new vehicular access facility, where: i. the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and ii. the cost of construction exceeds $20 million or such higher amount as is prescribed	Not applicable
(j)	Extending a road or vehicular access facility, where: i. the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and ii. the cost of construction exceeds $20 million or such higher amount as is prescribed	Not applicable
(k)	Constructing a new railway or new rail handling facility, where: i. the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft ii. the cost of construction exceeds $20 million or such higher amount as is prescribed	Not applicable

Appendix A – Consistency with the *Airports Act 1996*

Major Airport Development triggers **(Section 89(1) of the *Airports Act 1996*)**		**Relevance to the Birdwood Road Mixed-Use Project MDP Elements**
(l)	Extending a railway or rail handling facility, where: i. the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and ii. the cost of construction exceeds $20 million or such higher amount as is prescribed	Not applicable
(m)	A development of a kind that is likely to have significant environmental or ecological impact	The Project will not have any significant environmental or ecological impact
(n)	A development which affects an area identified as environmentally significant in the environment strategy	The Project is not located within an area which is identified as environmentally significant
(na)	A development of a kind that is likely to have a significant impact on the local or regional community	The Project is not likely to have a significant impact on the local and regional community, as specified in Sections 3, 4, 5, 6, 7, and 8.
(nb)	A development in relation to which the Minister has given an approval under section 89A	Not applicable
(o)	A development of a kind specified in the regulations	Not applicable

Appendix B

Architectural Plans

SBA ARCHITECTS
Commercial Industrial Residential Retail Interior Design
Phone: 02 9129 9188 Web: www.sbaarch.com.au

#	DESCRIPTION	DATE
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR REVIEW	23/10/24

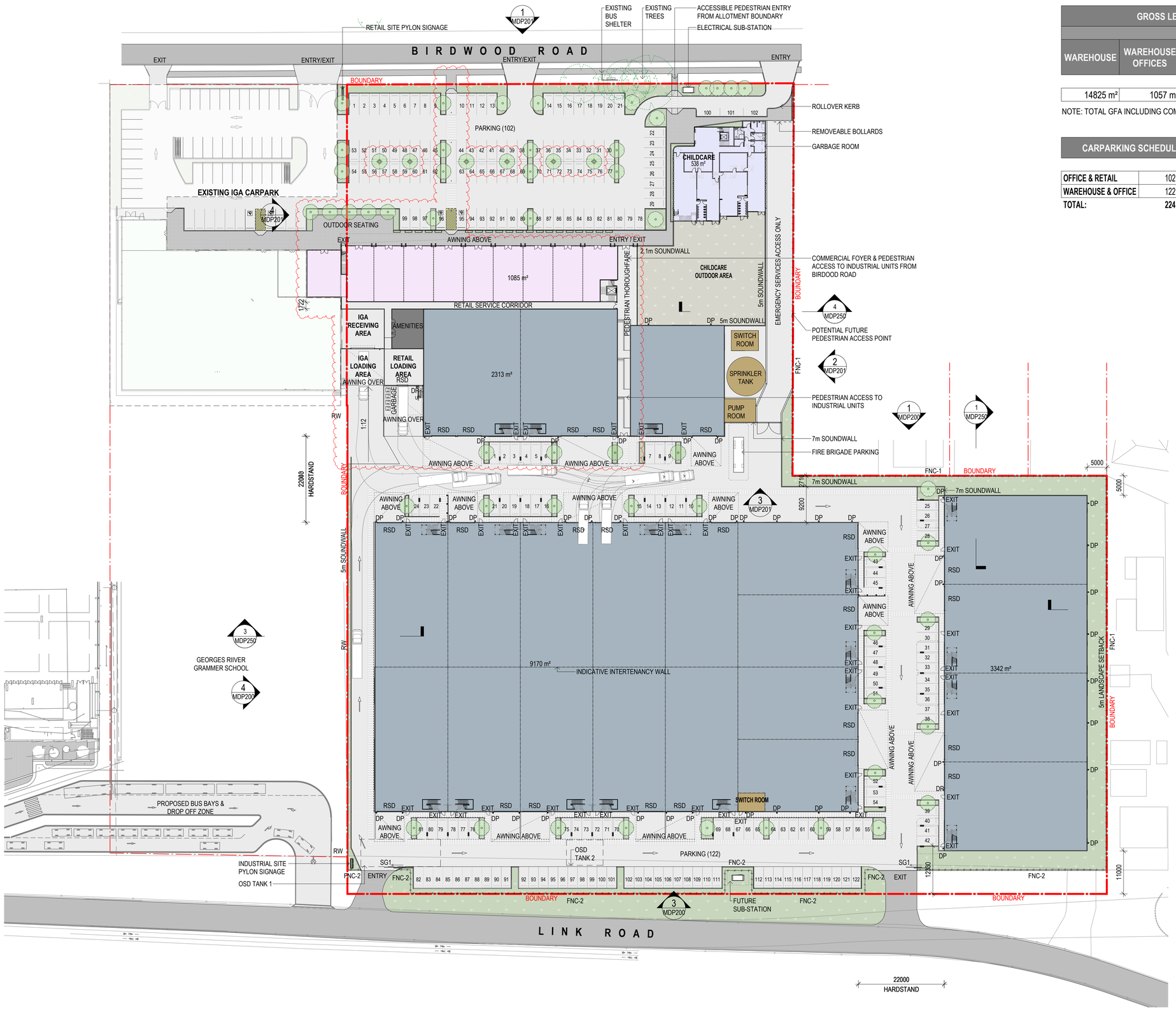
LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

NORTH

TITLE
SITE ANALYSIS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
05/11/24	1:500 @ A1 1:1000 @ A3	22249	MDP005	B



GROSS LETTABLE AREA SUMMARY

TYPE					
WAREHOUSE	WAREHOUSE OFFICES	OFFICES ABOVE RETAIL	RETAIL	CHILDCARE	TOTAL AREA
14825 m²	1057 m²	975 m²	1085 m²	743 m²	18685 m²

NOTE: TOTAL GFA INCLUDING COMMON AREAS = 19,667 m2

CARPARKING SCHEDULE

OFFICE & RETAIL	102
WAREHOUSE & OFFICE	122
TOTAL:	224

GENERAL NOTE:

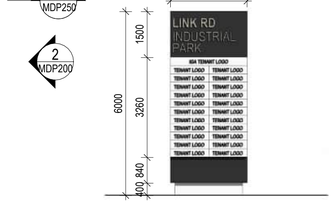
- SITE BOUNDARY
- LANDSCAPE SETBACK
- FNC-1, CHAINWIRE FENCING 2100mm HIGH
- FNC-2, PALISADE FENCING 2100mm HIGH
- INDUSTRIAL GUARD RAIL SAFETY BARRIER
- RW — RETAINING WALL
- HR — HANDRAIL TO BCA COMPLIANCE
- PG — PEDESTRIAN GATE
- SG1 — SLIDING GATE
- GM — GATE SWING - MANUAL

LANDSCAPE LEGEND

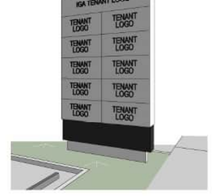
- LANDSCAPED AREA
- CHILDCARE OUTDOOR AREA

AREA LEGEND

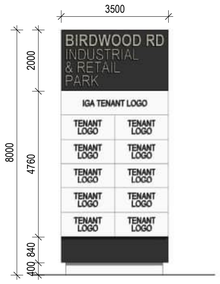
- AMENITIES AREA
- CHILDCARE AREA
- WAREHOUSE OFFICE AREA
- OFFICES ABOVE RETAIL AREA
- RETAIL AREA
- WAREHOUSE AREA



SIGNAGE ELEVATION - LINK ROAD



1 PYLON SIGNAGE 3D



SIGNAGE ELEVATION - BIRDWOOD ROAD

TYPICAL ELEVATION

SBA ARCHITECTS
Commercial Industrial Residential Retail Interior Design
Phone: 02 9929 9988 Web: www.sbaarch.com.au

G	UPDATED MDP ISSUE Retail carpark revised IGA loading area revised & shop added Retail building revised to improve pedestrian connectivity	13/06/25
F	POSSIBLE LINK RD CONNECTION REMOVED	11/11/24
E	ISSUE FOR MDP APPROVAL	05/11/24
D	ISSUE FOR REVIEW	28/10/24
#	DESCRIPTION	DATE

LINK ROAD MIXED USE PRECINCT

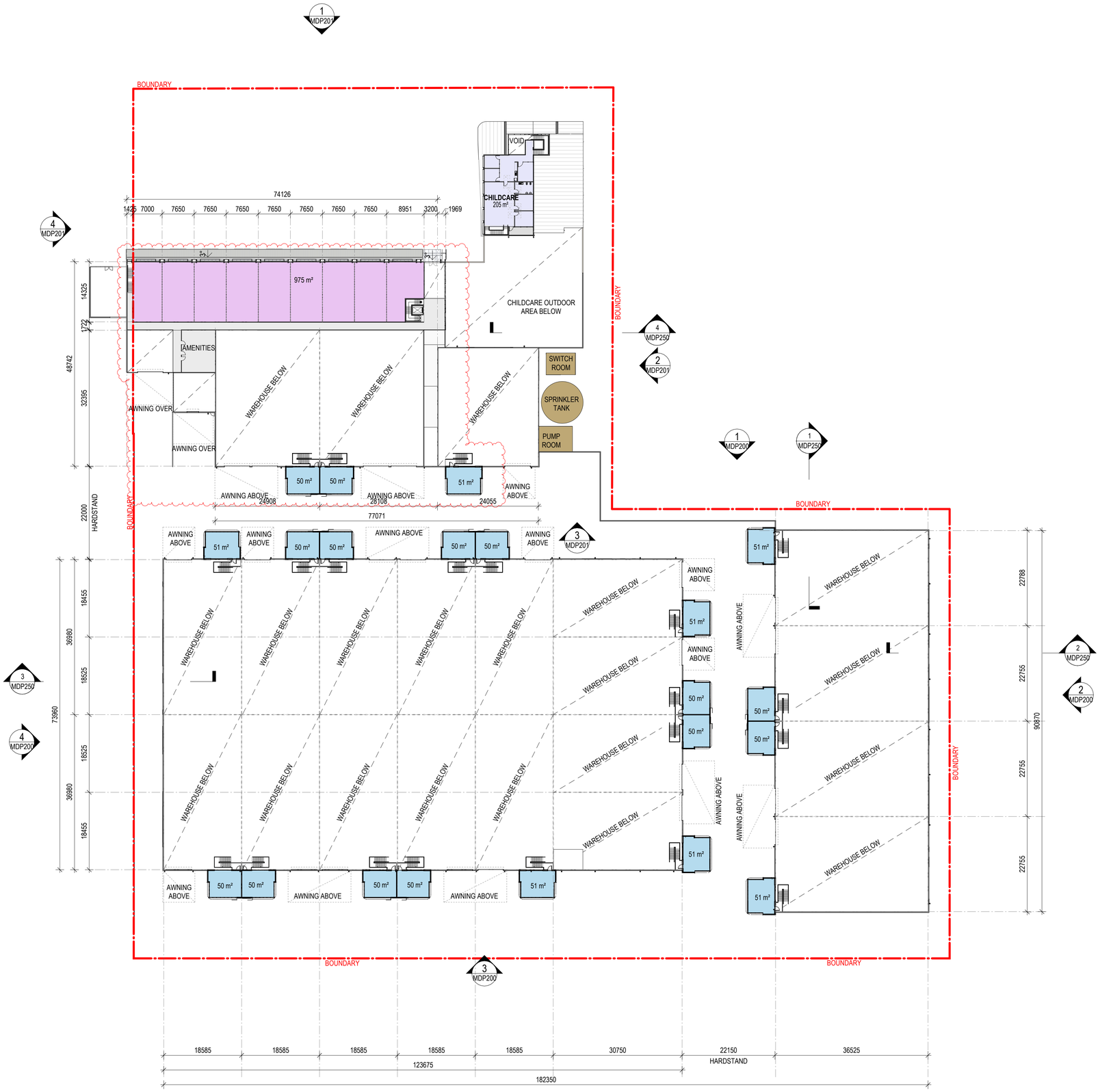
LINK ROAD, BANKSTOWN AIRPORT, NSW

NORTH

TITLE

SITE GROUND FLOOR PLAN

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25	1:500 @ A1 1:1000 @ A3	22249	MDP100	G



GENERAL NOTE:

- SITE BOUNDARY
- LANDSCAPE SETBACK
- FNC-1, CHAINWIRE FENCING 2100mm HIGH
- FNC-2, PALISADE FENCING 2100mm HIGH
- INDUSTRIAL GUARD RAIL SAFETY BARRIER
- RW — RETAINING WALL
- HR — HANDRAIL TO BCA COMPLIANCE
- PG — PEDESTRIAN GATE
- SG1 — SLIDING GATE
- GM — GATE SWING - MANUAL

LANDSCAPE LEGEND

- LANDSCAPED AREA
- CHILDCARE OUTDOOR AREA

AREA LEGEND

- AMENITIES AREA
- CHILDCARE AREA
- WAREHOUSE OFFICE AREA
- OFFICES ABOVE RETAIL AREA
- RETAIL AREA
- WAREHOUSE AREA

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E	UPDATED MDP ISSUE IGA loading area revised & shop added Retail building revised to improve pedestrian connectivity	13/06/25
D	POSSIBLE LINK RD CONNECTION REMOVED	11/11/24
C	ISSUE FOR MDP APPROVAL	05/11/24
B	ISSUE FOR REVIEW	28/10/24
A	ISSUE FOR INFORMATION	16/07/24
#	DESCRIPTION	DATE

LINK ROAD MIXED USE PRECINCT

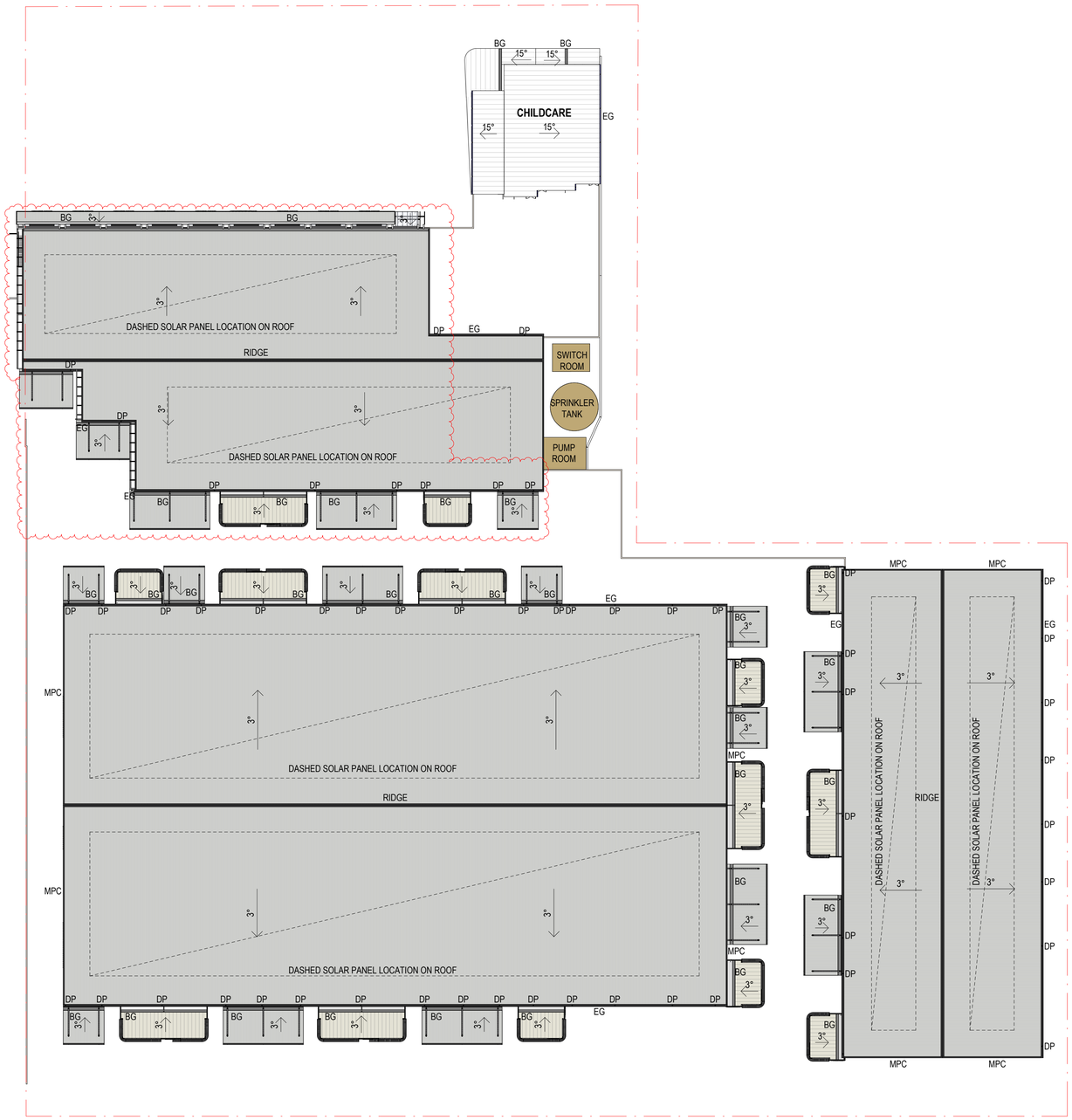
LINK ROAD, BANKSTOWN AIRPORT, NSW

NORTH

TITLE

LEVEL 1 FLOOR PLAN

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25	1:500 @ A1 1:1000 @ A3	22249	MDP101	E



GENERAL NOTE:

- SITE BOUNDARY
- LANDSCAPE SETBACK
- FNC-1, CHAINWIRE FENCING 2100mm HIGH
- FNC-2, PALISADE FENCING 2100mm HIGH
- INDUSTRIAL GUARD RAIL SAFETY BARRIER
- RW — RETAINING WALL
- HR — HANDRAIL TO BCA COMPLIANCE
- PG — PEDESTRIAN GATE
- SG1 — SLIDING GATE
- GM — GATE SWING - MANUAL

LEGEND

MPC	METAL PARAPET CAPPING - PREFINISHED
BG	BOX GUTTER
EG	EAVES GUTTER
MDR	METAL ROOF SHEETING
TRS	TRANSLUCENT SHEETING
SP	SOLAR PANELS
EJ	EXPANSION JOINT
MP	INDICATIVE LOCATION OF MECHANICAL PLANT ON ROOF

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#	DESCRIPTION	DATE
D	UPDATED MDP ISSUE IGA loading area revised & shop added Retail building revised to improve pedestrian connectivity	13/06/25
C	ISSUE FOR MDP APPROVAL	05/11/24
B	ISSUE FOR REVIEW	23/10/24
A	ISSUE FOR INFORMATION	18/07/24

LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

NORTH

TITLE
ROOF PLAN

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25		22249	MDP115	D

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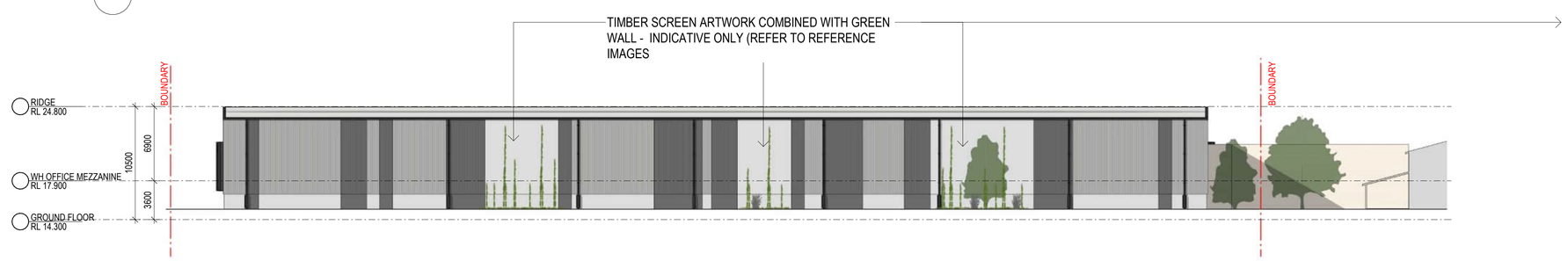
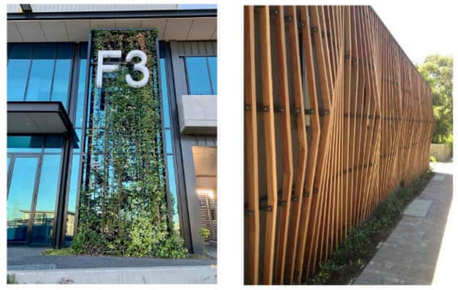
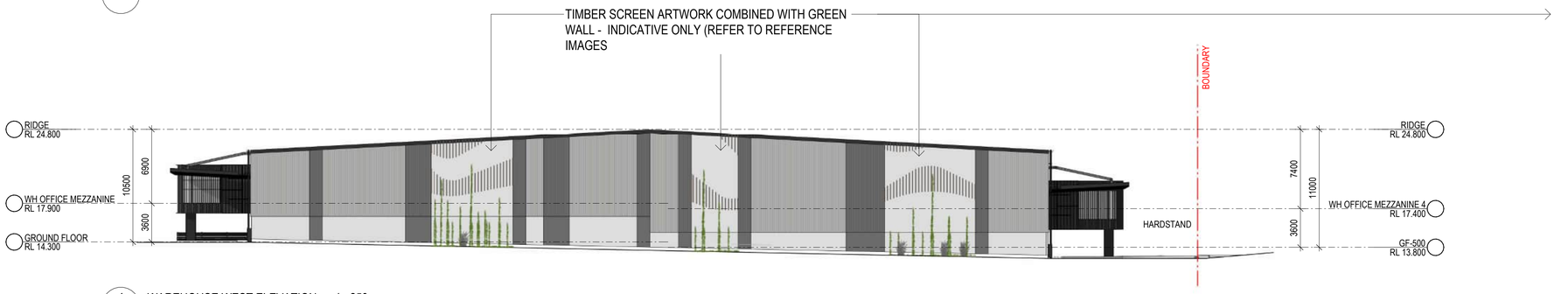
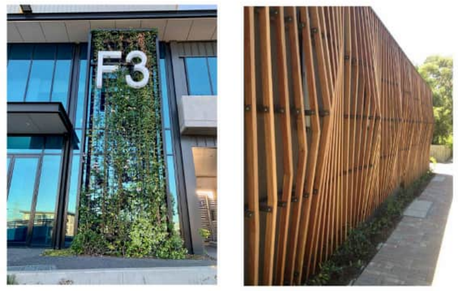




2 WAREHOUSE EAST ELEVATION 1 : 250

3 WAREHOUSE SOUTH ELEVATION 1 : 250





4 WAREHOUSE WEST ELEVATION 1 : 250

INDICATIVE EXTERNAL FINISHES *FINISHES SUBJECT TO AUTHORITY AND CLIENT APPROVAL*

1. TIMBER BATTEN SCREENING
2. METAL PROFILE CLADDING - TRIMDEK-COLORBOND BASALT
3. METAL PROFILE CLADDING - TRIMDEK - COLORBOND SHALE GREY
4. METAL DECK ROOFING - ZINCALUME - COLORBOND SURFMIST
5. PRECAST CONCRETE PANEL - PAINT FINISH COLORBOND BASALT
6. PRECAST CONCRETE PANEL - NATURAL FINISH
7. EXPANDED METAL MESH SCREEN - PAINT FINISH TO MATCH COLORBOND MONUMENT
8. ROLLER SHUTTER DOOR - PAINT FINISH TO MATCH COLORBOND BASLAT
9. GLAZING PANEL - LIGHT GREY TINT
10. SPANDREL PANEL - FINISH TO MATCH COLORBOND MONUMENT
11. ALUMINIUM WINDOW FRAMES - POWDERCOAT FINISH BLACK
12. DOWNPIPES, FASCIA & GUTTERS - POWDERCOAT FINISH TO MATCH COLORBOND MONUMENT
13. MASONRY BRICK WALL - BLONDE COLOUR
14. CHILDCARE ARTWORK WALL
15. METAL PROFILE CLADDING - KLIPLOK 700 - COLORBOND MONUMENT
16. MASONRY BRICK WALL - DARK COLOUR

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#	DESCRIPTION	DATE
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR INFORMATION	18/07/24

LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE
WAREHOUSE ELEVATIONS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
05/11/24	1:250 @ A1 1:500 @ A3	22249	MDP200	B

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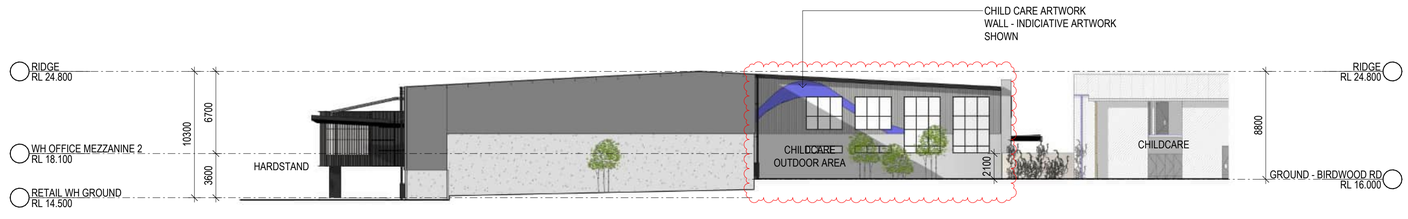
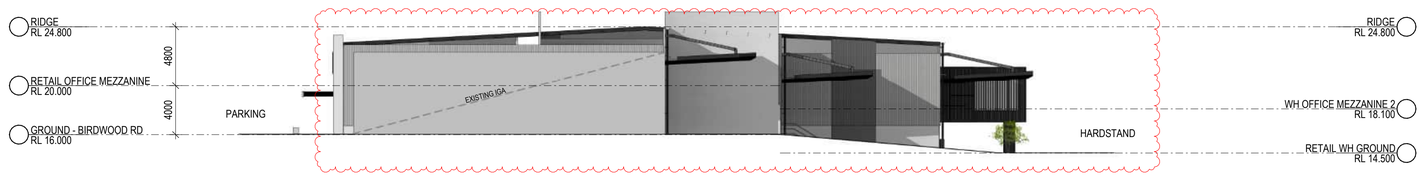


2 RETAIL EAST ELEVATION 1 : 250

3 RETAIL SOUTH ELEVATION 1 : 250



4 RETAIL WEST ELEVATION 1 : 250

INDICATIVE EXTERNAL FINISHES *FINISHES SUBJECT TO AUTHORITY AND CLIENT APPROVAL*

1. TIMBER BATTEN SCREENING
2. METAL PROFILE CLADDING - TRIMDEK-COLORBOND BASALT
3. METAL PROFILE CLADDING - TRIMDEK - COLORBOND SHALE GREY
4. METAL DECK ROOFING - ZINCALUME - COLORBOND SURFMIST
5. PRECAST CONCRETE PANEL - PAINT FINISH COLORBOND BASALT
6. PRECAST CONCRETE PANEL - NATURAL FINISH
7. EXPANDED METAL MESH SCREEN - PAINT FINISH TO MATCH COLORBOND MONUMENT
8. ROLLER SHUTTER DOOR - PAINT FINISH TO MATCH COLORBOND BASLAT
9. GLAZING PANEL - LIGHT GREY TINT
10. SPANDREL PANEL - FINISH TO MATCH COLORBOND MONUMENT
11. ALUMINIUM WINDOW FRAMES - POWDERCOAT FINISH BLACK
12. DOWNPIPES, FASCIA & GUTTERS - POWDERCOAT FINISH TO MATCH COLORBOND MONUMENT
13. MASONRY BRICK WALL - BLONDE COLOUR
14. CHILDCARE ARTWORK WALL
15. METAL PROFILE CLADDING - KLIPLOK 700 - COLORBOND MONUMENT
16. MASONRY BRICK WALL - DARK COLOUR

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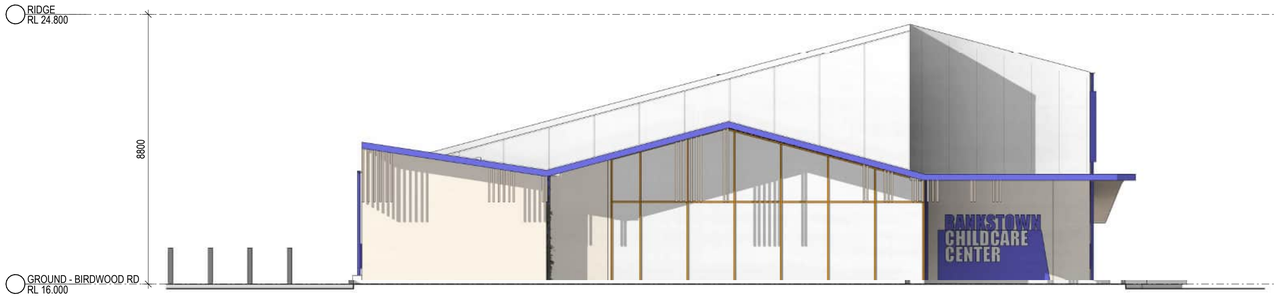
#	DESCRIPTION	DATE
D	UPDATED MDP ISSUE IGA loading area revised & shop added Retail building revised to improve pedestrian connectivity	13/06/25
C	ISSUE FOR MDP APPROVAL	05/11/24
B	ISSUE FOR REVIEW	28/10/24
A	ISSUE FOR INFORMATION	18/07/24

LINK ROAD MIXED USE PRECINCT

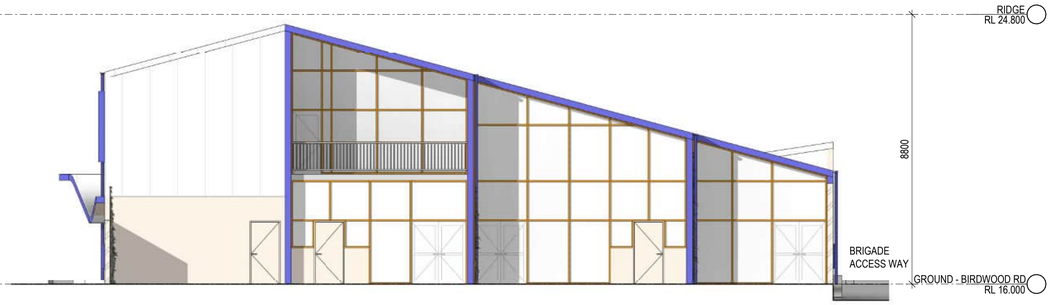
LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE
WAREHOUSE & RETAIL ELEVATIONS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25	1:250 @ A1 1:500 @ A3	22249	MDP201	D



1 CHILDCARE NORTH ELEVATION 1 : 100



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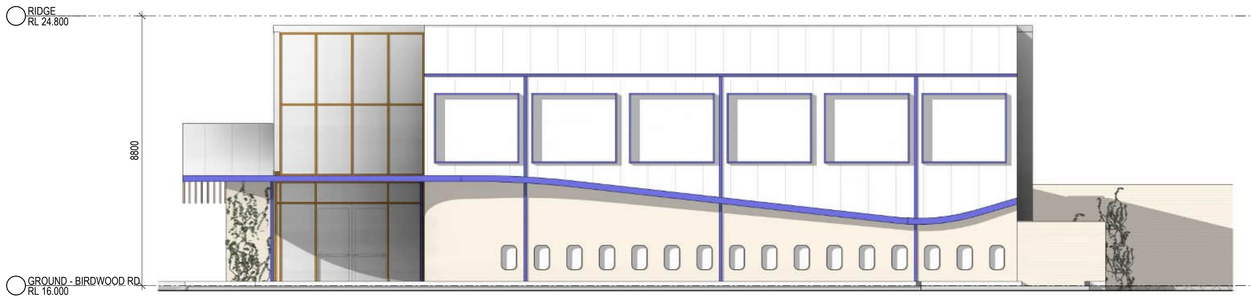

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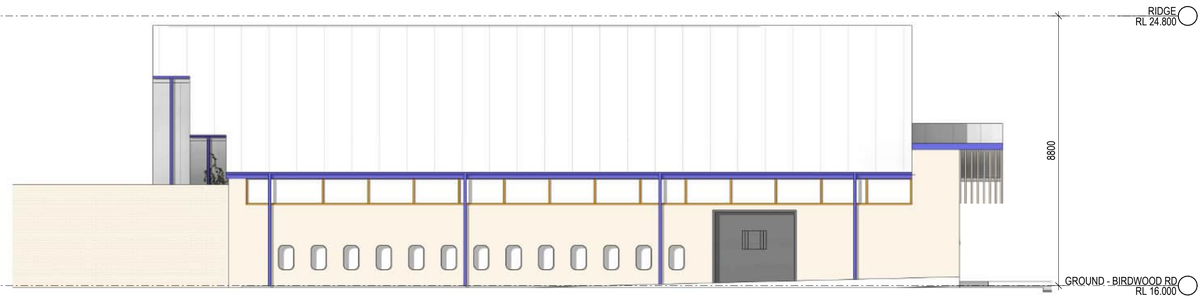

4 CHILDCARE EAST ELEVATION 1 : 100

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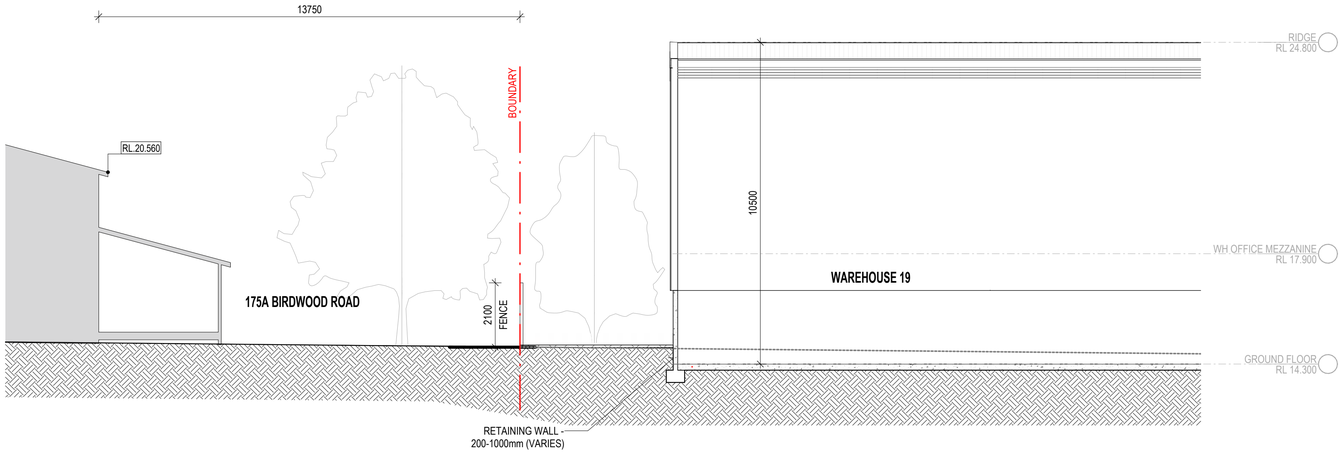
#	DESCRIPTION	DATE
C	ISSUE FOR MDP APPROVAL	05/11/24
B	ISSUE FOR REVIEW	28/10/24
A	ISSUE FOR INFORMATION	16/07/24

LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE
CHILD CARE ELEVATIONS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
05/11/24	1:100 @ A1 1:200 @ A3	22249	MDP202	C



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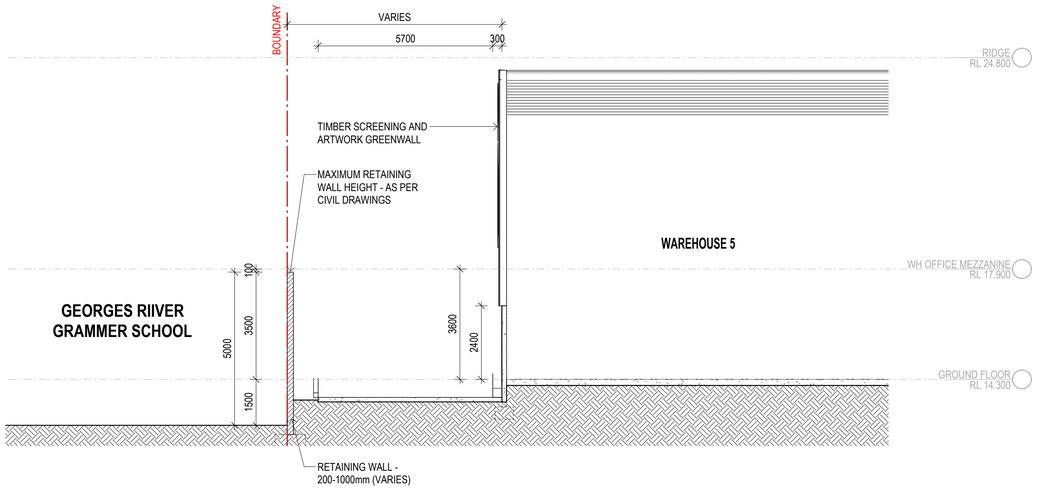

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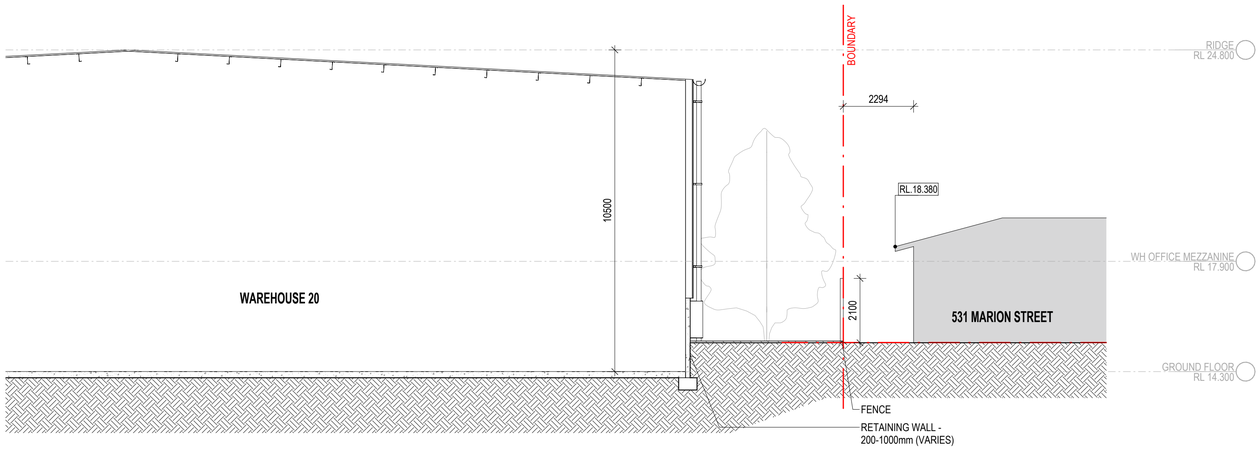

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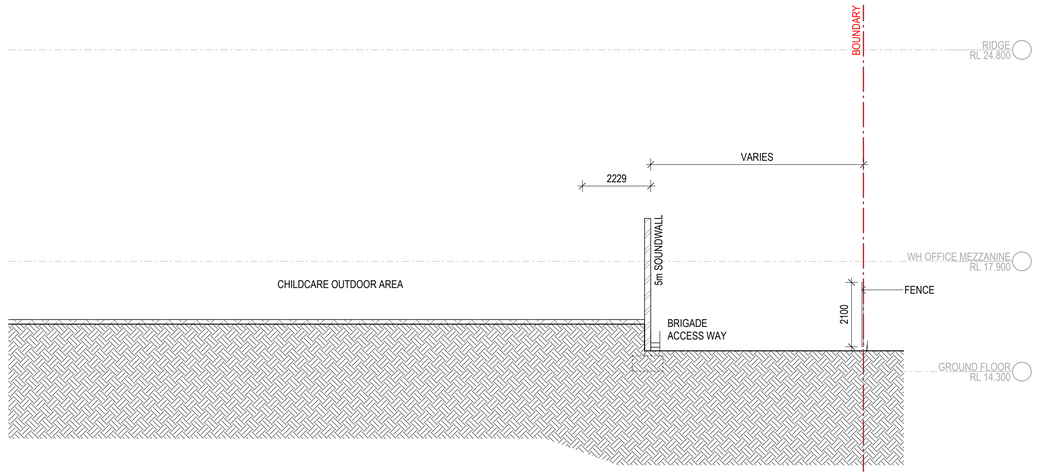

4 RESIDENTIAL INTERFACE - SECTION 4 1 : 100

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#	DESCRIPTION	DATE
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR INFORMATION	18/07/24

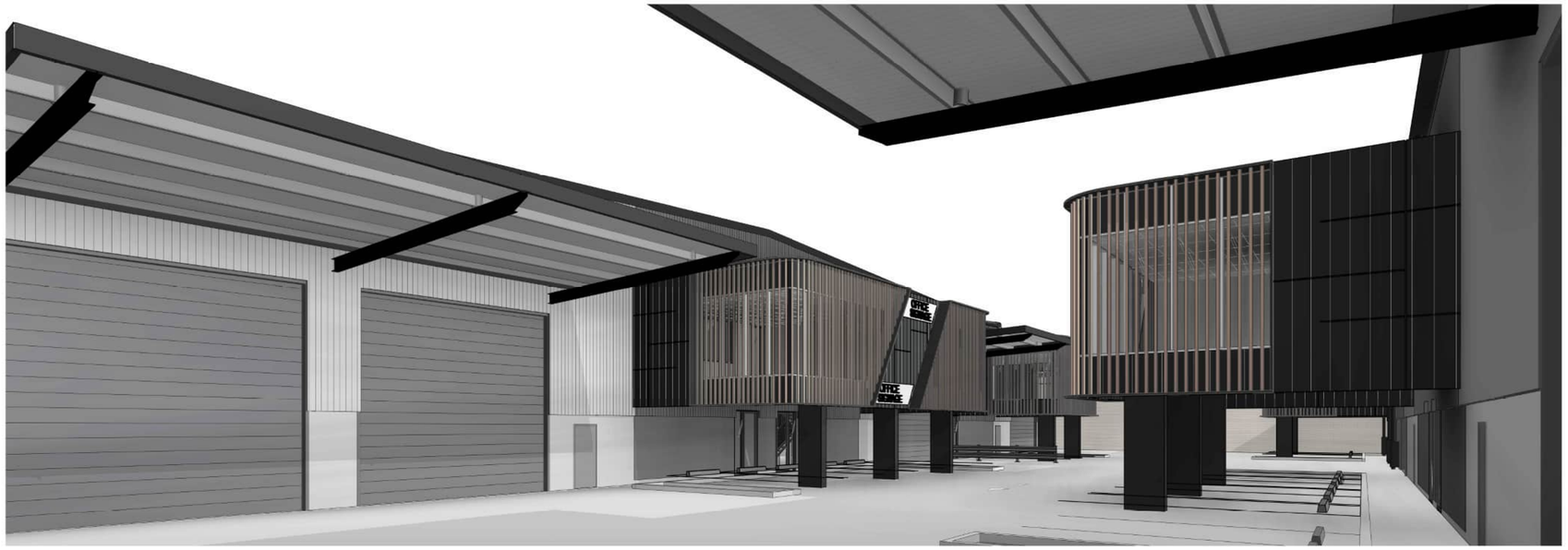
LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE
RESIDENTIAL INTERFACE - SECTIONS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
05/11/24	1:100 @ A1 1:200 @ A3	22249	MDP250	B

1 WAREHOUSE PERSPECTIVE 1



2 WAREHOUSE PERSPECTIVE 2

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#	DESCRIPTION	DATE
C	UPDATED MDP ISSUE	13/06/25
	Retail building revised to improve pedestrian connectivity	
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR INFORMATION	18/07/24

LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE

WAREHOUSE PERSPECTIVES

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25	NOT TO SCALE	22249	MDP500	C

1 RETAIL PERSPECTIVE 1

2 RETAIL PERSPECTIVE 2

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#	DESCRIPTION	DATE
C	UPDATED MDP ISSUE Retail carpark revised Retail building revised to improve pedestrian connectivity	13/06/25
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR INFORMATION	18/07/24

LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE

RETAIL PERSPECTIVES

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25	NOT TO SCALE	22249	MDP501	C

1 CHILDCARE PERSPECTIVE 1

2 CHILDCARE PERSPECTIVE 2

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#	DESCRIPTION	DATE
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR INFORMATION	18/07/24

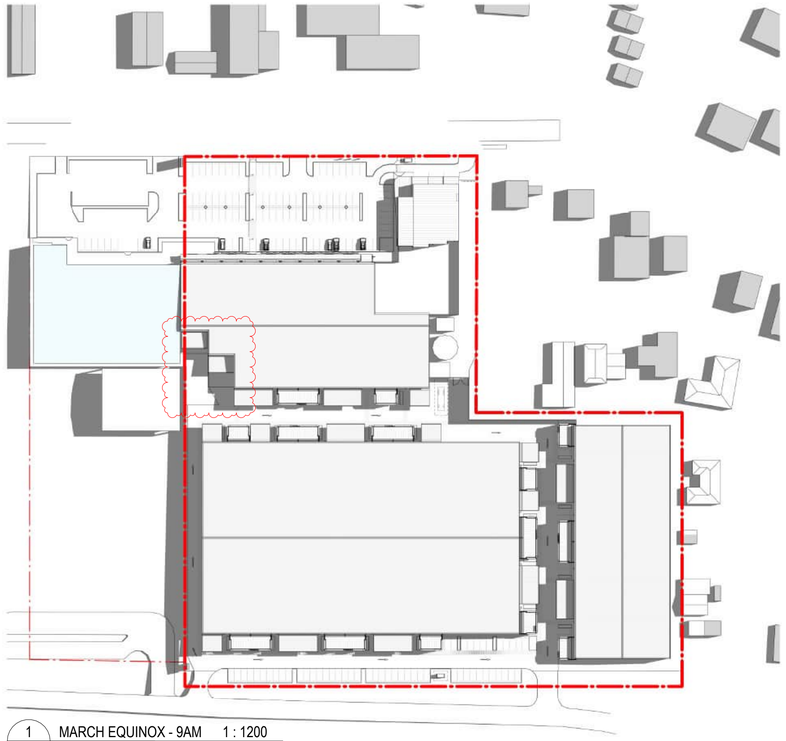
LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

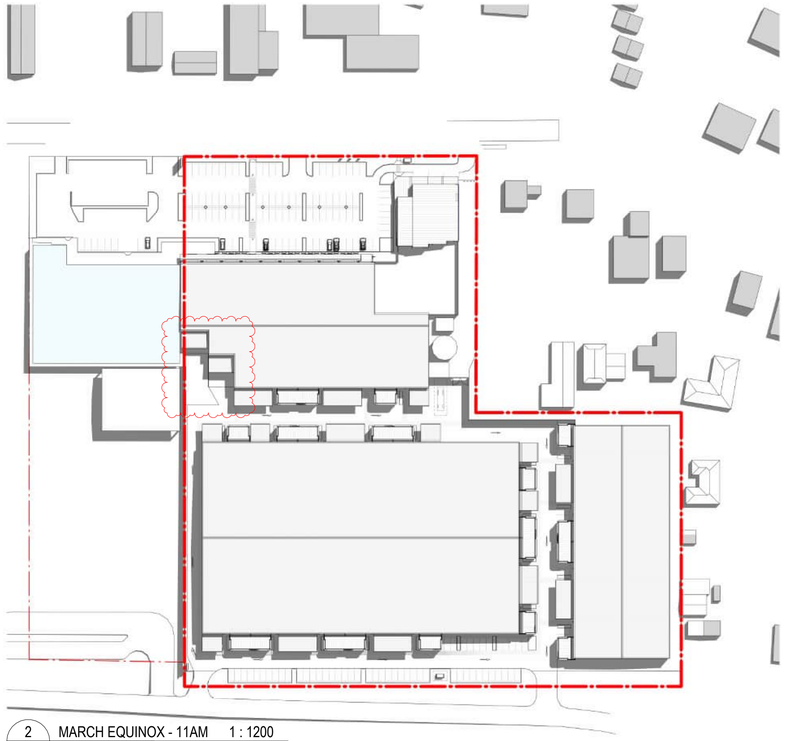
TITLE

CHILD CARE 3D PERSPECTIVES

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
05/11/24	NOT TO SCALE	22249	MDP502	B



1 MARCH EQUINOX - 9AM 1 : 1200



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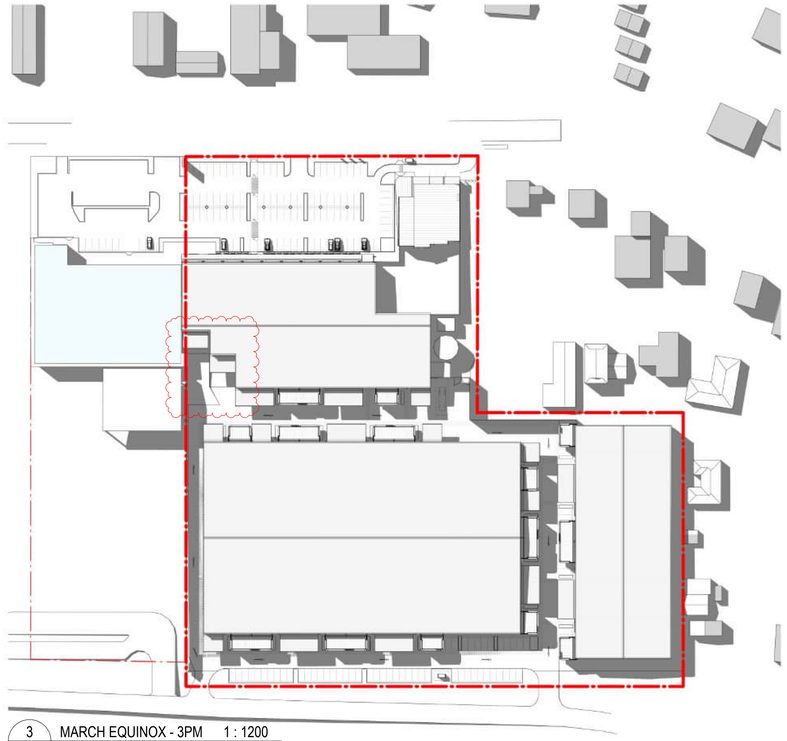
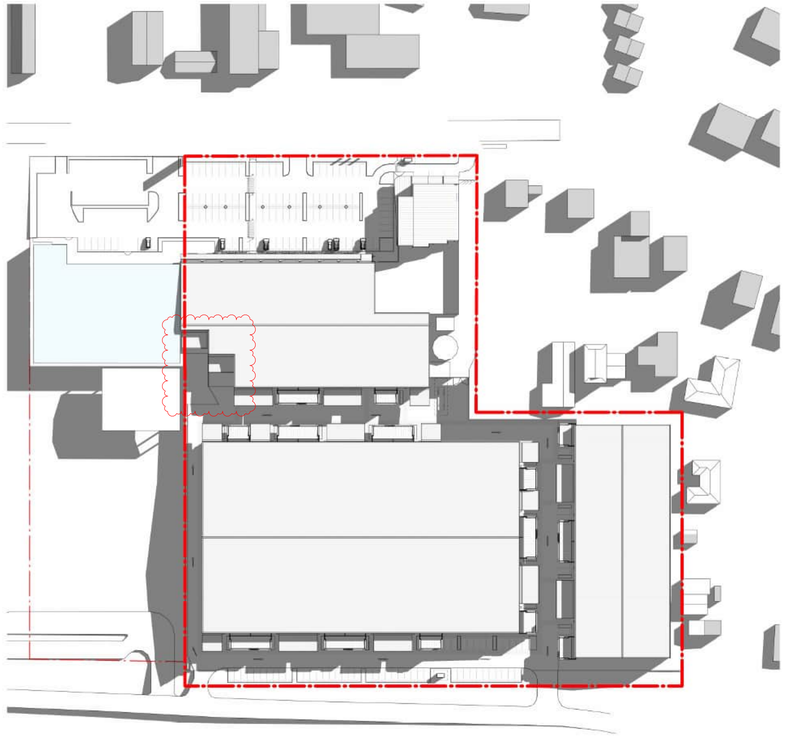
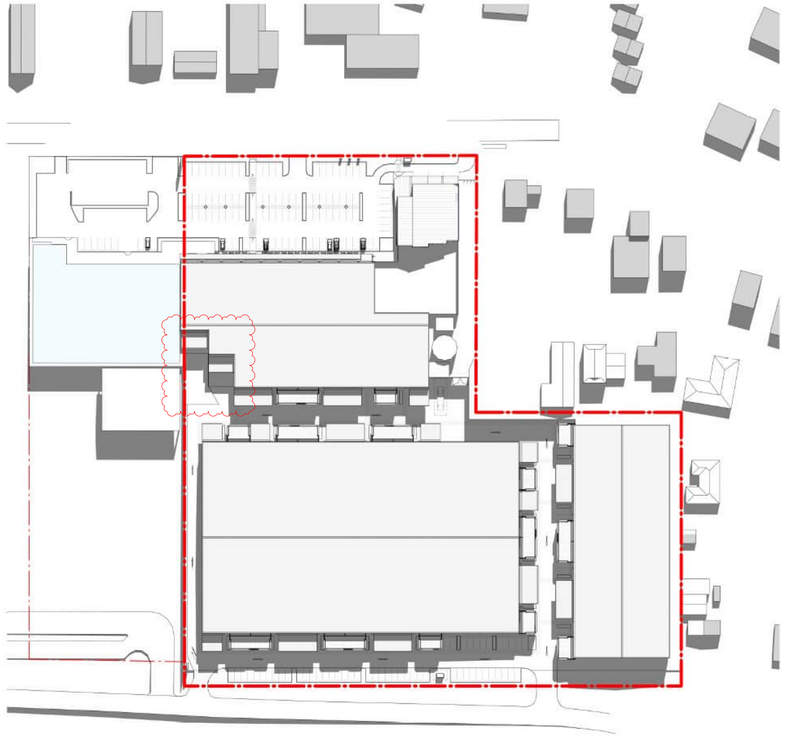


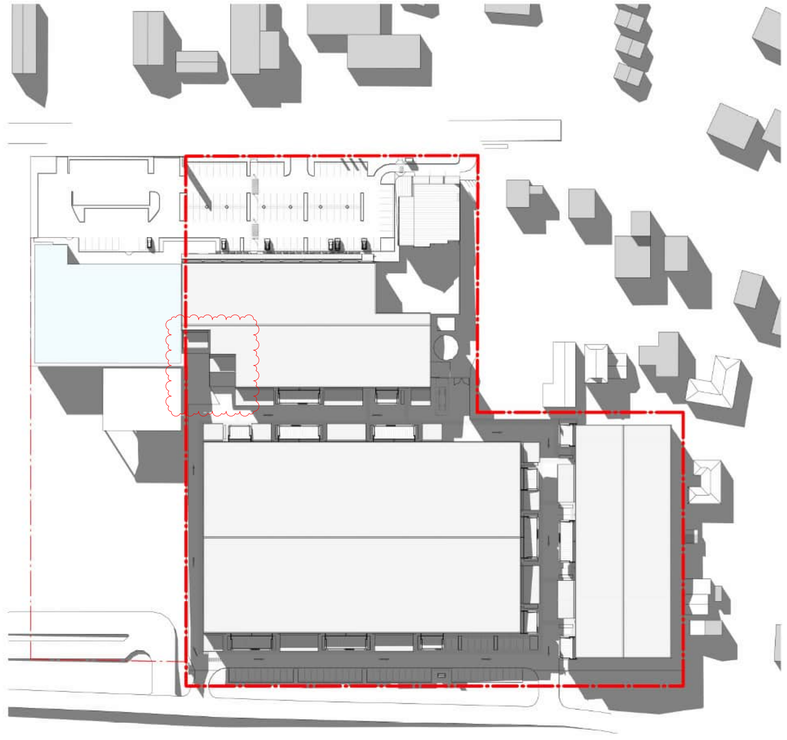
3 MARCH EQUINOX - 3PM 1 : 1200



4 WINTER SOLSTICE - 9AM 1 : 1200



5 WINTER SOLSTICE - 12PM 1 : 1200



6 WINTER SOLSTICE - 3PM 1 : 1200

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C	UPDATED MDP ISSUE IGA loading area revised & shop added Retail building revised to improve pedestrian connectivity	13/06/25
B	ISSUE FOR MDP APPROVAL	05/11/24
A	ISSUE FOR INFORMATION	18/07/24
#	DESCRIPTION	DATE

LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE

SHADOW DIAGRAMS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
13/06/25	NOT TO SCALE	22249	MDP600	C

Appendix C

Transport Impact Assessment

Bankstown Airport - Link Road Mixed Use Precinct

Transport Impact Assessment

Prepared for: Forge Venture Management

Ref: 301351384 | Date: 7 November 2024

Revision

Revision	Date	Comment	Prepared By	Approved By
A-Dr	1 December 2023	Draft	Patrick Obmasca/ Sabal Sharma	Bayzid Khan
A	7 November 2024	Final	Helen Aberra	Bayzid Khan

Bayzid Khan

For and on behalf of

Stantec Australia Pty Ltd

L9, The Forum, 203 Pacific Highway, St Leonards NSW 2065

Acknowledgment of Country

In the spirit of reconciliation, Stantec acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Limitations

CONTENTS

TRANSPORT IMPACT ASSESSMENT

Bankstown Airport - Link Road Mixed Use Precinct

Appendices

1. Introduction

1.1 Background

Stantec has been engaged by Forge Venture Management (Forge), to undertake a traffic impact assessment of a proposed Bankstown airport mixed-use development on land located at lot 5012 DP 1176822.

The proposal is a development within the Airport that will provide a mix of commercial land uses designed to complement the airport and provide new retail, office and childcare opportunities for the local community at the periphery of the airport, as well as small-scale warehouse tenancies.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements for the site
- the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- Canterbury-Bankstown Development Control Plan (DCP) 2023
- Canterbury-Bankstown Local Environmental Plan (LEP) 2023
- TfNSW Guide to Traffic Generating Developments (October 2002)
- Transport for NSW Technical Direction: Updated Traffic Surveys (TDT 2013/ 04a)
- Bankstown Airport Masterplan 2019
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2018
- plans for the proposed development prepared by SBA, Drawing Number SK100, Revision F, dated 08 November 2023
- other documents and data as referenced in this report.

2. Strategic Context

2.1 Overview

The following key strategies and plans have and will continue to influence development opportunities in Bankstown Airport and surrounding areas, together with deliberate effects on future travel demand and mode splits for both workers and residents in particular.

2.2 Bankstown Airport Masterplan 2019

This Master Plan 2019 for Bankstown Airport is the principal planning document for the Airport. It describes future aviation operations, land use, facilities and infrastructure, and the management of environmental and noise impacts. Specific to traffic infrastructure, the Ground Transport Plan is a subsection of the masterplan and has been prepared to support the aims and objectives of the Master Plan 2019.

According to the Bankstown Airport Masterplan 2019, the ground transport plan aims to improve the accessibility of the airport by providing a range of transport options for passengers and employees. The plan includes the following initiatives:

- Road network improvements: The plan proposes to improve the road network around the airport by widening roads, adding new lanes, and improving intersections.
- Public transport: The plan aims to improve public transport options to the airport by increasing the frequency of bus services and improving the connectivity of the existing train stations.
- Cycling and walking: The plan proposes to improve the cycling and walking infrastructure around the airport by building new cycleways and footpaths.
- Car parking: The plan aims to provide additional car parking spaces for passengers and employees.

The Airport is heavily reliant on the road network with approximately 96% of all people travelling to the Airport doing so by car. Improvements to public transport, cycle ways and footpaths servicing the Airport will encourage more journeys to the Airport using these modes of travel.

Masterplan assessment has developed a traffic model using VISSIM software to assess the implications of potential development at the Airport during the first five years of this Master Plan 2019. The Airport and the surrounding road network are forecast to experience an increase in traffic demands due to local development and broader traffic growth associated with greater Western Sydney expansion. The traffic modelling has been used to inform the creation of the five-year GTP to optimise the use of existing transport infrastructure and increase its capacity where necessary to support growth.

Figure 2.1 (Table 9.6 of the master plan) identifies road and transport improvements for the five-year planning horizon, addressing both on- and off-airport projects. The five-year plan recommends the construction of a new internal connector road within the Commercial Zone, linking Milperra Road and Murray Jones Drive to Tower Road and Henry Lawson Drive. This would improve intersection operating conditions at the intersection of Henry Lawson Drive, Milperra Road and Newbridge Road.

Bankstown Airport will work closely with Transport for NSW (TfNSW) and Canterbury-Bankstown Council about timely improvements to off-airport road and transport improvement projects.

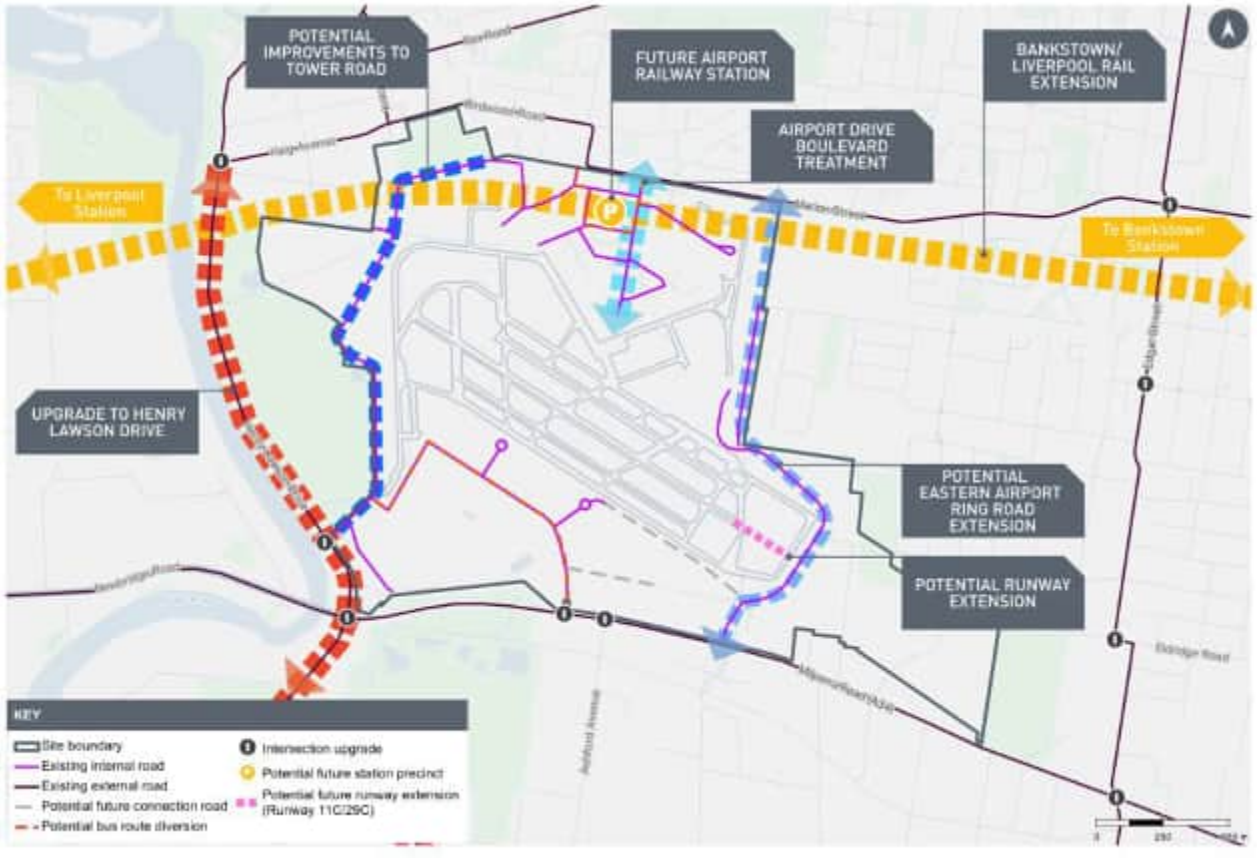
Figure 2.1: 5 Year Airport Development Program

Zone	Development	Trigger/Comment
COMMERCIAL ZONE	New internal collector road - Connecting Milperra Road/Murray Jones Drive intersection and Tower Road - To provide access to the proposed South-West Precinct commercial/ industrial estate	Under construction
EXTERNAL TO AIRPORT	Intersection upgrades and widening of roads surrounding Bankstown Airport Detailed description of potential road improvements included in Section 9.5. Key projects identified include: - Additional intersection capacity along Milperra Road (into Bankstown Airport) - Henry Lawson Drive between Milperra Road and Haig Avenue - duplication to two lanes in each direction	Subject to approvals and commercial demand
AIRPORT-WIDE	Improved wayfinding signage directing traffic into and around Bankstown Airport	Approved development

Source: Bankstown Airport Masterplan, 2019 (Table 9.6)

Road and transport improvements envisaged within this Master Plan's 20-year planning horizon show extended passenger rail between Bankstown and Liverpool CBDs. Active promotion of rail alignment on the northern boundary of Bankstown Airport with a station (bus-rail interchange) within the Airport land.

Figure 2.2: 20-Year Airport Development Strategy



Source: Bankstown Airport Masterplan, 2019 (Figure 9.2)

3. Existing Conditions

3.1 Location

The subject site is located at 185 Birdwood Road Bankstown Aerodrome NSW 2200. The site of approximately 31,100 sqm has a frontage of 115m to Birdwood Road and 200m to Link Road. The surrounding properties predominantly include mixed land uses, such as residential dwellings, private schools, and retail and commercial stores. The Bankstown Airport lies south of the proposed site, and an IGA supermarket is directly adjacent to the northwest corner of the proposed site, with Georges River Grammar School to the west of the site.

The site is currently zoned as SP2 Infrastructure– Road Infrastructure Facility in the Bankstown Local Environmental Plan 2023. The land presides on Birdwood Reserve, is presently undeveloped and has no current occupancies.

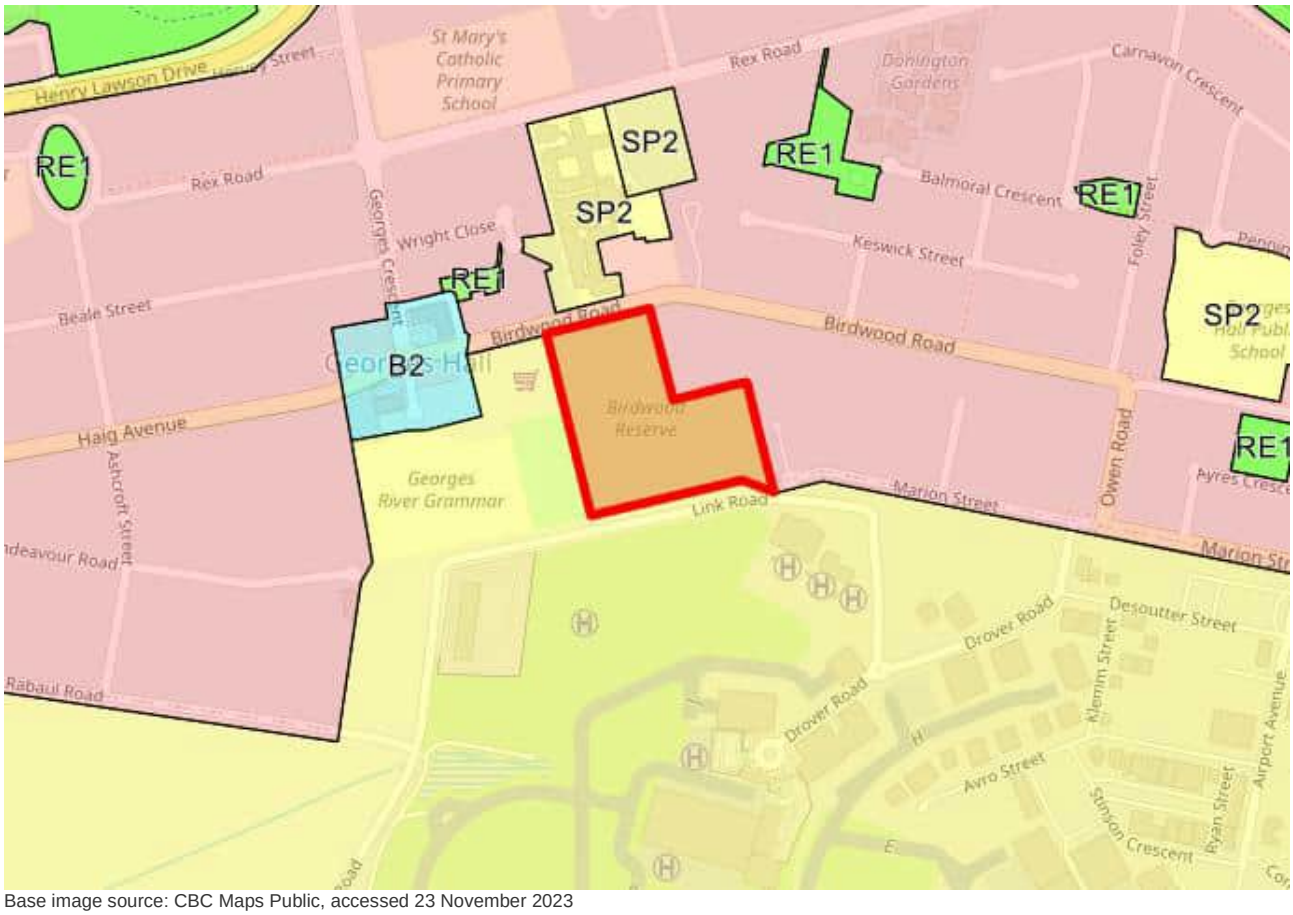
The location of the subject site and its surrounding environs is shown in Figure 3.1, while the LEP land use map is shown in Figure 3.2.

Figure 3.1: Subject Site and Its Environs

Base image source: Nearmap

Bankstown Airport is an airport and Business Park located in the City of Canterbury Bankstown Local Government Area, 22 kilometres from the central business district of Sydney. It is the second largest airport serving Sydney and is an attractive business location with a thriving Business Park.

Figure 3.2: Bankstown Land Use Map



Base image source: CBC Maps Public, accessed 23 November 2023

3.2 Transport Network

3.2.1 Road Hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies that guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. Transport for NSW (TfNSW) is responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules.

TfNSW defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

- Arterial Roads – Controlled by TfNSW, typically no limit in flow and designed to carry vehicles long distances between regional centres.
- Sub-Arterial Roads – Managed by either Council or TfNSW under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a subregion or provide connectivity from arterial road routes (regional links).
- Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.
- Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

3.2.2 Surrounding Road Network

Birdwood Road

Birdwood Road is a regional road that functions as a collector road, aligned in the east-west direction along the northern boundary of the site. The road connects to the state road of Henry Lawson Drive to the west and provides connectivity to the Bankstown train station to the east. Within the vicinity of the site, it is a two-way road with one lane configured in each direction, set within an approximately 12-metre-wide carriageway. Directly adjacent to the site, the road is a school zone with a posted speed limit of 40 kilometres per hour during school zone hours but otherwise has a posted speed limit of 50 kilometres per hour with kerbside parking on both sides of the road subject to various restrictions.

Link Road

Link Road is a local road aligned in the east-west direction along the southern boundary of the site. The road provides connectivity throughout the Bankstown Aerodrome south of the site. It is a two-way road with one lane configured in each direction, set within an approximately 8-metre-wide carriageway. The road has a posted speed limit of 40 kilometres per hour with no kerbside parking provided.

3.3 Public Transport

One bus stop is located directly fronting the site and another is opposite the site. These bus stops service the 905 bus route.

Route 905 connects Fairfield to Bankstown, via Villawood, Chester Hill and the north of the Airport (Airport Business Zone). This route connects the north of the Airport with Bankstown Railway Station and its train services. The bus service follows Marion Street, along the Airport's northern boundary. Route 905 runs every 30 minutes outside peak times and every 15 minutes during the morning peak period and afternoon and early evening peak period.

Figure 3.3: Bus Routes Map

Base image source: TfNSW, accessed 23 November 2023

Bankstown Station is approximately four kilometres east of the site which is served by Sydney Trains T3 Bankstown line services.

3.4 Pedestrian and Cycling Infrastructure

Birdwood Road has a dedicated footpath opposite the site in addition to a footpath adjacent to the site and fronting the IGA shopping centre. Birdwood Road also has a raised pedestrian crossing directly fronting the site, providing connectivity to locations directly opposite the site such as KU Georges Hall Preschool and Georges Hall Community Centre.

There are no footpaths provided on Link Road.

A regional off-road cycleway runs along the western side of Henry Lawson Drive and can be accessed via Birdwood Road as shown in Figure 3.4.

Figure 3.4: Cycleway Map

Base image source: TfNSW Cycleway Finder, accessed 23 November 2023

3.5 Crash History

An analysis the most recent five-year period of available crash data from 2018 to 2022 has been undertaken based on crash data provided by TfNSW for the roads surrounding the site. The locations and severity of the crash data for the five years is shown in Figure 3.5 and Table 3.1.

Figure 3.5: Crash data near the site (2018 to 2022)

Base image source: Transport for NSW, accessed 24 November 2023

Table 3.1 – Crash Incidents Between 2018 to 2022

Road	Number of Crashes	Number of People Injured	Number of Fatalities
Birdwood Road	2	4	0
Georges Crescent	2	1	0
Marion Street	1	0	0
Total	5	5	0

The following key statistics can be drawn from the crash data:

- No fatality was recorded during the five-year period surrounding the site.
- Both crashes on Birdwood Road resulted in serious injuries.
- All five incidents were the result of different types of crashes.
- Four out of the five crashes occurred during darkness hours.

Although the surrounding road network has recorded 5 incidents over the five-year period the data does not indicate any safety concern. Moreover, the development is not anticipated to materially change the types of vehicles or significantly increase traffic volumes at key intersections surrounding the site. Therefore, the proposal would not impact road safety surrounding the site.

4. Development Proposal

4.1 Land Uses

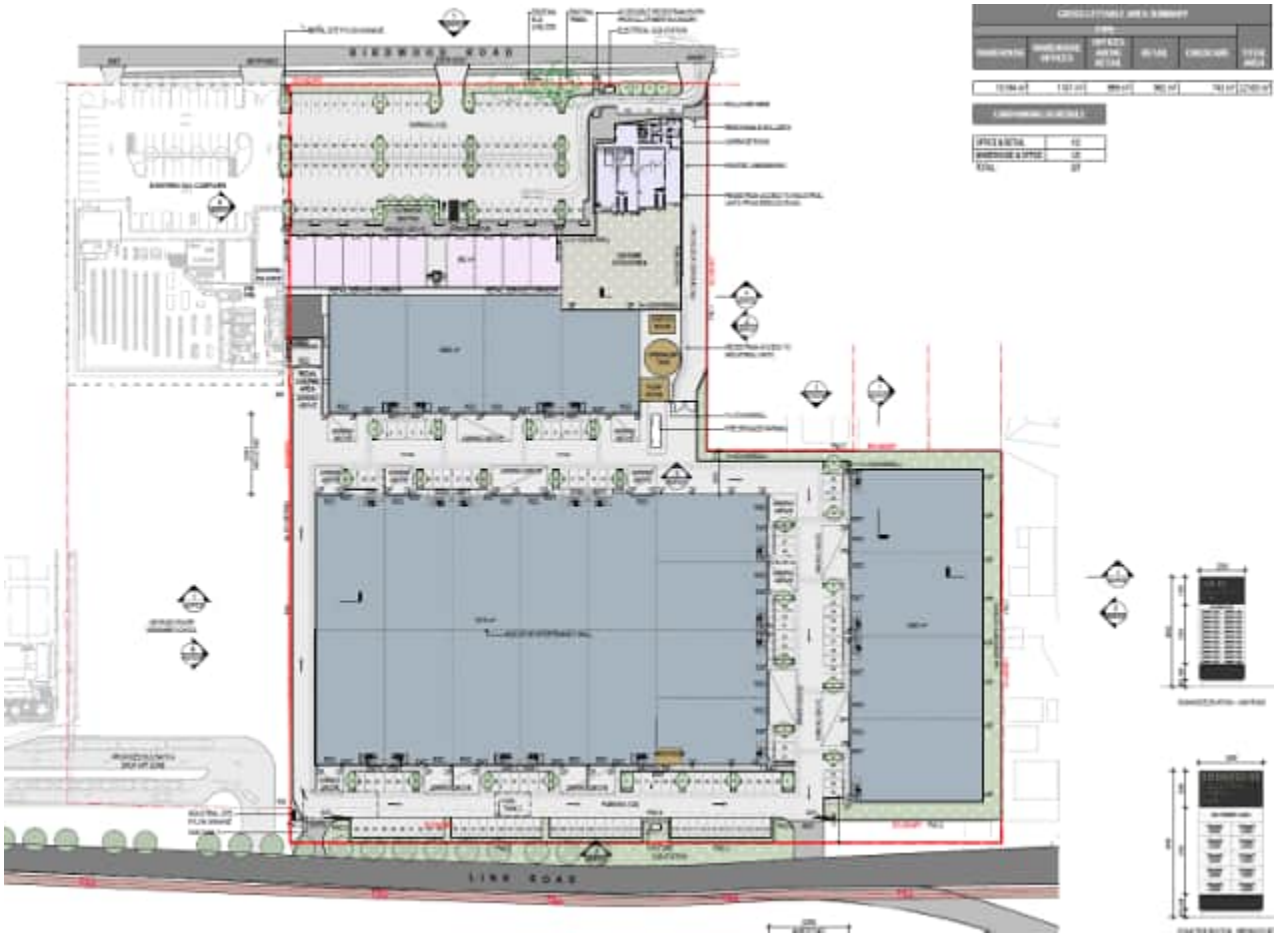
The proposal includes the construction of a mixed-use offering providing new retail, office and childcare opportunities for the local community at the periphery of the airport, as well as small-scale warehouse tenancies and premium smaller boutique warehouses to the south of the site.

A summary of the development yield is provided in Table 4.1 with the proposed ground floor plan shown in Figure 4.1.

Table 4.1: Development Schedule

Land Use	Size (Gross Lettable Area)
Warehouse	16,301 m^2 (including 1107 m^2 ancillary office)
Office	999 m^2
Childcare	743 m^2 (120 children)
Retail and Cafe	992 m^2 (70% retail and 30% café)

Figure 4.1: Proposed ground floor plan



Source: SBA Architects, Drawing Number MDP100, dated 5 November 2024

4.2 Vehicle Access

A total of four new proposed driveways are provided for vehicular entry/exit for the site. Two driveways pertaining to Birdwood Road servicing the childcare, retail offerings, and offices and two driveways pertaining to Link Road services the warehouses.

Birdwood Road

A one-way vehicular crossover is proposed on Birdwood Road in the northeast corner of the site for use by both light vehicles accessing the childcare drop off, at-grade car park and fire brigade vehicles accessing the south side of the site via the service road along the eastern boundary of the site.

A two-way vehicular crossover is also proposed on Birdwood Road, directly west of the one-way entrance. This crossover is intended to be used by light vehicles entering and exiting the site and circulating through the proposed at-grade carpark.

In addition, the proposed at-grade carpark will be directly connected to the existing IGA carpark to the west of the proposed site. The existing IGA carpark provides an entry/exit crossover on the northeast corner of the IGA, and a one-way exit driveway on the northwest corner of the IGA. With the existing IGA carpark intended to be connected to the proposed at-grade carpark, this provides additional circulation, car parking spaces and ingress/egress opportunities for the traffic generated from the proposed site.

Link Road

A one-way entry crossover is proposed on Link Road on the southwest corner of the site providing access to the warehouses to the south of the site, with a one-way exit crossover proposed on the southeast corner of the site. Both crossovers are expected to be used by service vehicles/light vehicles associated with staff parking intending to use the warehouses, with one-way clockwise circulation provided around the warehouses.

4.3 Car Parking and Loading

The proposed development will provide a total of 227 car parking spaces, the breakdown of car parking spaces is as follows:

- At-grade carpark and childcare drop-off accessed via Birdwood Road access: 102 spaces (including 3 spaces childcare drop off)
- Warehouse Staff carparking via Link Road access: 125 spaces

The retail loading area is provided on the western boundary of the site, adjacent to warehouse 1, and includes one loading bay suitable for accommodating service vehicles up to 12.5 metre HRV.

The individual warehouse units are serviced with vehicles up to 12.5 metre HRV. Vehicles would reverse into the roller shutter door and will be parked within the warehouse.

The suitability of the parking provision and layout is discussed in Section 5 of this report.

4.4 Pedestrian Access and Facilities

Pedestrian access to the childcare and retail offerings is proposed via Birdwood Road, with a pedestrian crossing provided adjacent to the two-way vehicular crossover. A pedestrian crossing is proposed near the childcare facility and connects with the external pedestrian walkways.

Pedestrian walkway is also proposed within the site and around the proposed warehouse. This provides internal connectivity for different parts of the site and ensure safe pedestrian movements within the site. Appropriate internal pedestrian crossing is also proposed as shown in Figure 4.1.

The development has been designed to ensure a high level of pedestrian permeability throughout the development with a pedestrian walkway provided throughout the site.

5. Car Parking

5.1 Car Parking Requirements

5.1.1 DCP Car Parking Requirements

The car parking provision requirements for different development types are set out in the *Canterbury-Bankstown Development Control Plan 2023.* As both Birdwood Road and Link Road provide separate access to the proposed land uses, a review of the car parking requirement rates for land uses served by the Birdwood Road Access and Link Road Access are summarised in Table 5.1 and Table 5.2 below.

Table 5.1: DCP 2023 Car Parking Requirements – Birdwood Road Access

Land Use	Gross Floor Area [1] (m^2)	DCP Car Parking Rate	DCP Car Parking Requirements
Office	999 m^2	1 car space per 40 m^2 gross floor area of the premises	25
Childcare	120 children	1 car space per 4 children	30
Cafe[2]	298m^2	0.15 car space per square metre in excess of 100m^2	30
Retail Shop[3]	694 m^2	1 car space per 40 m^2 of gross floor area	17
		Total	**102 spaces**

[1] The assumed Gross Lettable Area (GLA) equals to Gross Floor Area
[2] Assumed 30% of the total shop area (999m^2)
[3] Assumed 70% of the total shop area (992m^2)

The architectural plan shows the provision of 102 spaces, meeting the requirements specified by the council DCP.

Table 5.2: DCP 2023 Car Parking Requirements – Link Road Access

Land Use	Gross Floor Area [4] (m^2)	DCP Car Parking Rate	DCP Car Parking Requirements
Warehouse (including ancillary office)	16,301 m^2 140 estimated staff	1 car space per 300 m^2 gross floor area or 1 space for 2 staff	54 (based on GFA) or 70 (based on staff)
		Total	**54 spaces (based on GFA), or** **70 spaces (based on staff)**

[4] The assumed Gross Lettable Area (GLA) equals to Gross Floor Area

It is to be noted that a small office space is proposed for each of the warehouses to provide general administrative support to the warehouse and will not be separately leased as an independent office use. The office component is ancillary to the primary use of the land for a warehouse and will remain so in perpetuity. In this regard, reference is also made to the *TfNSW's Guideline to Traffic Generating Development (2002*) and *Bankstown Airport Urban Design Guideline (2015)* where the provision of 1 space per 300m^2 for the warehouse developments is based on the total warehouse GFA which may also include some ancillary office components.

However, due to the location of the proposed development (being within the Bankstown Airport), it is anticipated that the majority of the warehouse users would be staff with very few visitors. Therefore, it is recommended to determine the parking requirement for the warehouse based on the number of staff which may provide a realistic understanding of the future car parking demand.

The architectural plan shows the provision of 125 spaces, which is a surplus of 55 car parking spaces of the requirement as specified by council DCP and thus complies.

5.1.2 Summary

- The proposed land uses served by Birdwood Road access (office, childcare and retail shop) include provision for 102 car parking which satisfies the parking requirements of Bankstown Council DCP and the Bankstown Airport Urban Design Guidelines.
- The proposed land uses served by Link Road access include an industrial warehouse which is not intended to offer any retail, and the office shall only be used by tenants of the warehouse and not be used as stand-alone offices. It is also recommended to determine the warehouse parking requirement based on the number of staff. However, the provision of 125 car parking spaces for the warehouse developments satisfies the parking requirements based on both GFA and the number of staff.

5.2 Accessible Parking

Accessible Parking rates for various land uses are set out in the *Building Code of Australia* (BCA) which has been prepared to outline the accessible parking requirements for the proposed development.

Table 5.3: Accessible Parking Requirements

Access	Land Use	BCA Class	BCA Accessible Parking Rate	Total Parking Requirements	Accessible Parking Requirements
Birdwood Road	Office/Retail/Cafe	6	1 space for every 50 car parking spaces.	72	2
	Childcare	9b	1 space for every 50 car parking spaces or part thereof.	30	1
Link Road	Industrial Warehouse	7	1 space for every 50 car parking spaces	70	2

Furthermore, the adopted BCA rates are generally consistent with Canterbury- Bankstown DCP. Hence the proposed development requires 5 accessible parking spaces. The proposed development will provide the required number of accessible parking spaces and thus would comply with the requirement.

5.3 Bicycle Parking

Bicycle parking rates for various land uses are set out in *DCP 2023* which has been prepared to outline the bicycle parking requirements for the proposed development.

Table 5.4: DCP 2023 Bicycle Parking Requirements – Birdwood Road Access

Land Use	Gross Floor Area[5] (m^2)	DCP Bicycle Parking Rate	DCP Bicycle Parking Requirements
Office	999 m^2	Staff: 1 space per 300m^2 gross floor area Visitors: 1 space per 500m^2 gross floor area over 1,000m^2	4 staff
Childcare	120 children/20 Staff	1 space per 4 staff	5 staff
Retail Shop	694 m^2	Staff: 1 space per 300m^2 gross floor area Visitors: 1 space per 500m^2 gross floor area over 1,000m^2	3 staff
Cafe	298m^2	Staff: 1 space per 100m^2 Visitors: 2 spaces	3 staff 2 visitors
		Total	**15 staff spaces and 2 visitor spaces**

[5] The assumed Gross Lettable Area (GLA) equals to Gross Floor Area

Table 5.5: DCP 2023 Bicycle Parking Requirements – Link Road Access

Land Use	No of Staff	DCP Bicycle Parking Rate	DCP Bicycle Parking Requirements
Warehouse (including ancillary office)	140 Staff	1 space per 20 staff	7

The DCP bicycle parking rates specify a total combined requirement of 26 bicycle spaces including 20 staff spaces and 6 visitor spaces for the tenancies.

Furthermore, the DCP states that for non-residential development that requires over ten staff bicycle parking spaces, one shower and change room are to be provided per ten staff bicycle parking spaces. This results in a requirement of 2 end-of-trip facilities (shower/ change room).

The bicycle parking spaces along with end-of-trip facilities will be provided in the design revisions.

5.4 Waste Collection

The waste collection arrangements are anticipated to align with the loading arrangements described above in Section 4.3. Retail waste will be collected from the retail loading area along the western boundary of the site, adjacent to warehouse 1. Waste from warehouse units will be stored in separate tenancies.

The proposed development is designed to accommodate an HRV vehicle (12.5m). As such, it is anticipated that the council's garbage collection truck (which a smaller than HRV) will be able to access the site to collect the garbage.

The waste collection arrangement and vehicle type will be detailed as part of the Waste Management Plan.

5.5 Layout Review

The site access, loading and car park layout have been reviewed against the requirements of the Australian Standard for Off Streetcar Parking (AS/NZS2890.1:2004, AS2890.2:2018, AS/NZS2890.6:2022). This assessment included a review of the following:

- bay and aisle width
- adjacent structures
- turnaround facilities
- circulation roads and ramps
- ramp grades
- height clearances
- internal queuing
- pick-up/set-down area
- parking for persons with disabilities
- motorcycle/motor scooter parking.

A summary of the layout review is provided below:

- Overall, the proposed car park accessed via Birdwood Road is laid out clearly with users able to enter and exit in a forward direction and circulate as necessary. The car park includes dedicated childcare set-down and pick-up spaces.
- Link Road access and the internal roads surrounding the warehouse are designed to accommodate vehicles up to 12.5m long HRV within the site and able to access different warehouses with one-way clockwise circulation provided around the warehouses. All internal and circulating roads are designed in accordance with the relevant Australian Standards. Some minor modifications to the kerbs could be required to ensure seamless turning for HRVs.
- Both Link Road and Birdwood Road access are designed to accommodate fire truck entry/exit to the site. Internal roads are designed with adequate widths to accommodate fire truck movements during emergencies. Further assessment of the fire truck operation using a performance-based solution will be undertaken by a fire consultant.
- A 'Stop' control is proposed on the southern internal road eastbound approach (adjacent to the Link Road exit) to reduce the conflict and enhance safety. A mirror is also proposed at this location to watch other vehicle movements while turning. Appropriate signage and line marking are recommended to clearly delineate the pedestrian movement area.

- All loading docks, including the retail loading area, are designed to accommodate HRV vehicles' entry in the reverse direction and exit in the forward direction.
- All parking bays are designed to satisfy the relevant off-street car parking requirements and comply with the relevant Australian Standards.

Swept paths have been completed at key locations to confirm access, independent movements and manoeuvring generally. These are included in Appendix A.

6. Operational Traffic Impact Assessment

6.1 Traffic Generation

6.1.1 Design Rates

Traffic generation rates for the proposed uses have been sourced from the *TfNSW Guide to Traffic Generating Developments 2002* (the Guide) and *Technical Direction: Updated Traffic Surveys (TDT 2013/ 04a)*. TfNSW recommends the following rates applicable to the proposed development:

- *Childcare Centre:*
  - *Morning Peak – 0.8 trips per child*
  - *Evening Peak – 0.7 trips per child*
- *Warehouse:*
  - *Peak hour vehicle trips = 0.5 per 100m^2 gross floor area*
- *Office:*
  - *Morning peak hour vehicle trips = 1.6 per 100 m^2 gross floor area*
  - *Evening peak hour vehicle trips = 1.2 per 100 m^2 gross floor area*
- *Retail Shop:*
  - *Evening peak hour= 4.6 vehicle trips per 100m^2 Gross Leasable Floor Area*
- *Restaurant/ Cafe:*
  - *Morning peak hour vehicle trips = 5 per 100 m^2 gross floor area*

Estimates of peak hour traffic volumes resulting from the proposal are set out in Table 6.1 and Table 6.2.

Table 6.1: Traffic Generation – Birdwood Road Access

Land Use	Gross Floor Area[6]	AM Peak Hour	PM Peak Hour
Office	999 m^2	16	12
Childcare	120 children	96	84
Retail Shop[7]	694 m^2	16	32
Cafe[7]	298m^2	15	7
	Total	**143**	**135**

[6] The assumption that the Gross Leasable Floor Area is equal to Gross Lettable Area
[7] The retail and traffic generation during the AM peak hour is assumed to be approximately 50% of the PM peak hour.

The traffic generation rates, when applied, result in the sum of 143 peak-hour trips in the morning and 135 peak-hour trips in the evening.

Table 6.2: Traffic Generation – Link Road Access

Land Use	Gross Floor Area8	AM Peak Hour	PM Peak Hour
Warehouse (including office)	16,301 m^2	82	82
	Total	**82**	**82**

[8] The assumption that the Gross Leasable Floor Area is equal to Gross Lettable Area

It is understood that the office is related to the warehouse component and is not considered a separate traffic-generating development. The traffic generation rates, when applied, result in the sum of 82 peak-hour trips in the morning and evening.

6.2 Impacts on Surrounding Roads

Reference has been made to the *Bankstown Airport 2019 Masterplan* which assumed a total of 20,000m^2 of commercial land use (neighbourhood shopping centre) development on the subject site. The Masterplan assessment included detailed traffic modelling using VISSIM microsimulation software to assess the implications of the potential development of the airport. Based on this proposed development, there is considered to be no additional consequential impact on the

findings of the 2019 masterplan traffic and transport assessment based on what was assessed as a part of the masterplan.

6.3 Impacts on Adjacent Bus Bays

This proposed bus bay on the neighbouring grammar school located on the west of Link Road entry access is not anticipated to have any impacts on the Link Road site access. It is understood that the site access gates will be left open during business hours. This will allow all trucks to enter the site from Link Road without the requirement of waiting and hence, there will be no queues extending outside the property boundary. Further appropriate separation from the adjacent driveway is to be provided (5m) which enables an HRV to turn left into the site without the driveway splay extending onto the adjacent site frontage.

It is also recommended to minimize any HRV movements on Link Road during school drop off/pick up time to avoid any potential conflicts and enhance safety. Consideration should also be given to the operation of Bankstown Bus Depot and potential impacts on HRV movements along Link Road. This can be undertaken through the preparation of an operational traffic management plan once the individual tenants and their operations are known.

7. Overview Construction Traffic Management Plan

7.1 Overview

This section seeks to provide an overview of the Construction Pedestrian and Traffic Management Plan (CPTMP) initiatives to be implemented as part of the construction works associated with the proposed development.

Specifically, this overview of CPTMP considers the following:

- construction site access arrangements
- anticipated truck volumes during the construction stages
- truck routes to/ from the site
- requirements for works zones
- pedestrian and cyclist access
- site personnel parking
- traffic control measures
- overview of CPTMP requirements.

7.2 Principles of Traffic Management

The general principles of traffic management during construction activities are as follows:

- minimise the impact on pedestrian and cyclist movements
- maintain appropriate public transport access
- minimise the loss of on-street parking
- minimise the impact on adjacent and surrounding buildings
- maintain access to/ from adjacent buildings
- restrict construction vehicle movements to designated routes to/ from the site
- manage and control construction vehicle activity near the site
- Carry out construction activity in accordance with approved hours of works.

7.3 Work Hours

The works will be carried out during normal construction hours unless otherwise permitted. Indicative work hours are as follows:

- Weekdays: 7:00am – 5:00pm
- Saturdays: 8:00am – 12:00pm
- Sundays and public holidays: no work permitted.

Workers would be advised of the approved work hours during induction. Any works outside of the approved work hours would be subject to specific prior approval from the appropriate authorities (i.e., Canterbury Bankstown Council's Out-Of-Hours Work Application). Such works may include delivery of cranes, large plant or equipment required on the site that require oversize vehicle access.

7.4 Site Access and Loading

Construction vehicle access is anticipated to be primarily provided from Link Road. All loading is expected to take place within the bounds of the site. Should a works zone be required, an application will be made to the relevant authorities prior to commencement of works.

As part of the detailed CPTMP, Traffic Guidance Schemes (previously referred to as Traffic Control Plans) will be prepared in accordance with the principles of the Traffic Control at Work Sites manual (TfNSW, 2022). The Traffic Guidance Schemes primarily show where construction signs will be located at specific locations (such as uncontrolled intersections) along the approved truck routes to warn other road users of the increase in construction vehicle movements.

Access to the neighbouring sites by emergency vehicles would not be affected by the works as the road and footpath frontages would be unaffected. Emergency protocols on the site would include a requirement for site personnel to assist with emergency access from the street. All truck movements to the site and/or incident point would be suspended and cleared.

7.5 Construction Staff Parking

It is assumed there will be up to [50] workers on-site at any given time during peak activities. Parking for workers will generally be provided on site. Workers will be strongly encouraged to use public transport or carpool. During site induction, workers will be informed of the existing bus network servicing the site.

7.6 Heavy Vehicle Traffic Generation

There will be various types of construction vehicles accessing the site during construction. The largest of these vehicles will include:

- concrete trucks
- concrete pump and boom vehicles
- mobile cranes
- excavators and bulldozers
- rigid trucks, truck and dog combinations and articulated vehicles.

Most construction traffic will be associated with the removal of spoil, concrete pours and general delivery of materials and equipment. These activities will occur within the designated construction zone during each stage.

It is assumed that works could generate up to [5] construction vehicle movements per hour during any peak period. This equates to one vehicle every 12 minutes. Construction vehicle movements will be minimised/ avoided during peak hours where possible.

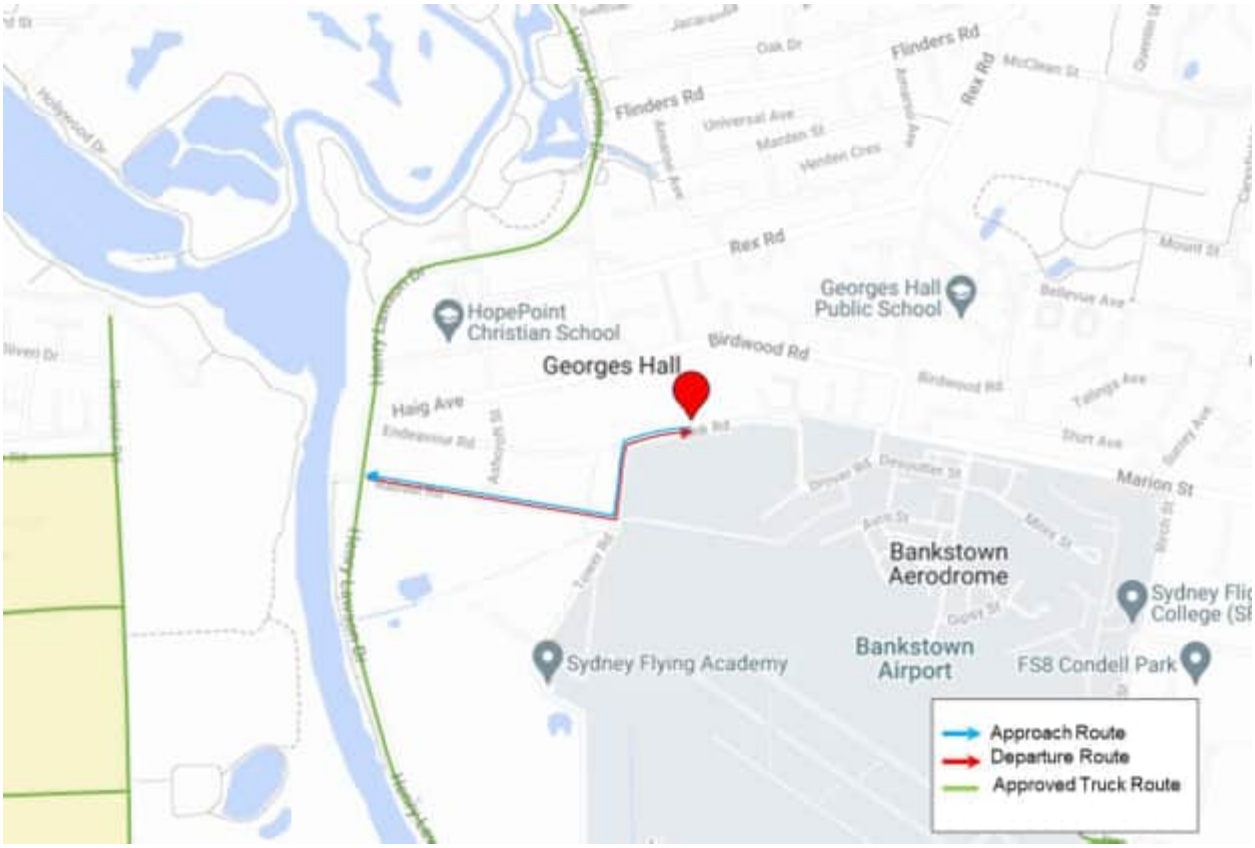
Given the expected low construction traffic volumes and the proximity of the site to the arterial road network, it is anticipated that the construction traffic will not have a significant impact on the surrounding road network.

7.7 Heavy Vehicle Access Routes

Heavy vehicle movements would be restricted to designated routes and confined to the arterial road network wherever feasible. Truck routes to/ from the site have been identified with the aim of providing the most direct routes to/ from the site as well as minimising the impact of heavy vehicles on local roads.

Figure 7.1 provides a summary of the anticipated construction vehicle routes to/ from the site. Truck drivers will be advised of the designated truck routes to/ from the site.

Figure 7.1: Construction Vehicle Route



7.8 Pedestrian and Cyclist Access

Overall, it is not expected that pedestrians or cyclists would be impacted by the construction works. Alternative pedestrian routes would be established to divert pedestrians/ cyclists to use alternative footpaths on the other side of the road if and as required.

7.9 Overview of CPTMP Requirements

This section provides an overview of the CPTMP initiatives that would be implemented for the construction of the project. A detailed CPTMP would be completed prior to commencement of construction to cover the following additional information:

- Description of construction activities and duration.
- Approved construction work hours.
- Detailed assessment of construction traffic impacts including any cumulative impacts.
- Swept path analysis of heavy vehicle access to the site and works zone.
- Detailed assessment of on-street parking impacts.
- Emergency vehicle access and impacts to public transport services.
- Traffic Guidance Scheme(s).
- Contact details of key project personnel.

8. Overview Green Travel Plan

8.1 Introduction

8.1.1 Travel Plan Framework

Transport is a necessary part of life, but it has economic, public health and environmental consequences. The transport sector is one of the fastest growing emissions sectors in Australia, and therefore is one of the key opportunities for reducing greenhouse gases. As well as delivering better environmental outcomes, providing a range of travel choices with a focus on walking, cycling and public transport will have major public health benefits and will ensure a strong and prosperous community.

The physical infrastructure being provided as part of the development is only part of the solution. A green travel plan (GTP) will ensure that the transport infrastructure, services and policies both within and external to the site are tailored to the users and co-ordinated to achieve the most sustainable outcome possible.

8.1.2 What is a GTP?

A GTP is a package of measures aimed at promoting sustainable travel and reducing reliance on the private car. It is not designed to be 'anti-car' however will encourage and support people's aspirations for carrying out their daily business in a more sustainable way. Travel plans can provide both:

- measures which restrict car use (disincentives or 'sticks')
- measures which encourage or support sustainable travel, reduce the need to travel or make travelling more efficient (incentives or 'carrots').

The travel plan would promote the use of transport, other than the private car, provide choice for staff to travel to and from the site, which is more sustainable and environmentally friendly.

Indeed, there are a range of "non-car" transport options that are available at the site which have been described in this report.

Given the developments aim to reduce private travel to the site, the implementation of a GTP would be beneficial.

8.2 Key Objectives

The aim of the GTP is to bring about better transport arrangements for living and working at the site. The key objectives of the Travel Plan are:

- to encourage walking
- to encourage cycling
- to encourage the use of public transport
- to reduce the use of the car, in particular single car occupancy
- where it is necessary to use the car, encourage more efficient use.

It is the intention therefore that the travel plan will deliver the following benefits:

- enable higher public and active travel mode share targets to be achieved
- contribute to greenhouse gas emission reductions and carbon footprint minimisation
- contribute to healthy living for all
- contribute to social equity and reduction in social exclusion
- improve knowledge and contribute to learning.

8.3 Site Specific Measures

The location of the site, in terms of its proximity to a wide range of sustainable transport including bus and train services is a key consideration for development in the precinct. A GTP will put in place measures to raise awareness and further influence the travel patterns of people travelling to/ from the site with a view to encouraging modal shift away from cars.

The following potential measures and initiatives could be implemented to encourage more sustainable travel modes:

1. Provide a Travel Access Guide (TAG) which would be provided to all staff and publicly available to all visitors. The document would be based on facilities available at the site and include detail on the surrounding public transport services and active transport initiatives. The TAG would be updated as the surrounding transport environment changes.
2. Providing public transport information boards/ apps to inform staff and visitors of alternative transport options (the format of such information boards would be based upon the TAG).
3. Providing a car sharing pod(s) on-site or nearby and promoting the availability of car sharing pods for trips that require the use of private vehicles.
4. Providing bicycle facilities including secure bicycle parking for staff, bicycle racks/ rails for visitors and shower and change room facilities.
5. Encouraging staff that drive to work and park on surrounding roads to carpool through creation of a carpooling club or registry/ forum.
6. Regularly promoting ride/ walk to work days.
7. Providing a regular newsletter to all staff members bringing the latest news on sustainable travel initiatives in the area.

8.3.1 Travel Access Guide

A TAG provides information to staff and visitors on how to travel to the site using sustainable transport modes such as walking and public transport. The information is presented visually in the format of a map (or app) showing the site location and nearby transport modes highlighting available pedestrian and cycle routes. The information is usually presented as a brochure (or app) to be included in a welcome pack or on the back of company stationery and business cards.

8.3.2 Information and Communication

Several opportunities exist to provide staff and visitors with information about nearby transport options. Connecting staff and visitors with information would help to facilitate journey planning and increase their awareness of convenient and inexpensive transport options which support change in travel behaviour. These include:

- Transport NSW provides bus, train and ferry routes, timetables and journey planning through their Transport Info website: http://www.transportnsw.info

In addition, connecting staff and visitors via social media may provide a platform to informally pilot new programs or create travel-buddy networks and communication.

8.3.3 Monitoring of the GTP

There is no standard methodology for monitoring the GTP, but it is suggested that it be monitored to ensure that it is achieving the desired benefits and modify it if required. It will not be possible at this stage to state what additional modifications might be made as this will be dependent upon the particular circumstances prevailing at that time.

The GTP should be monitored on a regular basis, e.g. yearly, by carrying out travel surveys. Travel surveys will allow the most effective initiatives of the GTP to be identified, and conversely less effective initiatives can be modified or replaced to ensure the best outcomes are achieved. It will clearly be important to understand people's reasons for travelling the way they do, any barriers to changing their behaviour, and their propensity to change.

To ensure the successful implementation of the GTP, a Travel Plan Coordinator (TPC) should be appointed to ensure the successful implementation of the GTP. This could be the building manager or a member of the body corporate.

8.4 Summary

The proposed development would be able to develop and utilise a travel plan to actively promote increased use of sustainable transport modes. Although it is difficult to predict what measures might be achievable, the above measures provide a framework for the site and implementation of a future travel plan.

9. Conclusion

Stantec has been engaged by Forge Venture Management (Forge), to undertake a traffic impact assessment of a proposed Bankstown airport mixed-use development on land located at lot 5012 DP 1176822.

Based on the analysis and discussions presented within this report, the following conclusions are made:

- The proposal is a development within the Airport that will provide a mix of commercial land uses designed to complement the airport and provide new retail, office and childcare opportunities for the local community at the periphery of the airport, as well as small scale warehouse tenancies.
- Two vehicular crossovers are proposed on Birdwood Road for vehicles intending to visit the childcare or retail tenancies. One of these crossovers is a two-way entry/exit and the other is a one-way exit driveway. Two vehicular crossovers are also proposed on Link Road for vehicles intending to use the warehouses. One of these crossovers is a two-way entry/exit and the other is a one-way exit driveway.
- The proposed parking provision satisfies the parking requirements of relevant standards, including Canterbury – Bankstown DCP 2023.
- The proposed development is required to provide a minimum of 26 bicycle parking spaces.
- All internal roads and parking bays are designed in accordance with the relevant Australian Standards (AS2890.1-6) and to accommodate the relevant largest vehicles.
- A 'Stop' control is proposed on the southern internal road eastbound approach (adjacent to the Link Road exit) to reduce the of conflict and enhance safety. A mirror is also proposed at this location to watch other vehicle movements while turning. Appropriate signage and line marking are recommended to clearly delineate the pedestrian movement area.
- The Birdwood Road Access associated tenancies are anticipated to generate up to 143 and 135 vehicle trips in the morning and afternoon peak, respectively. The Link Road Access associated tenancies are anticipated to generate up to 82 vehicle trips in the morning and afternoon peak.
- Bankstown Airport 2019 Masterplan assumed a total of 20,000m^2 of commercial land use (neighbourhood shopping centre) development on which the subject site. The Masterplan assessment included detailed traffic modelling using VISSIM microsimulation software to assess the implications of the potential development of the airport. Based on this proposed development, there is considered to be no additional consequential impact on the findings of the 2019 masterplan traffic and transport assessment based on what was assessed as a part of the masterplan assessment.
- Overall, the proposed development is well-considered and can be supported from a transport and parking perspective.

Appendix A. Compliance Review and Swept Paths

Stantec

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stantec.com/australia

Appendix D

Aviation Safeguarding Assessment

BRISBANE
Level 3, 12 Commercial Road, Newstead, QLD 4006
PO Box 112, Fortitude Valley, QLD 4006
(07) 3250 9000 info@lar.aero www.lar.aero

27 October 2023
Our File Ref: B23312AL001
Contact: Bridget Wouts

Bankstown Airport Limited
c/- Director
Forge Venture Management
L2, 50 York Street
Sydney NSW 2000

Attention: Mark Handley

RE: LINK ROAD MIXED USE PRECINCT – BANKSTOWN AIRPORT
AIRPORT SAFEGUARDING ASSESSMENT – PRELIMINARY ASSESSMENT

L+R Airport Consulting were engaged by Bankstown Airport Limited (BAL) to undertake an airport safeguarding assessment at key design documentation stages through the Major Development Plan process as it relates to Bankstown Airport against the National Airports Safeguarding Framework (NASF) Guidelines. This assessment is based on the Preliminary Documentation stage.

1.0 Proposed Development

The proposed Link Road Mixed Use precinct includes warehouses, retail and office space and a childcare facility. Forge Venture Management provided the following SBA Architects preliminary sketches in PDF and CAD format for assessment.

- Drawing no. 22249/SK100/RevB Site / Ground Floor Plan
- Drawing no. 22249/SK101/RevB Level 1 Floor Plan
- Drawing no. 22249/SK200/RevA Warehouse Elevations
- Drawing no. 22249/SK201/RevA Retail Elevations
- Drawing no. 22249/SK202/RevA Child Care Elevations
- Drawing no. 22249/SK203/RevA Warehouse Elevations Option 2
- Drawing no. 22249/SK250/RevB Residential Interface – Sections
- Drawing no. 22249/SK500/RevA Warehouse Perspectives
- Drawing no. 22249/SK501/RevA Retail Perspectives
- Drawing no. 22249/SK502/RevA Child Care 3D Perspectives
- Drawing no. 22249/SK503/RevA Warehouse Perspectives Option 2

The CAD files, not geographically referenced, were adjusted to best fit MGA94 Zone 56 coordinates for the purposes of this assessment. Reference coordinates adopted for the assessment are shown on the attached Figures. Any changes to the position of the building layout may change the results of the assessment.

The proposed precinct including all warehouses, retail and office space and the childcare facility is to be developed to a maximum elevation at 24.8 m AHD.

2.0 Bankstown Airport Prescribed Airspace

The proposed Link Road Mixed Use Precinct is within the extents of prescribed airspace for Bankstown Airport as described in the following sections.

2.1 Obstacle Limitation Surfaces (OLS)

The proposed development lies within the extents of the existing and future Obstacle Limitation Surfaces (OLS) at Bankstown Airport.

2.1.1. Existing OLS

The proposed development is below the Bankstown Airport existing OLS inner horizontal surface as illustrated on Figure B23312/01.

The proposed development at a maximum elevation of 24.8 m AHD will not infringe the existing OLS inner horizontal surface at 51.0 m AHD.

The OLS inner horizontal surface remains the critical surface over the site whether assessed with Runway 11R/29L strip width of 80 m (as is published in the Bankstown Airport Master Plan 2019) or a 90 m runway strip (as is currently marked on the ground).

2.1.2. Future OLS

The proposed development is also within the extents of the Bankstown Airport Master Plan 2019 OLS which allows for Runway 11C/29C to be extended and provided with a precision instrument approach. The proposed development at a maximum elevation of 24.8 m AHD will not infringe the Bankstown Airport Master Plan 2019 OLS inner horizontal surface at 51.0 m AHD as illustrated on Figure B23312/02.

2.1.3. Helicopter Landing Sites

Bankstown Airport has a Main HLS located centrally to the runway environment and north of Runway 11L/29R. Aiming points are provided on Taxiway N2 and west of Taxiway N1. There is also an additional HLS being considered on the POLAIR apron on the northern side of the runways as illustrated in Figure B23312/03. All flight paths operate parallel to the runway centrelines so as not to cause traffic conflicts with fixed wing operations.

The proposed development is within the extents of the existing Taxiway N1 aiming point OLS. The proposed development at a maximum elevation of 24.8 m AHD would remain well below this OLS which is at 126.6 m AHD at the closest point of the development site.

The proposed development is outside the lateral extents of the Main HLS, Taxiway N2 Aiming Point and the police HLS OLS at Bankstown Airport.

2.2 PANS-OPS

The proposed development lies within the extents of the existing and future PANS-OPS airspace at Bankstown Airport.

2.2.1. Existing PANS-OPS

The proposed development lies within the extents of the existing Bankstown Airport PANS-OPS Runway 11C and 29C Standard Instrument Departure (SID) turn area (Area 3) as illustrated on Figure B23312/04.

The proposed development maximum elevation at 24.8 m AHD should remain below the SID Area 3 protection surface which we have estimated to be at a minimum of 88.5 m AHD. However, the proposed development must be submitted to Airservices Australia for formal assessment and confirmation of any impacts on its procedures and facilities.

2.2.2. Future PANS-OPS

The future Bankstown Airport prescribed airspace includes an ILS (precision) approach for Runway 11C.

The proposed development at a maximum 24.8 m AHD would remain below the future Runway 11C Basic ILS surface elevation estimated at approximately 62.2 m AHD, as illustrated on Figure B23312/05.

2.3 Plume Rise

Plume rise must also be considered in relation to penetration of the OLS and PANS-OPS airspace. Aircraft operations in various stages of flight may be affected by an exhaust plume of significant vertical velocity.

Any plume rise exceeding a velocity of 4.3 m/s at the point of emission in accordance with the *Airports (Protection of Airspace) Regulations 1996* is an activity that results in air turbulence and must not be carried out without an approval.

CASA has published an Advisory Circular *AC 139.E-02 v1.0 Plume Rise Assessments.* The proponent should complete CASA Form 1247 *Operational Assessment of a Proposed Plume Rise* with the relevant details once these are available and submit the form directly to CASA Office of Airspace Regulations in order to commence the assessment process.

3.0 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.

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

NASF currently consists of a set of nine (9) guidelines, as below. Each has been summarised in relation to the proposed Link Road Mixed Use Precinct.

3.1 Guideline A: Measures for Managing Impacts of Aircraft Noise

Guideline A can be used in the assessment of new development applications for noise sensitive uses.

The proposed development lies within the endorsed Bankstown Airport 2039 ANEF 20 to 25 Zone as illustrated on Figure B23312/06. Therefore, noise impacts will need to be considered.

AS2021:2015 provides building site acceptability based on ANEF zones. AS2021-2015 would classify:

- light industrial use (such as a warehouse) as 'acceptable' in less than 30 ANEF;
- commercial buildings (such as retail) as 'acceptable in less than 25 ANEF; and
- school, University or house as 'acceptable ' in less than 20 ANEF and 'conditionally acceptable' between 20 to 25 ANEF. For 'conditionally acceptable' land uses, consideration of aircraft noise attenuation is required in accordance with AS2021-2015.

Given the location of the site is in close proximity to busy runways, the proponent should consider the acoustic treatment of the proposed warehouses and retail spaces to ensure it is fit for the use of the intended occupant (i.e. office spaces within the warehouses and retail).

3.2 Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports

The purpose of this Guideline is to assist land use planners and airport operators in their planning and development processes to reduce the risk of building generated windshear and turbulence at airports near runways. Applicability of Guideline B is initially determined by the location of the 'assessment trigger area' around the runway, that is:

- 1200 m or closer perpendicular from the runway centreline (or extended runway centreline);
- 900 m or closer in front of runway threshold (towards the landside of the airport); and
- 500 m or closer from the runway threshold along the runway.

The proposed warehouse lies within the assessment trigger areas for Runways 11L, 11C and 11R as illustrated on Figure B23312/07.

For developments within the assessment trigger areas Guideline B then refers to the mitigation of risk by use of a 'height multiplier' (the 1:35 surface) determining that if buildings do not exceed the 1:35 surface they will not create unsafe wind effects. That is, the distance from the runway centreline or extended centreline to the closest point of the building should be more than 35 times the height (above runway level) of the building.

The proposed building at a maximum elevation of 24.8m AHD would infringe the 1 in 35 surface for Runways 11L, 11C and 11R by maximum of approximately 5.7 m as shown in Table 1 below. Therefore in accordance with Guideline B further assessment is required.

Table 1: Guideline B - 1 in 35 Surfaces

Runway Assessment Trigger Areas	Runway Threshold Elev.	Proposed Development		
		24.8		
		Distance	1in35 sfc	+abv / -blw
11L	6.8	430.00	19.09	+5.7
29R	Outside Assessment Trigger Area			
11C	6.1	540.00	21.53	+3.2
29C	Outside Assessment Trigger Area			
11R	5.7	645.00	24.13	+0.6
29L	Outside Assessment Trigger Area			

Threshold elevations as per the OLS survey March 2021

However, there are a number of existing buildings that lie between the proposed development and the extended runway. I will be for Bankstown Airport Limited in consultation with CASA to determine the appropriate further assessment required.

3.3 Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports

Guideline C pertains to the way in which existing land use is managed in the vicinity of airports with respect to the attraction of wildlife, particularly birds.

The proposed development is an on-airport site and the site plan illustrates a warehouse, retail with office space and childcare facilities but otherwise no detail of landscaping, vegetation or other potential wildlife strike risks. The proposal when developed in detail must be submitted to BAL for review against the Bankstown Airport Wildlife Hazard Management Plan for approval.

3.4 Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers

This Guideline provides general information and advice in relation to wind farms and turbines and their hazards to aviation. Guideline D is not relevant to the proposed Link Road Mixed Use Precinct as provided.

3.5 Guideline E: Managing the Risk of Distraction to Pilots from Lighting in the Vicinity of Airports.

NASF Guideline E provides guidance on the risk of distractions to pilots of aircraft from lighting and light fixtures near airports. The CASA *Part 139 (Aerodromes) Manual of Standards 2019* Section 9.144: *Lights – requirements for zones* sets out the restrictions and degree of interference ground lights can cause as a pilot approaches, and provides advice to lighting designers and suppliers. The proposed development site is within the light control zones as illustrated on Figure B23312/08.

Lighting zones shown are for Runway 11C/29C only. Permanent lighting for Runway 11L/29R is no longer available but rather only portable lighting. As such lighting zones for Runway 11L/29R have not been included.

The proposed development is partially within light control Zone C and the remainder is within Zone D. Any lighting associated with the proposed development should therefore meet the restrictions associated with Zone C. Zone C allows for 150 cd intensity of light sources measured 3 degrees above the horizontal.

The design of lighting should take into consideration Guideline E to ensure there is no conflict from light fittings, coloured lights or glare caused by reflective surfaces and/or mitigation measures to be put in place. The lighting designer will need to ensure that the lights meet the requirements prescribed in the CASA *Part 139 (Aerodromes) Manual of Standards 2019.*

It should be noted that solar panel installation is a particular consideration in relation to glare/reflectivity affecting aircraft in various stages of flight as well as ATC operations. If any solar panels are proposed (such as roof-mounted array), whether as part of the initial construction or subsequently, the proponent may need to complete a solar glare hazard analysis to satisfy CASA that the safety of aircraft and ATC operations will not be affected.

3.6 Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports

Guideline F is intended to address the issue of intrusions into the operational airspace of airports by tall structures, such as buildings, cranes or activities that could cause air turbulence affecting aircraft in flight in the prescribed airspace.

This Guideline has been considered in this assessment of the proposed Link Road Mixed Use Precinct development throughout Section 2.0.

Guideline F should be considered for activities that could cause air turbulence and/or emissions of dust or other particulate matter.

Potential impacts during construction are discussed in Section 4.0.

3.7 Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS)

The purpose of Guideline G is to formalise the protection of CNS facilities in land use planning decisions. The Guideline provides land use planning guidance to better protect CNS facilities which support the systems and processes in place by various agencies to safely manage the flow of aircraft into, out of and across Australian airspace. The Guideline also informs procedures which ensure development associated activities within Building Restricted Areas (BRA) of CNS facilities do not adversely affect the facility or cause interference for air traffic controllers or aircraft in transit.

3.7.1. Existing CNS Facilities

The existing CNS facilities at Bankstown Airport include a Non-Directional Beacon (NDB) and a Precision Approach Path Indicator (PAPI). The proposed development has been assessed based on the guidance provided in NASF Guideline G for both facilities.

The proposed development is beyond the lateral limits of the obstacle assessment surfaces associated with Runway 11C/29C PAPI and the NDB.

The proposal should be submitted to Airservices Australia to ensure there is no impact on procedures and any other facilities (see Section 2.2.1).

3.7.2. Future CNS Facilities

The proposed development has been considered with respect to the guidance on Building Restricted Areas (BRA) for ILS installations provided in NASF Guideline G, for the scenario of a possible ILS installed on an extended Runway 11C/29C.

The proposed development is outside the lateral extents of the BRAs associated with a possible future ILS, as shown on Figure B23312/09.

3.8 Guideline H: Protecting Strategically Important Helicopter Landing sites (HLS)

Guideline H is not relevant to the proposed development. Guideline H defines such Strategic Helicopter Landing Sites as being areas not located on an aerodrome. The Bankstown Airport HLS are discussed under Section 2.1.3 above.

3.9 Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways

Guideline I provides guidance on approaches for the application of Public Safety Areas (PSA) planning framework in Australian jurisdictions. The Guideline is intended to ensure there is no increase in risk from new development and assist land-use planners to better consider public safety when assessing development proposals, rezoning requires and when development strategic land use plans.

The Guideline acknowledges that the UK and Queensland approaches to the development of PSA contours are of most relevance to Australia. The dimensions of the Queensland PSA template were determined with reference to the UK methodology for determining third party risk.

BAL has identified the PSAs at the end of each runway based on the Queensland state planning policy PSA Model, which Guideline I notes as providing an objective basis for a policy response through strategic and statutory planning processes. The proposed development is not within the PSAs as per the Bankstown Airport Master Plan 2019 and illustrated on Figure B23312/10.

4.0 CONSTRUCTION STAGE IMPACTS

Information in relation to the construction of the proposed development has not been provided. During construction, the construction sequencing and methodology should be considered carefully in relation to the OLS and PANS-OPS surfaces.

Penetrations of prescribed airspace by construction plant and equipment during construction constitute a controlled activity under the *Airports (Protection of Airspace) Regulations 1996*.

Construction activities on the site will need to be assessed and any penetrations of prescribed airspace will require approval under the Regulations.

5.0 CONCLUSION

L+R Airport Consulting has completed an aviation safeguarding assessment as it relates to Bankstown Airport against the NASF Guidelines for the proposed Link Road Mixed Use Precinct. The proposed development at a maximum elevation of 24.8 m AHD assessment is summarised below.

- Will not infringe the existing or Bankstown Airport Master Plan 2019 Obstacle Limitation Surfaces for Bankstown Airport;
- Will not infringe the HLS OLS at Bankstown Airport;
- Should not infringe the existing PANS-OPS Runway 11C and 29C SID, however must be submitted to Airservices Australia for formal assessment and confirmation of any impacts on procedures or facilities;
- Should not infringe the future PANS-OPS Runway 11C basic ILS transitional surface;
- Is within the current Bankstown Airport 2039 ANEF 20 to 25 zones. light industrial use (such as a warehouse) as ‘acceptable’ in less than 30 ANEF, commercial buildings as ‘acceptable in less than 25 ANEF; and school, University or house as ‘acceptable ‘ in less than 20 ANEF and ‘conditionally

acceptable' between 20 to 25 ANEF, however consideration of aircraft noise attenuation is required in accordance with AS2021-2015;

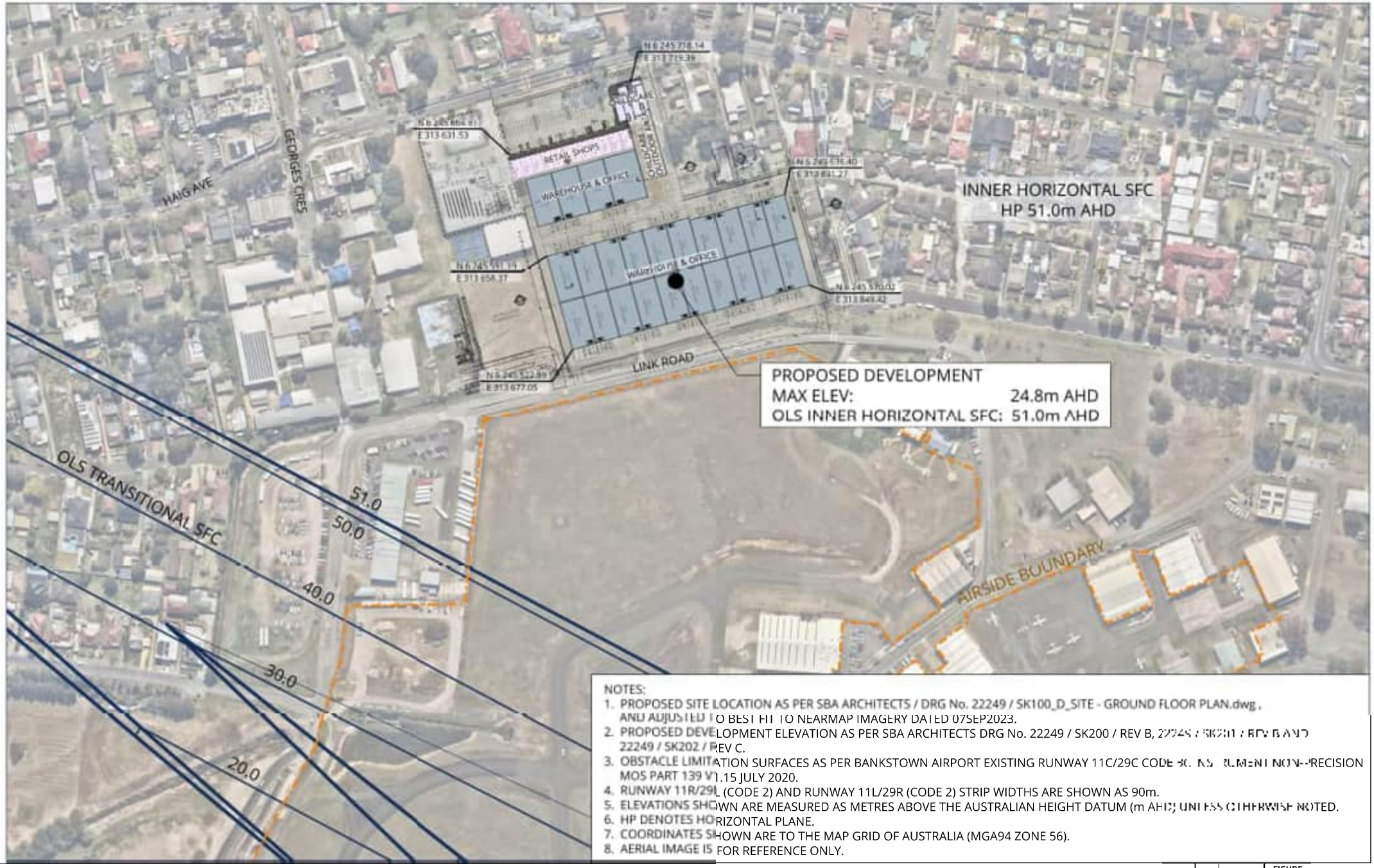
- Is within the Guideline B building generated windshear and turbulence assessment trigger areas for Runways 11L, 11C and 11R, and infringes the 1:35 slope for all three runways. However, due to the surrounding buildings between the proposed and the runways Bankstown Airport Limited may consult with CASA to determine the appropriate additional assessment;
- Is within the light control Zones C and D and should therefore meet the restrictions associated with Zone C. Zone C allows for 150 cd intensity of light sources measured 3 degrees above the horizontal. The lighting designer will need to ensure that the lights meet all requirements prescribed in the CASA *Part 139 (Aerodromes) Manual of Standards 2019*;
- Is outside the lateral protection areas associated with the Non-Directional Beacon (NDB) , the Runway 11C/29C PAPI as per NASF Guideline G;
- Is outside the BRAs for a possible future ILS;
- Is not within the PSAs as per the Bankstown Airport Master Plan 2019; and
- Construction sequencing and methodology must be considered in relation to the OLS and PANS-OPS surfaces. Penetrations of prescribed airspace by construction plan and equipment during construction constitute a controlled activity under the *Airports (Protection of Airspace) Regulations 1996*.

For further information in relation to this matter please do not hesitate to contact the undersigned.

Yours faithfully,
For and on behalf of
Lambert Rehbein (VIC) PTY LTD

B. WOUTS MPIA
PRINCIPAL CONSULTANT
AVIATION

Enc: Figures B23312/01 - 10
SBA Architects Drg No 22249/SK100/RevB
SBA Architects Drg No 22249/SK200/RevA
SBA Architects Drg No 22249/SK201/RevA
SBA Architects Drg No 22249/SK202/RevA



NOTES:

1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PROPOSED DEVELOPMENT ELEVATION AS PER SBA ARCHITECTS DRG No. 22249 / SK200 / REV B, 22249 / SK201 / REV B AND 22249 / SK202 / REV C.
3. OBSTACLE LIMITATION SURFACES AS PER BANKSTOWN AIRPORT EXISTING RUNWAY 11C/29C CODE 3C, NON-INSTRUMENT NON-PRECISION MOS PART 139 V1.15 JULY 2020.
4. RUNWAY 11R/29L (CODE 2) AND RUNWAY 11L/29R (CODE 2) STRIP WIDTHS ARE SHOWN AS 90m.
5. ELEVATIONS SHOWN ARE MEASURED AS METRES ABOVE THE AUSTRALIAN HEIGHT DATUM (m AHD) UNLESS OTHERWISE NOTED.
6. HP DENOTES HORIZONTAL PLANE.
7. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
8. AERIAL IMAGE IS FOR REFERENCE ONLY.

L-R AIRPORT CONSULTING
[illegible]
TEL PHONE [illegible] 9000
EMAIL [illegible]
WEB [illegible]

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

EXISTING OBSTACLE LIMITATION SURFACES - BANKSTOWN AIRPORT

NORTH

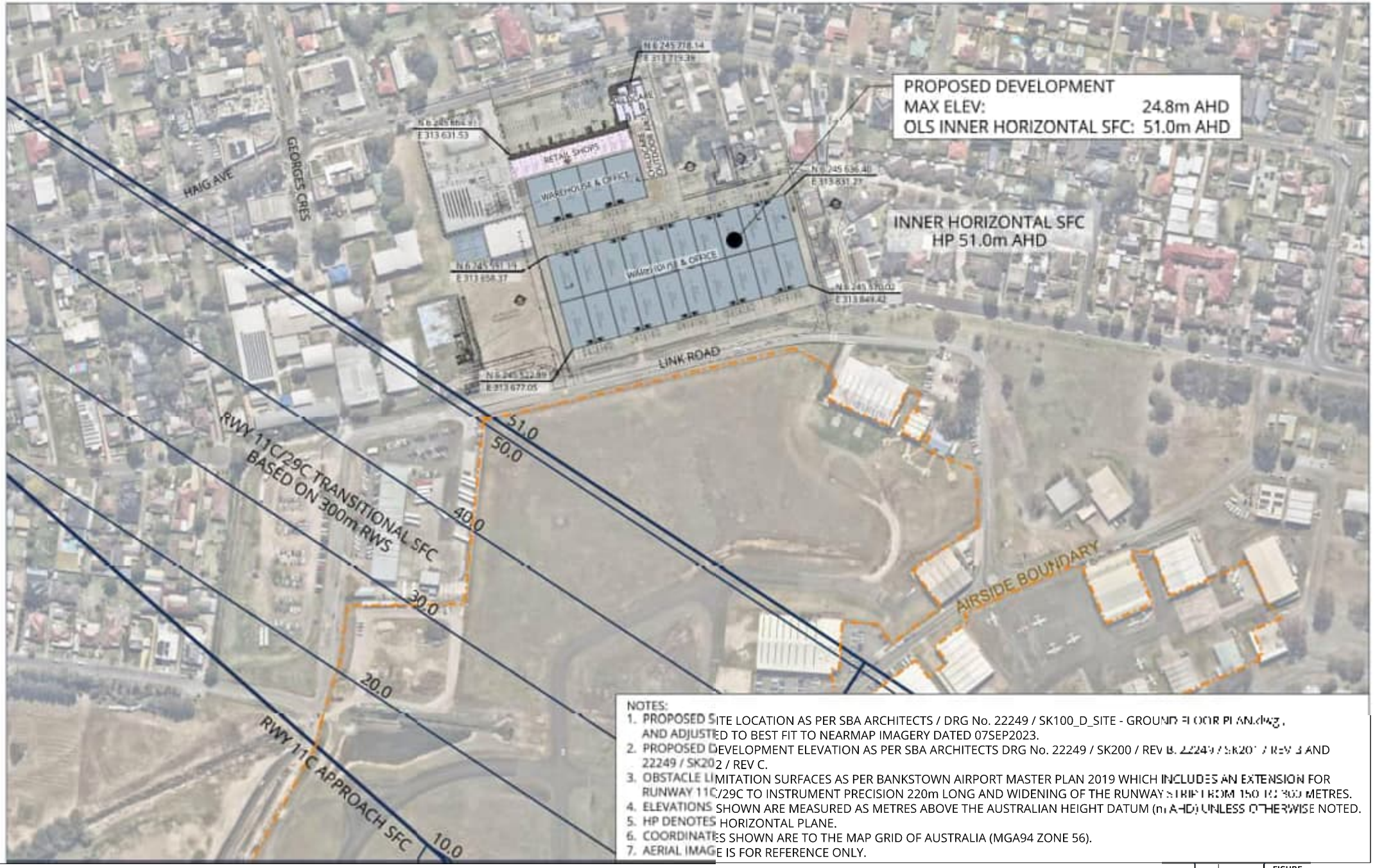
0 25 75 125m

1:2500@ A3

Rev.	Date
0	27.10.23

FIGURE:
B23312/01

Drawn: MK
Checked: BMW
Approved: BJH



NOTES:

1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg, AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PROPOSED DEVELOPMENT ELEVATION AS PER SBA ARCHITECTS DRG No. 22249 / SK200 / REV B. 22249 / SK201 / REV 3 AND 22249 / SK202 / REV C.
3. OBSTACLE LIMITATION SURFACES AS PER BANKSTOWN AIRPORT MASTER PLAN 2019 WHICH INCLUDES AN EXTENSION FOR RUNWAY 11C/29C TO INSTRUMENT PRECISION 220m LONG AND WIDENING OF THE RUNWAY STRIP FROM 150 TO 300 METRES.
4. ELEVATIONS SHOWN ARE MEASURED AS METRES ABOVE THE AUSTRALIAN HEIGHT DATUM (m AHD) UNLESS OTHERWISE NOTED.
5. HP DENOTES HORIZONTAL PLANE.
6. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
7. AERIAL IMAGE IS FOR REFERENCE ONLY.

L-R AIRPORT CONSULTING
TEL: 9000

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

FUTURE OBSTACLE LIMITATION SURFACES BANKSTOWN AIRPORT MASTER PLAN 2019

NORTH

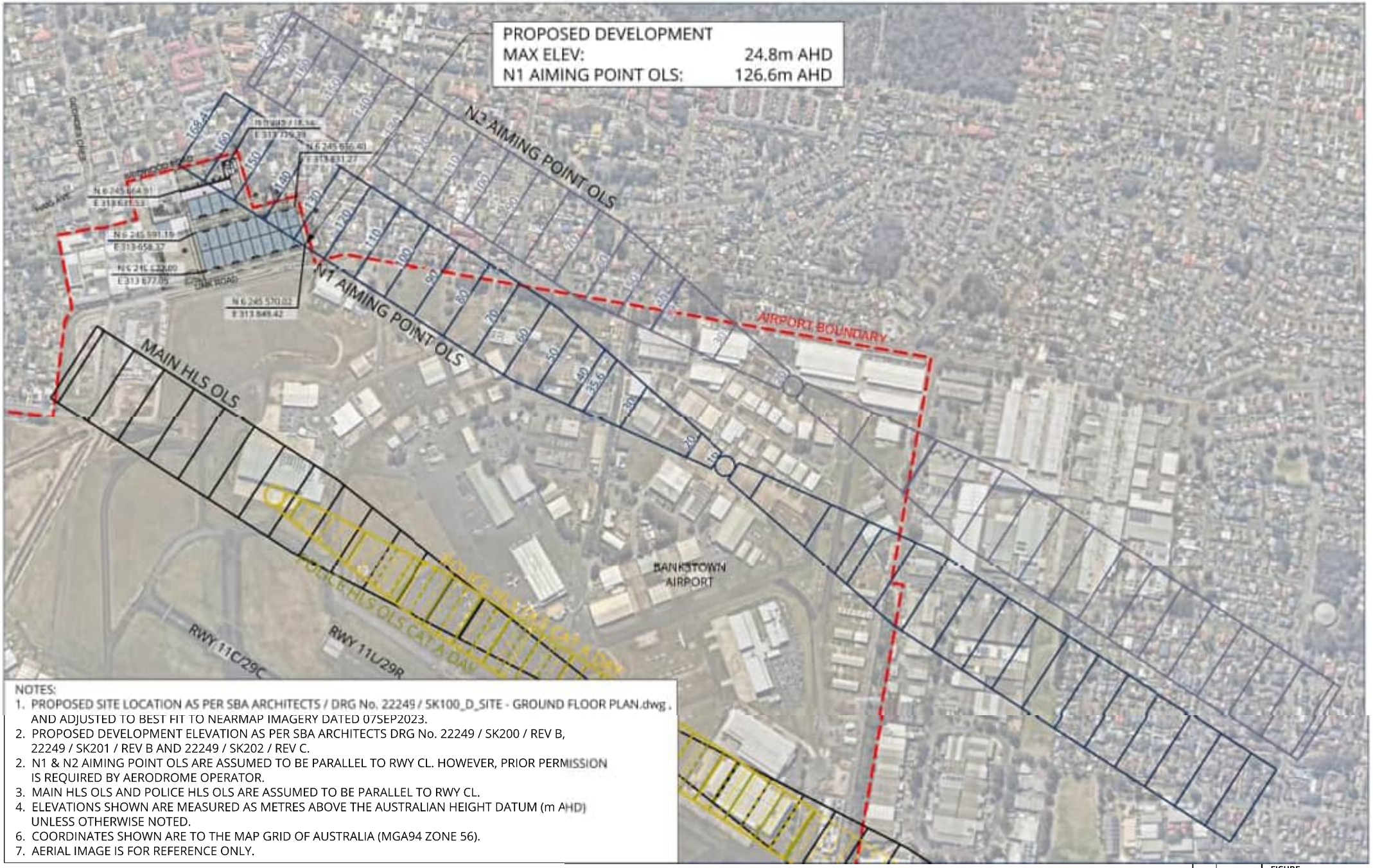
0 25 75 125m

1:2500@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/02

Drawn: MK
Checked: BMW
Approved: BJH



NOTES:

1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PROPOSED DEVELOPMENT ELEVATION AS PER SBA ARCHITECTS DRG No. 22249 / SK200 / REV B, 22249 / SK201 / REV B AND 22249 / SK202 / REV C.
2. N1 & N2 AIMING POINT OLS ARE ASSUMED TO BE PARALLEL TO RWY CL. HOWEVER, PRIOR PERMISSION IS REQUIRED BY AERODROME OPERATOR.
3. MAIN HLS OLS AND POLICE HLS OLS ARE ASSUMED TO BE PARALLEL TO RWY CL.
4. ELEVATIONS SHOWN ARE MEASURED AS METRES ABOVE THE AUSTRALIAN HEIGHT DATUM (m AHD) UNLESS OTHERWISE NOTED.
6. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
7. AERIAL IMAGE IS FOR REFERENCE ONLY.

L-R AIRPORT CONSULTING

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

HELI OLS - BANKSTOWN AIRPORT

NORTH

0 60 180 300m

1:6000@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/03

Drawn: MK
Checked: BMW
Approved: BJH

NOTES:

1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PROPOSED DEVELOPMENT ELEVATION AS PER SBA ARCHITECTS DRG No. 22249 / SK200 / REV B 22249 / SK201 / REV B AND 22249 / SK202 / REV C.
3. BANKSTOWN AIRPORT PANS-OPS IS AS PER THE BANKSTOWN AIRPORT MASTER PLAN 2019.
4. ONLY CRITICAL PANS-OPS SURFACE SHOWN. OTHER HIGHER SURFACES NOT SHOWN.
5. ELEVATIONS SHOWN ARE MEASURED AS METRES ABOVE THE AUSTRALIAN HEIGHT DATUM (m AHD) UNLESS OTHERWISE NOTED.
6. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
7. AERIAL IMAGE IS FOR REFERENCE ONLY.

L-R AIRPORT CONSULTING

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

PANS-OPS SID BANKSTOWN EIGHT DEP RWY 11C & 29C

NORTH

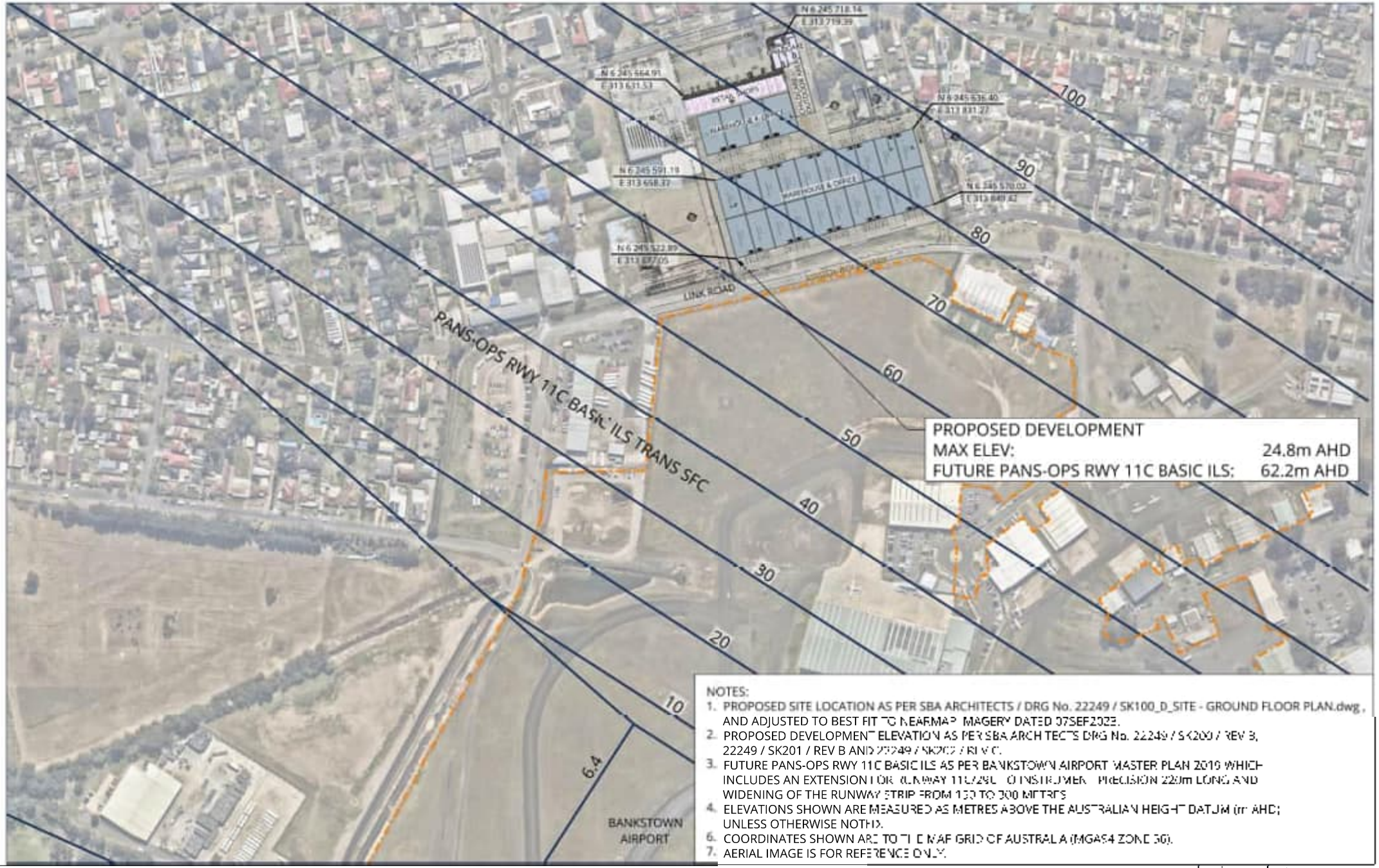
0 70 210 350m

1:7000@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/04

Drawn: MK
Checked: BMW
Approved: BJH



NOTES:

1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PROPOSED DEVELOPMENT ELEVATION AS PER SBA ARCHITECTS DRG No. 22249 / SK200 / REV B, 22249 / SK201 / REV B AND 22249 / SK202 / REV C.
3. FUTURE PANS-OPS RWY 11C BASIC ILS AS PER BANKSTOWN AIRPORT MASTER PLAN 2019 WHICH INCLUDES AN EXTENSION FOR RUNWAY 11C/29C TO INSTRUMENT PRECISION 220m LONG AND WIDENING OF THE RUNWAY STRIP FROM 150 TO 300 METRES
4. ELEVATIONS SHOWN ARE MEASURED AS METRES ABOVE THE AUSTRALIAN HEIGHT DATUM (m AHD) UNLESS OTHERWISE NOTED.
6. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
7. AERIAL IMAGE IS FOR REFERENCE ONLY.

L-R AIRPORT CONSULTING
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BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

FUTURE PANS-OPS RWY 11C BASIC ILS BANKSTOWN AIRPORT

NORTH

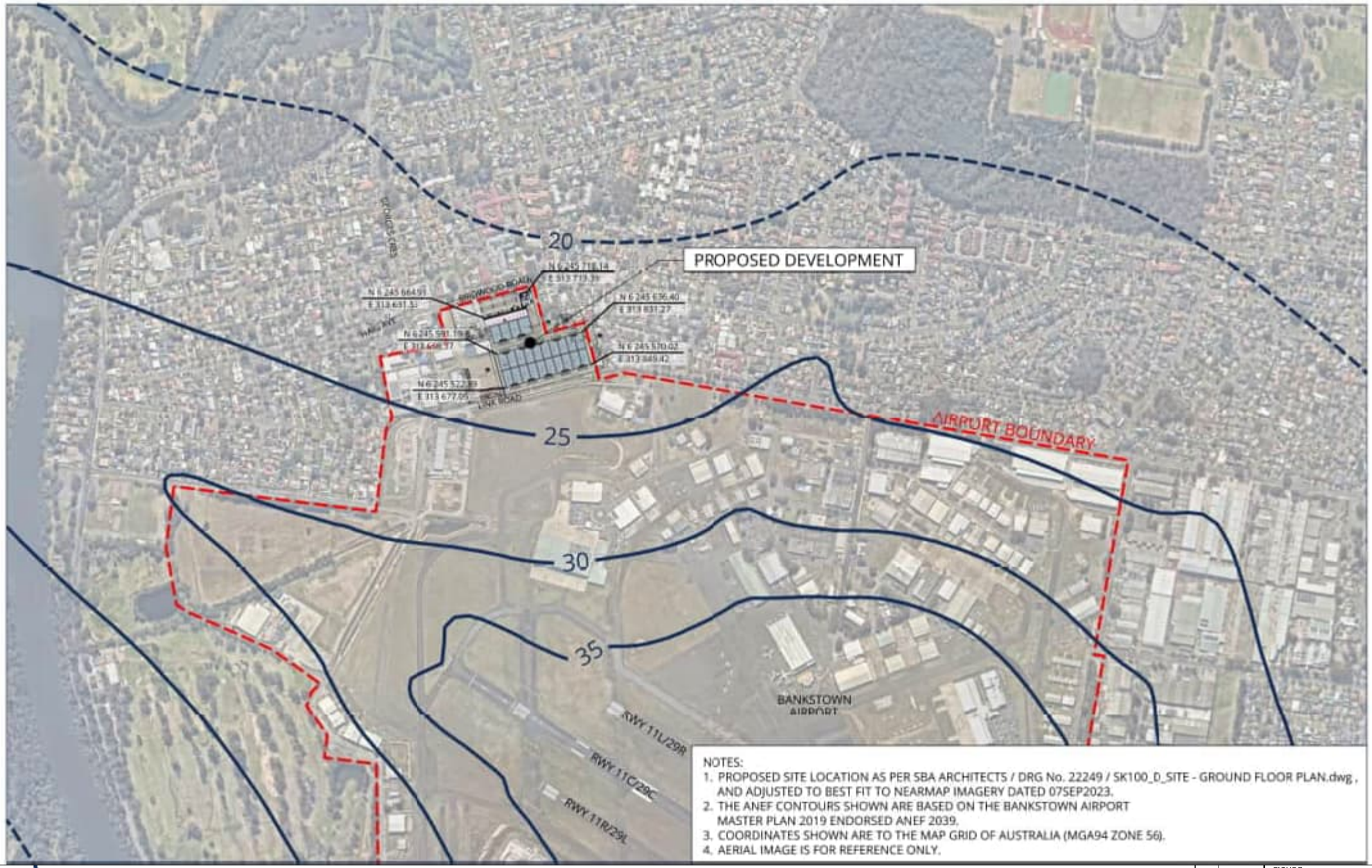
0 30 90 150m

1:3000@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/05

Drawn: MK
Checked: BMW
Approved: BJH



NOTES:
1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. THE ANEF CONTOURS SHOWN ARE BASED ON THE BANKSTOWN AIRPORT MASTER PLAN 2019 ENDORSED ANEF 2039.
3. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
4. AERIAL IMAGE IS FOR REFERENCE ONLY.

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BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

NASF GUIDELINE A - BANKSTOWN AIRPORT ENDORSED ANEF 2039

NORTH

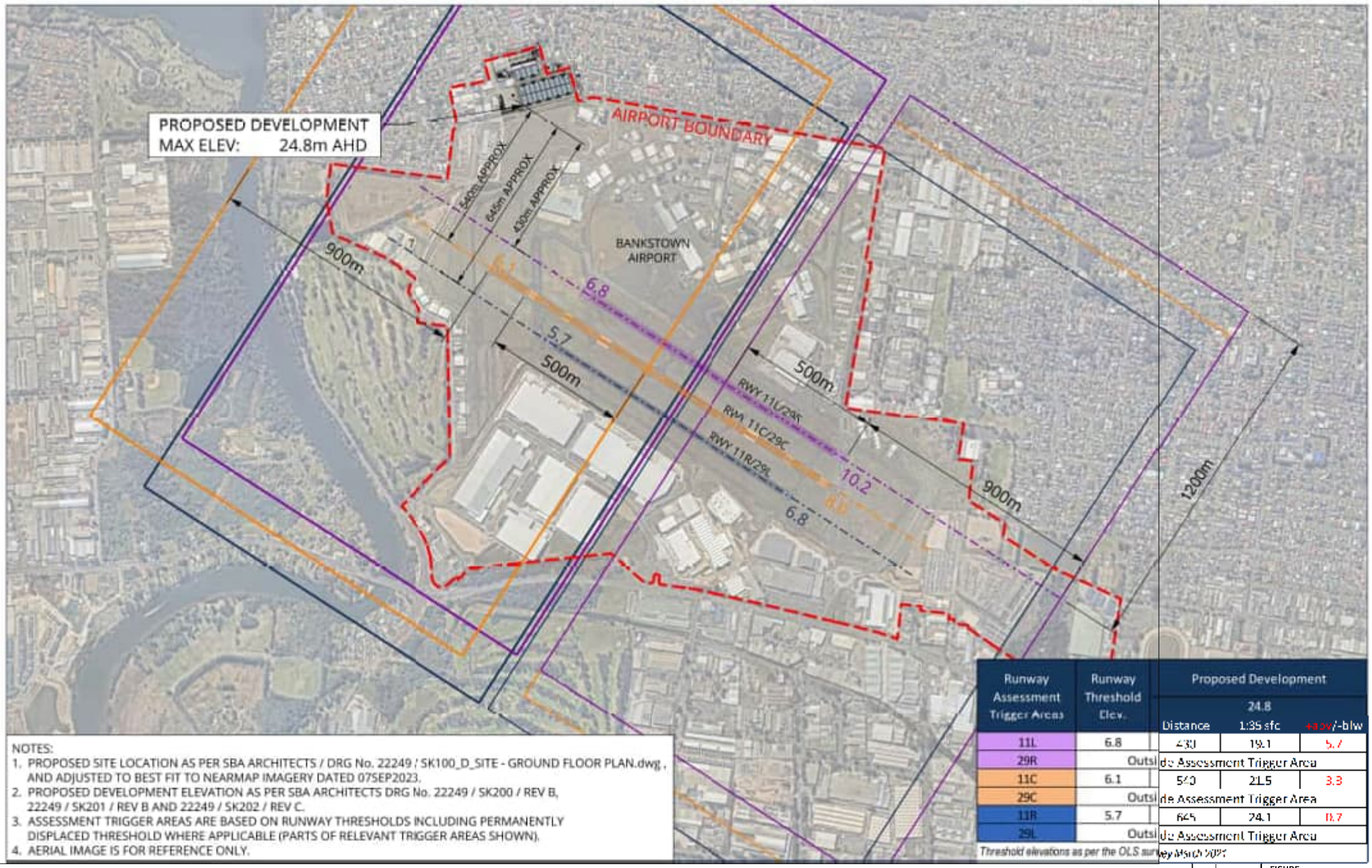
0 70 210 350m

1:7000@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/06

Drawn: MK
Checked: BMW
Approved: BJH



Runway Assessment Trigger Areas	Runway Threshold Elev.	Proposed Development 24.8		
		Distance	1:35 sfc	+ab/-blw
11L	6.8	430	19.1	5.7
29R	Outside Assessment Trigger Area			
11C	6.1	540	21.5	3.3
29C	Outside Assessment Trigger Area			
11R	5.7	645	24.1	0.7
29L	Outside Assessment Trigger Area			

Threshold elevations as per the OLS survey March 2021

NOTES:
1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PROPOSED DEVELOPMENT ELEVATION AS PER SBA ARCHITECTS DRG No. 22249 / SK200 / REV B, 22249 / SK201 / REV B AND 22249 / SK202 / REV C.
3. ASSESSMENT TRIGGER AREAS ARE BASED ON RUNWAY THRESHOLDS INCLUDING PERMANENTLY DISPLACED THRESHOLD WHERE APPLICABLE (PARTS OF RELEVANT TRIGGER AREAS SHOWN).
4. AERIAL IMAGE IS FOR REFERENCE ONLY.

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BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

NASF GUIDELINE B - BUILDING GENERATED WINDSHEAR & TURBULENCE - BANKSTOWN AIRPORT

NORTH

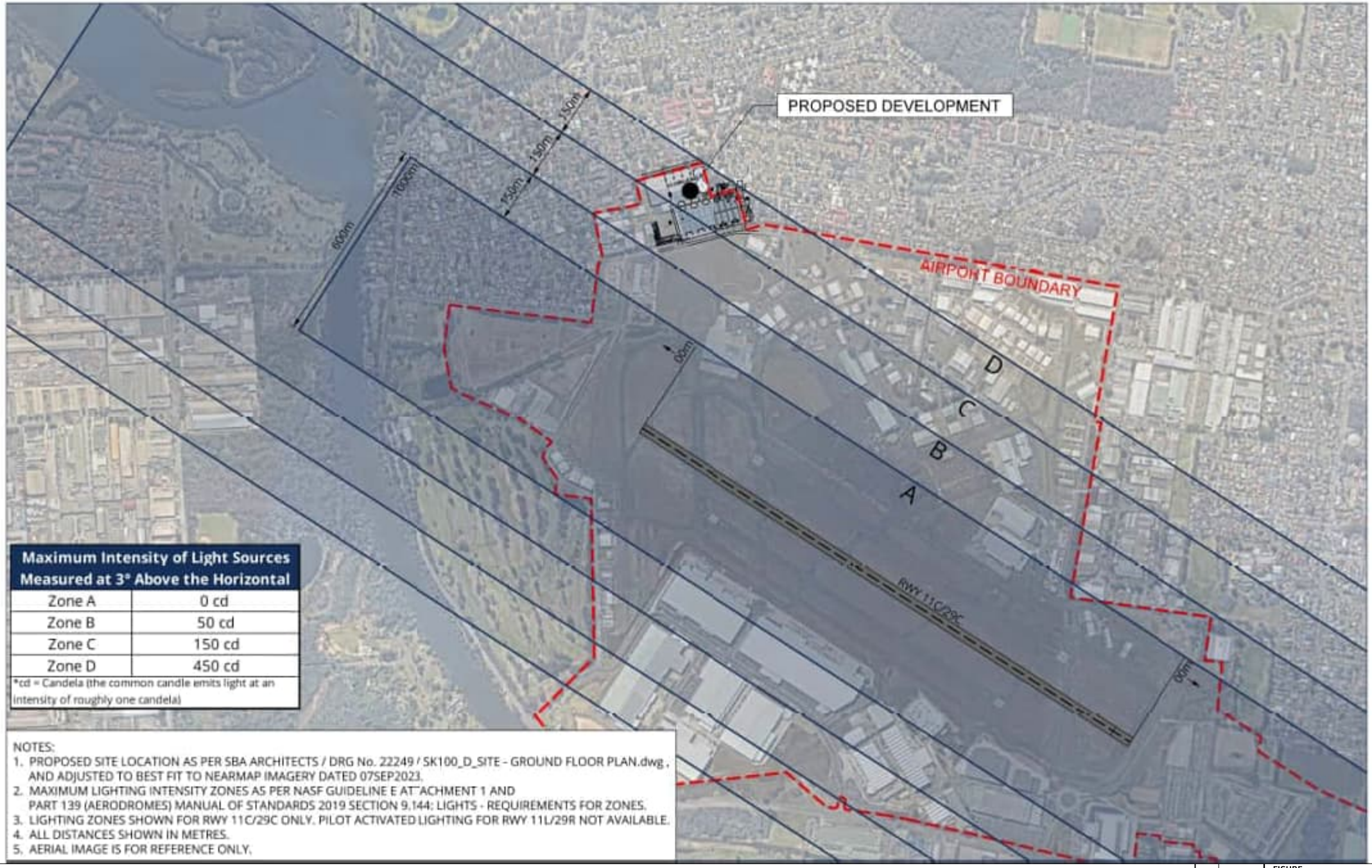
0 120 360 600m

1:12000@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/07

Drawn: MK
Checked: BMW
Approved: BJH



Maximum Intensity of Light Sources Measured at 3° Above the Horizontal	
Zone A	0 cd
Zone B	50 cd
Zone C	150 cd
Zone D	450 cd

*cd = Candela (the common candle emits light at an intensity of roughly one candela)

NOTES:
1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. MAXIMUM LIGHTING INTENSITY ZONES AS PER NASF GUIDELINE E ATTACHMENT 1 AND PART 139 (AERODROMES) MANUAL OF STANDARDS 2019 SECTION 9.144: LIGHTS - REQUIREMENTS FOR ZONES.
3. LIGHTING ZONES SHOWN FOR RWY 11C/29C ONLY. PILOT ACTIVATED LIGHTING FOR RWY 11L/29R NOT AVAILABLE.
4. ALL DISTANCES SHOWN IN METRES.
5. AERIAL IMAGE IS FOR REFERENCE ONLY.

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WEB [illegible]

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

NASF GUIDELINE E - MAXIMUM LIGHTING INTENSITY ZONES - BANKSTOWN AIRPORT

NORTH

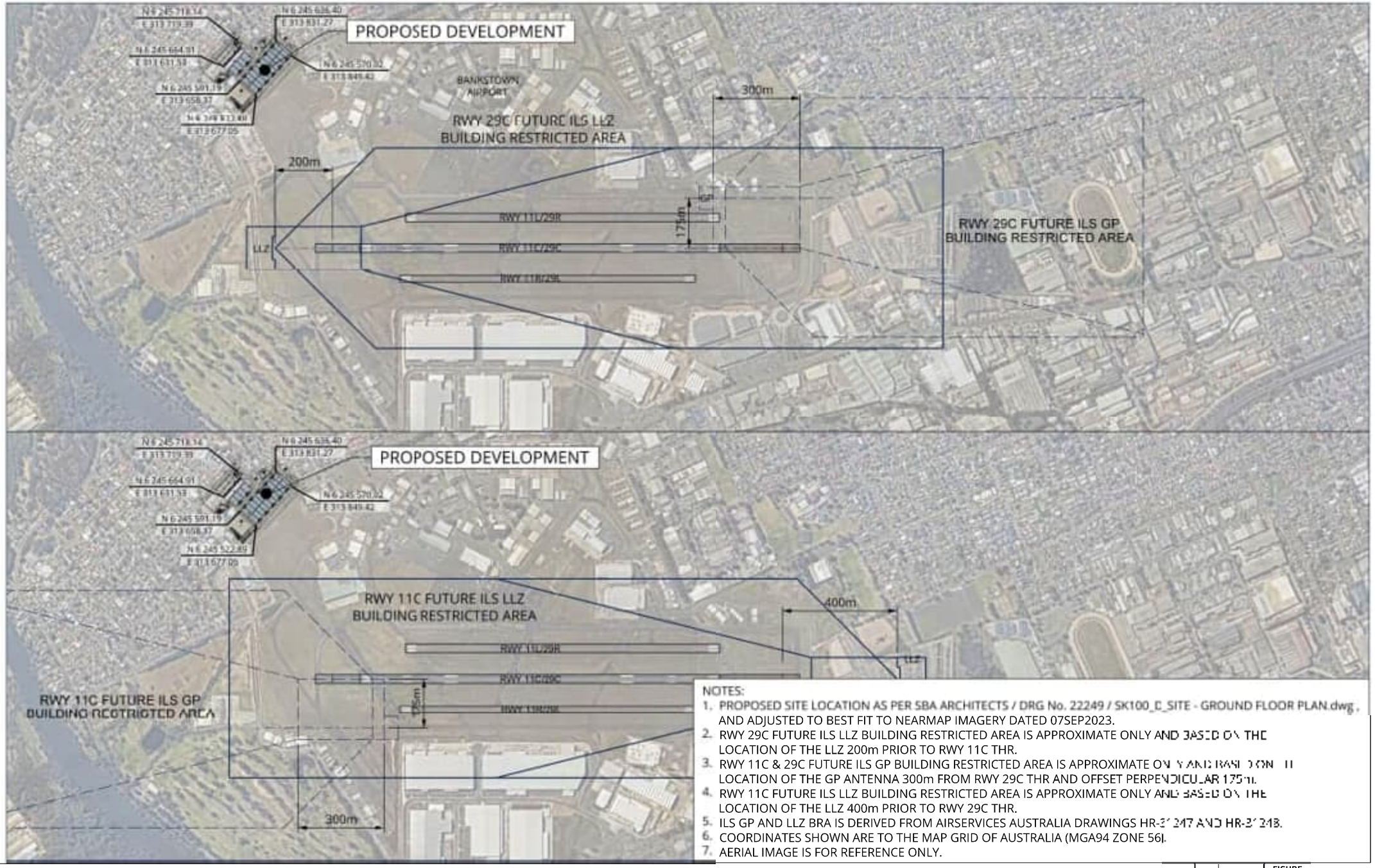
0 100 300 500m

1:10000@ A3

Rev.	Date
0	27.10.23

FIGURE:
B23312/08

Drawn: MK
Checked: BMW
Approved: BJH



NOTES:

1. PROPOSED SITE LOCATION AS PER SBA ARCHITECTS / DRG No. 22249 / SK100_C_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. RWY 29C FUTURE ILS LLZ BUILDING RESTRICTED AREA IS APPROXIMATE ONLY AND BASED ON THE LOCATION OF THE LLZ 200m PRIOR TO RWY 11C THR.
3. RWY 11C & 29C FUTURE ILS GP BUILDING RESTRICTED AREA IS APPROXIMATE ONLY AND BASED ON THE LOCATION OF THE GP ANTENNA 300m FROM RWY 29C THR AND OFFSET PERPENDICULAR 175m.
4. RWY 11C FUTURE ILS LLZ BUILDING RESTRICTED AREA IS APPROXIMATE ONLY AND BASED ON THE LOCATION OF THE LLZ 400m PRIOR TO RWY 29C THR.
5. ILS GP AND LLZ BRA IS DERIVED FROM AIRSERVICES AUSTRALIA DRAWINGS HR-37247 AND HR-37248.
6. COORDINATES SHOWN ARE TO THE MAP GRID OF AUSTRALIA (MGA94 ZONE 56).
7. AERIAL IMAGE IS FOR REFERENCE ONLY.

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TF PHONE [illegible] 9000

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

FUTURE ILS BUILDING RESTRICTED AREAS - BANKSTOWN AIRPORT

NORTH

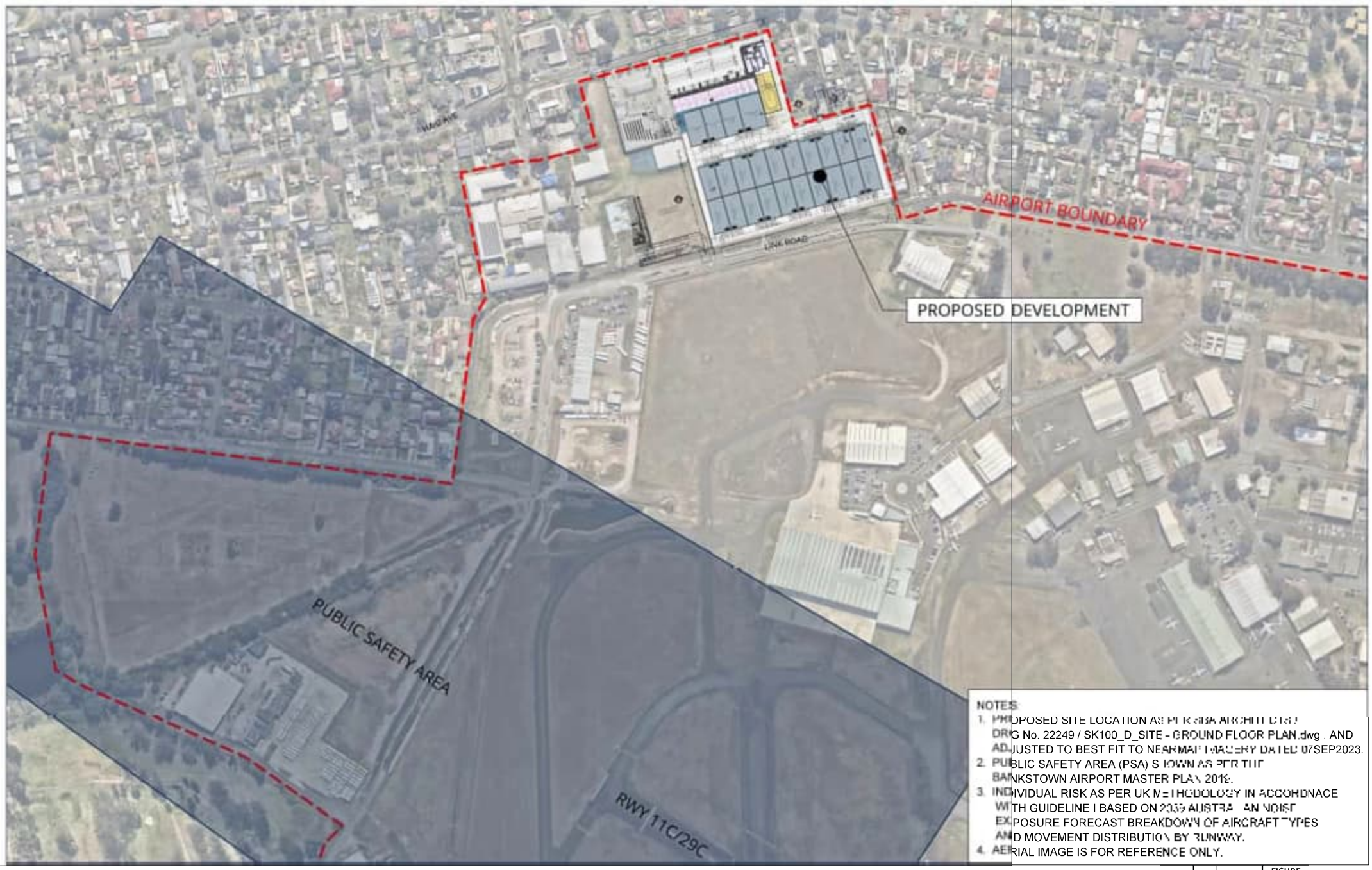
0 120 360 600m

1:12000@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/09

Drawn: MK
Checked: BMW
Approved: BJH



NOTES

1. PROPOSED SITE LOCATION AS PER BASA AIRCRAFT DATA DRG No. 22249 / SK100_D_SITE - GROUND FLOOR PLAN.dwg , AND ADJUSTED TO BEST FIT TO NEARMAP IMAGERY DATED 07SEP2023.
2. PUBLIC SAFETY AREA (PSA) SHOWN AS PER THE BANKSTOWN AIRPORT MASTER PLAN 2019.
3. INDIVIDUAL RISK AS PER UK METHODOLOGY IN ACCORDNACE WITH GUIDELINE I BASED ON 2039 AUSTRALIAN NOISE EXPOSURE FORECAST BREAKDOWN OF AIRCRAFT TYPES AND MOVEMENT DISTRIBUTION BY RUNWAY.
4. AERIAL IMAGE IS FOR REFERENCE ONLY.

L-R AIRPORT CONSULTING
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W.E. [illegible]

BANKSTOWN AIRPORT LIMITED

LINK ROAD MIXED USE PRECINCT - AVIATION ASSESSMENT

NASF GUIDELINE I - PUBLIC SAFETY AREA - BANKSTOWN AIRPORT MP2019

NORTH

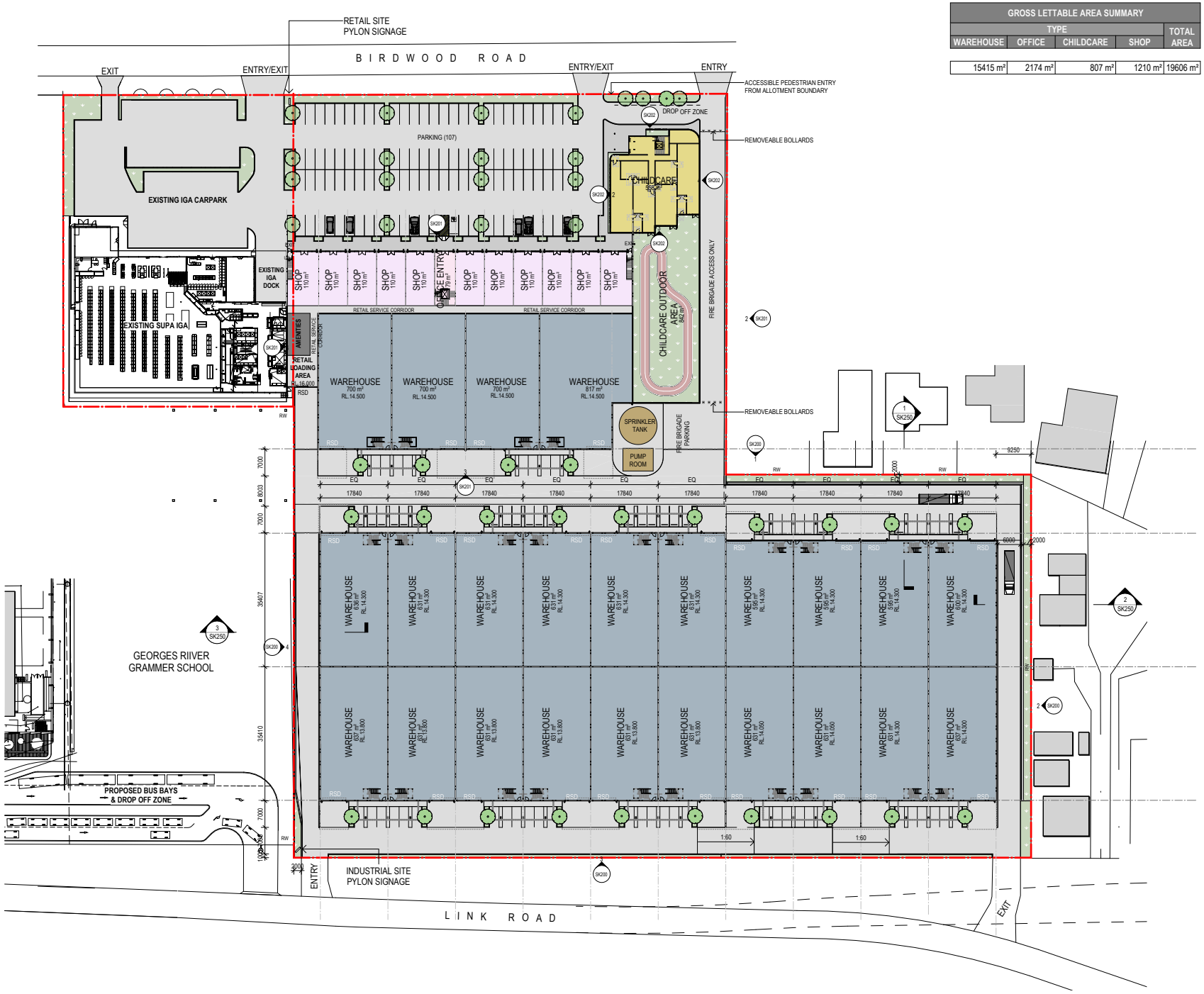
0 35 105 175m

1:3500@ A3

Rev.	Date
0	27.10.23

FIGURE: B23312/10

Drawn: MK
Checked: BMW
Approved: BJH



GROSS LETTABLE AREA SUMMARY				
TYPE				TOTAL AREA
WAREHOUSE	OFFICE	CHILDCARE	SHOP	
15415 m²	2174 m²	807 m²	1210 m²	19606 m²

GROSS LETTABLE AREA INDUSTRIAL			
DESCRIPTION	TYPE		TOTAL AREA
UNIT / TENANCY	WAREHOUSE	OFFICE	
1	700 m²	40 m²	740 m²
2	700 m²	40 m²	740 m²
3	700 m²	40 m²	740 m²
4	817 m²	40 m²	857 m²
5	636 m²	40 m²	676 m²
6	631 m²	40 m²	671 m²
7	631 m²	40 m²	671 m²
8	631 m²	40 m²	671 m²
9	631 m²	40 m²	671 m²
10	631 m²	40 m²	671 m²
11	595 m²	39 m²	634 m²
12	595 m²	40 m²	635 m²
13	595 m²	39 m²	634 m²
14	600 m²	40 m²	640 m²
15	637 m²	40 m²	677 m²
16	631 m²	40 m²	671 m²
17	631 m²	40 m²	671 m²
18	631 m²	40 m²	671 m²
19	631 m²	40 m²	671 m²
20	631 m²	40 m²	671 m²
21	631 m²	40 m²	671 m²
22	631 m²	40 m²	671 m²
23	631 m²	40 m²	671 m²
24	637 m²	40 m²	677 m²
TOTALS:	15415 m²	958 m²	16373 m²

GROSS LETTABLE AREA RETAIL		
DESCRIPTION	TYPE	TOTAL AREA
UNIT / TENANCY	SHOP	
1	110 m²	110 m²
2	110 m²	110 m²
3	110 m²	110 m²
4	110 m²	110 m²
5	110 m²	110 m²
6	110 m²	110 m²
7	110 m²	110 m²
8	110 m²	110 m²
9	110 m²	110 m²
10	110 m²	110 m²
11	110 m²	110 m²
TOTALS:	1210 m²	1210 m²

GROSS LETTABLE AREA CHILDCARE		
DESCRIPTION	TYPE	TOTAL AREA
UNIT / TENANCY	CHILDCARE	
1	807 m²	807 m²
TOTALS:	807 m²	807 m²

GROSS LETTABLE AREA OFFICE		
DESCRIPTION	TYPE	TOTAL AREA
UNIT / TENANCY	OFFICE	
1	99 m²	99 m²
2	110 m²	110 m²
3	110 m²	110 m²
4	110 m²	110 m²
5	88 m²	88 m²
6	72 m²	72 m²
7	88 m²	88 m²
8	110 m²	110 m²
9	110 m²	110 m²
10	110 m²	110 m²
11	110 m²	110 m²
12	99 m²	99 m²
TOTALS:	1216 m²	1216 m²

SBA ARCHITECTS

B	LANDSCAPE SETBACK ADDED	26/09/23
A	PRELIMINARY ISSUE	13/09/23
#	DESCRIPTION	DATE

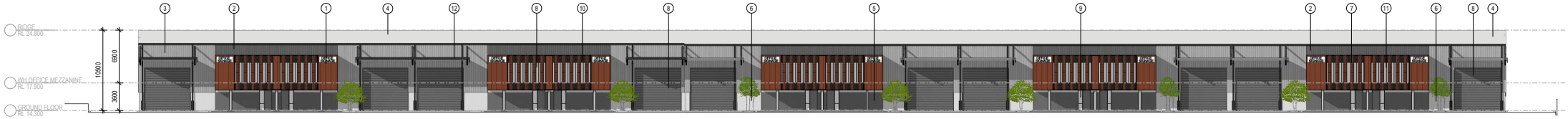
LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

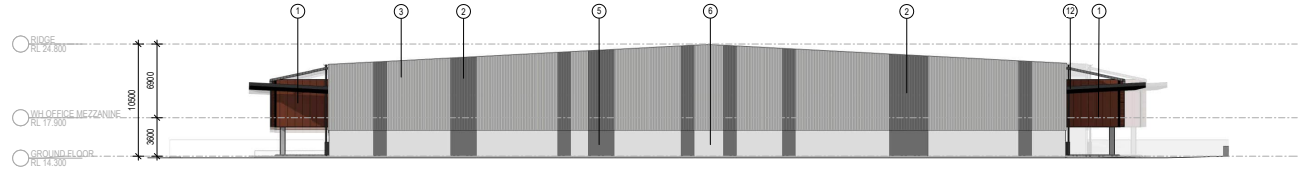
NORTH

TITLE: SITE / GROUND FLOOR PLAN

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
26/09/23		22249	SK100	B

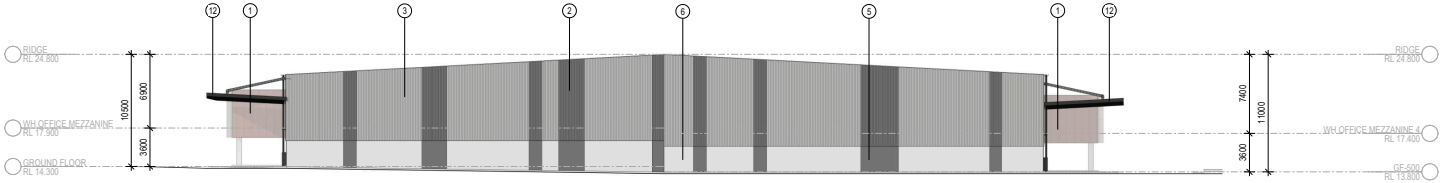


1 WAREHOUSE NORTH ELEVATION 1 : 250



2 WAREHOUSE EAST ELEVATION 1 : 250

3 WAREHOUSE SOUTH ELEVATION 1 : 250



4 WAREHOUSE WEST ELEVATION 1 : 250

INDICATIVE EXTERNAL FINISHES *FINISHES SUBJECT TO AUTHORITY AND CLIENT APPROVAL*

1. METAL PROFILE CLADDING-KIPLOK 700-COLOBOND ARIES
2. METAL PROFILE CLADDING - TRIMDEK-COLORBOND BASALT
3. METAL PROFILE CLADDING - TRIMDEK - COLORBOND SHALE GREY
4. METAL DECK ROOFING - ZINCALUME - COLORBOND SURFMIST
5. PRECAST CONCRETE PANEL - PAINT FINISH COLORBOND BASALT
6. PRECAST CONCRETE PANEL - NATURAL FINISH
7. EXPANDED METAL MESH SCREEN - PAINT FINISH TO MATCH COLORBOND MONUMENT
8. ROLLER SHUTTER DOOR - PAINT FINISH TO MATCH COLORBOND BASLAT
9. GLAZING PANEL - LIGHT GREY TINT
10. SPANDREL PANEL - FINISH TO MATCH COLORBOND MONUMENT
11. ALUMINIUM WINDOW FRAMES - POWDERCOAT FINISH BLACK
12. DOWNPIPES, FASCIA & GUTTERS - POWDERCOAT FINISH TO MATCH COLORBOND MONUMENT
13. MASONRY BRICK WALL - BLONDE COLOUR
14. CHILDCARE ARTWORK WALL
15. METAL PROFILE CLADDING - KLIPLOK 700 - COLORBOND MONUMENT
16. MASONRY BRICK WALL - DARK COLOUR

SBA ARCHITECTS
Commercial Industrial Residential Retail Interior Design
Phone: 02 9727 7188 Web: www.sbaarch.com.au

#	DESCRIPTION	DATE
A	CHILDCARE, RETAIL & WAREHOUSE ELEVATIONS	26/09/23

Forge. Industrial Management

ALTIS PROPERTY PARTNERS

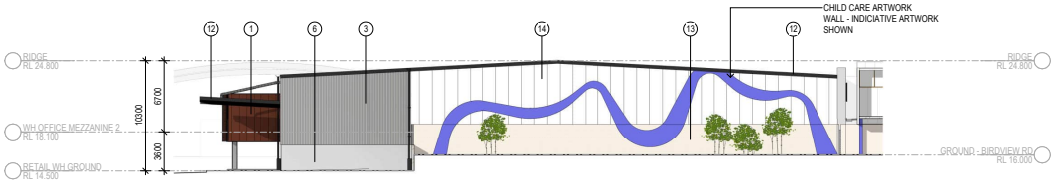
LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

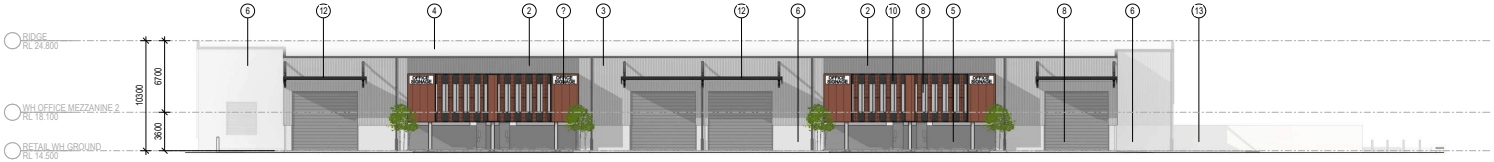
TITLE
WAREHOUSE ELEVATIONS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
26/09/23	1:250 @ A1 1:500 @ A3	22249	SK200	A

1 RETAIL NORTH ELEVATION 1 : 150



2 RETAIL EAST ELEVATION 1 : 250



3 RETAIL SOUTH ELEVATION 1 : 250

4 RETAIL WEST ELEVATION 1 : 250

INDICATIVE EXTERNAL FINISHES *FINISHES SUBJECT TO AUTHORITY AND CLIENT APPROVAL*

1. METAL PROFILE CLADDING-KIPLOK 700-COLOBOND ARIES
2. METAL PROFILE CLADDING - TRIMDEK-COLORBOND BASALT
3. METAL PROFILE CLADDING - TRIMDEK - COLORBOND SHALE GREY
4. METAL DECK ROOFING - ZINCALUME - COLORBOND SURFMIST
5. PRECAST CONCRETE PANEL - PAINT FINISH COLORBOND BASALT
6. PRECAST CONCRETE PANEL - NATURAL FINISH
7. EXPANDED METAL MESH SCREEN - PAINT FINISH TO MATCH COLORBOND MONUMENT
8. ROLLER SHUTTER DOOR - PAINT FINISH TO MATCH COLORBOND BASLAT
9. GLAZING PANEL - LIGHT GREY TINT
10. SPANDREL PANEL - FINISH TO MATCH COLORBOND MONUMENT
11. ALUMINIUM WINDOW FRAMES - POWDERCOAT FINISH BLACK
12. DOWNPIPES, FASCIA & GUTTERS - POWDERCOAT FINISH TO MATCH COLORBOND MONUMENT
13. MASONRY BRICK WALL - BLONDE COLOUR
14. CHILDCARE ARTWORK WALL
15. METAL PROFILE CLADDING - KLIPLOK 700 - COLORBOND MONUMENT
16. MASONRY BRICK WALL - DARK COLOUR

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#	DESCRIPTION	DATE
A	CHILDCARE, RETAIL & WAREHOUSE ELEVATIONS	26/09/23

Forge. Industrial Management

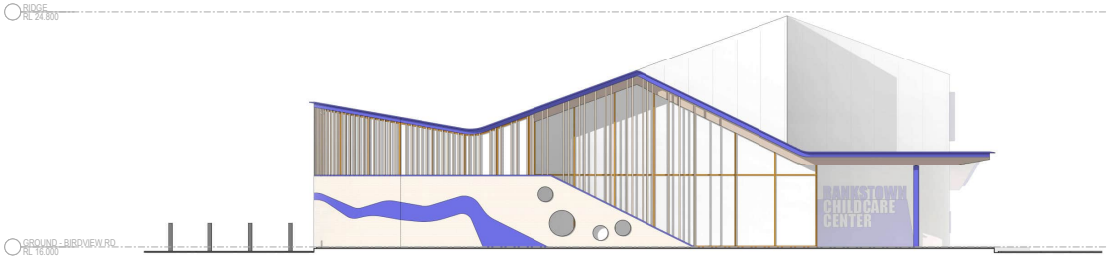
ALTIS PROPERTY PARTNERS

LINK ROAD MIXED USE PRECINCT

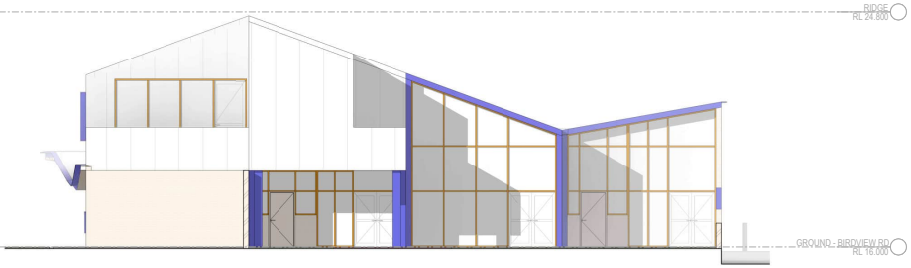
LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE
RETAIL ELEVATIONS

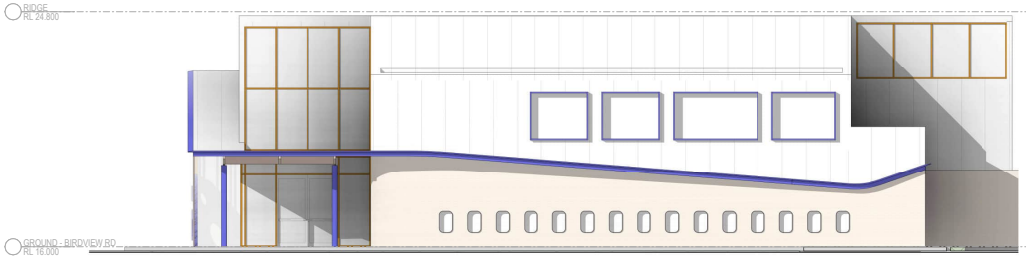
DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
26/09/23	1:250 @ A1 1:500 @ A3	22249	SK201	A



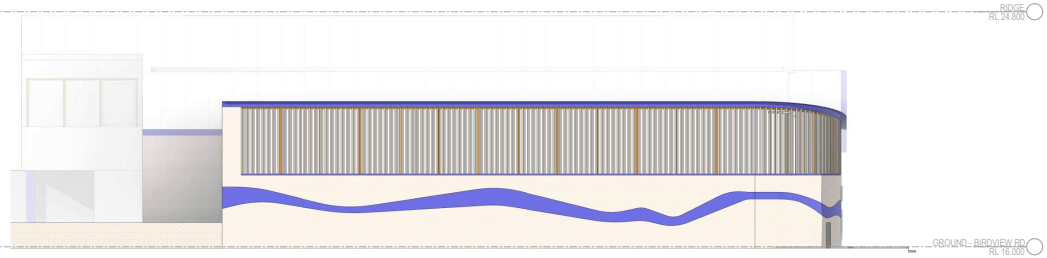
1 CHILDCARE NORTH ELEVATION 1 : 100



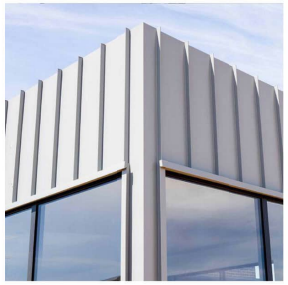
3 CHILDCARE SOUTH ELEVATION 1 : 100



2 CHILDCARE WEST ELEVATION 1 : 100



4 CHILDCARE EAST ELEVATION 1 : 100



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#	DESCRIPTION	DATE
A	CHILDCARE, RETAIL & WAREHOUSE ELEVATIONS	26/09/23

Forge. Karuta management

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LINK ROAD MIXED USE PRECINCT

LINK ROAD, BANKSTOWN AIRPORT, NSW

TITLE
CHILD CARE ELEVATIONS

DATE	SCALE	PROJECT NO.	DWG NO.	REVISION
26/09/23	1:100 @ A1 1:200 @ A3	22249	SK202	A

Appendix E

Wind Shear and Turbulence Impact Assessment

Link Road Mixed Use Precinct

CFD-based Windshear and Turbulence Study

Bankstown Airport Proprietary Limited

c/o Forge Venture Management
Level 7, 120 Sussex Street
SYDNEY NSW 2000

Prepared by:

SLR Consulting Australia

Tenancy 202 Submarine School,
Sub Base Platypus, 120 High
Street, North Sydney NSW 2060,
Australia

SLR Project No.: 610.031668

19 September 2024

Report Revision: R01-v1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
R01-v1.0	19 September 2024	Dr Neihad Al-Khalidy	Dr Peter Georgiou	Dr Neihad Al-Khalidy

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Bankstown Airport Proprietary Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Bankstown Airport Limited (BAL) to undertake a windshear and wind turbulence report for a proposed mixed use precinct at Link Road, Bankstown Airport.

The proposed site is located at the northeastern side of the airport's approach landing paths from the northwest – refer **Figure 1**.

BAL has commissioned a quantitative Computational Fluid Dynamics (CFD) modelling assessment and report on the windshear and wake turbulence effects of the proposed aviation facility development.

The assessment is conducted in accordance with the National Airports Safeguarding Framework (NASF) Guideline B, 2018 – *Managing the Risk of Building Generated Windshear and Turbulence at Airports* - specifically to address wind impacts on runways at Bankstown Airport. The NASF-B (2018) criteria are:

- The *"7-knot alongwind criterion"* - the variation in mean wind speed due to wind disturbing structures must remain below 7 kt (3.6 m/s) along the aircraft trajectory at heights below 200 ft. The speed deficit change of 7 kt must take place over a distance of at least 100 m.
- The *"6-knot crosswind criterion"* - the variation in mean wind speed due to wind disturbing structures must remain below 6 kt across the aircraft trajectory at heights below 200 ft. The speed deficit change of 6 kt must take place over a distance of at least 100 m.
- The *"4-knot turbulence criterion"* - the standard deviation of wind speed must remain below 4kt at heights below 200 ft.

The instability which building-induced wake effects can cause to an aircraft is significantly reduced once the airplane has touched down (upon landing) or is at reasonable height (200 ft off the ground prior to landing). After touch-down, the aircraft has increased stability/support from contact with the runway pavement. Above 200 ft, the consequences of a drop in altitude or a change in wind bank are considerably less and the pilot has increased latitude and hence time to correct for any unforeseen induced effects on the aircraft prior to touch-down.

Bankstown Airport is situated southwest of the Sydney CBD and comprises three runways (11R/29L, 11L/29R and 11C/29C) suitable for fixed wing aircraft movements and aeronautical facilities required for substantial rotary wing movements as well. Night operations on 11C/29C comprise approximately 2.5% of all movements.

In relation to the location of the proposed development, the wind directions deemed to have the greatest potential impact on the Runways are the winds originating from north-northeast (22.5°±22.5°).

The study of the current and post-development winds has been undertaken using a quantitative CFD analysis approach. The reference approach wind speed for this study is 20 kt at 10 m height taking into account the local exposure factors by wind direction. Crosswinds at and above 20 kt for the relevant northeast wind direction for the current study have zero frequency of occurrence.

- Bureau of Meteorology (BoM) records at Bankstown Airport, covering a 23-year period from 1999-2021 inclusive, show that, from the north-northeast (22.5°±22.5°), there were 0 hours where the mean wind speed exceeded 20 kt.

Assessments in the current report were made for the worst-case condition (ie covering all possible flight landing paths), starting from an altitude band of 30 m. The wind deficit at an altitude >30 m is negligible due to the proposed building's height and runway location. Offshoot landing is not analysed due to the location of the proposed building. The relationship distance-wise of the proposed development to the nearest Runway 11L can be seen in **Figure 2**.

While SLR's measurement positions do not cover the NASF-B *"900 m before the threshold and up to 500 m along the runways from the threshold at 100 m intervals"*, SLR assessed the results at more than 50 horizontal landing intervals to better capture the worst-case scenario. The results (as confirmed by previous SLR studies) show that modelling a greater number of possible landing scenarios in areas where the wake occurs (for example conducting modelling along the runway at horizontal intervals of 25 m or 50 m is more critical than presenting the results at every 100 m between changes -900 m to +500 m. In particular, the peak turbulence may not be captured if the results are presented every 100 m, subject to geometry, runway and building orientation.

The following major conclusions have been reached based on results of simulations for the critical wind directions and assessment of Bankstown Airport BoM Weather Station data.

The current study has involved the modelling of the following built environment "scenarios":

- "Current" - the existing built environment (as of August 2024) including recently approved developments. Refer **Figure 5A**
- "Post development - Proposed" - including Current + Proposed Development. Refer **Figure 5B** and **Figure 6**

Existing Wind Conditions

Mean Wind Speed at 10 m Height

- There were 0 hours where the mean wind speed exceeded 20 kt taking into account wind directions 22.5°±22.5° over the 23-year BoM record period.
- There were 8 hours per year where the mean wind speed exceeded 15 kt taking into account wind directions 22.5°±22.5° over the 23-year BoM record period.

Runway 11R/29L and Runway 11L/29R operate during daylight only from 06:00 hrs to 18:00 hrs while 11C/29C operates 24 hours a day. The occurrence of the exceedance for 15 kt is reduced to 6-7 hours per year when only daylight hours are included in SLR's assessment (refer **Section 3.2.1**)

Turbulence Exceedance at the Anemometer Location

- There were approximately 1,600 occasions during the 23-year BoM record period (69.5 per year) where natural turbulence exceeded 4 kt taking into account ALL wind directions.
- There were 2 occasions per year where natural turbulence exceeded 4 kt from winds orientating from 22.5°±22.5°.

It should be noted that while many of those exceedance "occasions" occurred on different days, some occurred in consecutive hours on the same day during the passage of major windstorm events.

Future Wind Conditions (Associated with the Post-Post Development Scenario)

The following major conclusions have been reached based on results of CFD simulations for the analysed wind directions:

Windshear – Approaching Wind Speed = 20 Knot at 10m above ground

- A number of warehouses and low-rise buildings are located to the northeast side of the runways.
- The variation in the mean wind speed for the existing and post development scenarios is either below 6 kt or impacted less than 100 m at a height below 60 m. The NASF-B windshear criterion is therefore not exceeded. due to the following:
    - Location of the building (eg the buildings are located behind existing buildings).
    - Relatively low building height (10.6 m)

Wind Turbulence – Approaching Wind Speed = 20 Knot at 10m above ground

- In the CFD modelling, the trees and vegetation surrounding the site were removed primarily to reduce computational time, noting that this removal makes the model slightly conservative as the addition of vegetation would typically reduce ground level wind speeds.
- The proposed development will have a minor impact on the peak turbulence levels taking into account 22.5°±22.5° wind directions.
- Peak (instantaneous) turbulence levels are increased by a modest amount for the wind 0° and 45° and slightly reduced for infrequent wind at 22.5°.
    - Wind angle 0°
        - 0.7 kt for 11L
        - 0.2 kt for 11C
    - Wind angle 22.5°
        - -0.4 kt for 11L
        - -0.25 kt for 11C
    - Wind angle 45˚
        - 0.1 kt for 11L
        - 0 kt for 11C

Summary Results

The results of simulations for the worst-case scenario are summarised below.

Scenario	Are the NASF-B Compliance Criteria Satisfied?		Runway 11L	Runway 11C
	Cross-Wind 6 kt	Turbulence 4 kt	No of Hours per Year Turbulence Criterion Exceeded 6 am - 6 pm	No of Hours per Year Turbulence Criterion Exceeded 6 am - 6 pm
Current	Yes	No	5[1,2]	5[1]
Post Development	Yes	No	5[1,2]	4[1]

Note 1: The results take into account 22.2±22.5° wind directions.

Note 2: Runway 11L operates during the daytime (6:00 am to 6:00 pm) ONLY. Refer **Table 7** and **Table 8**

Recommendations

To mitigate building-induced wake turbulence, it's recommended to implement operational risk mitigation measures accepted by the airport operator and CASA when winds exceed 12.8 kt from the NNE (wind angle 22.5°± 22.5°).

The addition of the proposed development has a minor impact on the peak turbulence levels, ie it increases the peak turbulence level by ~0.7 kt for the worst-case scenario but the number of exceedances for the current and post development scenarios is similar taking into account all analysed wind directions.

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Acronyms and Abbreviations

BAL	Bankstown Airport Propriety Limited
BoM	Bureau of Meteorology
CASA	Civil Aviation Safety Authority
NASF	National Aviation Safeguarding Framework
kt	knot (nautical mile per hour) – 1 kt = 0.5144 m/sec
SLR	SLR Consulting Australia Pty Ltd

1.0 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Bankstown Airport Limited (BAL) to undertake a wind shear and wind turbulence report for a proposed mixed-use precinct at Link Road, Bankstown Airport.

The proposed site is located at the northeastern side of the airport's approach landing paths from the northwest – refer **Figure 1** and **Figure 2**.

The proposed building would infringe the 1 in 35 surface for Runways 11L, 11C and 11R by a maximum of approximately 5.7 m, 3.2 m and 0.6 m, respectively.

Accordingly, BAL has commissioned a quantitative Computational Fluid Dynamics (CFD) modelling assessment and report on the potential windshear and wake turbulence effects of the proposed development.

- The main operational runway at Bankstown Airport is Runway 11C/29C. The runway is 1416 m in length and 30 m in width.
- Runway 11L/29R has primary and secondary operations which operate both independently and in conjunction with Bankstown's main runway.
- The southern Runway 11R/29L, at 1038 m in length and 23 m wide, is only suitable for single and small twin engine light aircraft such as Cessna 172, 206 and Piper aircraft.

Given the proposed development's position relative to the typical landing zone range of runways, simulations for the worst wind directions from the north-northeast (wind angle 22.5°±22.5°) have been modelled.

The objective of this study is to undertake a quantitative Computational Fluid Dynamics (CFD) analysis approach of current and post-development for the most critical crosswind directions.

1.1 Development Site

The proposed site area is 35,800 m^2, and the design involves developing a warehouse, retail and office spaces and childcare facilities.

- Existing IGA: 1998 m^2
- Warehouse; 15,227 m^2
- Office: 1,000 m^2
- Retail; 990 m^2
- Childcare: 744 m^2

Figure 1 Aerial View of Proposed Development Site

Figure 2 Aerial View of Proposed Development Site Showing Location to the Runway Centreline.

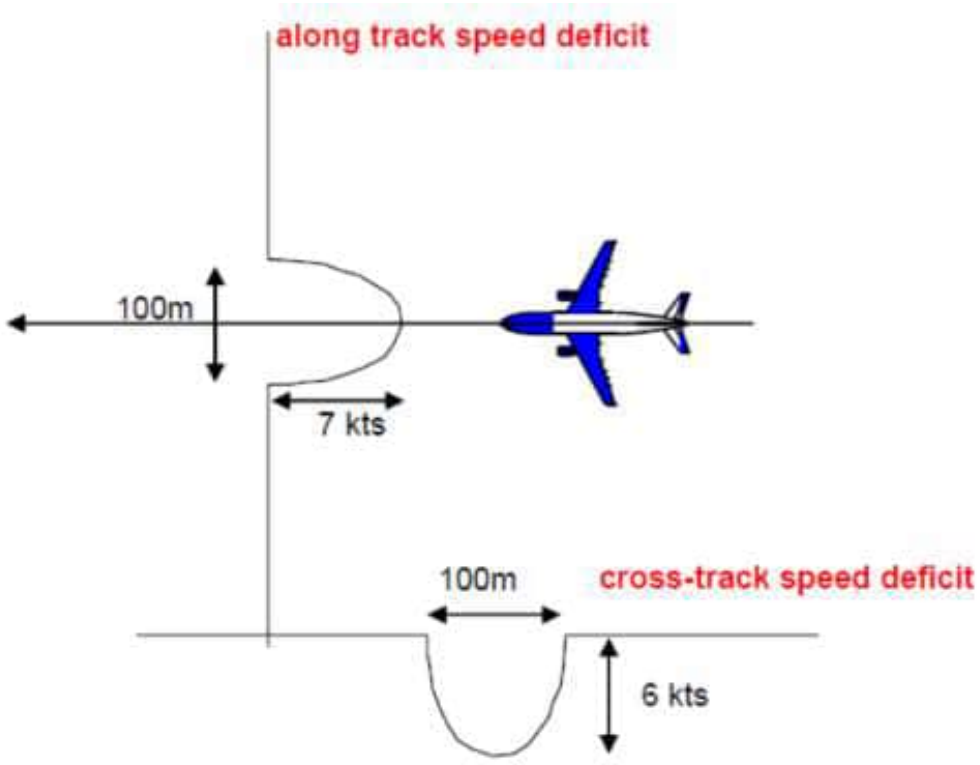
2.0 ACCEPTABILITY CRITERIA

2.1 The National Airports Safeguarding Framework (NASF) Guideline B - 2018

The assessment has been conducted in accordance with the National Airports Safeguarding Framework (NASF) Guideline B, 2018 – *Managing the Risk of Building Generated Windshear and Turbulence at Airports* specifically to address wind impacts on Bankstown Airport runways which state:

- The *"7-knot alongwind criterion"* - the variation in mean wind speed due to wind disturbing structures must remain below 7 kt (3.6 m/s) along the aircraft trajectory at heights below 200 ft. The speed deficit change of 7 kt must take place over a distance of at least 100 m.
- The *"6-knot crosswind criterion"* - the variation in mean wind speed due to wind disturbing structures must remain below 6 kt across the aircraft trajectory at heights below 200 ft. The speed deficit change of 6 kt must take place over a distance of at least 100 m.
- The *"4-knot turbulence criterion"* - the standard deviation of wind speed must remain below 4kt at heights below 200 ft.

Figure 3 NASF-B (2018) Windshear Criteria



3.0 LOCAL EXPOSURE OF THE SITE

3.1 Critical Wind Directions for the Site

Due to the relative position of proposed aviation facility to the runway direction, the crosswind directions for the windshear and turbulence are between North (0º) and East (90º).

3.2 Bankstown Airport Bureau of Meteorology Data

3.2.1 Mean Wind Speed Exceedance

SLR has analysed long-term wind records at the Bankstown Airport Bureau of Meteorology (BoM) Weather Station site. This dataset contains records at hourly intervals of:

- Mean Wind Speed – average wind speed during the 60-minute period.
- Gust Wind Speed – peak 2-3 second gust occurring (anytime) within the 60-minute period.
- Wind Direction – average wind direction during the 60-minute period.

From this dataset, SLR has derived the occurrence of the exceedance for various wind speed levels at a 10 m reference height (which is close to the proposed building height) where the angle bandwidth is ±22.5°. This covers wind directions from 0° to 360° - refer **Table 1**.

Table 1 Mean Wind Speed Exceedances (Hours/5-Year Period) versus Wind Direction (all hours of the day)

10m ht MEAN Wind Speed (kt)	Wind Direction (±22.5°)								
	N 0˚	NE 45˚	E 90˚	SE 135˚	S 180˚	SW 225˚	W 270˚	NW 315˚	ALL
5	1912	3351	2807	4429	3171	3339	2794	3022	24825
10	313	1260	1356	2848	1481	902	1125	587	9872
15	37	62	107	862	443	173	390	173	2247
20	0	0	7	115	89	10	74	26	321
25	0	0	0	12	7	0	7	1	27

Table 1 shows the following:

All Wind Directions

- There were 27 hours total (5.4 per year) where the mean wind speed exceeded 25 kt taking into account ALL wind directions.
- There were 321 hours total (64 per year) where the mean wind speed exceeded 20 kt taking into account ALL wind directions.
- There were 2,247 hours total (449 per year) where the mean wind speed exceeded 15 kt taking into account ALL wind directions.

Northeast Winds

- There were NO hours where the mean wind speed exceeded 25 kt.
- There were NO hours where the mean wind speed exceeded 20 kt.
- There were 49.5 hours (12 per year) where the mean wind speed exceeded 15 kt.

It should be borne in mind that the above "hours" of exceedance do not translate into the same number of discrete hourly "windstorm events". There were a number of occasions during the passage of extreme windstorm systems, when these exceedances occurred during consecutive hours on the same day, ie associated with the same windstorm.

One such example occurred during the passage of a strong low pressure system on 29 October 2013. The wind remained above 20 kt for a continuous 6-hour period between Noon and 6:00 pm that day. Accordingly, this one "event" accounted for 6 hourly exceedances of 20 kt.

The data shown in **Table 1** has been reproduced in **Table 2**, this time as an annual exceedance probability of occurrence. The following conclusions can be reached from **Table 1** and **Table 2**.

- The probability of a 20 kt or higher mean wind speed from the NE±22.5° is 0.0%.
- The probability of exceeding 15 kt from the northeast° is approximately 0.14%, ie a 1.4 in 1000 chance of exceeding 15 kt from that direction.

Table 2 Mean Wind Speed Exceedance Probability versus Wind Direction (all hours of the day)

10m ht MEAN Wind Speed (kt)	Wind Direction (±22.5°)								
	N 0˚	NE 45˚	E 90˚	SE 135˚	S 180˚	SW 225˚	W 270˚	NW 315˚	ALL
5	4.36%	7.65%	6.41%	10.11%	7.24%	7.62%	6.38%	6.90%	56.6%
10	0.71%	2.88%	3.09%	6.50%	3.38%	2.06%	2.57%	1.34%	22.5%
15	0.08%	0.14%	0.24%	1.97%	1.01%	0.39%	0.89%	0.39%	5.13%
20	0.000%	0.000%	0.016%	0.262%	0.203%	0.023%	0.169%	0.059%	0.732%
25	0.000%	0.000%	0.000%	0.027%	0.016%	0.000%	0.016%	0.002%	0.062%

Table 3 shows the annual number of movements at Bankstown Airport in 2014. Runway 11R/29L and Runway 11L/29R operate during daylight only from 0600hr to 1800hr while 11C/29C operates 24 hours per day. As per **Table 3**, the annual number of movements in 2014 was:

- 116,240 on Runway 11R/29L.
- 32,141 on Runway 11C/29C (with 804 movements occurring at night-time).
- 47,220 on Runway 11L/29R.

Table 3 Total Number of Movements at Bankstown Airport in 2014

Category	Movements	HLS	NWS	11L	11C	11R	29L	29C	29R
Fixed Wing	79,362			23.8%	16.2%			24.3%	35.7%
Fixed Wing Training	116,240					40%	60%		
Helicopters	26,217	100%							
Rescue Helicopters	1,360			30%	10%		20%		40%
Helicopter Training	6,377		100%						
TOTAL in 2014	**229,556**								

Table 3 shows that night-time activity at Runway 11C/29C is approximately 2.5% of all movements. Accordingly, the data shown in **Table 1** and **Table 2** have been reproduced in **Table 4** and **Table 5**, this time only for daylight hours.

Table 4 Mean Wind Speed Exceedances (Hours/5-Year Period) versus Wind Direction (Daylight Hours only)

10m ht MEAN Wind Speed (kt)	Wind Direction (±22.5°)								
	N 0˚	NE 45˚	E 90˚	SE 135˚	S 180˚	SW 225˚	W 270˚	NW 315˚	ALL
5	1288	1418	1584	2396	1690	1959	1792	2087	14214
10	242	644	907	1715	950	633	736	425	6252
15	35	44	90	605	315	129	304	155	1677
20	0	0	3	85	62	8	66	25	249
25	0	0	0	7	6	0	7	1	21

Table 5 Mean Wind Speed Exceedance Probability versus Wind Direction (Daylight Hours only)

10m ht MEAN Wind Speed (kt)	Wind Direction (±22.5°)								
	N 0˚	NE 45˚	E 90˚	SE 135˚	S 180˚	SW 225˚	W 270˚	NW 315˚	ALL
5	2.94%	3.24%	3.61%	5.47%	3.86%	4.47%	4.09%	4.76%	32.4%
10	0.55%	1.47%	2.07%	3.91%	2.17%	1.44%	1.68%	0.97%	14.3%
15	0.080%	0.100%	0.205%	1.381%	0.719%	0.294%	0.694%	0.354%	3.83%
20	0.000%	0.000%	0.007%	0.194%	0.141%	0.018%	0.151%	0.057%	0.568%
25	0.000%	0.000%	0.000%	0.016%	0.014%	0.000%	0.016%	0.002%	0.048%

Table 4 and **Table 5** show the following:

ALL Wind Directions

- There were 21 hours total (4.2 per year) where the mean wind speed exceeded 25 kt.
- There were 249 hours total (50 per year) where the mean wind speed exceeded 20 kt.
- There were 1,667 hours total (333 per year) where the mean wind speed exceeded 15 kt.

NE ±22.5°

- There were NO hours where the mean wind speed exceeded 25 kt.
- There were NO hours where the mean wind speed exceeded 20 kt.
- There were 44 hours (8.8 per year) where the mean wind speed exceeded 15 kt.

With regard to the limits of the approaching wind speed, SLR has been advised that there are practical aspects of the runways becoming inoperable in high crosswinds at and above 25 kt.

3.2.2 Natural and Existing Built Environment Turbulence Exceedance

SLR's analysis of the Bankstown Airport Bureau of Meteorology (BoM) Weather Station data has yielded the annual exceedance characteristics of 4 kt turbulence shown in **Table 6** and **Figure 4**

ALL Wind Directions

- There were 66 hours per year where 4 kt turbulence was exceeded. While many of those exceedances occurred on different days, some would have occurred in consecutive hours during the passage of major windstorm events.

22.5 ±22.5°

- There were 2.5 hours per year where 4 kt turbulence was exceeded. Again, in any one year, these may have occurred on consecutive hours during the passage of a major windstorm event.

Table 6 4-knot Turbulence Exceedance Probability versus Wind Direction

Annual Exceedances	Wind Direction (±22.5°)								
	N 0˚	NE 45˚	E 90˚	SE 135˚	S 180˚	SW 225˚	W 270˚	NW 315˚	ALL
No / Year	2.2	2.2	3.0	5.4	13.8	8.8	20.2	10.2	65.8
%age	0.025%	0.025%	0.034%	0.062%	0.158%	0.100%	0.231%	0.116%	0.025%

Figure 4 4 knot Turbulence Exceedance Probability in 1-Year – Bankstown Airport BOM Weather Data

4.0 CFD MODELLING, ASSUMPTIONS AND ANALYSIS

SLR has modelled the proposed development and the surrounds using the Creo Parametric software package. This was then imported to ANSYS to prepare the model for solving.

The surrounding buildings and airport runways were included in the study. The model was then moved to the specialised world leading CFD software ANSYS-FLUENT for computation.

Ambient wind profiles have been created for all critical wind directions.

Wind speeds were then determined at the runways relative for the current and post development scenarios.

4.1 Modelling

A 3D model of the development area and surrounding buildings was created from sketches and 2D AutoCAD files supplied by Forge (received 5/7/2024).

Figures 5 to 7 show the geometry for CFD Modelling. The developed model accounts for all small features of the proposed development (e.g., parapet, gaps, etc.).

SLR has also reviewed the survey data for the areas of interest. The available survey data for the proposed development site shows elevated ground at the areas of interest. All complex topographic features are also included in the current and post-development scenarios (Refer **Figure 5**).

The CFD analysis used a calculation domain 2,200 m long, 2,744 m wide, and 400 m high.

4.2 Wind Condition

The results in the following sections are presented for a reference approach wind speed of 20 kt at 10 m height taking into account the local exposure factors by wind direction.

SLR's analysis of Bankstown Airport Bureau of Meteorology (BoM) Weather Station data shows that there were 0 hours total (refer **Table 1**) where the mean wind speed exceeded 20 kt from the relevant critical wind direction of 22.5°±22.5°. The results in this study will be presented for the worst-case wind conditions.

At the upwind free boundary inlet, velocity profiles were derived from the Australian Wind Code, AS1170.2. For example, the approaching wind speed is 20 kt at 10 m height with a vertical profile determined by the surrounding terrain in accordance with the Terrain Category classification contained in the Code. The effect of terrain roughness on wind speed is then used to obtain the variation in wind speed with height.

Figure 5 Development Site and Surrounds

A: Current Scenario

B: Post Development

Figure 6 3D Model of the Site and Surrounds, Including Modelled Site Topography

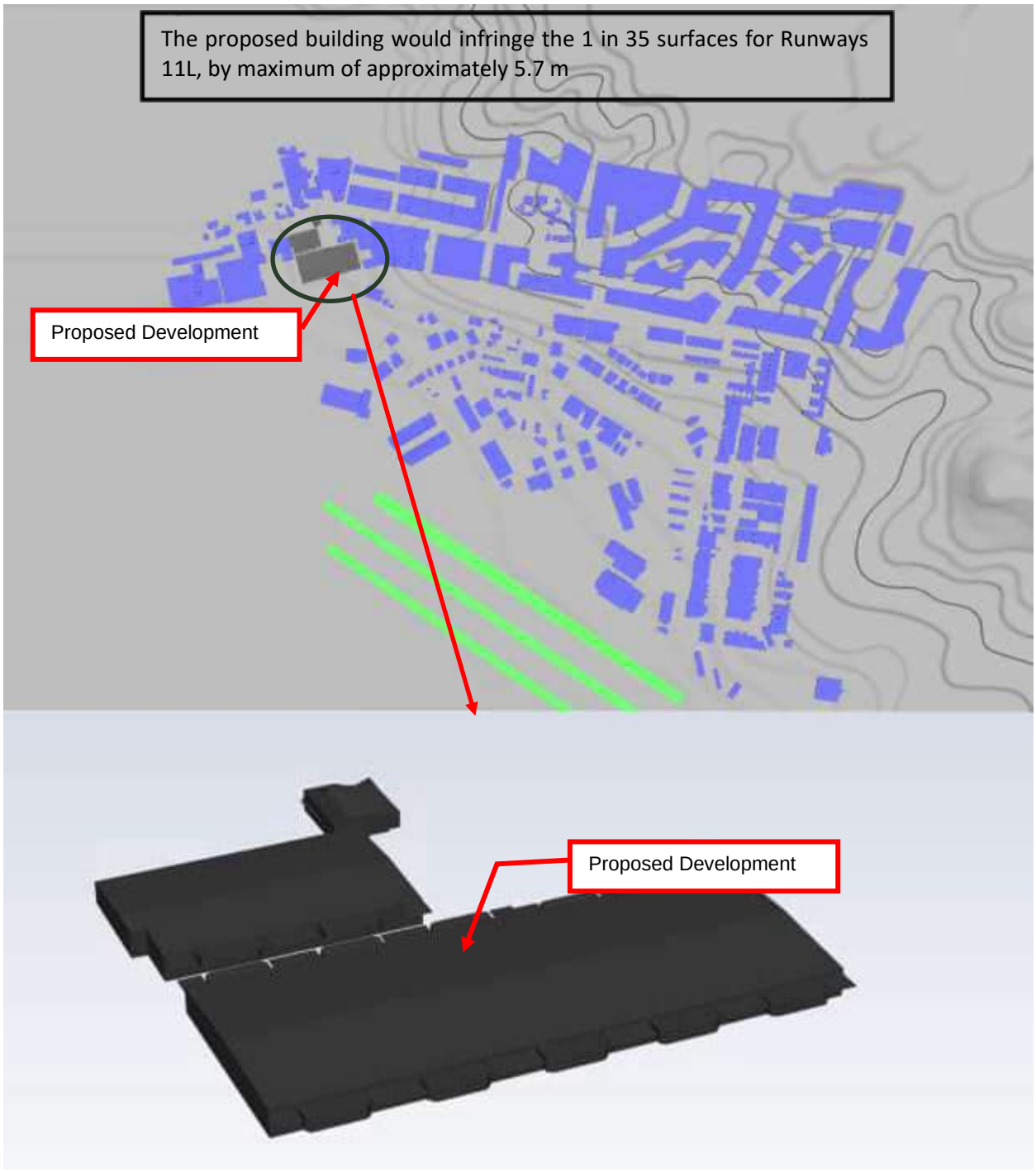


Figure 7 3D Model of the Proposed Development

4.3 Turbulence Model

For the current study, SLR used an advanced Delayed Detached Eddy Simulation (DDES) turbulence model to capture the unsteadiness arising from turbulence for a number of critical wind directions.

- The proposed DDES (hybrid modelling mythology) approach combines the benefits of Reynolds-averaged Navier–Stokes equations (or RANS equations) and LES while minimising their disadvantages
- While the RANS (Realizable k-epsilon in this study) can achieve good prediction for attached boundary layers, LES can capture unsteady motions of large eddies in separated regions.
- The DDES can also be coupled with different turbulence model (eg SST k-omega, Spalart - Allmaras, etc).

This approach is significantly more reliable than the RANS approach for the turbulence prediction. However, it is important to understand that the DDES method is substantially more computationally demanding than RANS simulations. SLR has used a very small-time step in the order of 0.1 sec, to provide an adequate temporal resolution of the flow as it passes through each cell at the area of interest.

It is anticipated that the DDES may generate a more conservative turbulence data near the ground when compared to LES.

4.4 Discretization

The quality of the mesh is a critical aspect of the overall numerical simulation and it has a significant impact on the accuracy of the results and solver run time.

A mesh sensitivity assessment has been carried out for the current and post development scenarios. A procedure has been developed to adopt very fine meshes at areas of interest including site topography and analysed flight paths.

For all cases in this study, polyhedral elements with a total number of 27,071,370 nodes for the post-development scenario and 29,076,570 nodes for the current scenario were used to cover the computational domain. This is significantly higher than the number of cells typically used in RANS CFD Wind Studies.

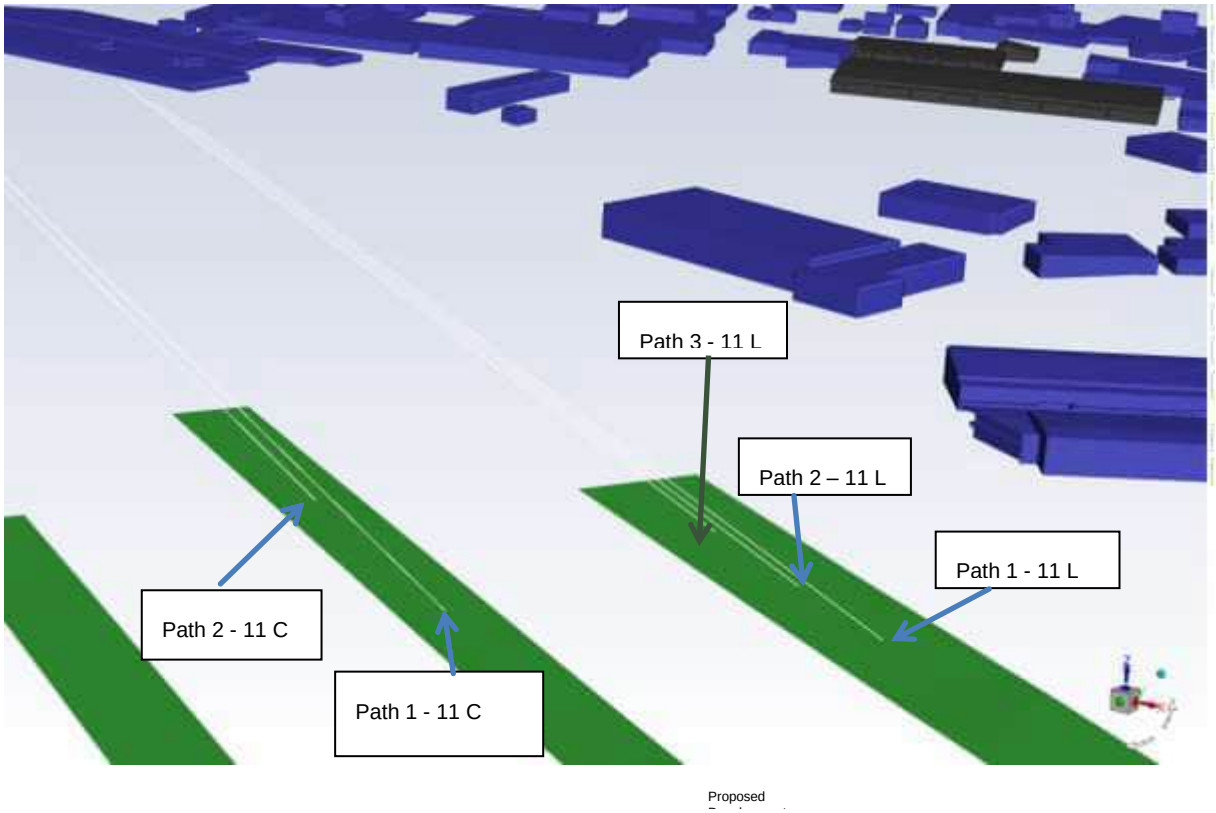
Polyhedral cells are especially beneficial for handling recirculating flows and used to provide more accurate results than even hexahedra mesh. For a hexahedral cell, there are three optimal flow directions which lead to the maximum accuracy while for a polyhedron, with 12 faces, there are six optimal directions which, together with the larger number of neighbours, lead to a more accurate solution with a lower cell count.

5.0 RESULTS AND DISCUSSION

5.1 Runway Modelling

The flight path glide angle for landing can vary between 2.7 degrees and 4 degrees, with 3 degrees considered as the average. Three critical landing scenarios per runway with an approaching angle of 3 degrees are analysed in this study – refer **Figure 8**. Offshoot landing is not analysed due to location of the proposed building.

Figure 8 Possible Landing Scenarios for a 3° Glide Landing Path



5.2 Wind Directions Analysed

Due to the relative position of buildings to the runway direction, the following wind directions for the windshear and turbulence are analysed in this study:

- North Wind – (Wind Angle 0o)
- North-Northeast Wind - (Wind Angle = 22.5o)
- Northeast Wind (Wind Angle = 45o)

5.3 Wind Angle: North (0°)

5.3.1 Windshear Assessment

Figure 9 shows the velocity vector results of the CFD simulations at CFD Model RL 10m. Dark blue represents still conditions at 0 m/s and red representing the strongest wind speed. The following conclusions can be reached from the above figure:

- The CFD model captures the fluid flow characteristics in significant detail. Wind is approaching the site from the north at 0^{o} as per the given boundary condition. Wind is then accelerated near the edges and stagnated and recirculated behind the buildings.
- The localised impact of the proposed development is shown in **Figure 9B**.

There is a minor variation in wind speeds along the width of the runways. Refer **Figure 10**

A comparison for the windshear shows that the proposed development will have a minor impact at the runways and that disturbance to the approaching mean wind speed is localised due to the size of the proposed building, eg building height = 13.15 m (Refer Figure 1). Figure 11 can also be viewed showing the stability of mean wind speed profiles throughout the domain in areas not affected by buildings.

The crosswind variation in mean wind speed due to wind-disturbing structure must remain below 6 kt along the aircraft trajectory at a height below 200 ft (60 m). The speed change of 6 kt must take place over a distance of at least 100 m (NASF-B, 2018). The aircraft instability is significantly reduced once the airplane has touched down or is above 200 feet off the ground after take-off.

The flight path angle for landing can vary between 2.7 degrees and 4 degrees, with 3 degrees considered as the average. Critical landing scenarios with an approaching angle of 3 degrees are analysed in this study. Offshoot landing is not analysed due to location of the proposed building. The location of the proposed development with respect to the nearest landing runways is shown in **Figure 2**. Landing paths are shown in **Figure 8**.

A comparison for the wind along the aircraft trajectory for the above paths is shown in **Figure 12** and **Figure 13**. The following comments are made with regards to the above graphs:

- The graphs present the results at variable height of the aircraft trajectory (3-degree glide path).
- The presentations are made for the worst-case condition, starting from an altitude band of 30 m or similar with the focus on the impacted areas. The mean wind speed deficit at an altitude >30 m is negligible due to the building's height and runway's relative locations.
- The windshear calculation is based on the normal component of the approaching wind.

The following clarifications are provided with regards to **Figure 12**:

- Runway 11L starts at position Y=940m for flight path 1 – the aircraft lands at position 890 m for flight path 1-11L.
- The approaching mean wind speed at 10 m above ground is 20 kt. Wind speed increases with height. The presented results accounts for site topography and shielding from the surrounding buildings.
- Impact of the existing built environment is captured by the CFD model (Refer **Figure 12A**).
- The highest mean wind speed deficit is obtained at the wake of buildings (existing and/or proposed development).
- The mean wind speed at the ground = 0. All tested points in **Figure 12** are located above ground.

The following conclusions can be reached from **Figure 12** and **Figure 13**:

- The variation in the mean wind speed for the existing and post-development scenarios is either below 6 kt or impacted less than 100m at a height below 60 m. The NASF-B windshear criterion is therefore, not exceeded.

Figure 9 Velocity Vector (m/s) at CFD Model RL 20 m - DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 20°

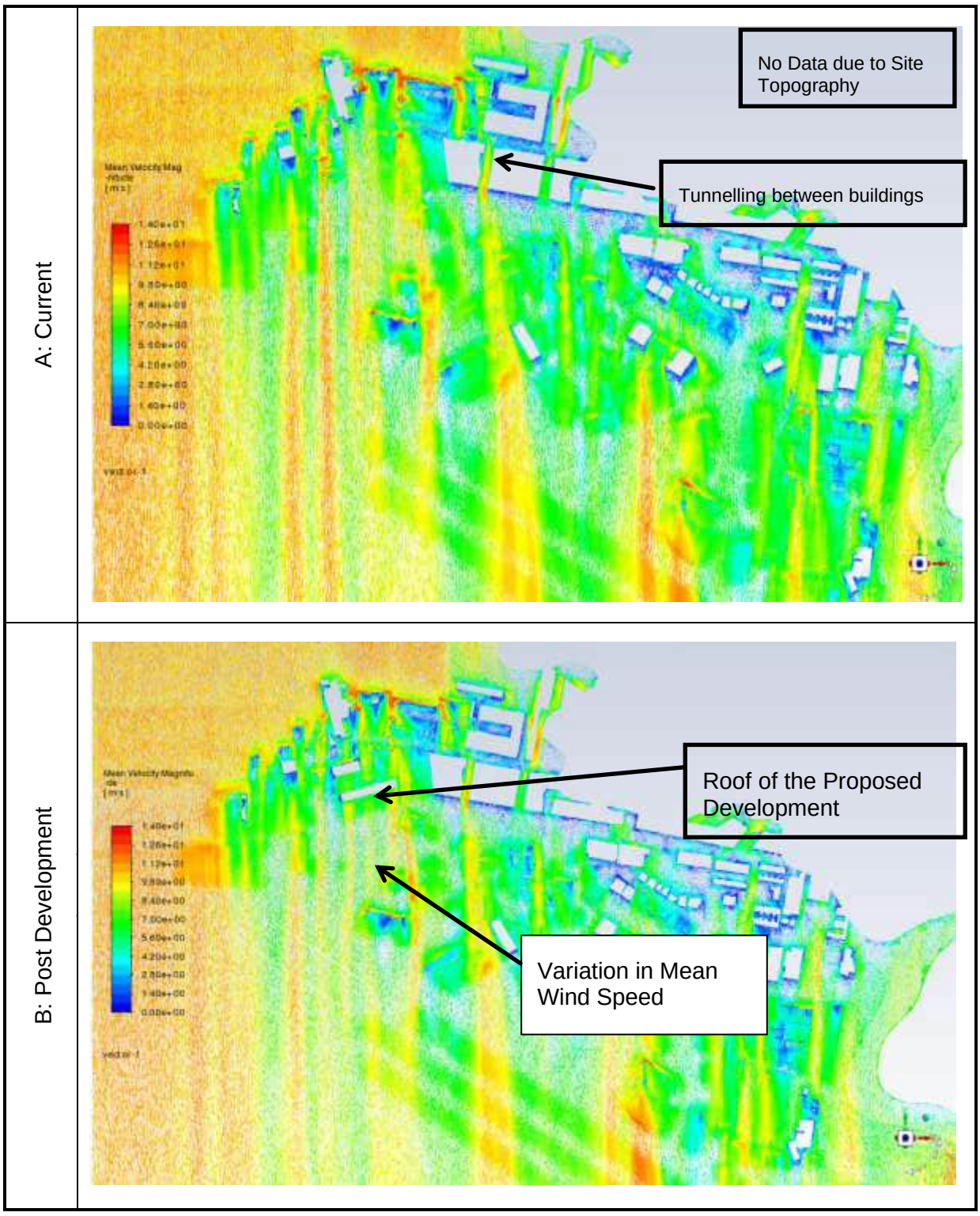


Figure 10 Velocity Vector Contoured by Velocity Magnitude (m/s) - Wind Angle = 0°

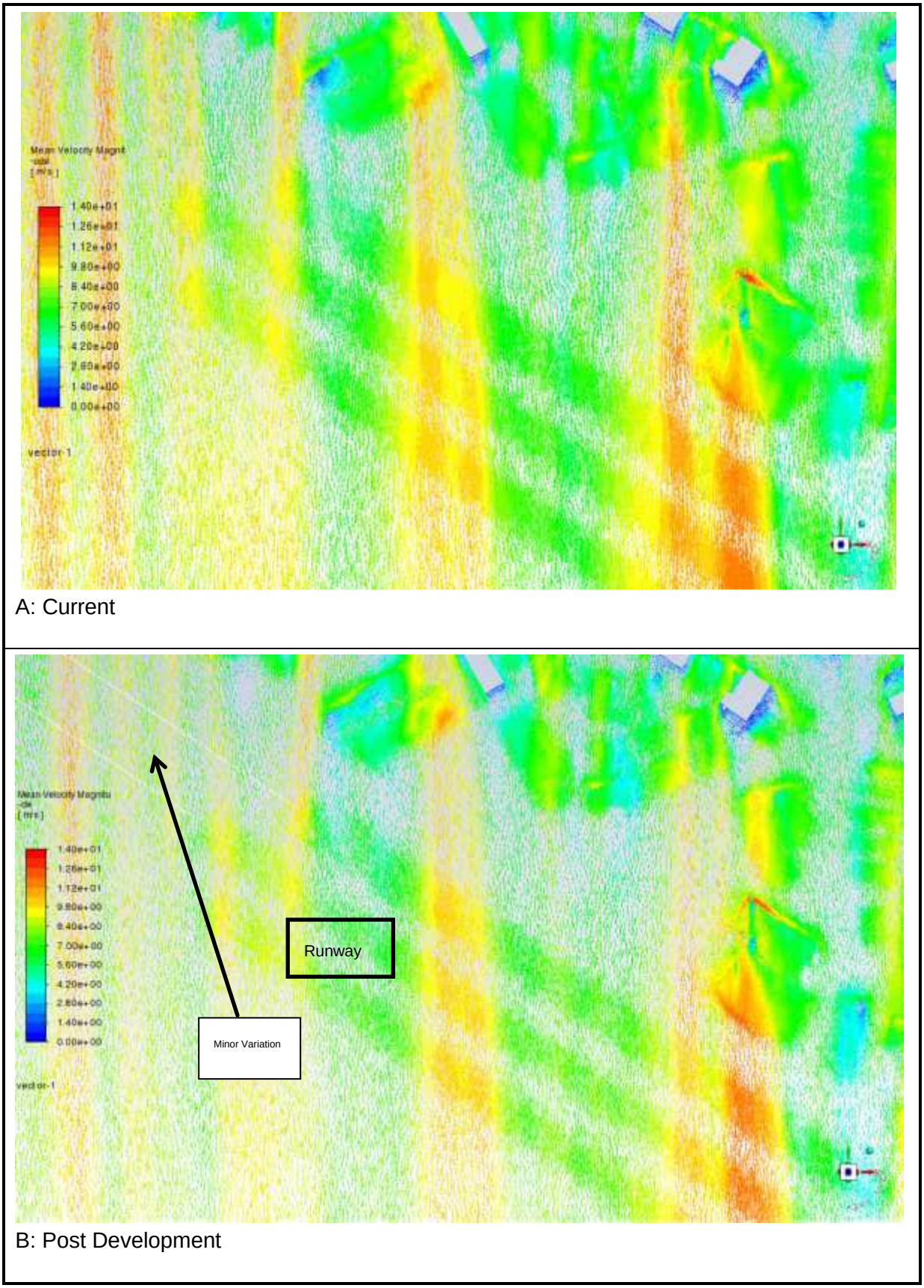


Figure 11 Velocity Contours at a 2D Vertical Section Contoured by Velocity Magnitude (m/s) - Wind Angle = 0°

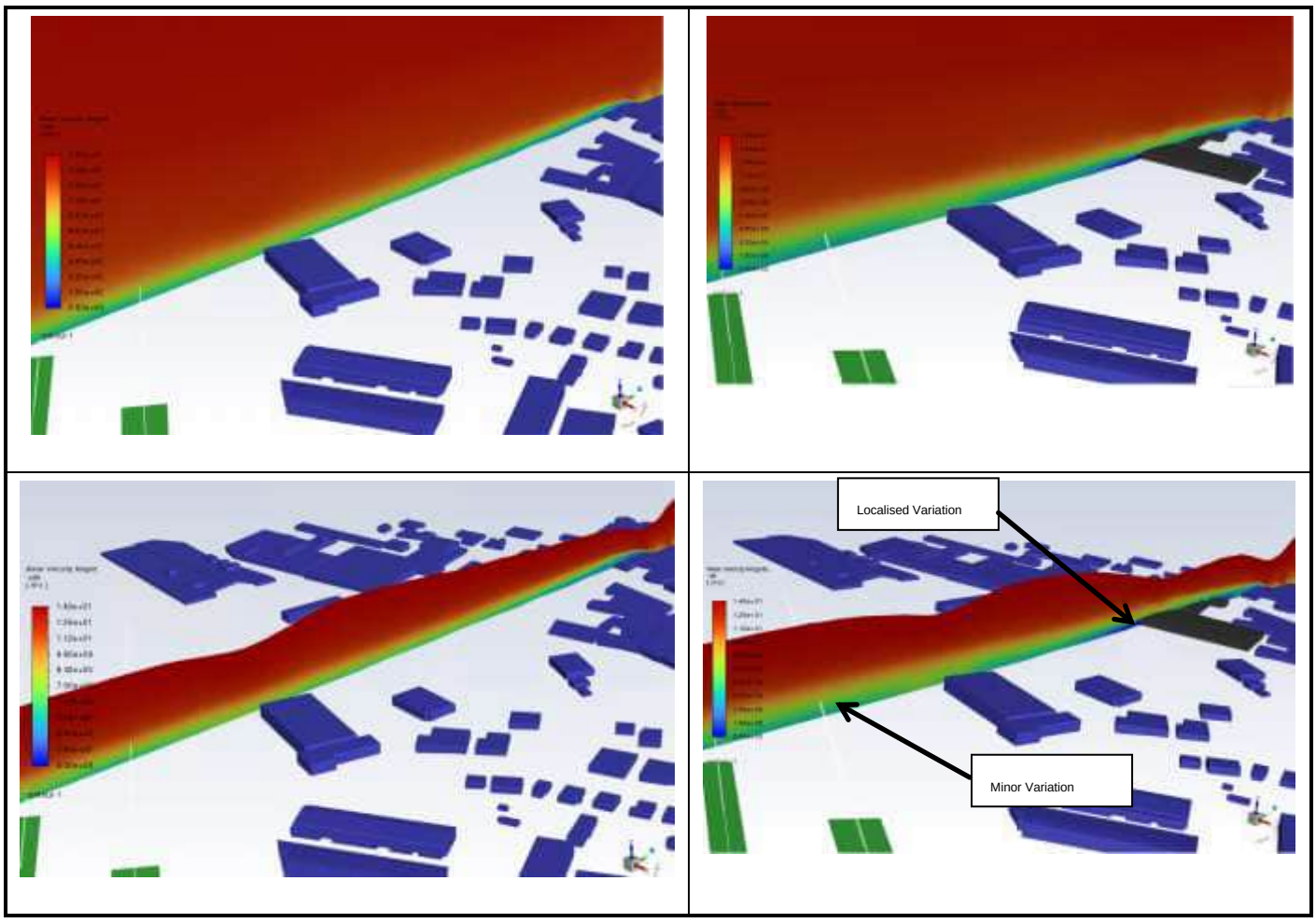
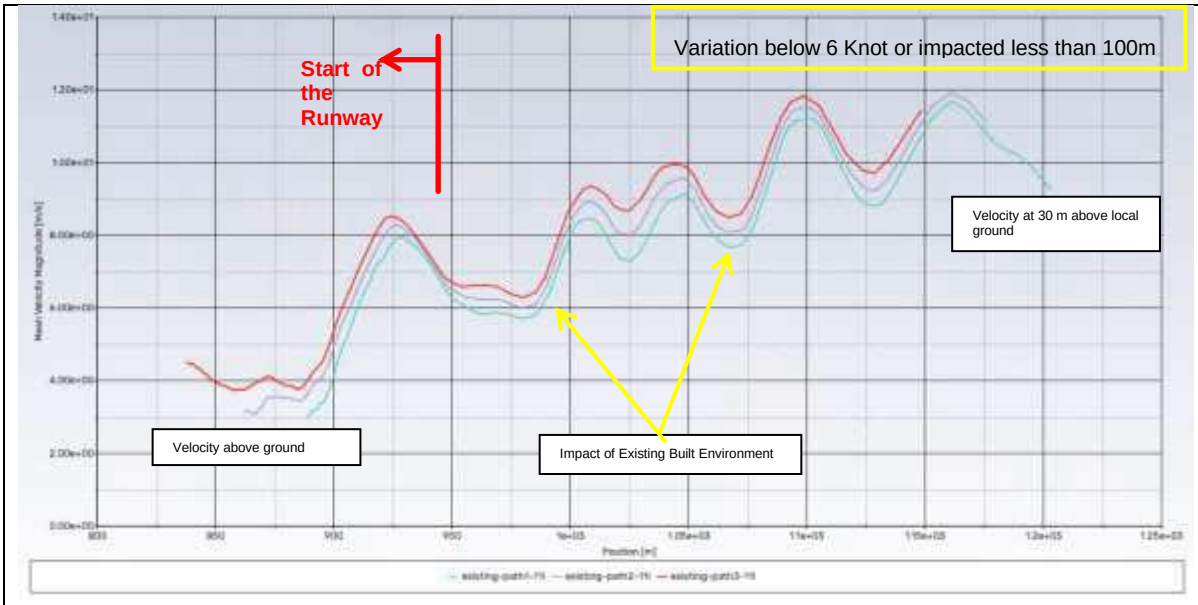
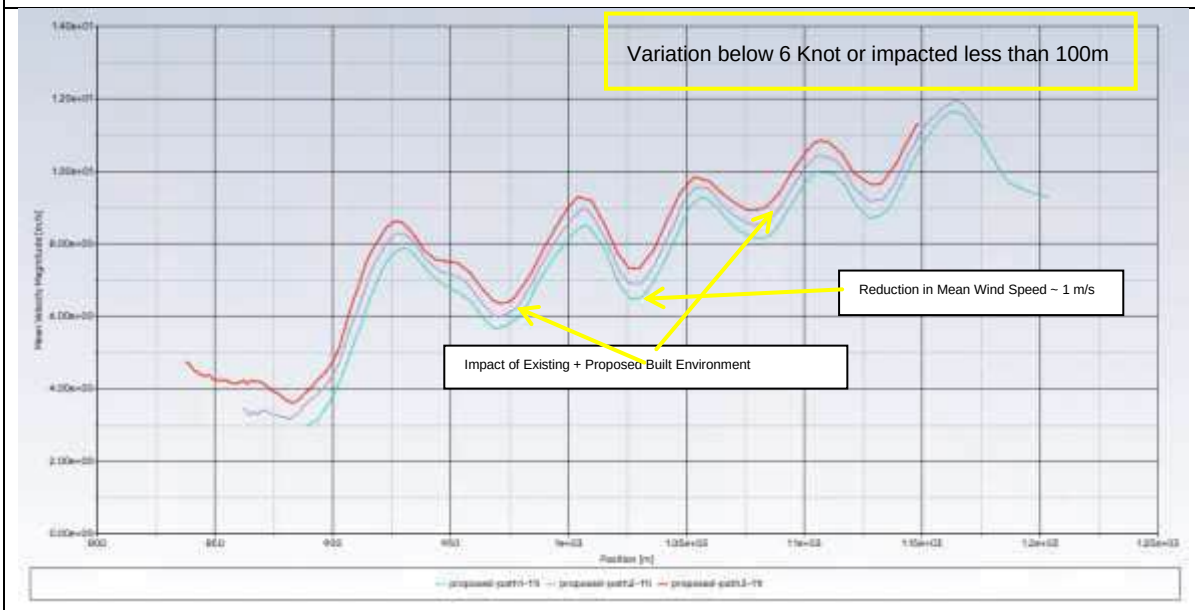


Figure 12 Comparison of the Normal Velocity Component (m/s) – Runway 11 L (DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 0°)

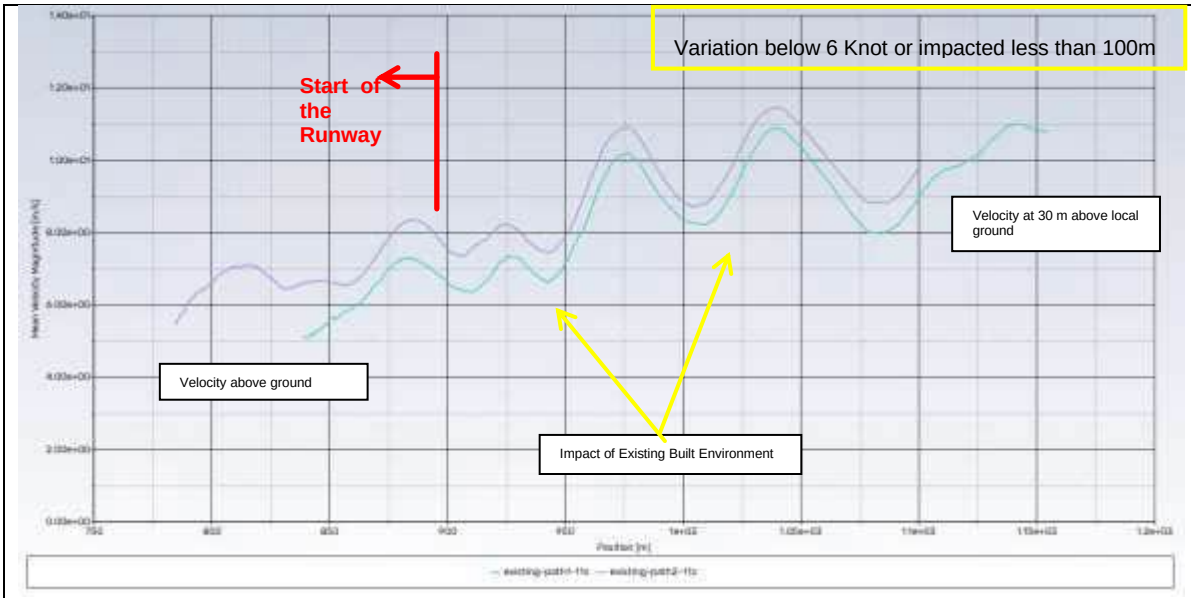


A: Current

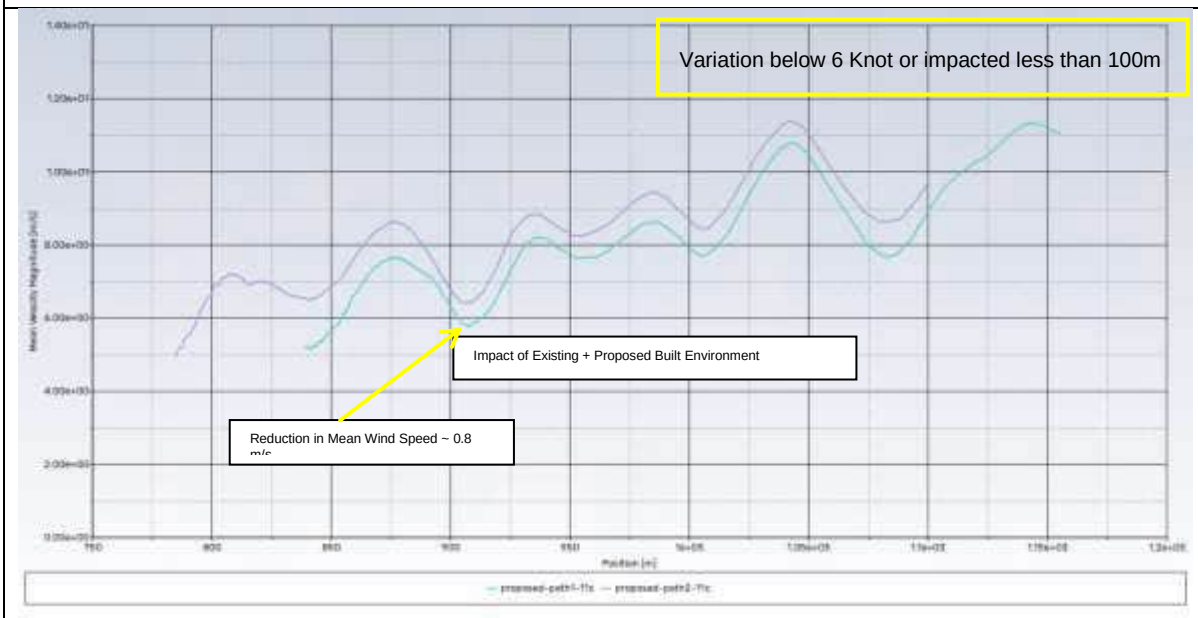


B: Post Development

Figure 13 Comparison of the Normal Velocity Component (m/s) – Runway 11C (DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 0°)



A: Current



B: Post Development

5.3.2 Turbulence Assessment

The NASF Guideline B, 2018 adopts the NLR additional turbulence criteria:

- The “4-knot turbulence criterion” – i.e. the standard deviation of wind speed must remain below 4 kt at heights below 200ft.

The turbulence or root-mean-square (RMS or σ_V) value along the aircraft trajectory for the flight paths is predicted using the following relationship.

$$\sigma_V = \sqrt{\frac{\sum(V - \bar{V})^2}{N}}$$

where V = instantaneous wind speed

$\bar{V}$ = mean wind speed

N = no of samples

SLR assumes that the criterion is triggered if 4 kt is exceeded at any point along the aircraft trajectory for the analysed flight paths.

The results of the simulations for turbulence level are shown in **Figure 14**

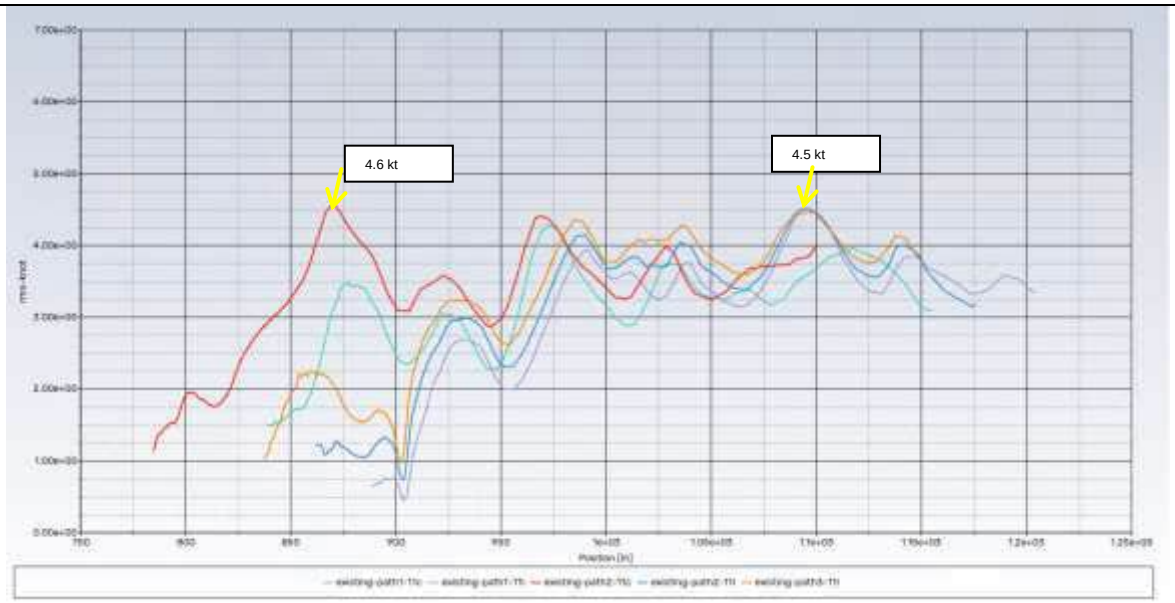
Runway 11 L

- The peak RMS (standard deviation or turbulence) is above the 4 kt for an approaching wind of 20 kt at 10 m above ground for the current and post development scenarios.
- The peak localised (instantaneous) turbulence for the existing scenario is 4.5 kt and the averaged turbulence over a distance of 100 m spanning the peak is below 4 kt.
- The location of the peak turbulence changes due to the addition of the proposed building.
- The peak localised (instantaneous) turbulence for the post development is 5.2 kt and the averaged turbulence over a distance of 100 m spanning the peak is below 4 kt.
- The peak turbulence is increased by 0.7 kt due to the addition of the proposed development.

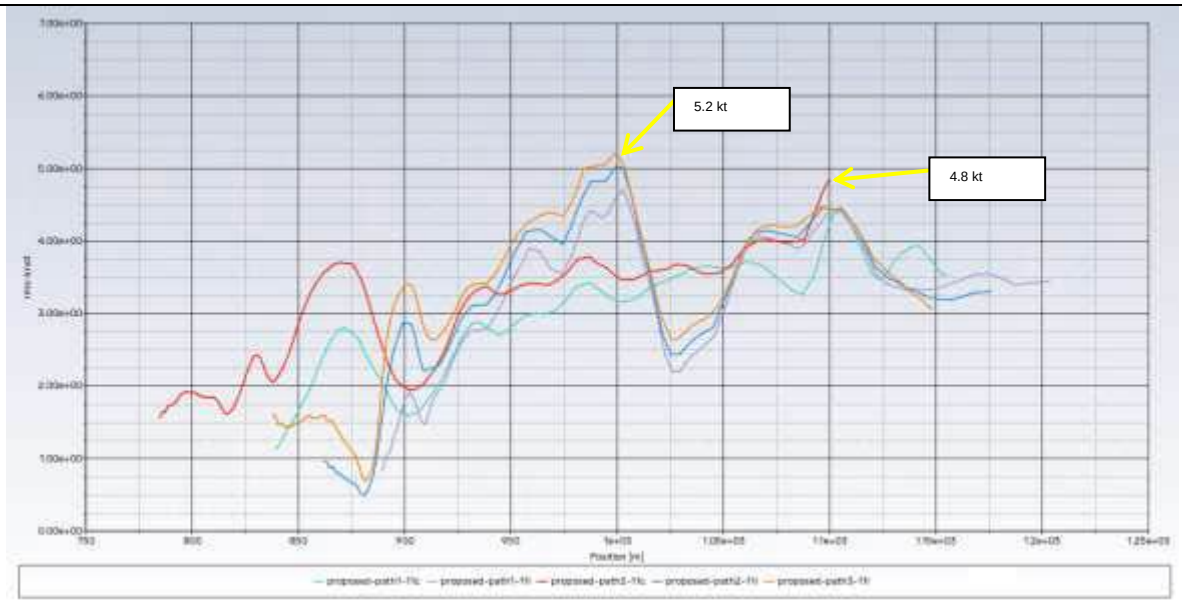
Runway 11 C

- The peak localised (instantaneous) turbulence for the existing and proposed scenarios is 4.6 kt and 4.8 kt, respectively.

Figure 14 RMS (Standard Deviation) Value in Knot across the Aircraft Trajectory at Runway 11L – DDES Turbulence Model (Approaching Wind = 20 Knot at 10 m above Ground, Wind Angle =0°)



A: Current



B: Post Development

5.4 Wind Angle: North-Northeast (22.5°)

Figure 15 shows the wind speeds on 0-14 m/s colour coded scales.

- The CFD model captures the fluid flow characteristics in significant detail. Wind is approaching the site from the NNE at 22.5^{o} as per the given boundary condition. Wind is then accelerated near the edges and stagnated and recirculated behind the buildings.
- There is approximately 0.6 m/s reduction in the mean speed at 11 L Runway.
- The localised wake behind the proposed facility is shown in **Figure 15B**.

5.4.1 Windshear Assessment

A comparison for the wind along the aircraft trajectory for the flight paths in **Figure 8** is shown in **Figure 16** and **Figure 17**. The following conclusions can be reached from the above figures:

- The variation in the mean wind speed for the existing and post development scenarios is either below 6 kt or impacted less than 100 m at a height below 60 m. The NASF-B windshear criterion is therefore not exceeded.

5.4.2 Turbulence Assessment

The turbulence or root-mean-square (RMS) value along the aircraft trajectory for the flight paths in **Figure 8** are shown in **Figure 18**.

Runway 11 L

- The peak RMS (standard deviation or turbulence) is above the 4 kt for an approaching wind of 20 kt at 10 m above ground for the current and post development scenarios.
- The localised (instantaneous) turbulence for the existing and post development condition is 5.9 and 5.5 kt, respectively.
- The averaged turbulence over a distance of 100 m spanning the peak is below 4 kt.

Runway 11 C

- The peak RMS (standard deviation or turbulence) is above the 4 kt for an approaching wind of 20 kt at 10 m above ground for the current and post development scenarios.
- The localised (instantaneous) turbulence for the existing scenario is 6.25 kt and the averaged turbulence over a distance of 100 m spanning the peak is below 4 kt
- The localised (instantaneous) turbulence for the post development is 6.0 kt and the averaged turbulence over a distance of 100 m spanning the peak is below 4 kt
- The peak turbulence is slightly reduced by 0.25 kt at the most impacted are due to the edition of the proposed development.

Figure 15 Velocity Vector (m/s) at RL 10 m - DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 22.5°

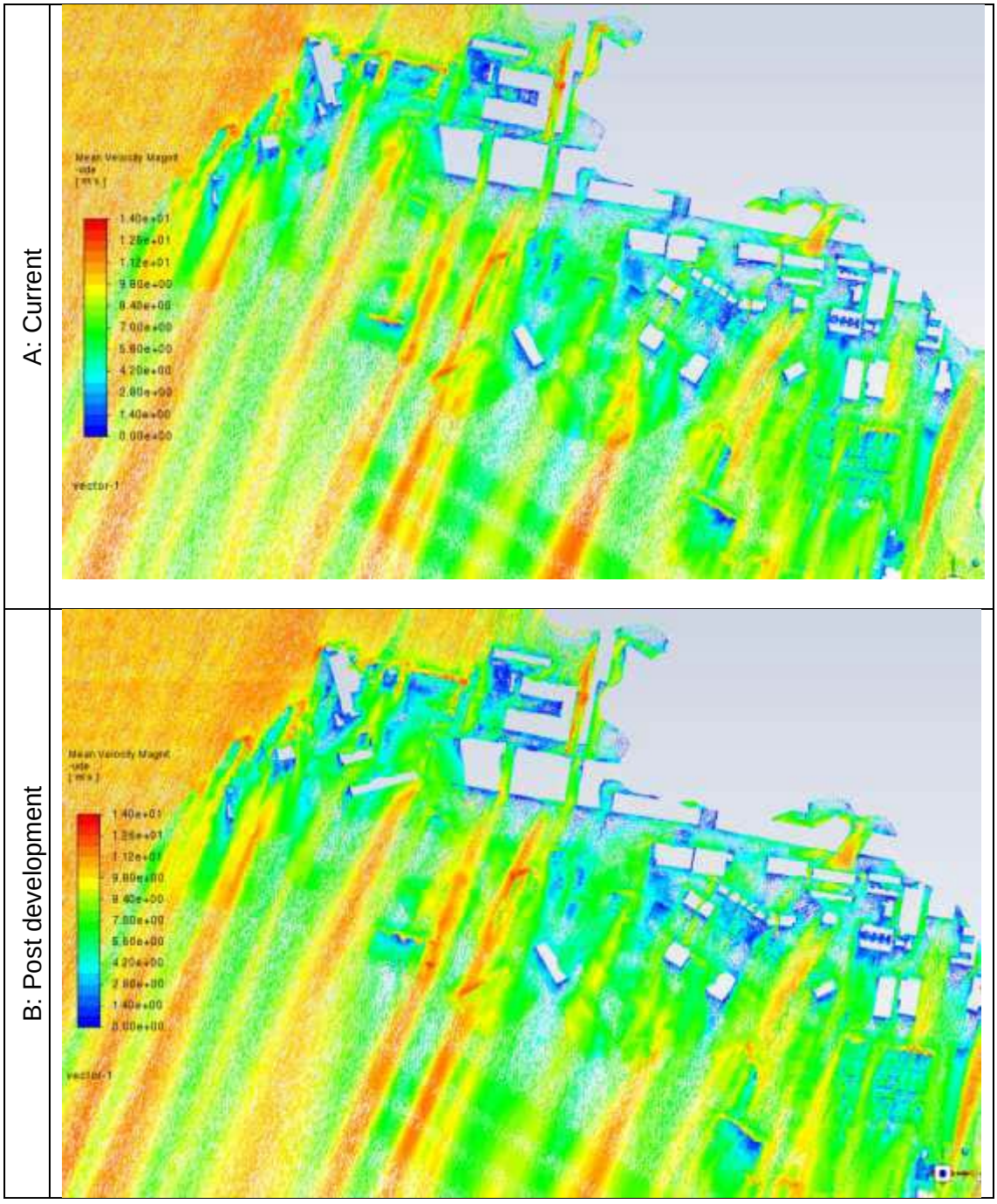
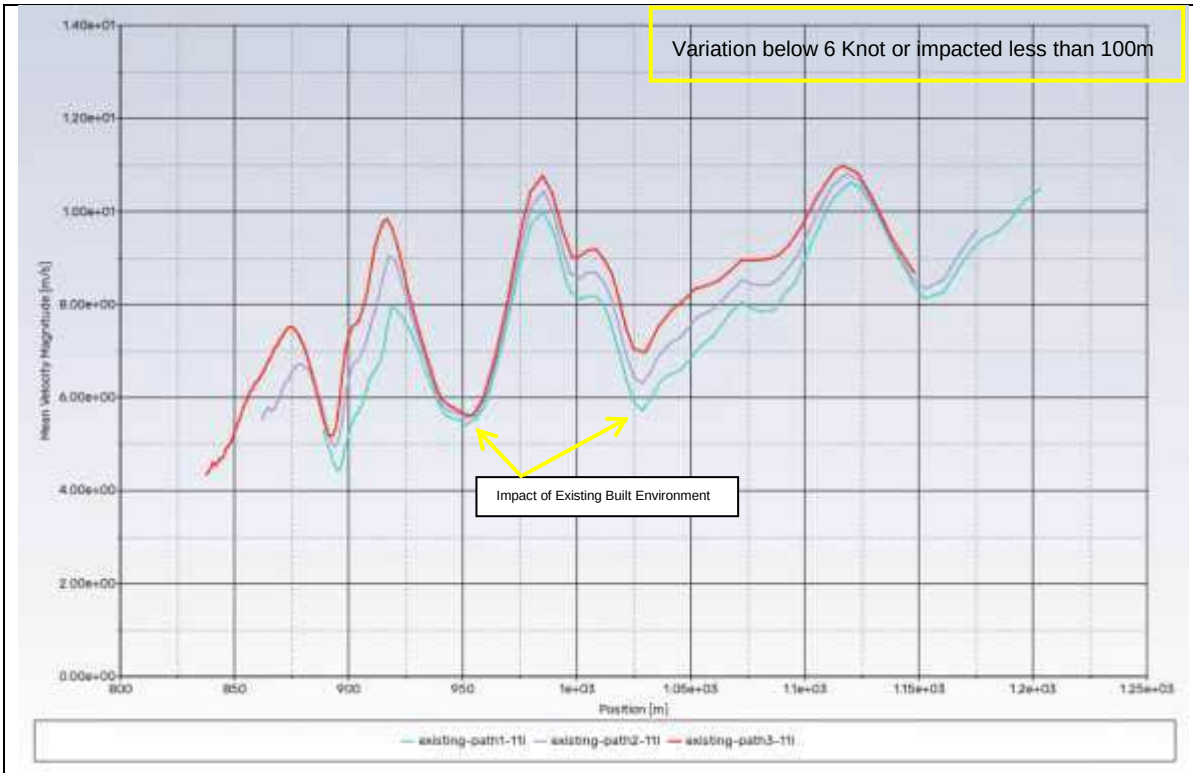
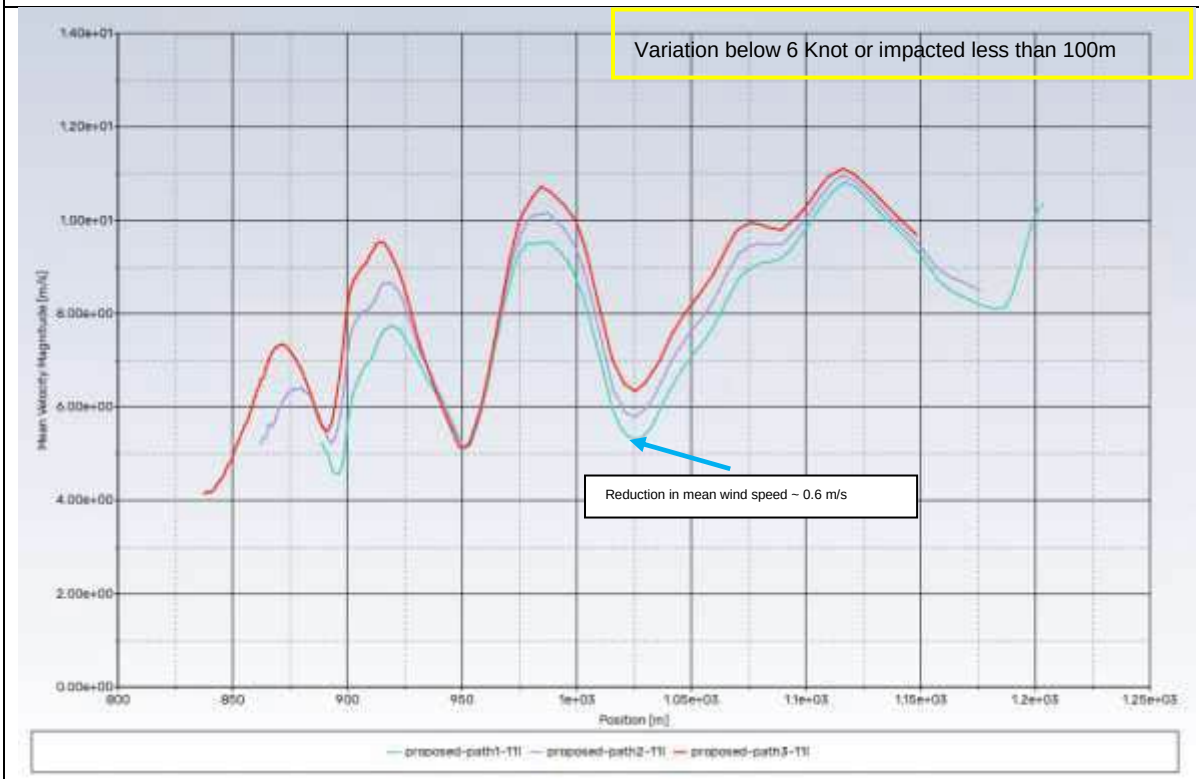


Figure 16 Comparison of the Normal Velocity Component (m/s) – Runway 11 L (DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 22.5°)

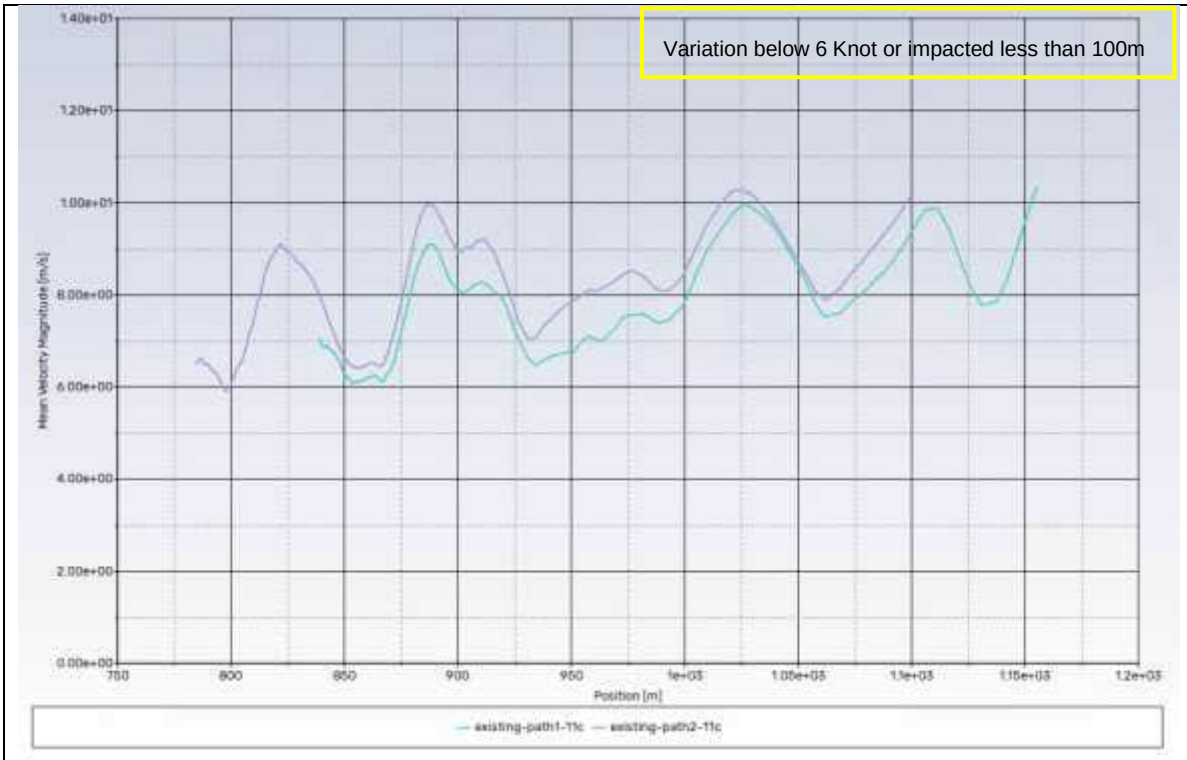


A: Current

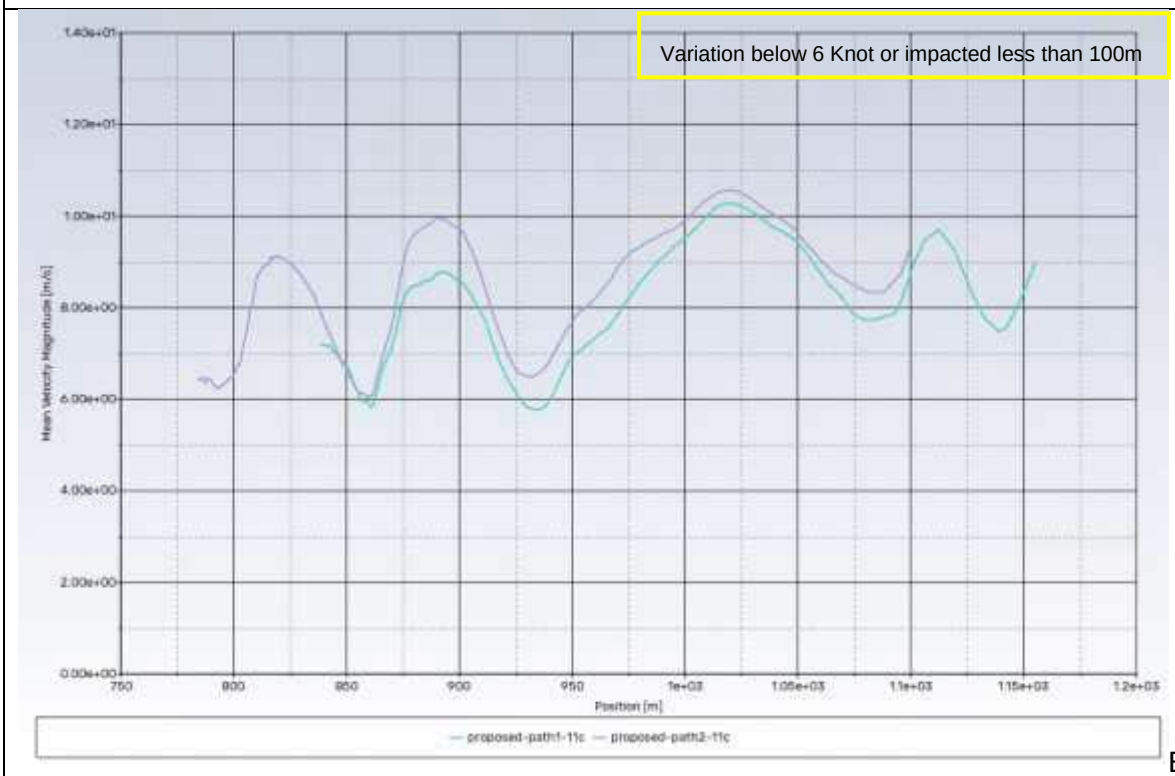


B: Post Development

Figure 17 Comparison of the Normal Velocity Magnitude (m/s) – Runway 11C – (DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 22.5°)

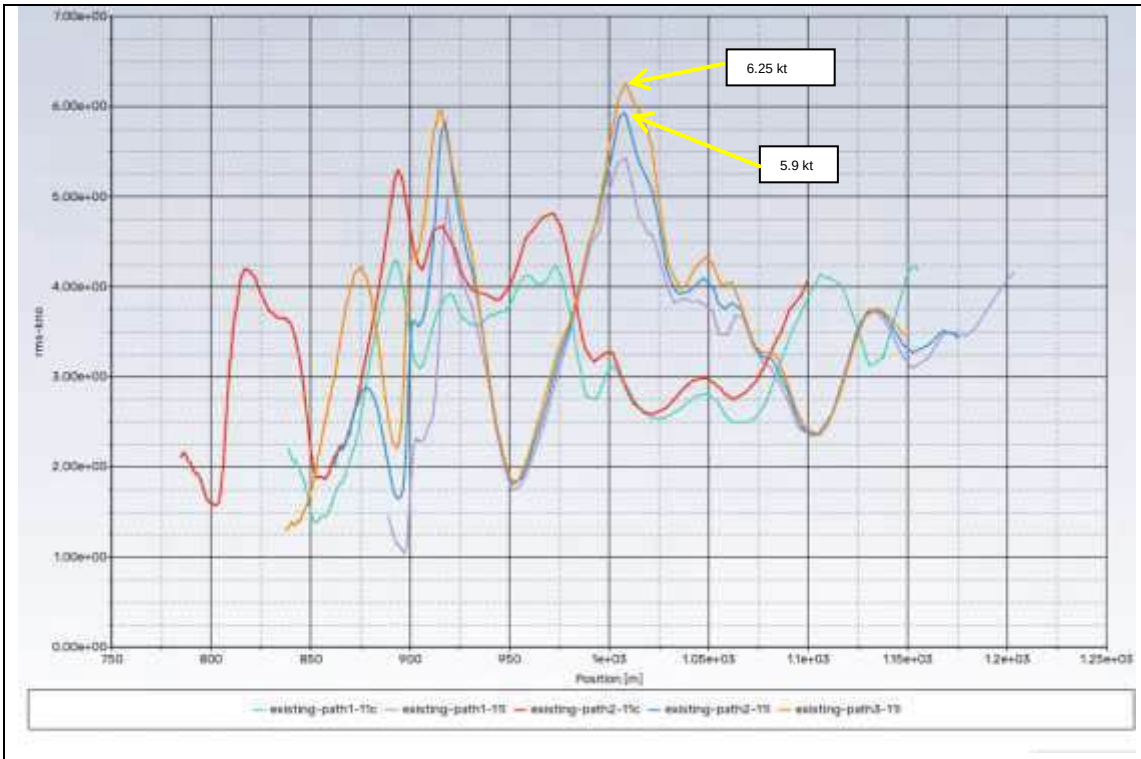


A: Current

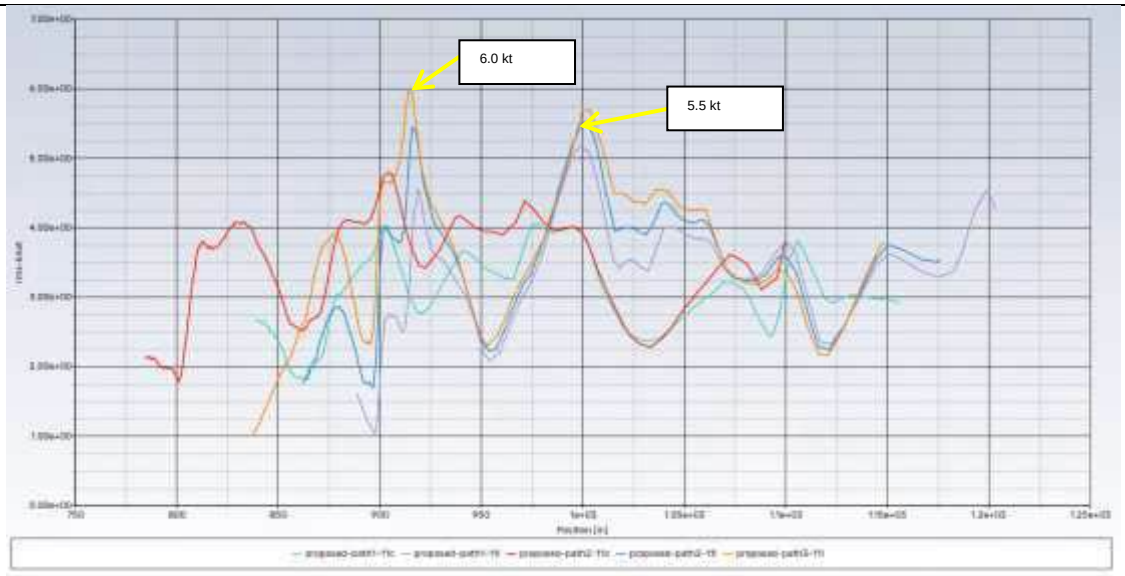


B: Post Development

Figure 18 RMS (Standard Deviation) Value in Knot across the Aircraft Trajectory at 11 L Runway – DES Turbulence Model (Approaching Wind = 20 Knot at 10 m above Ground, Wind Angle =22.5°)



A: Current



B: Post Development

5.5 Wind Angle: East Northeast (45°)

Figure 19 shows the wind speeds on 0-14 m/s colour coded scales.

- The CFD model captures the fluid flow characteristics in significant detail. Wind is approaching the site from the northeast at 45^{o} as per the given boundary condition. Wind is then accelerated near the edges and stagnated and recirculated behind the buildings.
- There is a minor variation in wind speeds along the width of the runways.
- The localised wake behind the proposed development is shown in **Figure 19B**.

5.5.1 Windshear Assessment

A comparison for the wind along the aircraft trajectory for the flight paths in **Figure 8** is shown in **Figure 20** and **Figure 21**. The following conclusions can be reached from the above figures:

- The variation in the mean wind speed for the existing and post development built environment scenarios is either less than 6 kt along all analysed aircraft trajectories at a height below 60 m or the variations occurs below 100 m.

5.5.2 Turbulence Assessment

The turbulence or root-mean-square (RMS) value along the aircraft trajectory for the flight paths in **Figure 8** are shown in **Figure 22.** The following conclusions can be achieved from the above figure:

Runway 11 L

- The localised (instantaneous) turbulence for the existing scenario is 5.15 kt.
- The localised (instantaneous) turbulence for the post development is 5.25 kt.
- The peak turbulence is reduced by 0.1 kt at the most impacted are due to the edition of the proposed development.

Runway 11 C

- The localised (instantaneous) turbulence for the existing and post development scenarios is 5.0 kt.

Figure 19 Velocity Vector (m/s) at RL 10m - DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 45°

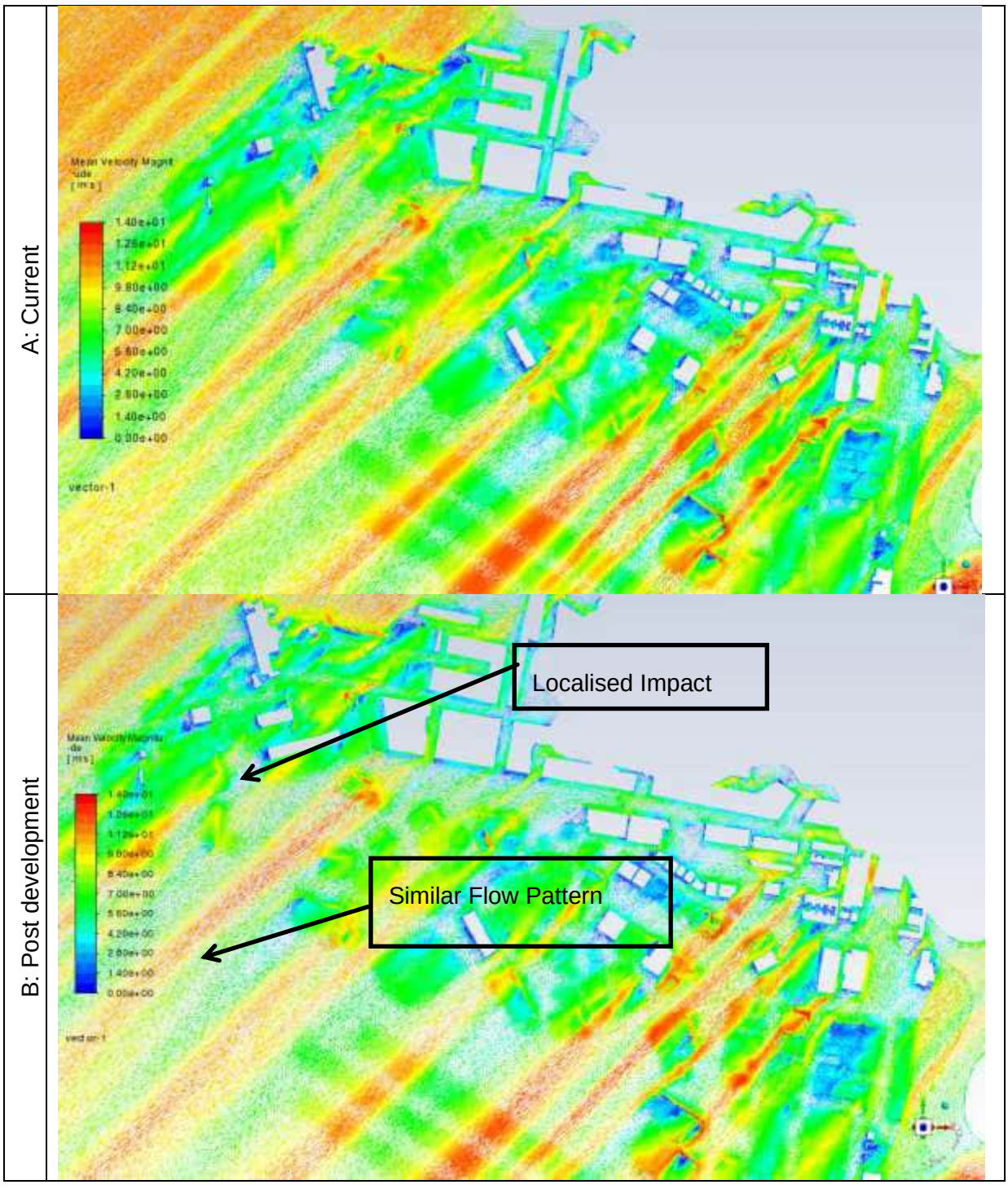
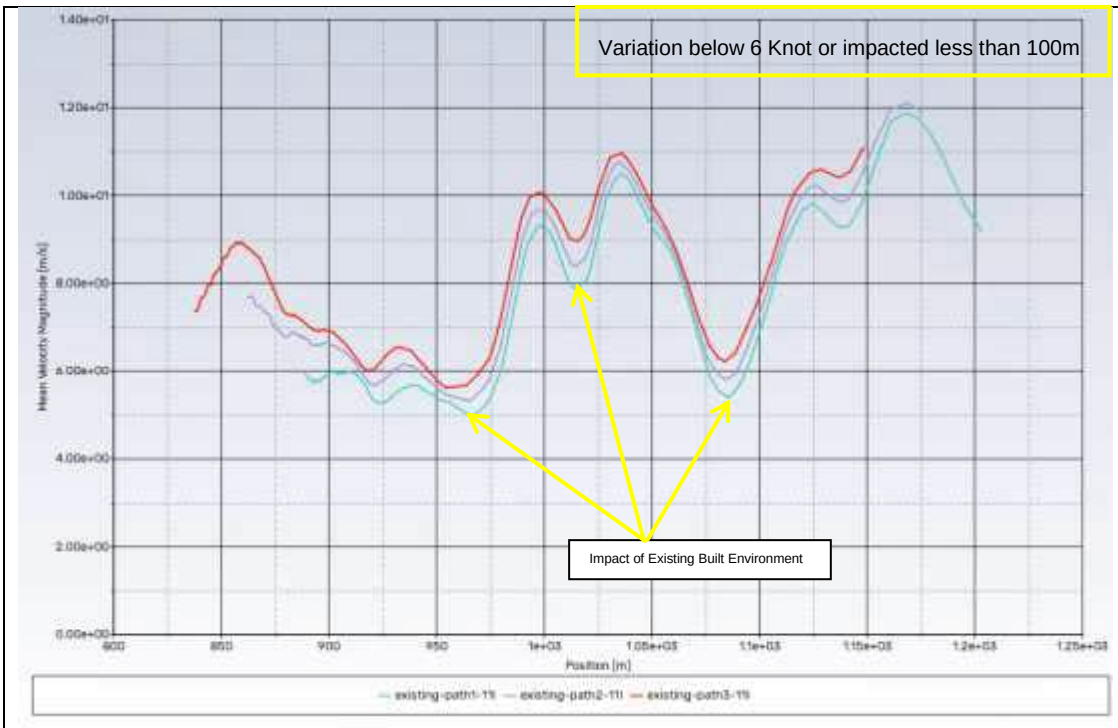
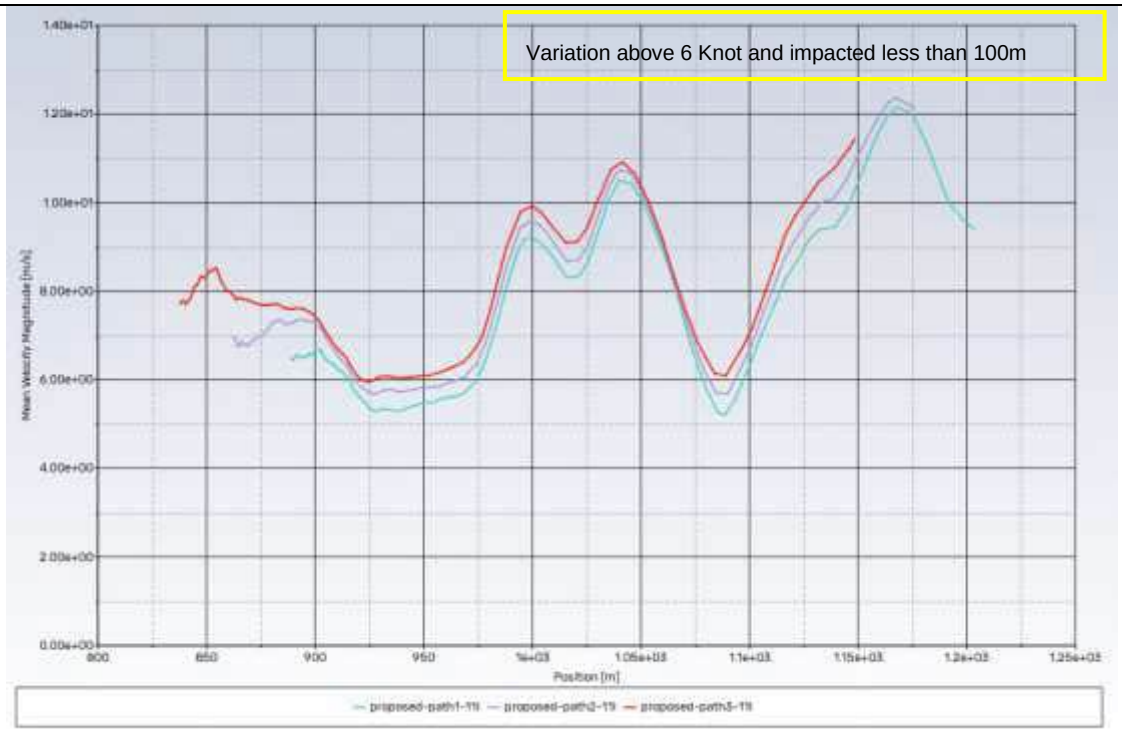


Figure 20 Comparison of the Normal Velocity Component (m/s) – Runway 11 L (DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 45°)

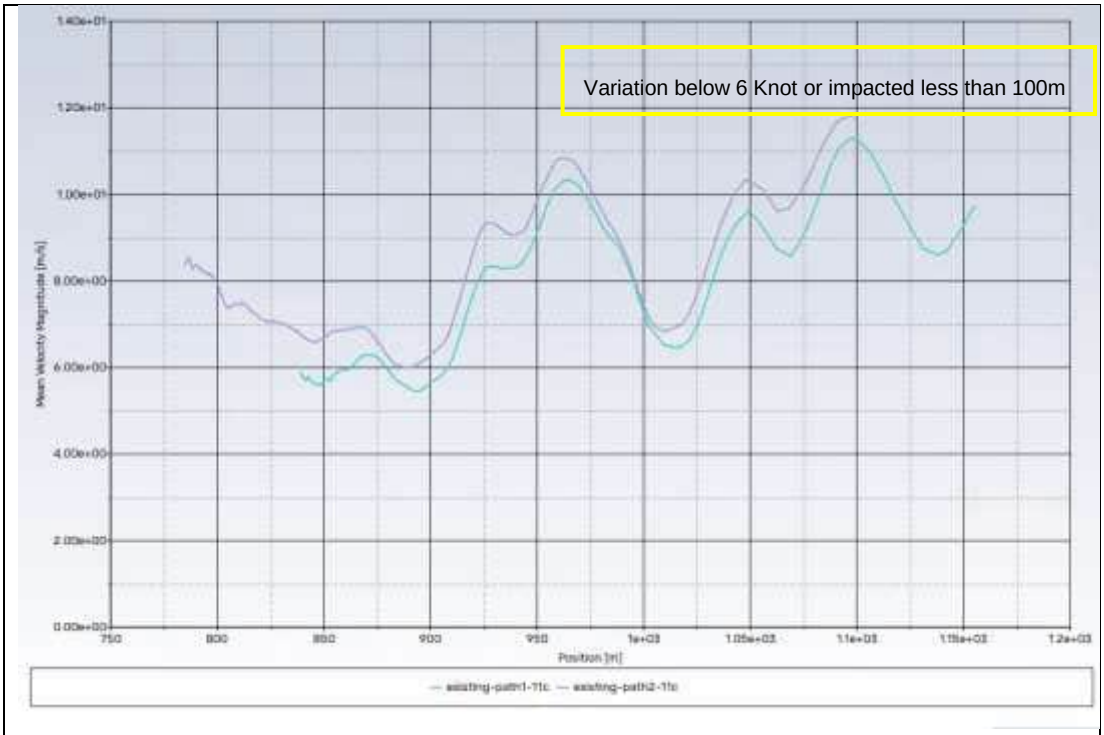


A: Current

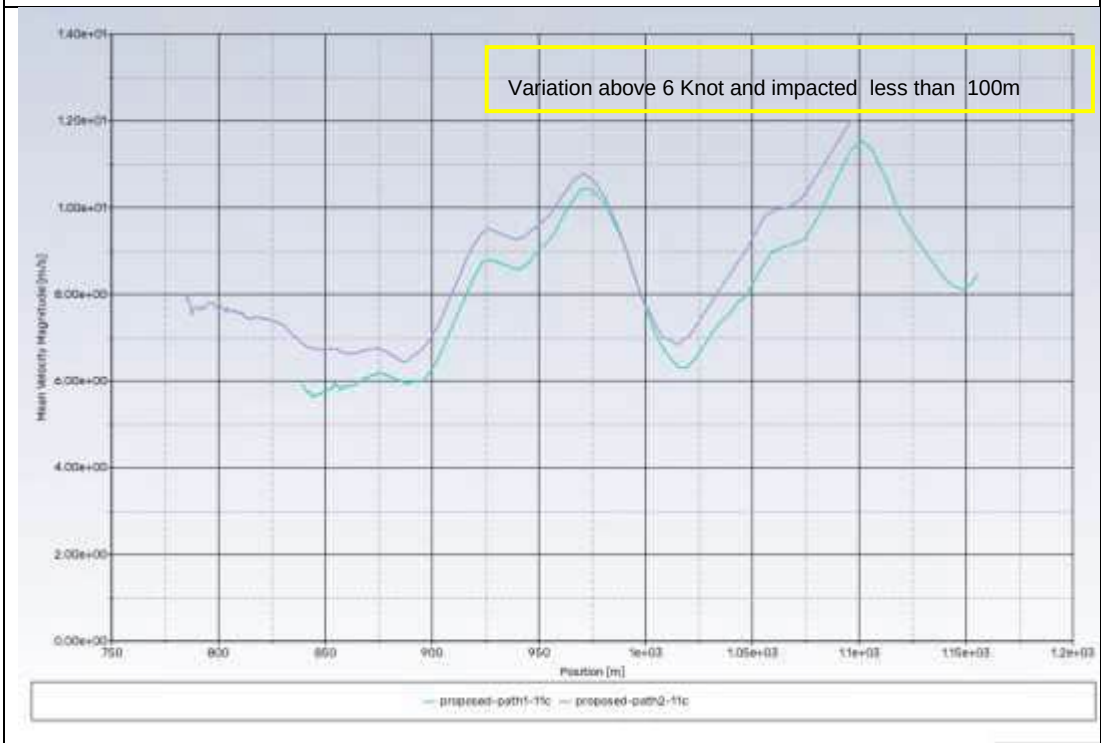


B: Post Development

Figure 21 Comparison of the Normal Velocity Component (m/s) – Runway 11 C (DDES Turbulence Model, Approaching Wind = 20 Knot, Wind Angle = 45°)

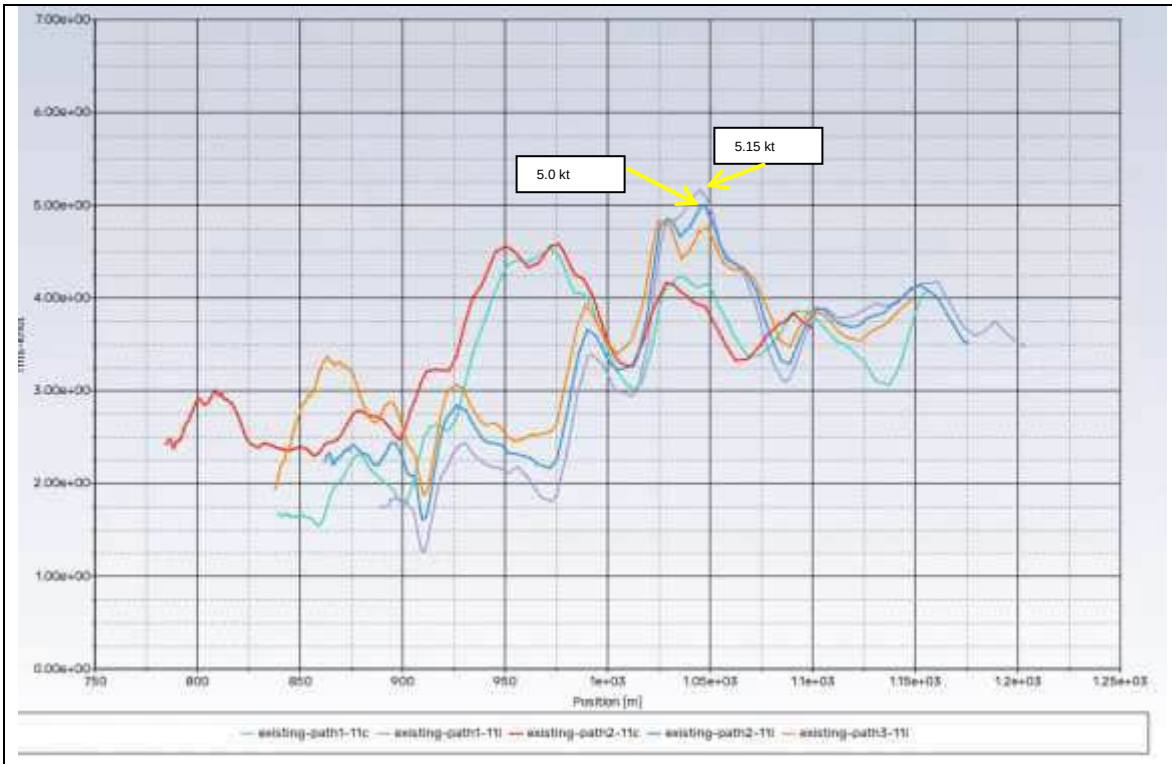


A: Current

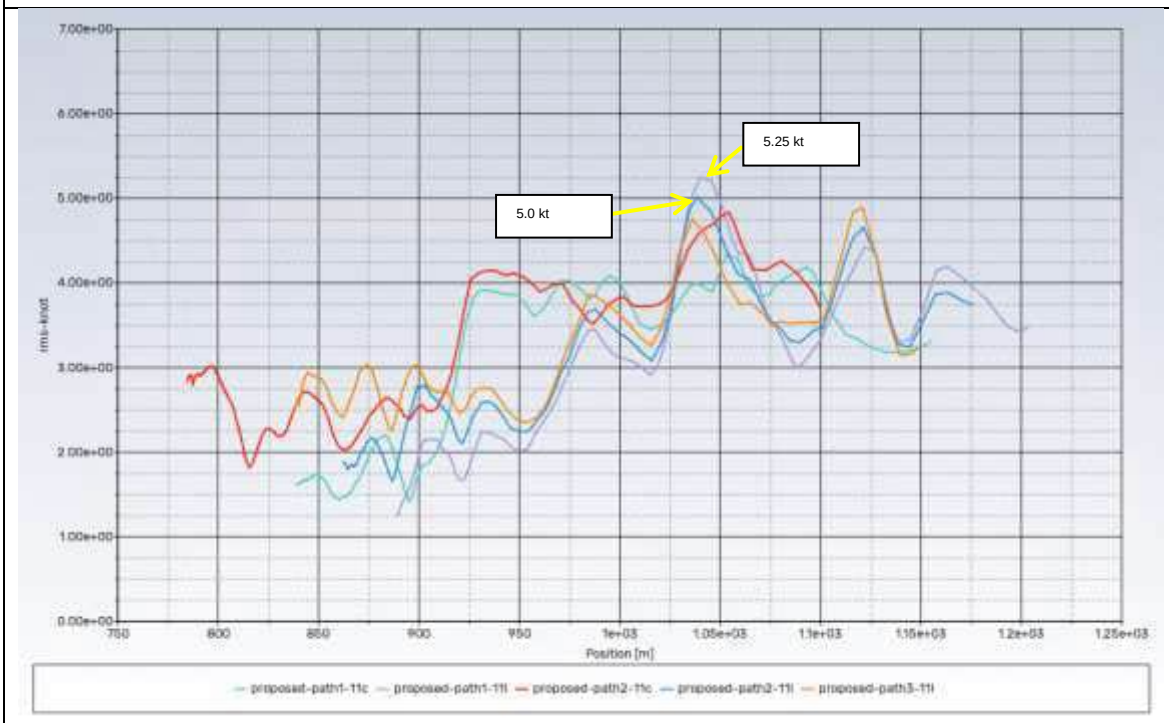


B: Post Development

Figure 22 RMS (Standard Deviation) Value in Knot across the Aircraft Trajectory at Runway 11 L– DES Turbulence Model (Approaching Wind = 20 Knot at 10 m above Ground, Wind Angle = 45°)



A: Current



B: Post Development

5.6 Summary Results of Simulations

The trees and vegetation to the north were removed primarily to reduce computational time, noting that this removal makes the model more conservative as the addition of vegetation would typically reduce ground level wind speeds.

The following major conclusions are made from the simulations:

- The disturbance to the approaching mean wind speed for the post development scenario is localised due to the following:
  - Location of the buildings (eg the building is located behind existing buildings.
  - Relatively low buildings height (the highest point is 10.6 m above finished floor level).

5.6.1 Windshear – Approaching Wind Speed = 20 kt at 10m above Ground

- Current Scenario: The variation in the mean wind speed is either below 6 kt or impacted less than 100 m at a height below 60 m.
- Post Development Scenario: The variation in the mean wind is either below 6 kt or impacted less than 100 m at a height below 60 m.
  - The proposed facility will have a localised impact on the existing shears due to location, low height and distance to the runways.

5.6.2 Turbulence - Approaching Wind Speed = 20 kt at 10m above Ground

Results of simulations are detailed in **Section 5** of this study and summarised for critical flightpaths in **Table 7** and **Table 8**:

11L

- Current Scenario: the turbulence criterion of 4 kt across the aircraft trajectory at heights below 60 m (200ft) is triggered at an approaching wind of approximately 13.5 kt (wind angle = 22.5^{o}) for the most critical wind direction.
- Post Development Scenario: the turbulence criterion 4kt across the aircraft trajectory at heights below 60 m (200ft) is triggered at approaching wind of approximately 14.5 kt for the most critical wind direction (wind angle =32.5^{o}).

11C

- Current Scenario: the turbulence criterion of 4 kt across the aircraft trajectory at heights below 60 m (200ft) is triggered at approaching wind of approximately 12.8 kt for the most critical wind direction (wind angle = 33.8^{o}).
- Post Development Scenario – design Modification 2: the turbulence criterion of 4 kt across the aircraft trajectory at heights below 60 m (200ft) is triggered at approaching wind of approximately 13.3 kt for the most critical wind direction (wind angle = 33.8^{o}).

The results show a slight reduction in the turbulence level for the most critical wind direction (22.5o). High wind speed from this wind direction is infrequent.

Peak (instantaneous) turbulence levels are increased by a modest amount for the wind 0^{o} and 45^{o}. Refer **Section 6**.

Table 7 Predicted Turbulence vs Approaching Cross-wind (ALL flight Paths) - Runway 11L

Built Environment Scenario	Wind Angle	Approach Wind for 4 kt Turbulence[1]	No of Hours 4 kt Exceeded[2]	No of Hours 4 kt Exceeded[3]
Turbulence - Existing	0°	16 kt	2	1.5
	22.5°	13.5 kt	3	2.5
	45°	15.5 kt	2	1.5
Turbulence - Proposed	0°	15.2 kt	3	2.5
	22.5°	14.5 kt	0.5	0.5
	45°	15.2 kt	2	11.5

Note 1: Instantaneous turbulence at the most impacted location. The averaged turbulence for the current and post development scenarios over a distance of 100 m spanning the peak is less than 4 kt for all analysed scenarios.

Note 2: The number of hours per annum that a 4kt turbulence exceedance occurs is based on the mean wind speeds data recorded during the period 2001-2020 at BoM Station 66137 during the period 1999-2021.

Note 3: Runway 11L operates during the daytime (6:00s am to 6:00 pm) ONLY. Number of exceeded hours are approximated.

Table 8 Predicted Turbulence vs Approaching Cross-wind (NNE Wind) for the Worst Case Scenario – Runway 11C

Built Environment Scenario	Wind Angle	Approach Wind for 4 kt Turbulence	No of Hours 4 kt Exceeded
Turbulence - Existing	0°	17.3 kt	0
	22.5°	12.8 kt	5
	45°	16.0 kt	0
Turbulence - Proposed	0°	16.6 kt	0
	22.5°	13.3 kt	4
	45°	16.0 kt	0

Note 1: The number of hours per annum that a 4kt turbulence exceedance occurs is based on the mean wind speeds data recorded during the period 2001-2020 at BoM Station 66137 during the period 1999-2021.

6.0 Mitigation Option for the current and Post Development structures

Section 5 provided guidance as to the areas where the windshear and/or turbulence acceptability criterion had the potential to be exceeded.

- The variation in the mean wind speed for both existing and post development is either below 6 kt or impacted less than 100 m at a height below 60 m. The NASF B windshear criterion is not triggered.
- Highest turbulence levels are obtained upstream the threshold.
- Peak (instantaneous) turbulence levels are increased by a modest amount for the wind 0o and 45o and slightly reduced for infrequent wind at 22.5o.
    - Wind angle 0º – Perpendicular Wind
        - 0.7 kt for 11L
        - 0.2 kt for 11C
    - Wind angle 22.5º
        - -0.4 kt for 11L
        - -0.25 kt for 11C
    - Wind angle 45˚
        - 0.1 kt for 11L
        - 0 kt for 11C

With regards to the nearest 11L/29R operations, the following comments are made:

- Runway 11L/29R is used for originating take off, full stop landing and “touch and go”.
- The actual number of movements on 11R/29L was 116,240 in 2014. 60% of the movements occurred on 29 L and 40% of the movements occurred on 11R.
- Runway 11R/29L is used during daytime only (6:00 am to 6:00 pm).
- Runway 11R/29L and Runway 11L/29R can be operated simultaneously but Runway 11C/29C is only operated singularly.
- Maintenance operation and runways closure for grass cutting are undertaken 8 times per year. The runway may be closed for 4 hours each time. An alternative runway is used during the maintenance operation as per the air traffic control direction.
- Other operational restrictions published in The En-route Supplement Australia (ERSA) are mostly related to noise abatement.

To mitigate building-induced wake turbulence, it's recommended to implement operational risk mitigation measures accepted by the airport operator and CASA when winds exceed 12.8 kt from the NNE (wind angle 22.5°± 22.5°).

7.0 Conclusions

The current study has involved the modelling of the following built environment "scenarios":

- "Current" - the existing built environment (as of September 2022) including recently approved developments. Refer **Figure 5A**
- "Post development - Proposed" - including Current + Proposed Development. Refer Figure 5B and Figure 6

Existing Wind Conditions

Mean Wind Speed at 10 m Height

- There were 0 hours where the mean wind speed exceeded 20 kt taking into account wind directions 22.5°±22.5° over the 23-year BoM record period.
- There were 8 hours per year where the mean wind speed exceeded 15 kt taking into account wind directions over the 23-year BoM record period.

Runway 11R/29L and Runway 11L/29R operate during daylight only from 06:00 hrs to 18:00 hrs while 11C/29C operates 24 hours a day. The occurrence of the exceedance for 15 kt is reduced to 6-7 hours per year when only daylight hours are included in SLR's assessment (refer **Section 3.2.1**)

Turbulence Exceedance at the Anemometer Location

- There were approximately 1,600 occasions during the 23-year BoM record period (69.5 per year) where natural turbulence exceeded 4-kt taking into account ALL wind directions.
- There were 2. occasions per year where natural turbulence exceeded 4-kt from winds orientating from 22.5°±22.5°.

It should be noted that while many of those exceedance "occasions" occurred on different days, some occurred in consecutive hours on the same day during the passage of major windstorm events.

Future Wind Conditions (Associated with the Post-Post Development Scenario)

The following major conclusions have been reached based on results of CFD simulations for the analysed wind directions:

Windshear – Approaching Wind Speed = 20 Knot at 10m above ground

- A number of warehouses and low-rise buildings are located to the northeast side of the runways.
- The variation in the mean wind speed for the existing and post development scenarios is either below 6 kt or impacted less than 100 m at a height below 60 m. The NASF-B windshear criterion is therefore not exceeded. due to the following:
    - Location of the building (eg the buildings are located behind existing buildings).
    - Relatively low building height (10.6 m)

Wind Turbulence – Approaching Wind Speed = 20 Knot at 10m above ground

- In the CFD modelling, the trees and vegetation surrounding the site were removed primarily to reduce computational time, noting that this removal makes the model slightly conservative as the addition of vegetation would typically reduce ground level wind speeds.
- The proposed development will have a minor impact on the peak turbulence levels taking into account 22.5°±22.5° wind directions.
- Peak (instantaneous) turbulence levels are increased by a modest amount for the wind 0º and 45º and slightly reduced for infrequent wind at 22.5º.
  - Wind angle 0º
    - 0.7 kt for 11L
    - 0.2 kt for 11C
  - Wind angle 22.5º
    - -0.4 kt for 11L
    - -0.25 kt for 11C
  - Wind angle 45˚
    - 0.1 kt for 11L
    - 0 kt for 11C

Summary Results

The results of simulations for the worst-case scenario are summarised below.

Scenario	Are the NASF-B Compliance Criteria Satisfied?		Runway 11L	Runway 11C
	Cross-Wind 6 kt	Turbulence 4 kt	No of Hours per Year Turbulence Criterion Exceeded 6 am - 6 pm	No of Hours per Year Turbulence Criterion Exceeded 6 am - 6 pm
Current	Yes	No	5[1,2]	5[1]
Post Development	Yes	No	5[1,2]	4[1]

Note 1: The results take into account 22.2±22.5º wind directions.
Note 2: Runway 11L operates during the daytime (6:00 am to 6:00 pm) ONLY. Refer **Table 7** and **Table 8**

Recommendations

To mitigate building-induced wake turbulence, it's recommended to implement operational risk mitigation measures accepted by the airport operator and CASA when winds exceed 12.8 kt from the NNE (wind angle 22.5°± 22.5°).

The addition of the proposed development has a minor impact on the peak turbulence levels, ie it increases the peak turbulence level by ~0.7 kt for the worst-case scenario but the number of exceedances for the current and post development scenarios is similar taking into account all analysed wind directions.

8.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

Appendix F

Noise and Vibration Impact Assessment

Prepared for
Aeria Management Group (Bankstown Airport Pty Ltd)
ABN: 50 083 058 637

Bankstown Airport Link Road Mixed Use Precinct

Construction and Operational Noise and Vibration Impact Assessment

22-Jul-2024
Bankstown Airport Link Road Mixed Use Precinct
Doc No. 60710490-RPNV-01_D
Commercial-in-Confidence

aecom.com

Delivering a better world

Bokarina Beach Masterplan, Sunshine Coast, Australia

Bankstown Airport Link Road Mixed Use Precinct

Construction and Operational Noise and Vibration Impact Assessment

Client: Aeria Management Group (Bankstown Airport Pty Ltd)

ABN: 50 083 058 637

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22-Jul-2024

Job No.: 60710490

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

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Rev	Revision Date	Details	Approved	
			Name/Position	Signature
A	22-Dec-2023	Draft for client review	Andrew Raeburn Principal Urban Planner	
B	11-Jan-2024	Draft for client review	Andrew Raeburn Principal Urban Planner	
C	05-Apr-2024	Draft of updated design for client review	Andrew Raeburn Principal Urban Planner	
D	22-Jul-2024	Final updated design for client review	Andrew Raeburn Principal Urban Planner	

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Executive Summary

Bankstown Airport is Sydney's major general aviation airport. It is the third most active general aviation facility in Australia and the fifth most active overall. It caters for charter and private business flights, flight training, freight, emergency and aeromedical services and recreational flights. It operates on a 24/7 basis and currently averages around 220,000 movements per annum with capacity for up to 450,000.

The Link Road Mixed Used Precinct proposal is a development within the Airport that will provide a mix of commercial land uses designed to complement the airport and provide new retail, office and childcare opportunities for the local community. It is to be located at the periphery of the airport, and would also provide small-scale warehouse tenancies.

Aeria Management Group is proposing to submit an application for Major Development Plan (MDP) approval to the Minister for Infrastructure, Transport, Regional Development and Local Government (the Minister) for the development of the proposed Link Road Mixed Used Precinct.

Nearby noise and vibration sensitive receivers were identified and unattended noise measurements were completed to characterise the existing noise environment. The noise levels were used to establish construction Noise Management Levels and operational project noise trigger levels.

Construction noise and vibration

Construction scenarios for the proposal were developed in consultation with the Forge Venture Management project management team, with the proposed plant and equipment detailed within this report. Three distinct construction stages were used in a computer-based noise model to determine the potential construction noise generation. Construction impacts were then assessed at all receivers at various locations across the project area. The ICNG's NMLs are more stringent than the construction noise criteria outlined in the Airports Regulations, therefore ICNG's NMLs have been utilised as the design criteria for the proposal.

A conservative assessment predicts that 49 receivers within Georges Hall will experience noise levels above the NML for the Foundations construction scenario. Of these receivers, eight are expected to be highly affected. For the Site Establishment scenario, 28 receivers are expected to experience noise levels above the NML, with six of these expected to be highly affected. For the Frame and Façade construction scenario, 32 receivers are expected to experience noise levels above the NML, with eight of these expected to be highly affected.

Fourteen non-residential receivers are expected to exceed the construction NMLs for the highest impact construction scenario (Foundations). These receivers include Bankstown Montessori Pre-school, Georges River Grammar School, SUPA IGA Georges Hall, Georges Hall Community Centre, and St Martin's Anglican Church.

An assessment of the likely construction traffic movements cannot be conducted at this stage as existing traffic volumes along access routes are not yet available. A construction traffic assessment should be conducted at the detailed design stage.

The main source of vibration during construction would be the use of piling rigs during earthwork and structural works. Minimum working distances for vibration intensive construction work have been presented. Equipment size would be selected by the construction contractor accounting for the minimum working distances and the distance between the area of construction and the most affected sensitive receiver. If work needs to be carried out within minimum working distances, vibration monitoring would be carried out to manage potential structural damage.

Operational noise and vibration

An operational noise assessment was carried out in accordance with the EPA's *Noise Policy for Industry, 2017,* as required under Bankstown Airport Noise and Vibration Management Plan (NVMP). Likely operational scenarios during the daytime, evening and night-time were assessed at representative receiver locations near to the project area against the project noise trigger levels. In addition, likely maximum noise events from operational activities within the proposed warehousing area were used to assess sleep disturbance at all nearby residential assessment receivers.

Results show predicted operational noise emissions from the proposed site are compliant with the project noise trigger levels provided that the maximum equipment noise levels, traffic movements, noise barriers, and plans of management presented in this report are properly implemented. Noise mitigation strategies provided in this report are high level and should be verified at the detailed design stage.

An assessment of the likely operational road traffic was not conducted at this stage as existing traffic counts along access routes are not yet available. This operational road traffic noise assessment should be conducted at the detailed design stage in accordance with the EPA's *Road Noise Policy*.

Operation of the proposal is not predicted to generate any adverse vibration to nearby sensitive receivers.

Aircraft noise assessment

Based on the location of the precinct with respect to the most up-to-date Bankstown Airport 2039 ANEF chart, the location of the proposal indicates that the development would be 'acceptable' for light industrial and commercial usage and 'conditionally acceptable' for school (childcare centre) usage.

A maximum aircraft noise level of L_{Asmax} 72 dB has been predicted from general aviation aircraft to the site. Indicative Rw values and construction detail have been recommended for the proposed childcare centre. These recommendations should be verified during the detailed design stage, prior to construction. Other sensitive land uses for the site to be determined at a later stage should also be verified prior to construction.

1.0 Introduction

Bankstown Airport is Sydney's major general aviation airport. It is the third most active general aviation facility in Australia and the fifth most active overall. It caters for charter and private business flights, flight training, freight, emergency and aeromedical services and recreational flights. It operates on a 24/7 basis and currently averages around 220,000 movements per annum with capacity for up to 450,000.

Aeria Management Group is proposing to submit an application for Major Development Plan (MDP) approval to the Minister for Infrastructure, Transport, Regional Development and Local Government (the Minister) for the development of land in the north-east sector of Bankstown Airport.

The Bankstown Airport Link Road Mixed Use Precinct is located within the "*Airport Business Zone*" of Bankstown Airport and is currently a vacant site between Bankstown Montessori Pre School, SUPA IGA Georges Hall and Georges River Grammar School to the west, with residential properties to the north and east and the airport to the south.

The proposal will provide a mix of commercial land uses designed to complement the airport and provide new retail, office and childcare opportunities for the local community at the periphery of the airport, as well as small-scale warehouse tenancies.

Aeria Management Group (Bankstown Airport Proprietary Ltd) commissioned AECOM Australia Pty Ltd (AECOM) to conduct a construction and operational noise and vibration impact assessment for the Link Road Mixed Use Precinct to support the MDP approval process.

1.1 Scope of works

The scope of this acoustic assessment was to:

- Identify nearby noise sensitive receivers potentially affected by the construction and operation of the project.
- Establish construction and operational noise management levels based upon the measured background noise levels and the following documents:
  - Airports (Environment Protection) Regulations 1997
  - NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI)
  - EPA's NSW Road Noise Policy (RNP)
  - Bankstown Airport - Noise and Vibration Management Plan (NVMP), SMA-EN-BAL-PLN-000709
- Undertake a construction and operational noise impact assessment at nearby sensitive receivers, in accordance with Airports (Environment Protection) Regulations 1997, the NVMP, ICNG and NpfI.
- Undertake a construction and operational traffic noise assessment in accordance with the RNP;
- Consider aircraft noise impacts in accordance with Australian Standard AS 2021: 2015 *Acoustics – Aircraft Noise Intrusion – Building Siting and Construction* (AS 2021:2015)
- Consider potential operational and construction vibration impacts.
- Recommend indicative construction and operational noise mitigation measures if required to meet established noise management levels.

1.2 Relevant policies and guidelines

The following policies and guidelines are relevant for this assessment and have been utilised or referenced where appropriate:

- *Airports (Environment Protection) Regulations,* Office of Parliamentary Counsel, Canberra, 1997
- Bankstown Airport - Noise and Vibration Management Plan (NVMP), Bankstown Airport document number: SMA-EN-BAL-PLN-000709, 2019.
- *Interim Construction Noise Guideline* (ICNG), Department of Environment and Climate Change (DECC), 2009.
- *Assessing Vibration: a technical guideline* (AVATG), Department of Environment and Conservation (DEC), 2006.
- *NSW Road Noise Policy* (RNP), Department of Environment Climate Change and Water (DECCW), 2011.
- *Noise Policy for Industry (NPfI),* Environmental Protection Authority (EPA), 2017.
- Australian/New Zealand Standard AS/NZS IEC 61672.1:2019 *Electroacoustics - Sound level meters – Part 1: Specifications*, 2019.
- Australian Standard AS 2021:2015 *Acoustics – Aircraft noise intrusion – Building siting and construction,* 2015.

2.0 Noise and Vibration Criteria

2.1 Airports (Environment Protection) Regulations 1997

Bankstown Airport is regulated by the Commonwealth Government, and the noise and vibration emission requirements are based on Commonwealth Legislation. The *Airports (Environment Protection) Regulations 1997* (Airports Regulations) outlines Bankstown Airport's major obligations with respect to environmental matters at the Airport.

Table 1 presents a summary of the key acoustic requirements from the Airport Regulations applicable to this proposed development.

Table 1 Relevant Airports Regulations acoustic requirements

Reference	Subject	Provision
Part 2 – What is pollution or excessive noise		
2.04	What is offensive noise	1. Noise that is offensive occurs when noise is generated at a volume, or in a way, or under a circumstance, that, in the opinion of an airport environment officer, offensively intrudes on individual, community or commercial amenity. 2. In forming an opinion, an airport environment officer must have regard to: a. the volume, tonality and impulsive character (if any) of the noise; and b. the time of day, and duration, of the noise; and c. background noise levels at the time the noise is generated; and d. the location, in relation to the source of the noise, of: i. sensitive receptors; or ii. if there is no affected sensitive receptor—commercial receptors; and e. the excessive noise guidelines in Schedule 4 of the regulations. Note: Generation of excessive noise is not, of itself, an offence under the Regulations (refer to Schedule 4 – 1.01).

Reference	Subject	Provision
Part 4—Duties of operators of undertakings at airports		
4.06	General duty to prevent offensive noise occurring	1. The operator of an undertaking at an airport must take all reasonable and practicable measures: a. to prevent the generation of offensive noise from the undertaking; or b. if prevention is not reasonable or practicable—to minimise the generation of offensive noise from the undertaking. An operator of an undertaking at an airport is complying with that duty if the noise is not offensive or meets the guidelines in Schedule 4 of the regulations (or any local standard set by or authorised by the Minister).
Schedule 4—Excessive noise—guidelines		
Schedule 4 – 1.01	Purpose of Schedule	For subregulation 2.04 (2) of the Regulations, this Schedule sets out indicators of noise that is excessive. Note: Generation of excessive noise is not, of itself, an offence under the Regulations.
Schedule 4 – 2.02	Noise from construction, etc.	The $L_{A10\ (15\ min)}$ noise level generated from construction, maintenance or demolition of a building or other structure at an airport should not exceed 75 dB(A), at the site of a sensitive receptor.
Schedule 4 – 2.03	Noise from road traffic	Noise generated from road traffic on the site of an operator of an undertaking at an airport should not exceed: a. $L_{Aeq\ (24\ hour)}$ noise level of 60 dB(A) for a 24 hour period of measurement; and b. $L_{Aeq\ (8\ hour)}$ noise level of 55 dB(A), for an 8 hour period of measurement from 22:00 hours on a particular day to 06:00 hours on the following day.

The Airport Regulations provides general principles to be applied by the Airport's environment officer. In addition, the Airport Regulations provide noise emission criteria generated from construction, maintenance or demolition of a building or other structures at an airport.

2.2 NSW Government policies and guidelines

The key NSW Government policies and guidelines considered as part of this construction and operational noise and vibration impact assessment for Bankstown Airport Link Road Mixed Use Precinct are described in the following sections. These policies and guidelines are not statutory documents but may be referenced in instruments in relation to the assessment and management of construction and operational noise sources at the Airport.

It should be noted that the NSW Environment Protection Authority (EPA) has no role in regulating the noise and vibration generated by activities within Bankstown Airport.

2.2.1 Interim Construction Noise Guideline

The EPA's *Interim Construction Noise Guideline* (ICNG) is a NSW Government document that identifies ways to manage impacts of construction noise on residences and other noise sensitive land uses. It is the principal guideline for the assessment and management of construction noise in NSW and is used to establish construction noise management levels.

2.2.2 Noise Policy for Industry

Bankstown Airport Noise and Vibration Management Plan (NVMP), Section 6.4.2 *Masterplan noise management, nominates the* EPA's *Noise Policy for Industry* (NpfI) as the relevant guideline for

assessing operational noise from the ongoing upgrading and replacement of existing facilities at the Airport.

The NPfI is a NSW Government document that sets out guidelines for the assessment and control of industrial noise. The overall aim is to allow the need for industrial activities to be balanced with the desire for quiet in the community. The policy outlines processes to help strike a feasible and reasonable balance between the establishment and operation of industrial activities and the protection of the community from noise levels that are intrusive or unpleasant. The NPfI provides appropriate criteria for the assessment of ground-based Airport operational activities since these activities are characteristically industrial in nature.

2.2.3 Assessing Vibration: a technical guideline

The EPA's *Assessing Vibration: a technical guideline* (AVATG) is a NSW Government document that presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques.

2.2.4 NSW Road Noise Policy

The EPA's NSW Road Noise Policy (RNP) is a NSW Government document that aims to identify the strategies that address the issue of road traffic noise from new traffic-generating developments. The Road Noise Policy also defines criteria to be used in assessing the impact of such noise.

3.0 Existing Acoustic Environment

3.1 Site description

The proposed site is located on the northern side of Bankstown Airport, at the location of the existing Birdwood Reserve separated by Link Road to the south and Birdwood Road to the north. Residential premises are located directly adjoining the site to the east, and north across Birdwood Road. Industrial receivers within Bankstown airport are located to the south, whilst commercial and educational receivers (Georges River Grammar School) exist to the west, refer to Figure 1.

The acoustic environment is dominated by road traffic noise from Link Road and Birdwood, in addition to aircraft noise from Bankstown Airport.

3.2 Noise and vibration sensitive receivers

Noise and vibration sensitive receivers within the study area have been identified as residential, and non-residential properties using aerial photography and on-site surveying. Residential receivers surrounding the proposal area are mostly single storey residential dwellings. Given the localised location of the proposal and nearby sensitive receivers, all receivers have been considered in one noise catchment area (NCA). Non-residential receivers in the area include schools, community centres, places of worship, childcare centres, commercial premises, and industrial premises.

3.2.1 Representative receivers

Residential and non-residential receivers potentially affected by the construction and operation of the project have been identified and are shown in Figure 1.

The nearest residential receivers are located directly adjoining the site to the east. The nearest industrial receiver is located to the south of Link Road, approximately 45 metres from the site boundary. The nearest potentially impacted receivers assessed in the construction and operational noise assessment are listed in Table 2.

Figure 1 Site map showing NCAs, noise monitoring location, and representative receiver locations

Table 2 Nearest potentially impacted residential and non-residential receivers

Receiver number	Usage	Address
Residential receivers		
R1	Residential	179 Birdwood Road, Georges Hall
R2	Residential	173A Birdwood Road, Georges Hall
R3	Residential	531 Marion Street, Georges Hall
R4	Residential	533 Marion Street, Georges Hall
R5	Residential	192 Birdwood Road, Georges Hall
R6	Residential	203 Birdwood Rd, Georges Hall (upper floor level)
Non-residential receivers		
E1	Education	Bankstown Montessori Pre-school 179b Birdwood Road, Georges Hall
E2	Education	Georges River Grammar 53 Georges Crescent, Georges Hall
CO1	Community Centre	Georges Hall Community Centre 188 Birdwood Road, Georges Hall
W1	Place of Worship	St Martin's Anglican Church 176 Birdwood Road, Georges Hall
C1	Commercial	SUPA IGA Georges Hall 195 Birdwood Road, Georges Hall
I1	Industrial	Heliflite 121 Link Road, Bankstown Aerodrome
I2	Industrial	Transit Systems - Bankstown Bus Depot 127 Link Road, Bankstown Aerodrome

3.3 Noise monitoring

Ambient noise monitoring was conducted at one location within the study area in November 2023. This included both long term monitoring and short-term attended measurements.

3.3.1 Instrumentation

A Rion NL-52 noise logger was installed on the subject site (5012/DP1176822). The noise logging location is presented in Figure 1.
The sound level meter used to conduct attended noise measurements was a Bruel & Kjaer 2250 (Serial Number 3009329). All the acoustic instrumentation employed during the noise measurements comply with the requirements of Australian/New Zealand Standard AS/NZS IEC 61672.1:2019 *Electroacoustics - Sound level meters – Part 1: Specifications* and were calibrated prior to and after the monitoring session with a drift in calibration not exceeding ± 0.5 dB.

All instruments used were within their current National Association of Testing Authorities, Australia (NATA) certified in-calibration period (i.e. calibration in the last 2 years).

3.3.2 Unattended continuous noise monitoring

Unattended noise monitoring was undertaken from 13 November 2023 to 22 November 2023 at one location considered to be representative of the noise sensitive receivers within the Project area.

A noise logger measures the noise level over the sample period and then determines L_{A1}, L_{A10}, $L_{A90,}$ and L_{Aeq} levels of the noise environment. The L_{A1}, L_{A10} and L_{A90} levels are the levels exceeded for 1%, 10% and 90% of the sample period respectively.

The L_{A1} is indicative of maximum noise levels due to individual noise events. The L_{A90} is taken as the background noise level. The L_{Aeq} is essentially the energy averaged sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

The assessment background level (ABL) is established by determining the lowest tenth-percentile level of the L_{A90} noise data acquired over each period of interest. The background noise level or rating background level (RBL) representing the day, evening and night-time assessment periods is based on the median of individual ABLs determined over the entire monitoring duration. The RBL is representative of the average minimum background sound level, or simply the background level.

Graphical representations of the logging results are provided in Appendix B.

A summary of the measured L_{A90} background noise levels and existing L_{Aeq} ambient noise levels is presented in Table 3.

Table 3 Existing background and ambient noise levels, dB(A)

Measurement location	Rating background level			Ambient noise levels		
	Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
NL1	45	39	36	58	51	51

Notes:

1. In accordance with the NPfI, time of day is defined as follows:
   Day – the period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
   Evening – the period from 6 pm to 10 pm.
   Night – the remaining periods.

3.3.3 Attended noise monitoring

Attended monitoring was conducted at the unattended monitoring location on 23 November 2023. Each measurement was conducted over a 15 minute period. Weather conditions were overcast on the day of monitoring, with light to moderate winds. The attended measurement data is presented in Table 4.

Table 4 Attended noise monitoring results

Monitoring location	Date	Time	Description	Measurements, dB(A)		
				$L_{A10,\ 15min}$	$L_{Aeq,\ 15min}$	$L_{90,\ 15min}$
NL1	23/11/23	12:27	• Traffic noise from Link Road and Birdwood Road dominant. • Children playing at nearby schools. • Trucks and car pass-bys over speed bumps on Link Road 50-56 dBA. • Helicopters passing over Birdwood Reserve 51 dB-65 dBA. • Helicopter above tarmac at the airport and helicopter flying over the reserve 81 dBA. • Windy weather conditions	79	64	49

4.0 Construction Noise and Vibration Criteria

4.1 Construction noise management levels

4.1.1 Airports Regulations

Schedule 4 – 2.02 of the Airports Regulations specifies the following provision for noise from construction activities:

> *The $L_{A10\ (15\ min)}$ noise level generated from construction, maintenance or demolition of a building or other structure at an airport should not exceed 75 dB(A), at the site of a sensitive receptor.*

For the purpose of comparison, the Airports Regulations criterion maybe presented as a L_{Aeq} level. This is considered reasonable as typically L_{Aeq} levels are approximately 3 dB(A) less than the L_{A10} levels for noise emissions from typical construction activities. Therefore, the Airports Regulations criterion is equivalent to $L_{Aeq\ (15\ min)}$ not to exceed 72 dB(A).

4.1.2 Interim Construction Noise Guideline

The EPA's Interim Construction Noise Guideline (ICNG) provides the basis for construction noise assessments in NSW and is used to establish construction noise management levels (NMLs).

The ICNG recommends that a quantitative assessment is carried out for all *'major construction projects that are typically subject to the EIA process'*. Additionally, the ICNG recommends that qualitative assessment is only used on short-term infrastructure maintenance works that are not likely to affect an individual or sensitive land use for more than three weeks in total. As the proposed works are expected to continue for a period of more than three weeks, and are within fairly close proximity to sensitive receivers, a quantitative assessments, based on 'reasonable' worst case construction scenarios, has been carried out for this work. Predicted construction noise levels at nearby receivers are compared to the levels provided in Section 4 of the ICNG.

Where an exceedance of the NMLs is predicted, the ICNG advises that receivers can be considered 'noise affected' and the proponent should apply all feasible and reasonable work practices to minimise the noise impact. The proponent should also inform all potentially impacted residents of the nature of the works to be carried out, the expected noise level and duration, as well as contact details.

Where construction noise levels reach 75 dB(A) residential receivers can be considered as 'highly noise affected' and the proponent should, in consultation with the community, consider restricting hours to provide respite periods.

The ICNG defines what is considered to be feasible and reasonable as follows:

> *Feasible*
>
> *A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.*
>
> *Reasonable*
>
> *Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.*

Table 5 sets out management levels for noise at residences and how they are to be applied.

Table 5 Noise management levels at residences

Time of day	Management level, $L_{Aeq\ (15min)}$ dB(A)[1]	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL +10 dB(A)	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL +5 dB(A)	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2 of the ICNG.

Notes:

1. Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

4.2 Construction hours

Construction hours are defined as follows in the ICNG:

- Standard hours: 7 am to 6 pm Monday to Friday and 8 am to 1 pm Saturday;
- Out of hours: before 7 am and after 6 pm Monday to Friday, before 8 am and after 1 pm Saturday, and all Sunday and public holidays.

No work is generally expected to be required outside of standard construction hours.

The construction works are proposed to be scheduled during in standard hours. Provided below are the applicable NMLs for this project, based on the RBLs in Table 3 and noise management levels in Table 5.

Table 6 Construction noise management levels at residential receivers (standard hours)

Noise management levels			
Receiver Type	RBL, $L_{A90, 15min}$	Noise management $L_{Aeq, 15min}$ dB(A)	Highly noise affected level $L_{Aeq, 15min}$ dB(A)
Residential	45	55	75

The NMLs for non-residential receivers are provided below. These NMLs apply only during the hours in which the properties are in use.

Table 7 Construction noise management levels for non-residential receivers

Noise management levels	
Land use	Management noise level $L_{Aeq, 15min}$ dB(A)
Industrial premises	75
Offices, retail outlets	70
Places of worship	55[1]
School	55[1]
Community centres	55[2]

Notes:

1. Based on an internal noise level of 45 dB outlined in the ICNG, where a conservative estimate of 10 dB has been assumed between internal and external noise levels.
2. Based on *AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors* indoor noise level for "Leisure centres and gaming. A conservative estimate of 10 dB has been assumed between internal and external noise levels.

4.2.1 Sleep disturbance

Where construction works are planned to extend over more than two consecutive nights, and where a quantitative assessment method is used, the analysis should cover the maximum noise level, and the extent of the number of times that the maximum noise level exceeds the RBL.

It is understood that works are not proposed to be conducted outside of standard construction hours; therefore a sleep disturbance assessment for construction is not required and therefore has not been conducted.

4.2.2 Construction road traffic noise criteria

The roads listed in Table 8 will likely be used by construction traffic. The road type and whether residential receivers are located on the road in that area are also indicated in Table 8. Construction vehicle routes are shown in Figure 2.

Table 8 Roads used by construction traffic

Road	Type	Residential receivers
Henry Lawson Drive	Arterial	Yes
Haig Avenue/Birdwood Road	Sub-arterial	Yes

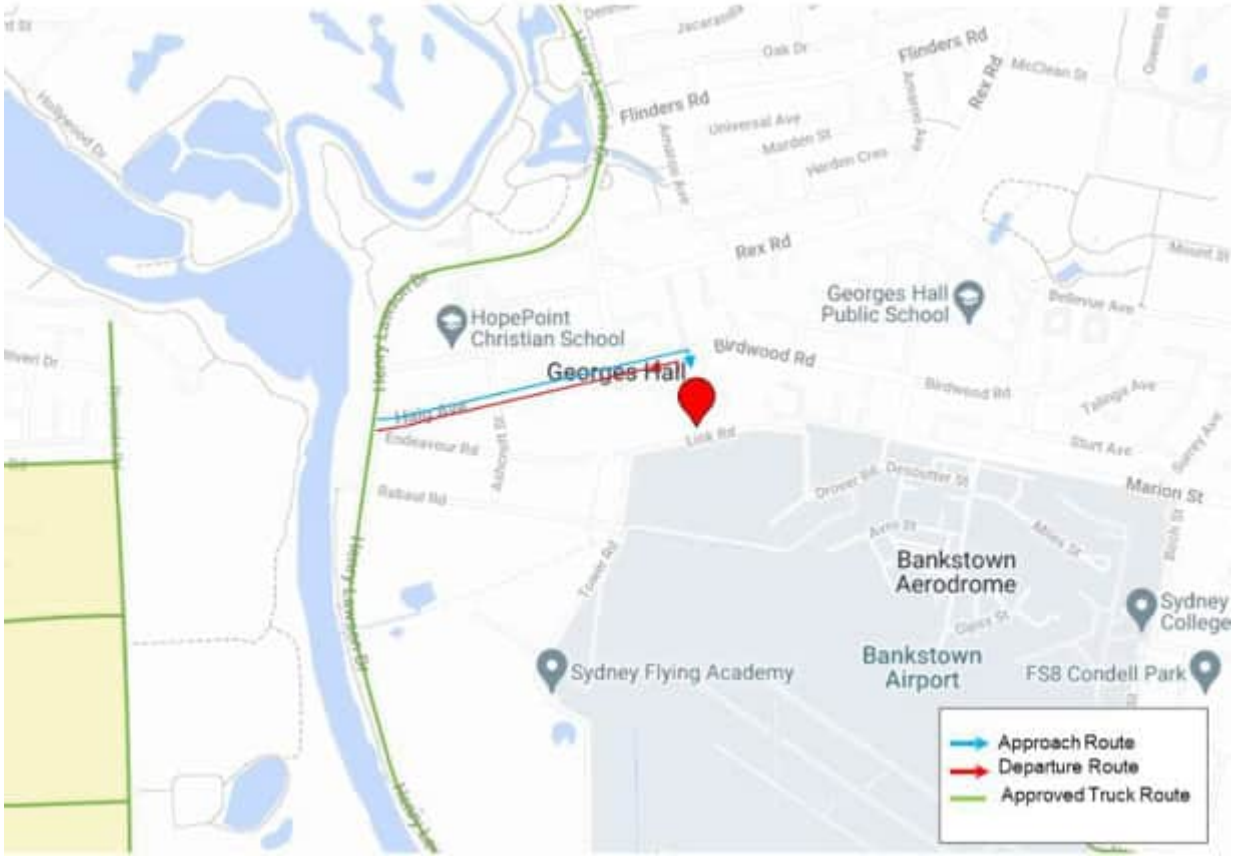

Figure 2 Construction vehicle route

4.2.3 Airports Regulations

Schedule 4 – 2.03 of the Airports Regulations provides on-site noise criteria for '*noise from road traffic noise*'. The Airports Regulations criteria do not specifically cover construction traffic noise on public roads.

4.2.4 NSW Road Noise Policy

Noise from construction traffic on public roads is not covered by the ICNG. However the ICNG does refer to the *Environmental Criteria for Road Traffic Noise*, now superseded by the *NSW Road Noise Policy (RNP)*, for the assessment of noise arising from construction traffic on public roads.

To assess noise impacts from construction traffic an initial screening test should be undertaken by evaluating whether existing road traffic noise levels will increase by more than 2 dB(A). Where the predicted noise increase is 2 dB(A) or less, then no further assessment is required. However, where the predicted noise level increase is equal to or greater than 2 dB(A), and the predicted road traffic noise level exceeds the road category specific criterion then noise mitigation should be considered for those receivers affected in accordance with the RNP.

4.3 Construction vibration criteria

The relevant standards/guidelines for the assessment of construction vibration are summarised in Table 9.

Table 9 Standards / guidelines used for assessing construction vibration

Item	Standard/guideline
Structural damage	• Heritage structures – *German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (DIN 4150)* • Non-heritage structures – *Evaluation and Measurement for Vibration in Buildings Part 2, (British Standard (BS) 7385:Part 2-1993)*
Human comfort (tactile vibration)	• *Assessing Vibration: A Technical Guideline*[1]
Human comfort (ground-borne noise)	• *Interim Construction Noise Guideline*

Notes:

1. This document is based upon the guidelines contained in British Standard 6472:1992, "Evaluation of human exposure to vibration in buildings (1-80 Hz)". This British Standard was superseded in 2008 with BS 6472-1:2008 "Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting" and the 1992 version of the Standard was withdrawn. Although a new version of BS 6472 has been published, the NSW EPA still requires vibration to be assessed in accordance with the 1992 version of the Standard at this point in time.

Vibration, at levels high enough, has the potential to cause damage to structures and disrupt human comfort. Vibration and its associated effects are usually classified as continuous, impulsive or intermittent as follows:

- continuous vibration continues uninterrupted for a defined period and includes sources such as machinery and continuous construction activities for example, a vibratory roller
- impulsive vibration is a rapid build up to a peak followed by a damped decay. It may consist of several cycles at around the same amplitude, with a duration of typically less than two seconds and no more than three occurrences in an assessment period. This may include occasional dropping of heavy equipment or loading activities
- intermittent vibration occurs where there are interrupted periods of continuous vibration, repeated periods of impulsive vibration or continuous vibration that varies significantly in magnitude. This may include intermittent construction activity such as from impact pile driving and jack hammers.

4.3.1 Structural damage

At present, no Australian Standards exist for the assessment of building damage caused by vibration.

DIN 4150 and BS 7385-2 provide recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration and are presented in

Table 10 and Table 11. DIN 4150 states that buildings exposed to higher levels of vibration than recommended limits would not necessarily result in damage. Structural damage criteria for heritage items have been taken from DIN 4150, whilst criteria for commercial/residential items have been taken from BS 7385.

Table 10 Structural damage safe criteria (DIN 4150) for building vibration (Peak particle velocity)

Group	Type of structure	At foundation – Less than 10 Hz	At foundation – 10 Hz to 50 Hz	At foundation – 50 Hz to 100 Hz[1]	Vibration at the horizontal plane of the highest floor for all frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20 mm/s	20 to 40 mm/s	40 to 50 mm/s	40 mm/s
2	Dwellings and buildings of similar design and/or use	5 mm/s	5 to 15 mm/s	15 to 20 mm/s	15 mm/s
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (eg buildings that are under a preservation order/heritage listed)	3 mm/s	3 to 8 mm/s	8 to 10 mm/s	8 mm/s

Notes:

1. At frequencies above 100 Hz, the values given in this column may be used as minimum values

Table 11 BS 7385-2: Transient vibration guide values for cosmetic damage

Group	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

4.3.2 Human comfort

Humans are sensitive to vibration such that they can detect vibration levels well below those required to cause any risk of damage to a building or its contents. Criteria to avoid annoyance are therefore more stringent than those to prevent structural damage.

4.3.2.1 Intermittent vibration

The assessment of intermittent vibration outlined in *Assessing Vibration: A Technical Guideline* is based on Vibration Dose Values (VDVs). The VDV accumulates the vibration energy received over the daytime and night-time periods.

Maximum and preferred VDVs for intermittent vibration arising from construction activities are listed in Table 12. The VDV criteria are based on the likelihood that a person would be annoyed by the level of vibration over the entire assessment period.

Table 12 Preferred and maximum vibration dose values for intermittent vibration ($m/s^{1.75}$)

Location	Day time		Night-time	
	Preferred	Max	Preferred	Max
Residences	0.20	0.40	0.13	0.26

4.3.2.2 Continuous and impulsive vibration

Acceptable levels of human exposure to continuous and impulsive vibration are dependent on the time of day and the activity taking place in the occupied space. *Assessing Vibration: A Technical Guideline* provides the preferred values for continuous and impulsive vibration. These are presented in Table 13.

There is low probability of adverse comment or disturbance to building occupants at vibration values below the preferred values in Table 13. Situations exist where vibration above the preferred values can be acceptable, particularly for temporary disturbances and infrequent events of short duration. Vibration levels above those indicated in Table 13 may be dealt with through negotiation with the regulator of the affected community.

Table 13 Peak particle velocity for continuous and impulsive vibration (mm/s)

Location	Assessment period	Preferred	Maximum
Continuous vibration			
Residences	Day Night	0.28 0.20	0.56 0.40
Impulsive vibration			
Residences	Day Night	8.60 2.80	17.0 5.60

5.0 Operational noise criteria

5.1.1 Airports Regulations

Schedule 4 – 2.03 of the Airports Regulation outlines criteria for noise generated from road traffic on-site. These criteria are presented as $L_{Aeq\ (24hour)}$ and $L_{Aeq\ (8\ hour)}$ noise metrics. The purpose of these criteria are to outline the noise limits for road traffic traversing internal roads within the airport. As the proposal does not possess any major internal roads, but rather carparks and loading docks, an $L_{Aeq,15min}$ criterion is more applicable to the project and has been adopted for on-site road traffic movements.

5.1.2 Noise Policy for Industry

The NPfI provides noise trigger levels for assessing the potential impact of noise from industry and includes a framework for considering feasible and reasonable noise mitigation measures. The assessment procedure for industrial noise sources has two components that must be considered:

- Controlling intrusive noise impacts in the short term for residences; and
- Maintaining noise level amenity for residences and other land uses.

5.1.2.1 Intrusive noise impacts

The NPfI states that the intrusiveness of an industrial noise source may generally considered acceptable if the level of noise from the source (L_{Aeq} level), measured over a 15 minute period, does not exceed the background noise level measured by more than 5 dB. The rating background level (RBL) is the background noise level to be used for assessment purposes and is determined by the methods given in Fact Sheet B of the NPfI. Adjustments are to be applied to the level of noise produced if the noise at the receiver contains annoying characteristics such as tonality or impulsiveness.

The project intrusiveness noise levels are presented in Table 14.

Table 14 Project intrusiveness noise levels

Land use	Time of day[1]	RBL, dB(A)	Intrusiveness noise level RBL + 5 ($L_{Aeq,15min}$)
Residential	Day	45	50
	Evening	39	44
	Night	36	41

Notes:

1. In accordance with the NPfI time of day is defined as follows :

   Day – the period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
   Evening – the period from 6 pm to 10 pm
   Night – the remaining periods.

5.1.2.2 Protecting noise amenity

To limit continuing increases in noise levels, the maximum ambient noise level resulting from all industrial noise sources in an area should not normally exceed the acceptable levels specified in Table 2.2 of the NPfI. As per the definitions of receiver types in Table 2.3 of the NPfI, residences within the assessment area have been classed as “urban”

The project amenity level for a project is equal to the recommended amenity level – 5 dB. In addition, the project amenity level is converted from a period to 15 minutes by adding 3 dB. Therefore, the relevant noise amenity level for each type of receiver is shown below in Table 15.

Table 15 Recommended L_{Aeq} noise levels from industrial noise sources.

Type of receiver	Indicative noise amenity area	Time of day	Recommended amenity noise level, $L_{Aeq\ (period)}$	Project amenity noise level, $L_{Aeq,15min}$
Residential	Urban	Day	60	58
		Evening	50	48
		Night	45	43
Active recreation	All	When in use	55	53
Place of worship - internal	All	Noisiest 1-hour period when in use	40	48[1]
Industrial premises	All	When in use	70	68
School classroom – internal	All	Noisiest 1-hour period when in use	40	48[1]
Commercial premises	All	When in use	65	63

Notes:

1. Based on an internal noise level outlined in the NPfI, where a conservative estimate of 10 dB has been assumed between internal and external noise levels based on windows being open for adequate natural ventilation.

5.1.2.3 Project noise trigger levels

The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Provided in Table 16 are the established project noise trigger levels for the assessment locations in close proximity to the development. Table 16 presents the project noise trigger levels for the day, evening and night-time periods.

Table 16 Operational noise criteria

Noise catchment area	Assessment period	RBL (L_{A90}), dB(A)	Intrusive noise levels $L_{Aeq,\ 15min}$	Amenity noise levels $L_{Aeq,\ 15min}$	Project noise trigger levels $L_{Aeq,\ 15min}$
Residents	Day	45	50	58	50
	Evening	39	44	48	44
	Night	36	41	43	41
Active recreation	When in use	-	-	53	53
Place of worship	When in use	-	-	48	48
School classroom	Noisiest 1-hour period when in use	-	-	48	48
Commercial premises	When in use	-	-	63	63
Industrial premises	When in use	-	-	68	68

5.1.3 Tonality and NPfI modifying factors

The NPfI provides guidance and project noise trigger levels for assessing noise emissions from sources with “annoying characteristics” such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content. Penalties of up to a maximum of 10 dB(A) may be applied where the subject noise has such characteristics at the receiver.

5.1.4 Maximum noise level assessment

The NPfI requires the potential for sleep disturbance to be assessed by considering maximum noise level events during the night-time period.

Where the subject development/premises night-time noise levels at a residential receiver location exceed the following screening levels:

- $L_{Aeq,\ 15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- $L_{A,max}$ 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

a detailed maximum noise level even assessment should be undertaken.

The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Sleep disturbance research presented in the *Road Noise Policy* concludes that ‘Maximum internal noise levels below 50-55 dB(A) are unlikely to cause awakening reactions’. Therefore, given that an open window provides about 10 dB(A) in noise attenuation from outside to inside, external noise levels of 60-65 dB(A) are unlikely to result in awakening reactions.

Based on the measured background noise levels during the night, the sleep disturbance criteria for the nearest noise sensitive residential receivers are presented in Table 17.

Table 17 Night-time sleep disturbance criteria

Noise catchment area	Measured night-time RBL, $L_{A90,\ 15min}$	Sleep disturbance screening levels	
		Sleep disturbance screening level LA1(1 minute), dB(A)	Awakening reaction level LA1(1 minute), dB(A)
Residents	36	52	60-65

5.1.5 Operational road traffic noise criteria

The main roads providing access to the proposed precinct are:

Arterial roads

- Henry Lawson Drive

Sub-arterial roads

- Haig Avenue/Birdwood Road
- Tower Road/Link Road

Table 18 and Table 19 present the road traffic noise criteria from the RNP for land use developments with a potential to create additional traffic on existing freeways or motorways/ arterial roads or sub-arterial roads. The external noise criteria are applied 1 m from the external facade of the affected residential buildings.

Table 18 Road traffic noise criteria - arterial roads

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 am–10 pm)	Night (10 pm–7 am)
Freeway/ arterial/ sub-arterial roads	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq, (15\ hour)}$ 60 (external)	$L_{Aeq, (9\ hour)}$ 55 (external)

Table 19 Road traffic noise assessment criteria for non-residential land uses affected by proposed road projects and traffic generating developments

Existing sensitive land use	Assessment criteria – dB(A)	
	Day (7 am–10 pm)	Night (10 pm–7 am)
1. School classrooms	$L_{Aeq, (1\ hour)}$ 40 (internal) when in use	-
3. Places of worship	$L_{Aeq, (1\ hour)}$ 40 (internal) when in use	$L_{Aeq, (1\ hour)}$ 40 (internal) when in use

To assess noise impacts from traffic generated by the site, an initial screening test should be undertaken by evaluating whether existing road traffic noise levels will increase by more than 2 dB. Where the predicted noise increase is 2 dB or less, then no further assessment is required. However, where the predicted noise level increase is equal to or greater than 2 dB, and the predicted road traffic noise level exceeds the road category specific criterion then noise mitigation should be considered for those receivers affected. The RNP does not require assessment of noise impact to commercial or industrial receivers.

6.0 Construction Noise and Vibration Impact Assessment

6.1 Construction stages and scheduling

Construction works to take place as part of the proposed are outlined in Table 20. These works were based on the information provided by Forge Venture Management.

For the construction noise impact assessment, three construction scenarios were considered. These scenarios are shown in Table 20. The modelled scenario includes all equipment that could be reasonably assumed to be operating at the same time for an entire 15 minute period. Table 21 shows the construction equipment for each construction scenario and their sound power levels.

Table 20 Construction stages and scheduling

Construction scenario	Activities	Timing
Site establishment and enabling works	• Site establishment • Services relocations • Bulk cut / fill and import	Daytime – Standard hours
Foundations	• Detailed earthworks / trim • Pouring of concrete	Daytime – Standard hours
Frame and façade	• Erection of structure on site • Pouring of concrete	Daytime – Standard hours

6.2 Plant and equipment levels

Table 21 presents the typical sound power levels of the construction equipment to be used in each modelled scenario. These sound power levels are typical values taken from data provided in Australian Standard AS2436-2010, “Guide to noise and vibration control on construction, demolition and maintenance sites”, the UK Department for Environment, Food and Rural Affairs (DEFRA) “Update of noise database for prediction of noise on construction and open sites” noise database and AECOM’s noise database. It was assumed that equipment is modern and in good working order.

Table 21 Typical sound power levels of construction equipment

Equipment	Sound power level, dB(A)	Construction scenario		
		Site establishment and enabling works	Foundations	Frame and façade
Large excavator	98	●	●	
Backhoe	102	●		
Dump truck	95	●		
Franna crane	98		●	●
Vibratory roller	108	●		
Water carts	100	●		
Piling rig (bored)	112		●	
Concrete pump	106		●	●
Concrete truck	106		●	●
General hand tools	94			●
Large truck	108		●	●
Total construction scenario SWL		**110**	**115**	**112**

6.3 Noise modelling methodology

Noise levels due to the construction activities shown in Section 6.1 and 6.2 were predicted at nearby noise sensitive receivers using SoundPLAN 8.2 noise modelling software. The CONCAWE method was originally developed for predicting the long-distance propagation of noise from petrochemical complexes. It is especially suited to predicting noise propagation over large distances because it accounts for a range of atmospheric conditions that can significantly influence the propagation of noise over large distances.

The noise model was created to represent ‘reasonable’ worst periods of construction works.

The following features were included in the noise model:

- Ground topography
- Ground absorption and reflection
- Receivers
- Construction noise sources.

It can be expected that there may be differences between predicted and measured noise levels due to variations in instantaneous operating conditions, plant in operation during the measurement and also the location of the plant equipment.

6.3.1 Construction modelling assumptions

The following assumptions were made in modelling all construction noise scenarios:

- For all construction scenarios all equipment would be operating at the same time, which is unlikely, and is a conservative assumption.

- Equipment was assumed to be operating at the closest point in the site to each receiver, in order to present the worst case scenario for each receiver. In reality the equipment would only be closest point to each receiver for a limited period of the durations presented in Table 20.
- Neutral atmospheric conditions i.e. relatively calm, no wind.

6.4 Predicted construction noise impacts

Predicted construction noise levels associated with the precinct are presented in Table 22. Construction noise contours calculated at 1.5 m above ground level are presented in Appendix C. These contours are indicative only and should not be referred to for noise levels at specific receivers; rather reference should be made to Table 22 and Table 23.

Considering the ICNG criteria is more stringent than the the Airport Regulations $L_{Aeq\ (15\ min)}$ 72 dB(A) criteria, only the ICNG NML criteria has been considered for the construction noise impact assessment.

6.4.1 Residential receivers

Table 22 Number of residential buildings where noise levels may exceed NMLs

Construction Scenario	Exceedance of NML (Daytime)			
	1-10 dB	11-20 dB	> 20 dB	Highly Noise Affected
Site establishment and enabling works	14	8	6	6
Foundations	29	12	8	8
Frame and façade	15	9	8	8

It can be seen in Table 22 that 49 receivers within Georges Hall will experience noise levels above the NML for the Foundations construction scenario. Of these receivers, eight are expected to be highly affected. For the Site Establishment scenario, 28 receivers are expected to experience noise levels above the NML, with six of these expected to be highly affected. For the Frame and Façade construction scenario, 32 receivers are expected to experience noise levels above the NML, with eight of these expected to be highly affected.

6.4.2 Other receivers

Table 23 presents the construction noise modelling results for non-residential properties which shows the number of properties where the NMLs are likely to be exceeded during their hours of use. It is important to consider that this assessment is representative of the worst case 15-minute period of construction activity, while the construction equipment is at the nearest location to each receiver location.

Table 23 Number of non-residential buildings where noise levels may exceed NMLs

Phase	Exceedance of NML		
	1-10 dB	11-20 dB	> 20 dB
Site establishment and enabling works	5	0	2
Foundations	10	2	2
Frame and façade	8	1	2

14 non-residential receivers are expected to exceed the construction NMLs for the peak construction scenario (Foundations). These receivers include Bankstown Montessori Pre-school, Georges River Grammar School, SUPA IGA Georges Hall, Georges Hall Community Centre, and St Martin's Anglican Church, Park.

6.4.3 Overlapping construction activities

While most construction activities are expected to occur at distinct scheduled times and at different locations, it is possible that noisy construction activities for the proposal may occur at the same time in close proximity to each other. In these cases, it is possible that an increase of up to 3 dB(A) of the highest noise level predicted for any construction stage may occur (assuming that at any one location equal noise levels from two stages of works are experienced). In this case, this increase is not expected to create any further exceedances in the noise management levels.

Overlapping construction stages and identification of any receivers subject to increased noise levels would be determined during detailed design. Any additional mitigation measures subsequently required would also be identified during detailed design.

6.5 Construction vibration

6.5.1 Minimum working distances

Construction vibration may be generated due to the vibration intensive equipment proposed to be used during some stages of work. The minimum working distances for these items of equipment from off-site receivers are shown in Table 24.

Table 24 Recommended minimum working distances for vibration intensive plant

Plant item	Rating/Description	Minimum working distance	
		Cosmetic damage (BS 7385) Light-framed structures	Human response (EPA's Vibration guideline)
Vibratory Roller	< 50 kN (Typically 1-2 t)	5 m	15 m
	< 100 kN (Typically 2-4 t)	6 m	20 m
	< 200 kN (Typically 4-6 t)	12 m	40 m
	< 300 kN (Typically 7-13 t)	15 m	100 m
	> 300 kN (Typically 13-18 t)	20 m	100 m
	> 300 kN (> 18 t)	25 m	100 m
Pile Boring	≤ 800 mm	2 m (nominal)	7 m

This is based on recommendations of the *Construction Noise and Vibration Guideline* and AECOM's previous project experience. If these minimum working distances are complied with, no adverse impacts from vibration intensive works are likely in terms of human response or cosmetic damage. Equipment size would be selected by the construction contractor and would take into account the minimum working distances and the distance between the area of construction and the nearest receiver. If vibration intensive works are required within these minimum working distances, mitigation measures to control excessive vibration may be required.

6.5.2 Human comfort

Works undertaken within the human comfort minimum working distances may cause some people to experience annoyance and concern for cosmetic damage. Receivers located within the minimum distances for human comfort would be notified of the potential impacts as part of the notification of highly noise affected receivers.

6.5.3 Cosmetic damage

Table 24 presents minimum working distances to minimise the likelihood of cosmetic damage on buildings and structures, including heritage items. The non-Aboriginal and Aboriginal Heritage assessments prepared for the proposal do not identify any heritage items that are likely to be impacted by construction vibration, due to their distance from vibration intensive works.

Works undertaken within minimum working distances for cosmetic damage may cause damage to buildings. However, damage to heritage and other buildings is unlikely to occur when the management measures have been implemented appropriately. These measures include undertaking attended vibration measurements at the work site when work commences, to determine site specific minimum working distances. These measurements would be made progressively at distances outside the minimum working distances to ensure no structure damage occurs and would provide detailed information regarding the transmission of vibration to allow site specific safe working distances to be determined.

6.6 Construction traffic assessment

Construction traffic activities were based on *Bankstown Airport – Link Road Mixed Use Precinct Transport Impact Assessment Ref: 301351384, dated 1 December 2023* provided by Stantec (the traffic report). Construction traffic movements in this document were used to conservatively assess the following number of vehicle movements:

- 55 truck movements per daytime period (11-hour working day)
- 50 light vehicle movements per daytime period (11-hour working day)

Existing traffic counts along the proposed construction traffic routes are not available at this stage, therefore a full assessment of construction traffic impact cannot be undertaken. The traffic report however states that *Given the expected low construction traffic volumes and the proximity of the site to the arterial road network, it is anticipated that the construction traffic will not have a significant impact on the surrounding road network.* This should be verified at the detailed design stage when existing traffic counts around the site are available.

6.7 Construction noise and vibration safeguards

This section describes safeguards and management measures to address the potential impacts of the proposal identified in this assessment. These measures would be incorporated into the detailed design, construction and/or operation stages of the proposal where relevant.

Table 25 Draft noise management plan

Environmental safeguards	Responsibility	Timing
The noise and vibration impact assessment presented in this Technical Report should be re-evaluated based on the detailed design in order to confirm noise predictions and potential impacts as a result of the project.	Aeria Management Group	Pre-construction
A Construction Noise and Vibration Management Plan would be prepared as part of the Construction Environmental Management Plan. The CNVMP would identify: • all potential significant noise and vibration generating activities associated with the activity • noise and vibration sensitive receivers • measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haulage road maintenance and controlling the location and use of vibration generating equipment	Contractor	Pre-construction and construction

Environmental safeguards	Responsibility	Timing
• arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.		
All sensitive receivers likely to be affected would be notified at least five days prior to commencement of any works associated with the scenario that may have an adverse noise or vibration impact. The notification would include details of: • the proposal • construction period and construction hours • contact information for proposal management staff • complaint and incident reporting and how to obtain further information.	Contractor	Construction
All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all relevant proposal specific and standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.	Contractor	Construction
Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Works generating high noise and/or vibration levels should be scheduled during less sensitive time periods.	Contractor	Construction
Where feasible and reasonable, high noise generating work (75 dB(A) L_{Aeq} at receiver) be carried out during standard construction hours and in continuous blocks of no more than three hours with at least one hour respite between each block of work generating high noise impact, where the location of the work is likely to impact the same receiver.	Contractor	Construction
Where high noise generating activities (75 dB(A) L_{Aeq} at receiver) are required out of hours the following would be implemented: • equipment would be used prior to 10pm where feasible and reasonable • where the above cannot be achieved the equipment would be used prior to midnight where feasible and reasonable • it is not proposed to apply a three hour on and a one hour off respite approach in an effort to ensure that the use of such equipment is completed as early in the night as possible.	Contractor	Construction
The following would be implemented for deliveries to and from the Site: • loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers	Contractor	Construction

Environmental safeguards	Responsibility	Timing
• dedicated loading/unloading areas are to be shielded if close to sensitive receivers • delivery vehicles are to be fitted with straps rather than chains for unloading, wherever possible • construction site would be arranged to limit the need for reversing associated with regular/repeatable movements.		
Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work.	Contractor	Construction
In circumstances where the noise levels are predicted to exceed construction noise management levels after implementation of the general work practices, additional mitigation measures are required. These measures include the following: • monitoring • notification (letterbox drop or equivalent) • specific notifications • phone calls • individual briefings • respite Offers • respite Periods • duration Respite alternative Accommodation.	Contractor	Construction
Vibration intensive equipment size would be selected to avoid working within the structural damage minimum working distances. The use of less vibration intensive methods of construction or equipment would be considered where feasible and reasonable.	Contractor	Construction
Where vibration intensive works are proposed within minimum working distances, vibration monitoring should be undertaken to determine site specific minimum working distances and to ensure that appropriate thresholds are not exceeded. Monitoring would be carried out in conjunction with a visual inspection of the bridge to assess any potential vibration impacts.	Contractor	Pre-Construction
Where the use of vibration intensive equipment within the relevant minimum working distances cannot be avoided, prior to the commencement of vibration intensive work, a detailed inspection would be carried out and a written and photographic report prepared to document the condition of buildings and structures within the minimum working distances. A copy of the report would be provided to the relevant landowner or land manager.	Contractor	Pre-Construction
Review of equipment noise levels, locations, and potential frequency related penalties during Detailed Design.	Aeria Management Group	Pre-construction

7.0 Operational Noise Assessment

7.1 Assessment methodology

Noise emissions from the proposed warehouse, retail spaces, and childcare centre within the development were predicted to nearby receiver locations based upon typical operational noise from this type of development. The typical scenarios were modelled to assess the potential impact to nearby sensitive receiver locations and achieve the required project noise trigger presented in Section 0. The predicted noise levels are presented in section 7.12 for typical daytime, evening, and night-time operations.

7.2 Modelling

Noise levels from the proposed operation of the precinct developments have been predicted at nearby noise sensitive receivers using SoundPLAN 8.2 noise modelling software. The operational noise levels were predicted using an implementation of CONCAWE[1] algorithms in the SoundPLAN noise propagation software. The CONCAWE method is especially suited to predicting noise propagation over large distances because it accounts for a range of atmospheric conditions that can significantly influence the propagation of noise over large distances.

7.2.1 Meteorological conditions

Both standard and noise enhancing meteorological conditions were considered, with the following parameters:

Daytime/evening

- Standard meteorological conditions – Pasquill-Gillford stability category D with wind speed up to 0.5 m/s at 10 metres.
- Noise enhancing meteorological conditions – Pasquill-Gillford stability category D with wind speed up to 3 m/s at 10 metres.

Night-time

- Standard meteorological conditions – Pasquill-Gillford stability category D with wind speed up to 0.5 m/s at 10 metres.
- Noise enhancing meteorological conditions – Pasquill-Gillford stability category D with wind speed up to 3 m/s at 10 metres, and/or stability category F with winds up to 2 m/s at 10 metres.

Previous assessments have identified that the 3 m/s source to receiver wind meteorological condition predictions to be consistently between 0 dB to 1 dB higher than temperature inversion predictions. As such this report has limited the assessment of adverse conditions to the more conservative 3 m/s source to receiver wind meteorological condition.

The modelling includes:

- Ground topography;
- Buildings and structures;
- All identified noise producing items within the project site modelled as point or line sources where appropriate;
- All sources are modelled to assume a ‘reasonable’ worst case 15 minute period scenario; and
- Ground absorption.

[1] CONCAWE – The oil companies’ international study group for conservation of clean air and water – Europe (established in 1963) Report 4/81 “The propagation of noise from petroleum and petrochemical complexes to neighbouring communities”.

It can be expected that there may be differences between predicted and measured noise levels due to variations in instantaneous operating conditions, plant in operation during the measurement and also the location of the plant equipment.

The noise models take into account significant noise sources and locations, screening effects, receiver locations, ground topography and noise attenuation due to geometrical spreading, air absorption, ground absorption and the effects of the prevailing weather conditions. The noise model was based on ground topography, general site layouts and indicative plant equipment sound power levels.
All predicted noise levels are free field and 1.5 m above ground level at the most-affected point within a residential property boundary within 30 m of the nearest facade.

7.3 Noise producing operational equipment

This section discusses the typical sources of noise emission from this type of development. The activities are generally categorised into the following two groups:

- Steady-state or quasi steady-state noise, which is typically continuous and consistent noise. As the number of truck activities on the proposed site is assumed to be constant within each assessment period for the facility, the assessment considered noise from trucks as being quasi-steady state; and,
- Discrete noise, which occurs infrequently and for short durations of time. This type of noise includes forklift and truck reversing alarms, car door slams etc.

7.4 Building services plant noise

At this stage the specific tenancy usage within the site are not known. As such, a selection of typical mechanical plant based upon similar facilities were used. Mechanical plant servicing the offices, childcare centre, and retail spaces is to be included in the noise model. These plant items have been selected for modelling at this preliminary stage, and further detailed assessment of each site should be undertaken prior to construction. Noise from mechanical plant is considered to be steady state noise. The cumulative noise impact from the precinct was assessed against the project noise trigger levels outlined in Section 5.0.

If either the number of plant items increases, or the assumed sound power level is higher than that of the individual proposed unit to be used in the development, then a reassessment of the potential noise impacts is recommended.

The mechanical plant proposed with associated sound power levels are presented in Table 26 below.

Table 26 Mechanical plant quantity and sound power levels

Mechanical plant designation	Quantity	Overall sound power level, dB(A)	Octave band frequency – Hz, dB							
			63	125	250	500	1000	2000	4000	8000
AC condenser unit (Enclosure limited to 65dBA)	1 per office tenancy, 1 per retail tenancy, 2 per childcare centre	65	46	57	59	65	56	55	53	51
Toilet exhaust fan	1 per office tenancy, 2 per childcare centre	66	56	56	63	59	61	61	58	46
Kitchen Exhaust fan	1 per food and drink premises (25% of retail premises)	70	67	68	65	67	65	64	52	46

7.5 Truck and forklift noise levels

The noise levels presented in Table 27 were used for trucks and forklifts as part of the warehouse operations. Noise data was based on measurements conducted at a similar nearby industrial site located at 430 Marion Street, Bankstown.

Table 27 Truck and forklift sound power levels

Source description ($L_{Aeq, 15\ minute}$)	Overall sound power level, dB(A)	Octave band frequency – Hz, dB							
		63	125	250	500	1000	2000	4000	8000
Typical Heavy Rigid Vehicle idling	91	90	88	86	86	87	83	78	72
Typical Heavy Rigid Vehicle manoeuvring and entering/leaving	98	106	95	91	90	93	93	90	81
Typical forklift	92	97	88	90	88	87	85	74	66

7.6 Retail premise noise levels

The noise levels presented in Table 28 were used for the food and drink premises proposed as part of the development. A normal male vocal effort was utilised for patrons within outdoor seating areas as the areas are proposed to be low capacity and will not require patrons to speak with a raised vocal effort. Male mean vocal effort was utilised for the assessment as a conservative case.

Table 28 Retail premises sound power levels

Source description ($L_{Aeq, 15\ minute}$)	Overall sound power level, dB(A)	Octave band frequency – Hz, dB						
		125	250	500	1000	2000	4000	8000
Normal vocal effort (male)	66	54	64	66	60	56	52	47

7.7 Carpark noise levels

The noise levels presented in Table 28 were used for car park noise sources traversing the site.

Table 29 Carpark premises sound power levels

Source description	Noise metric	Overall sound power level, dB(A)
Car moving at 10 km/h, engine igniting, 2 car doors slamming	$L_{Aeq, 15\ minute}$	83

7.8 Childcare centre noise sources

The noise levels presented in Table 27 were used for noise sources specific to the proposed childcare centre. Effective sound power levels for groups of children playing was referenced from the *Association of Australian Acoustical Consultants (AAAC) Guideline for Child Care Centre Acoustic Assessment V3.*

Table 30 Childcare centre sound power levels

Source description ($L_{Aeq, 15\ minute}$)	Overall sound power level, dB(A)	Octave band frequency – Hz, dB							
		63	125	250	500	1000	2000	4000	8000
10 children playing – 0 to 2 years	78	54	60	66	72	74	71	67	64
10 children playing – 2 to 3 years	85	61	67	73	79	81	78	74	70
10 children playing – 3 to 5 years	87	64	70	75	81	83	80	76	72

The proposed age breakdown of the childcare centre is as follows:

- 30 children aged 0-2 years old
- 25 children aged 2-3 years old
- 65 children aged 3-5 years old

7.9 Traffic movements

The breakdown of car and truck movements has been provided by Stantec as apart of the traffic report and a request for further information. Traffic movements within into the site via both the Birdwood Road entrance, and Link Road entrance are given in Table 31. These values were rounded up to the nearest whole number.

Table 31 Summary of traffic volumes provided in traffic report

Carpark entrance	Daytime peak, 1 hour		Daytime peak, 15 minutes		Night-time peak, 1 hour		Night-time peak, 15 minutes	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Birdwood Road	150	-	38	-	159	-	40	-
Link Road	84	20	21	5	84	20	21	5

Using the information in Table 31, a reasonable worst-case light and heavy vehicle movements was assumed for the warehouses, retail, office, and childcare centre operating within the proposed development. This information is provided below in Table 32.

Table 32 Assumed peak period on-site vehicle movements for proposed development

Site	Daytime truck movements (15 mins)	Night-time truck movements (15 mins)	Daytime car movements (15 mins)	Night-time car movements (15 mins)
Office/Retail (Birdwood Road)	0	0	14	19
Childcare Centre (Birdwood Road	0	0	24	21
Southern carpark (Link Road)	5	5	21	21

The following information and assumptions are also relevant as part of the noise impact assessment:

- Upon arriving at the site, the truck drivers must turn their engines off whilst waiting. In this assessment it has been assumed that the same number of trucks that enter the site will idle for 5 minutes then turn off their engines once they have pulled into the allocated loading dock position;
- Forklifts are assumed to be outside the building for 7 minutes in every 15 minutes when loading and unloading trucks; and
- No truck re-fuelling facilities are located on site.

7.9.1 Reversing alarms

It was assumed that forklifts would be fitted with broadband type alarms, whilst trucks were assumed to have tonal reversing alarms.

7.10 Hours of operation

This assessment has been based upon 24 hour operation of the warehouse facilities. The childcare centre is assessed to operate during the daytime only, whilst retail and food and drink premises are assessed to operate during the daytime and evening periods.

7.11 Operational scenarios

As the operations of the warehouses, retails spaces, and offices are not currently known, a reasonable worst case 15 minute period was assessed against the project noise trigger levels for daytime, evening and night-time operations. The 15-minute operation for each individual warehouse was assumed to be roughly the same. It was assumed that L_{Aeq} noise sources from the proposed warehouse developments would be relatively similar during the evening and night periods. The childcare centre is proposed to operate from 7am to 7pm at the latest, whilst half of the proposed retail premises are assumed to be food and drink premises with outdoor seating. For daytime, evening and night-time scenarios, the following noise modelling was undertaken:

Daytime scenario

1. Office mechanical plant (1x condenser unit and 1x toilet exhaust fan per office tenancy);
2. Trucks idling outside of 20% of warehouse tenancies. Trucks are assumed to only idle for 5 minutes out of a standard 15 minute period;
3. Truck movements, from Table 32 during a 15 minute period;
4. One forklift for every two warehouses. Operating around loading areas for 7 minutes of the 15 minute period;
5. Light vehicle movements from Table 32 during a 15 minute period;
6. 50% of children from 2-3 years and 50% of children from 3-5 years age bracket playing outdoors
7. Retail mechanical plant, 1x condenser unit per tenancy, 1x kitchen exhaust fan for 25% of retail tenancies
8. Childcare centre mechanical plant, 2x condenser units, 2x toilet exhaust fans; and
9. Food and drink premises 10x patrons in each outdoor dining area, 50% speaking with normal vocal effort;

Evening scenario

1. Office mechanical plant (1x condenser unit and 1x toilet exhaust fan per office tenancy);
2. Trucks idling outside of 20% of warehouse tenancies;
3. Truck movements, from Table 32 during a 15 minute period. Trucks are assumed to only idle for 5 minutes out of a standard 15 minute period;

4. One forklift for every two warehouses. Operating around loading areas for 7 minutes of the 15 minute period;
5. Light vehicle movements from Table 32 during a 15 minute period;
6. Retail mechanical plant, 1x condenser unit for 50% of retail tenancies, 1x kitchen exhaust fan for 50% of retail tenancies; and
7. Food and drink premises 10x patrons in each outdoor dining area, 50% speaking with normal vocal effort;

Night scenario

1. Office mechanical plant (1x condenser unit and 1x toilet exhaust fan per office tenancy);
2. Trucks idling outside of 20% of warehouse tenancies. Trucks are assumed to only idle for 5 minutes out of a standard 15 minute period;
3. Truck movements, from Table 32 during a 15 minute period;
4. One forklift for every two warehouses. Operating around loading areas for 7 minutes of the 15 minute period; and
5. Light vehicle movements from Table 32 during a 15 minute period;

7.12 Predicted operational noise impacts

7.12.1 L_{Aeq} noise levels

Predicted noise levels and environmental noise limits for the precinct are presented in Table 33, Table 34, and Table 35.

Noise barriers as proposed in the architectural drawings have been considered in the base design scenario:

- Noise barrier totalling 5 metres along the eastern and southern boundary of the CCC outdoor play area
- Noise barrier totalling 2.1 metres along the northern and western boundary of the CCC outdoor play area
- Operable noise barrier and gate for the entrance to the fire brigade access corridor and north-eastern boundary to a height of 7 metres
- Noise barrier along the western extent of the site to a height of 5 metres

Noise barrier locations are shown in Figure 3. A graphical representation of results is shown in Appendix D.

Table 33 Noise levels at all representative receiver locations during daytime

Receiver	EPA's Npfl Project noise trigger levels, dB(A)	Neutral conditions		Worst case meteorological conditions	
		Result	Exceedance (EPA's NPfl)	Result	Exceedance (EPA's NPfl)
R1	50	45	-	45	-
R2	50	40	-	42	-
R3	50	34	-	36	-
R4	50	36	-	38	-
R5	50	49	-	50	-
R6	50	45	-	47	-
E1	48	48	-	48	-
E2	48	41	-	41	-
CO1	53[1]	44	-	45	-
W1	48	39	-	41	-
C1	63	50	-	51	-
I1	78	49	-	51	-
I2	78	47	-	49	-
RE1	53	42	-	42	-

Notes:

1. Local community centre assessed as "Active Recreation" under the EPA's Noise Policy for Industry

Table 34 Noise levels at all representative receiver locations during evening

Receiver	EPA's Npfl Project noise trigger levels, dB(A)	Neutral conditions		Worst case meteorological conditions	
		Result	Exceedance (EPA's NPfl)	Result	Exceedance (EPA's NPfl)
R1	44	42	-	43	-
R2	44	40	-	41	-
R3	44	34	-	35	-
R4	44	36	-	38	-
R5	44	47	**3**	48	**4**
R6	44	42	-	43	-
CO1[1]	53[1]	44	-	44	-
W1	48	38	-	40	-
C1	63	50	-	50	-

Notes:

1. Local community centre assessed as "Active Recreation" under the EPA's Noise Policy for Industry

Table 35 Noise levels at representative residential receiver locations during night-time

Receiver	EPA's Npfl Project noise trigger levels, dB(A)	Neutral conditions		Worst case meteorological conditions	
		Result	Exceedance (EPA's NPfl)	Result	Exceedance (EPA's NPfl)
R1	41	40	-	41	-
R2	41	40	-	41	-
R3	41	34	-	35	-
R4	41	36	-	38	-
R5	41	38	-	39	-
R6	41	37	-	38	-

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Figure 3 Proposed noise barrier locations

7.12.2 Discussion of results and proposed noise treatment

The operation of the precinct was assessed against the project noise trigger levels. The predicted noise levels at each representative receiver were found to be below the project noise trigger levels at all receivers for the daytime and night-time scenarios for all operational scenarios.

The operation of the precinct during the evening period was found to exceed the evening project noise trigger levels at receiver R5 (192 Birdwood Road, Georges Hall). Receiver R5 is located directly across the road from the site. The exceeding noise level during the evening period is due to vehicle movements within the proposed carpark, primarily due to the use of the proposed childcare centre. As a worst-case scenario this assessment considers all PM childcare centre vehicle movements occurring within the same 15 minute period after 6:00 pm. This is a highly conservative assumption as it is expected that most childcare centre pickups will be spread out across the afternoon and early evening.

In addition to this, traffic noise levels along Birdwood Road and therefore the existing background noise levels during the 6 pm to 7 pm period, will be higher than what is presented in this report for the standard EPA NPfI “evening” period (6 pm to 10 pm). As predicted noise levels generated from the carpark would be lower, and the noise criteria would be less stringent during the early evening, the predicted exceedance at receiver R5 during the evening scenario is deemed acceptable. A plan of management should be implemented, instructing drivers of heavy vehicles to turn off their engines immediately once they have parked to reduce idling truck noise. The use of reverse alarms should also be limited where possible.

The total number of children to occupy the childcare centre outdoor play area should be limited as outlined in Section 7.8.

Provided equipment and activity noise levels are limited to what has been assumed in Section 7.11 of this report, compliance to the EPA’s project noise trigger levels are predicted for all operational scenarios during the daytime, evening and night-time periods. Equipment noise levels, a plan of management, and on-site activities should be verified by a qualified acoustic consultant prior to construction.

7.12.3 Annoying characteristics correction

As the actual operations of the tenants are not currently known, a detailed assessment of tonality and NPfI modifying factors was not included within this assessment.

During the Development Application (DA) and design phase of each individual lot, an assessment of the potential for individual sites to produce noise containing tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content should be undertaken.

7.12.4 Sleep disturbance

The operation of the trucks and forklifts are identified as the noise sources with the greatest potential for causing sleep disturbance, through the use of air brakes and reversing beepers. The predicted $L_{A1\ (1\ minute)}$ noise levels were based upon attended measurements undertaken during previous noise assessments at similar facilities. The mechanical plant associated with the warehouse operations is a relatively constant noise source, and as such there would not be a significant variation between the L_{AFmax} and $L_{Aeq\ (15\ minute)}$ noise levels.

An assessment of a typical truck operations was undertaken, with reversing beepers modelled with a L_{AFmax} sound power level of 110 dB(A), and air brake events modelled with a L_{AFmax} sound power level of 116 dB(A). These were assessed to determine the impact on nearby residential receiver locations.

The night-time sleep disturbance assessment was undertaken under noise-enhancing meteorological conditions, and the results are presented in Table 36.

Table 36 Predicted LA1 noise levels at representative sensitive receiver locations during night-time

Receiver[1]	Criteria		Predicted L_{AFmax} with worst case meteorological conditions	
	Screening Level	Awakening Reaction	Result	Exceed
R1	52	60 - 65	50	-
R2	52	60 - 65	52	-
R3	52	60 - 65	41	-
R4	52	60 - 65	41	-
R5	52	60 - 65	45	-
R6	52	60 - 65	37	-

Notes:

1. Only residential receivers were assessed for sleep disturbance.

The results of the sleep disturbance assessment show that the predicted L_{AFmax} does not exceed the screening level and/or awakening criteria for nearby residential receiver locations.

7.13 Operational road traffic noise assessment

The impact of additional vehicles operating on public roads during the operational phase of the project is to be assessed separately. As existing traffic counts on nearby site access roads are not yet available, an operational road traffic noise assessment cannot be conducted at this stage. Noise impact of additional vehicles on nearby public roads should be assessed at a more advanced design stage when existing traffic counts are available.

8.0 Aircraft Noise Assessment

8.1 Aircraft noise – Land-use acceptability

AS 2021:2015 provides a standard for use in land use planning, and the siting and construction of buildings in the vicinity of airports. The application of AS 2021:2015 is intended to provide guidance for land-use and for building constructions to mitigate aircraft noise in the vicinity of airports. In some areas, assessment using AS 2021:2015 is explicitly required through local and/or state planning policy.

8.2 Australian Standard AS 2021:2015

AS 2021:2015 contains detailed guidelines for assessing maximum levels of aircraft noise intrusion based on the location of a building with respect to Australian Noise Exposure Forecast (ANEF) contours. The ANEF contours provide a guide to annualised daily noise exposure, based on forecast aircraft movements, noise levels, frequency, time of day and available flight paths. The suitability of the site for a given building type is then ranked as either:

- Acceptable
- Conditionally acceptable
- Unacceptable

Based on the acceptability of the site for the proposed building use, AS 2021:2015 provides further detailed procedures to determine the noise reduction required of the building construction to control and satisfy maximum internal noise levels due to aircraft flyovers.

For a school (e.g. childcare centre, light industrial building type (e.g. warehouses) and commercial building type (e.g. retail/office), the conditions for site acceptability in relation to ANEF zoning is listed in Table 1.

Table 37 Building site acceptability based on ANEF zones (AS 2021)

Building type	ANEF zone of site		
	Acceptable	Conditionally acceptable	Unacceptable
School[1]	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF

Notes:

1. Proposed childcare centre to be considered a school for the purposes of this assessment. School study areas and residential sleeping areas both require an indoor design sound level no more than L_{ASMax} 50 dB, therefore this will be adopted for the childcare centre.

Where a location is deemed ‘acceptable’, no further assessment is required.

Where the location of a building type is deemed ‘conditionally acceptable’, aircraft noise levels expected across the site should be predicted or measured using a methodology provided in the standard, in order to assess constructions necessary to achieve internal sound design levels. This process may also be applied to individual spaces within a building (e.g. office spaces within an industrial building), if desired, even if the building type as a whole is considered acceptable.

8.3 Site assessment

Figure 4 presents the location of the Link Road Precinct with respect to the most up-to-date Bankstown Airport 2039 ANEF chart. Figure 4 indicates that the proposed site is located between the ANEF 20 and ANEF 25 contour. In this case, commercial and light industrial uses for the proposed site (warehouses, offices, retail) are all deemed “acceptable” so no further aircraft noise intrusion assessment is required. The childcare centre land use however is deemed conditionally acceptable, therefore noise impact from nearby aircraft operations should be assessed.

At this stage, the final usage and location of commercial spaces, offices, etc. have not been finalised. As such, during the design development of these spaces, it is recommended that aircraft noise levels across the site should be predicted or measured using a methodology provided in AS 2021:2015 if there are other land uses proposed that would be considered aircraft noise sensitive. At this stage a high level assessment of aircraft noise intrusion has been provided for the proposed childcare centre considering it is only conditionally acceptable based on its location. Indicative façade treatment has been provided for the childcare centre as required. The predictions and recommendations provided for aircraft noise intrusion should be verified and developed further during the detailed design stage.

8.4 Aircraft noise intrusion

Aircraft noise was determined to be L_{ASMax} 72 dB at each building façade from general aviation aircraft utilising the Bankstown Airport fixed wing training circuit flight paths. Considering noise ingress through each façade and roof of the building, required Rw values and indicative treatment are provided in order to achieve the aircraft noise insulation criteria given in AS 2021:2015.

Recommended indicative construction systems for building envelope required to meet established acoustic criteria for noise intrusion are presented in Table 38.

Figure 4 Details of Bankstown Airport 2039 ANEF chart, with location of the proposed development

Table 38 Indicative construction systems for Child care Centre building envelope

Element	Rw[1]	Indicative construction[2]	Comments
External walls (Light weight)	Rw 45	6mm Fibre Cement cladding / 92mm steel stud with minimum 75mm thick 14kg/m^3 insulation / 13mm standard plasterboard	
External walls (Masonry)	Rw 58	110mm brick / 92mm steel stud with minimum 75mm thick 14kg/m3 insulation / 13mm standard plasterboard	
Glazing	Rw 32-36	6.38mm or 10.38mm laminated glass in fixed or sliding configuration	Fixed configuration may be required to achieve proposed Rw value. Other configurations should be checked for low frequency insulating properties.
External Doors	Rw 32	44mm solid core door with with Raven RP38 and RP24 Seals or equivalent	Any glazing inserts on solid core doors to match that of glazing requirements
Roof/ceiling	Rw 45	Sheet metal roof / ceiling cavity of approximately250mm depth or greater with 75mm 14kg/m^3 insulation / 13mm standard plasterboard ceiling	

Notes:

1. High level predicted Rw required to achieve an internal noise level of L_{ASMax} 50 dB.
2. Indicative construction to be verified at the detailed design stage.

Acoustic treatment requirements to control noise intrusion from Birdwood Road and operational activities from the Precinct to the proposed Childcare have been reviewed. The acoustic treatment recommended to control aircraft noise intrusion, refer to Table 38, should be sufficient to control other external noise intrusion sources, i.e. road traffic on Birdwood Road and operational activities associated with the proposed Bankstown Airport Link Road Mixed Use Precinct. Acoustic treatment options for other external noise sources should be verified at the detailed design stage.

9.0 Conclusion

This report presents the results of an operational noise and vibration impact assessment for the proposed Link Road Mixed Use Precinct.

This acoustic assessment details the appropriate environmental criteria, the likely environmental noise levels from the construction and operation of the precinct, and a discussion of the compliance of these activities with the relevant criteria.

Construction noise and vibration

Construction scenarios for the proposal were developed in consultation with the Forge Venture Management project management team, and the proposed equipment has been detailed within this report. Three distinct construction stages were used in a computer-based noise model to determine the potential impact of construction noise. Construction impacts were then assessed at all receivers at various locations across the project area. The ICNG's NMLs are more stringent than the construction noise criteria outlined in the Airports Regulations, therefore the ICNG's NMLs have been utilised as the design criteria for the proposal.

A conservative assessment predicts that 49 receivers within Georges Hall will experience noise levels above the NML for the Foundations construction scenario. Of these receivers, eight are expected to be highly affected. For the Site Establishment scenario, 28 receivers are expected to experience noise levels above the NML, with six of these expected to be highly affected. For the Frame and Façade construction scenario, 32 receivers are expected to experience noise levels above the NML, with eight of these expected to be highly affected.

Fourteen non-residential receivers are expected to exceed the construction NMLs for the peak construction scenario (Foundations). These receivers include Bankstown Montessori Pre-school, Georges River Grammar School, SUPA IGA Georges Hall, Georges Hall Community Centre, and St Martin's Anglican Church, Park.

An assessment of the likely construction traffic movements cannot be conducted at this stage as existing traffic volumes along access routes are not yet available. A construction traffic assessment should be conducted at the detailed design stage.

The main source of vibration during construction would be the use of piling rigs during earthwork and structural works. Minimum working distances for vibration intensive construction work have been presented. Equipment size would be selected by the construction contractor accounting for the minimum working distances and the distance between the area of construction and the most affected sensitive receiver. If work needs to be carried out within minimum working distances, vibration monitoring would be carried out to manage potential structural damage.

Operational noise and vibration

An operational noise assessment was carried out in accordance with the EPA's *Noise Policy for Industry, 2017* (NPfI) as required under Bankstown Airport Noise and Vibration Management Plan (NVMP). Likely operational scenarios during the daytime, evening and night-time were assessed at representative receiver locations near to the project area against the project noise trigger levels. In addition, likely maximum noise events from operational activities around the proposed warehouse buildings were used to assess sleep disturbance at all nearby assessment residential receivers.

Results show predicted operational noise emissions from the proposed site are compliant with the project noise trigger levels provided that the maximum equipment noise levels, traffic movements, noise barriers, and plans of management presented in this report are properly implemented. Noise mitigation strategies provided in this report are high level and should be verified at the detailed design stage.

An assessment of the likely operational road traffic was not conducted at this stage as existing traffic counts along access routes are not yet available. This operational road traffic noise assessment should be conducted at a more advanced design stage in accordance with the EPA's NSW Road Noise Policy (RNP).

Operation of the proposal is not predicted to generate any adverse vibration to nearby sensitive receivers.

Aircraft noise assessment

Based on the location of the precinct with respect to the most up-to-date Bankstown Airport 2039 ANEF chart, the location of the proposal indicates that the development would be ‘acceptable’ for light industrial and commercial usage and ‘conditionally acceptable’ for school (childcare centre) usage.

A maximum aircraft noise level of L_{Asmax} 72 dB has been predicted from general aviation aircraft to the site. Indicative Rw values and construction detail have been recommended for the proposed childcare centre. These recommendations should be verified during the detailed design stage, prior to construction. Other sensitive land uses for the site to be determined at a later stage should also be verified prior to construction.

Appendix A

Acoustic Terminology

Appendix A Acoustic Terminology

The following is a brief description of acoustic terminology used in this report.

Sound power level	The total sound emitted by a source
Sound pressure level	The amount of sound at a specified point
Decibel [dB]	The measurement unit of sound
A Weighted decibels [dB(A])	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:
	0dB(A) Threshold of human hearing
	30dB(A) A quiet country park
	40dB(A) Whisper in a library
	50dB(A) Open office space
	70dB(A) Inside a car on a freeway
	80dB(A) Outboard motor
	90dB(A) Heavy truck pass-by
	100dB(A) Jackhammer/Subway train
	110 dB(A) Rock Concert
	115dB(A) Limit of sound permitted in industry
	120dB(A) 747 take off at 250 metres
Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.
Equivalent continuous sound level [Leq]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
Lmax	The maximum sound pressure level measured over the measurement period
Lmin	The minimum sound pressure level measured over the measurement period
L10	The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the L10.

L90	The sound pressure level exceeded for 90% of the measurement period. For 90% of the measurement period it was louder than the L90.
Ambient noise	The all-encompassing noise at a point composed of sound from all sources near and far.
Background noise	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The L90 sound pressure level is used to quantify background noise.
Traffic noise	The total noise resulting from road traffic. The Leq sound pressure level is used to quantify traffic noise.
Day	The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays.
Evening	The period from 1800 to 2200 h Monday to Sunday and Public Holidays.
Night	The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays.
Assessment background level [ABL]	The overall background level for each day, evening and night period for each day of the noise monitoring.
Rating background level [RBL]	The overall background level for each day, evening and night period for the entire length of noise monitoring.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 “Acoustics – Glossary of terms and related symbols”, the EPA’s Noise Policy for Industry and the EPA’s Road Noise Policy

Appendix B

Unattended Noise Monitoring Summaries

Noise Logger Report

5012/DP1176822, Georges Hall

Item	Information
Logger Type	NL-52
Serial number	898334
Address	5012/DP1176822, Georges Hall
Location	North-eastern end of site
Facade / Free Field	Free field
Environment	Traffic noise from Link Road and Birdwood Road dominant. Children playing at nearby schools.Trucks and car pass-bys over speed bumps on Link Road - 50-56dBA. Helicopters passing over Birdwood Reserve - 51dB-65dBA. Helicopter above tarmac at the airport and helicopter flying over the reserve 81dBA. Windy weather conditions

Measured noise levels

Logging Date	$L_{Aeq,day}$ 7am-6pm	$L_{Aeq,evening}$ 6pm-10pm	$L_{Aeq,night}$ 10pm-7am	ABL Day 7am-6pm	ABL Eve 6pm-10pm	ABL Night 10pm-7am	$L_{Aeq,15hr}$ 7am-10pm	$L_{Aeq,9hr}$ 10pm-7am
Mon Nov 13 2023	65	49	44	-	39	-	62	44
Tue Nov 14 2023	57	51	49	45	40	35	56	49
Wed Nov 15 2023	56	52	50	-	39	36	55	50
Thu Nov 16 2023	58	48	49	-	-	-	56	49
Fri Nov 17 2023	57	50	50	-	-	-	56	50
Sat Nov 18 2023	54	52	47	-	-	37	53	47
Sun Nov 19 2023	52	51	45	-	39	36	52	45
Mon Nov 20 2023	54	52	52	42	40	39	53	52
Tue Nov 21 2023	56	51	57	45	41	36	55	57
Wed Nov 22 2023	58	51	49	-	-	38	57	49
Summary	**58**	**51**	**51**	**45**	**39**	**36**	**56**	**51**

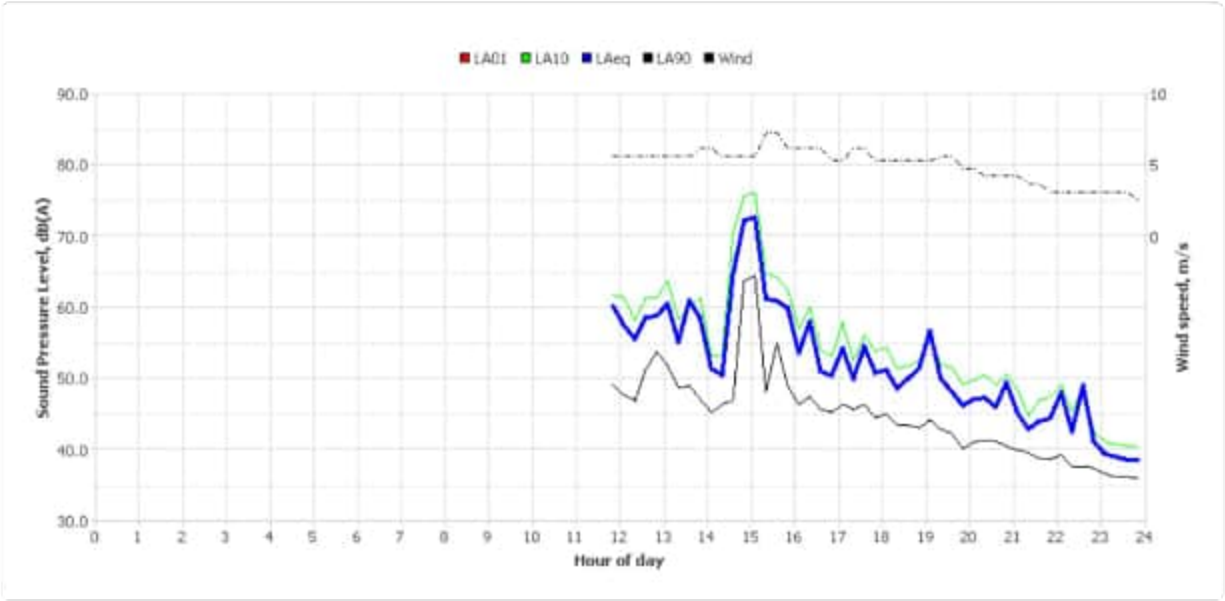
Note: Results denoted with '-' do not contain enough valid data for a value to be calculated. The data has been excluded either manually or automatically as a result of adverse weather conditions.

Logger Location

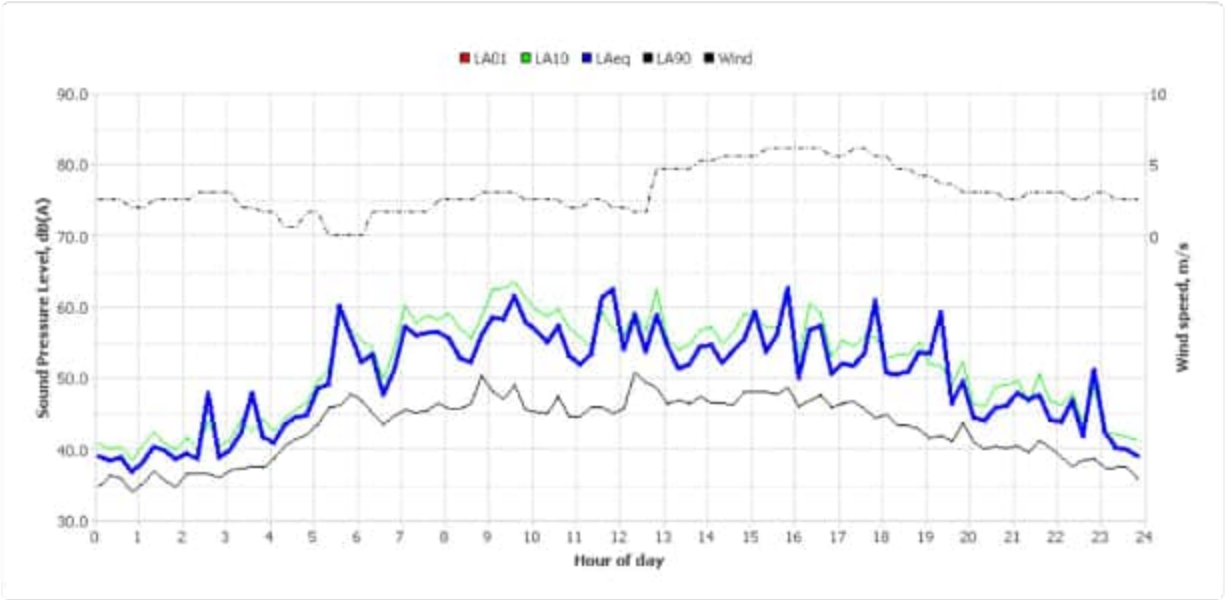
5012/DP1176822, Georges Hall

Logger Deployment Photo

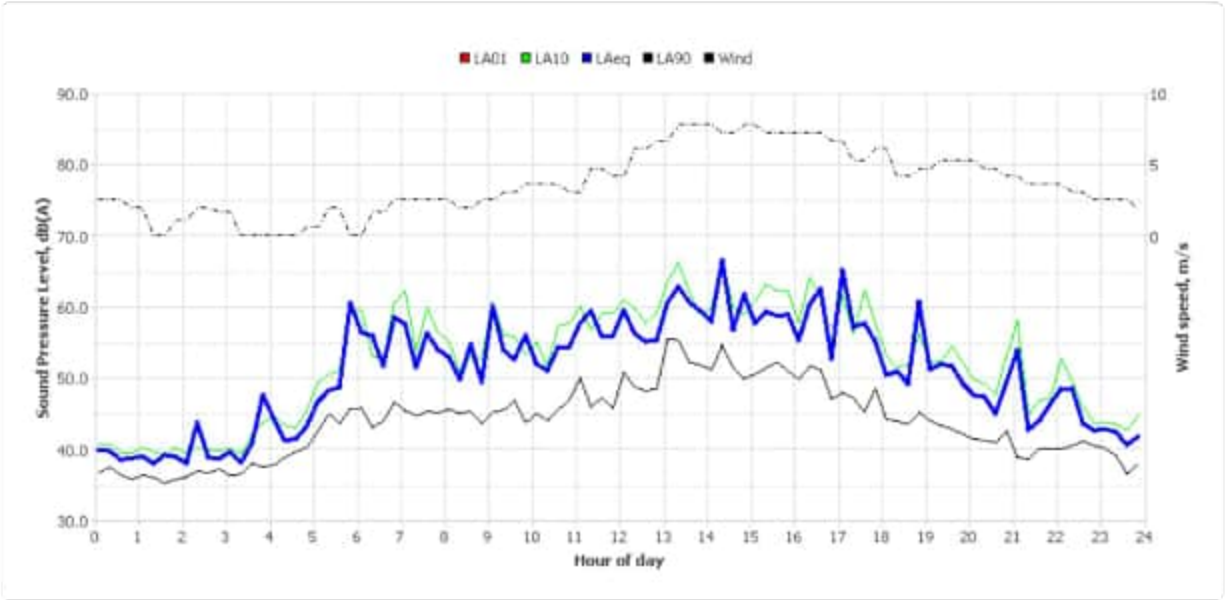
Monday, 13 Nov 2023



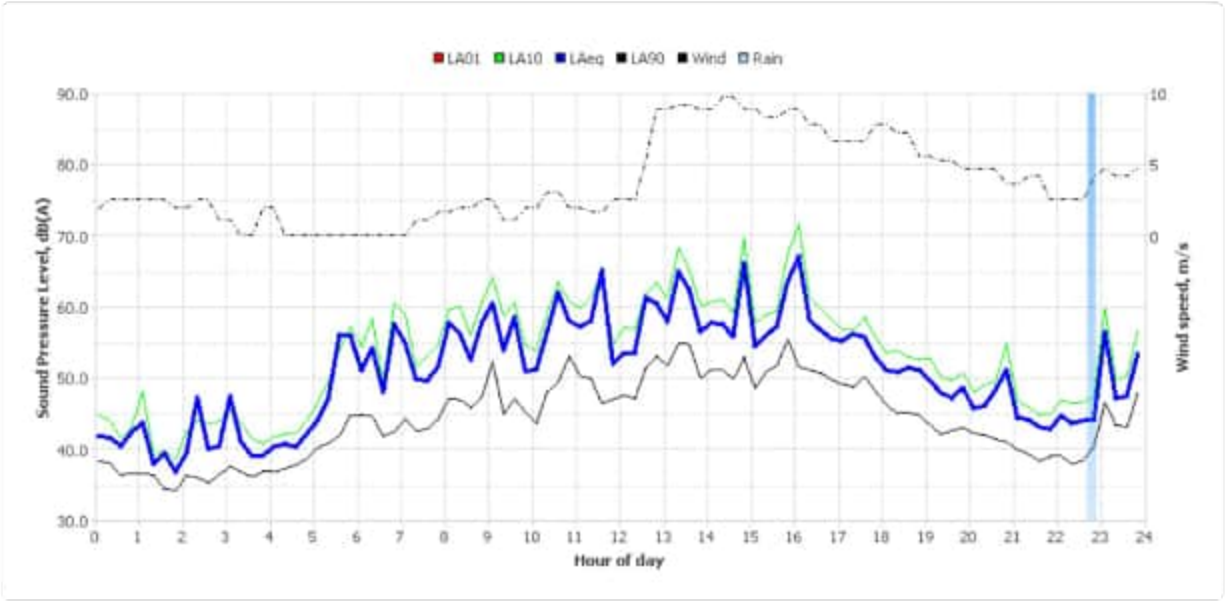
Tuesday, 14 Nov 2023



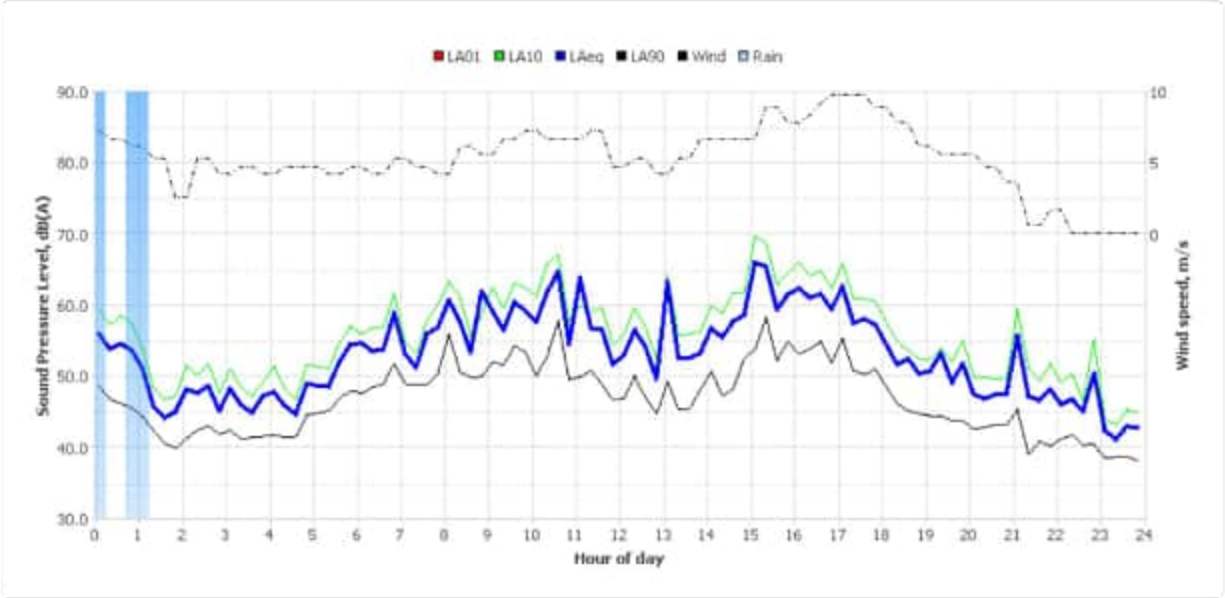
Wednesday, 15 Nov 2023



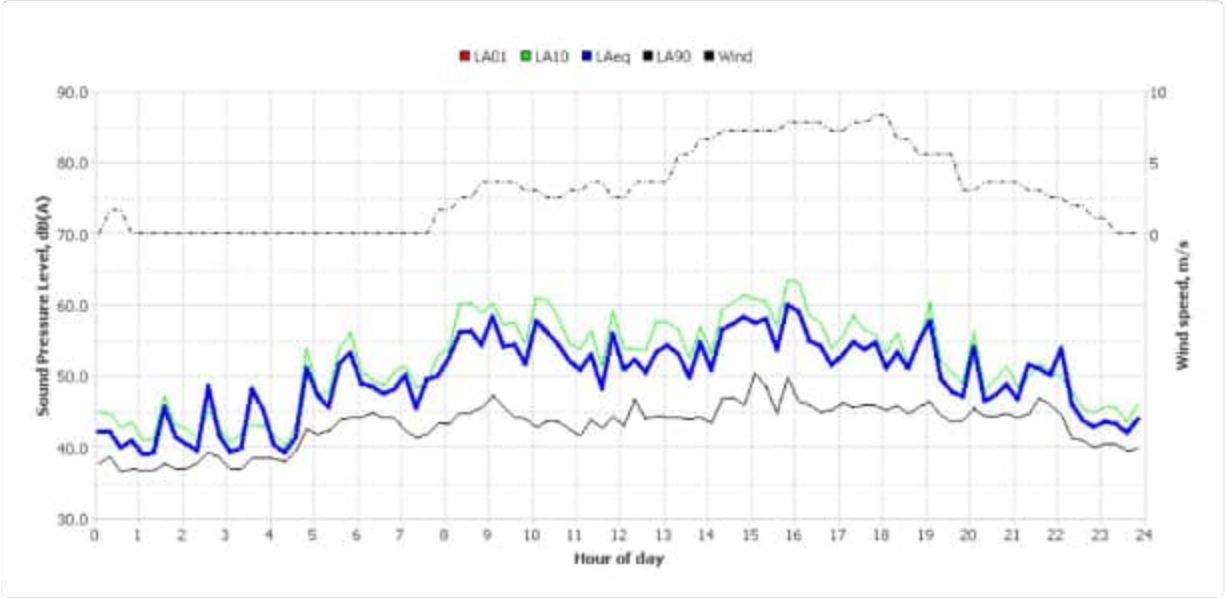
Thursday, 16 Nov 2023



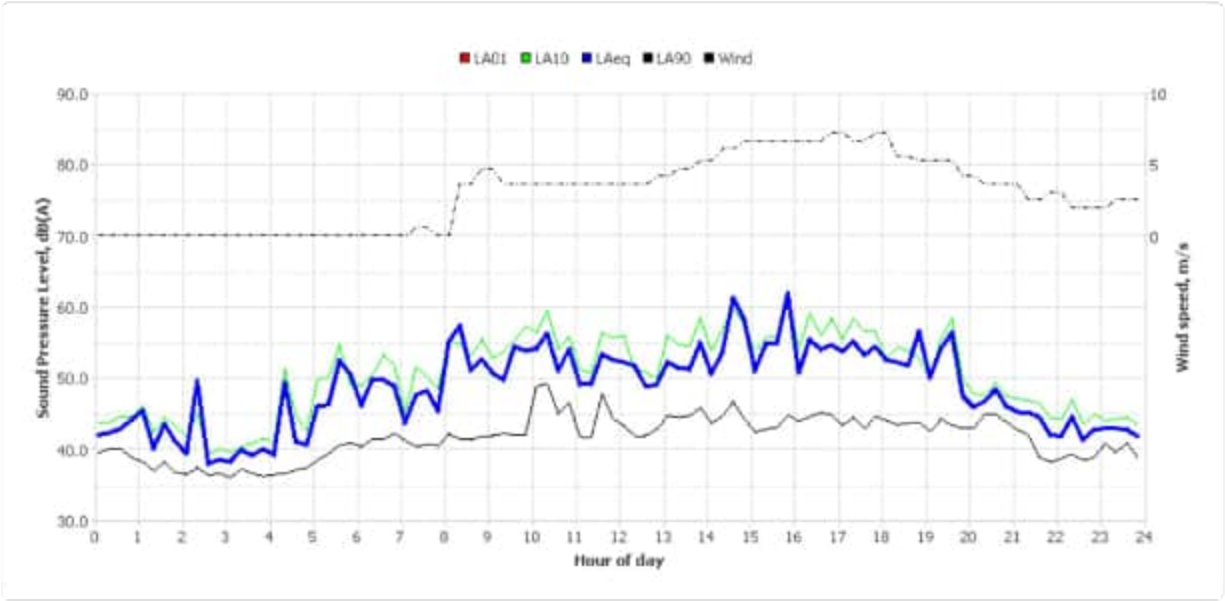
Friday, 17 Nov 2023



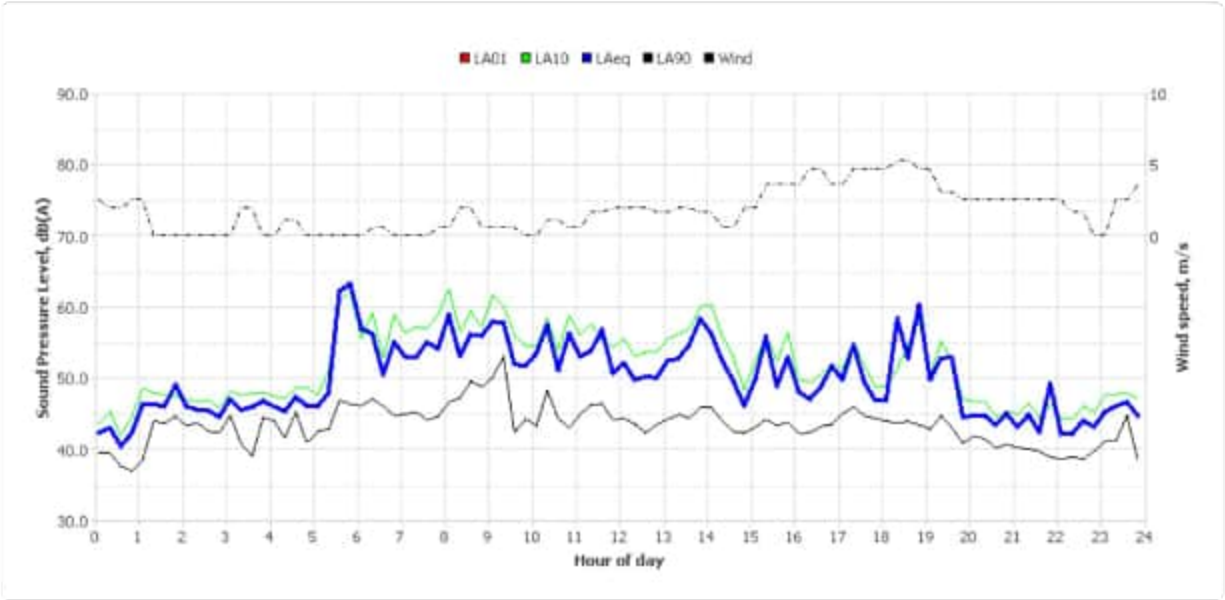
Saturday, 18 Nov 2023



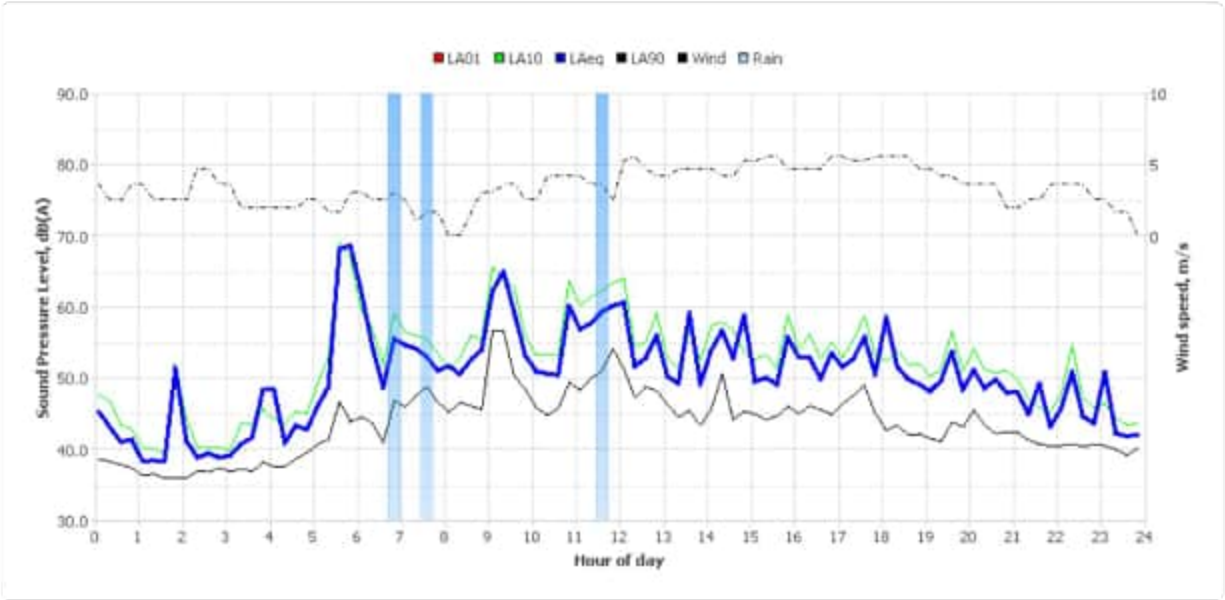
Sunday, 19 Nov 2023



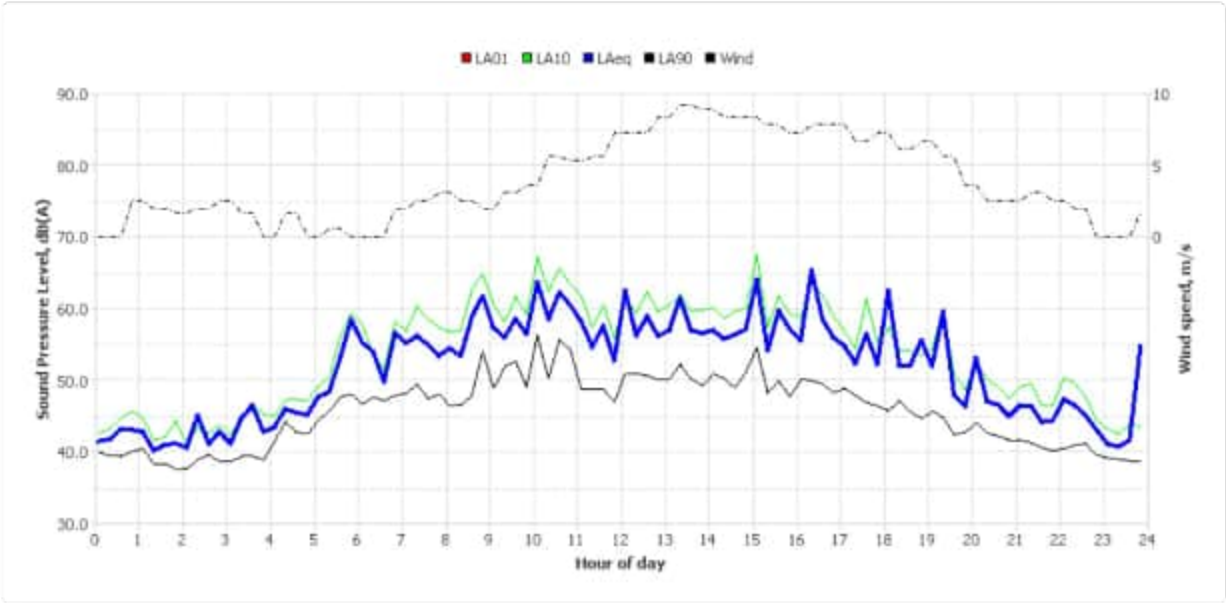
Monday, 20 Nov 2023



Tuesday, 21 Nov 2023

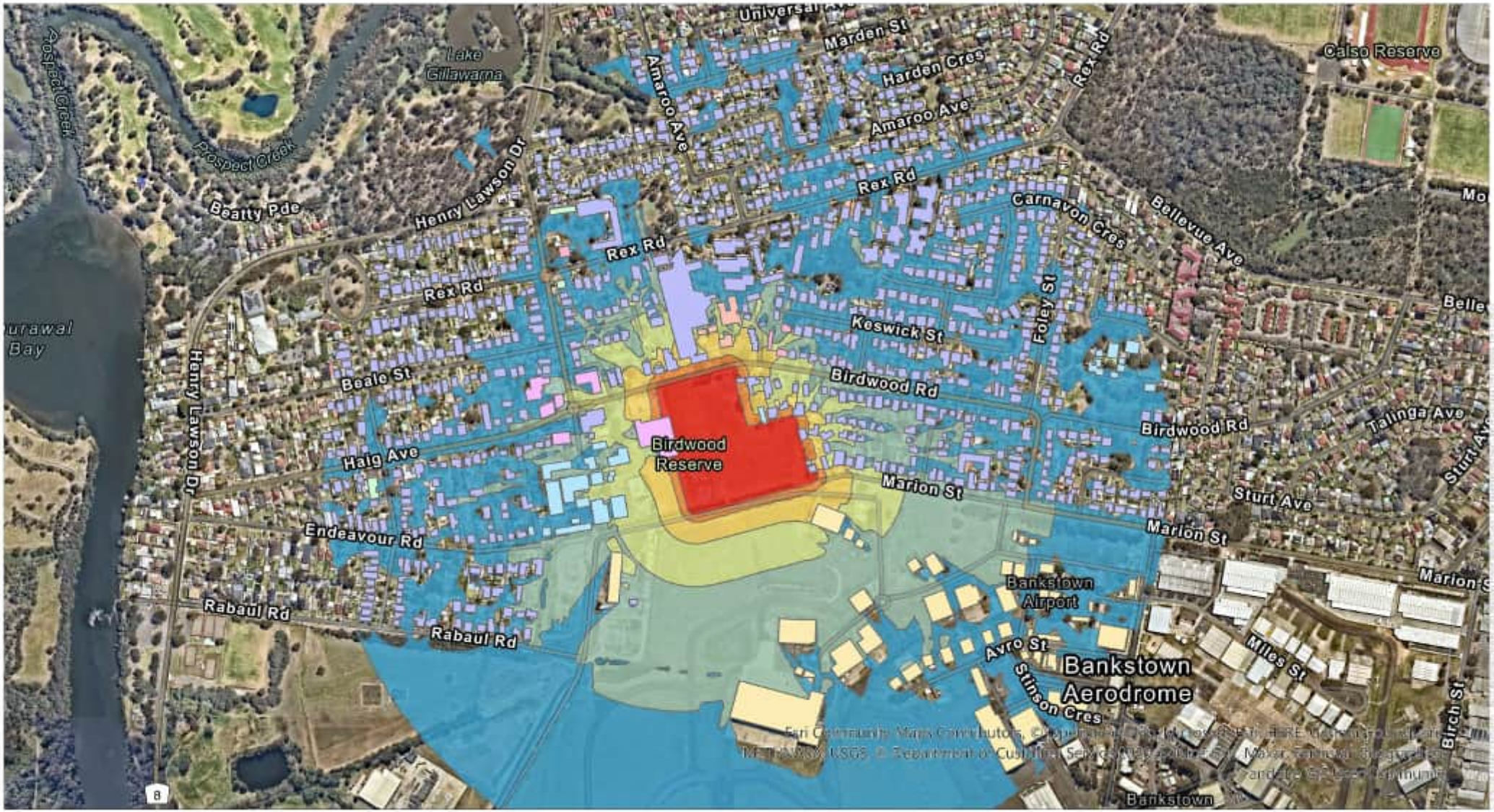


Wednesday, 22 Nov 2023



Appendix C

Construction Noise Contour Maps



Bankstown Airport Link Road Mixed Use Precinct
Construction Noise Contours - Scenario 1

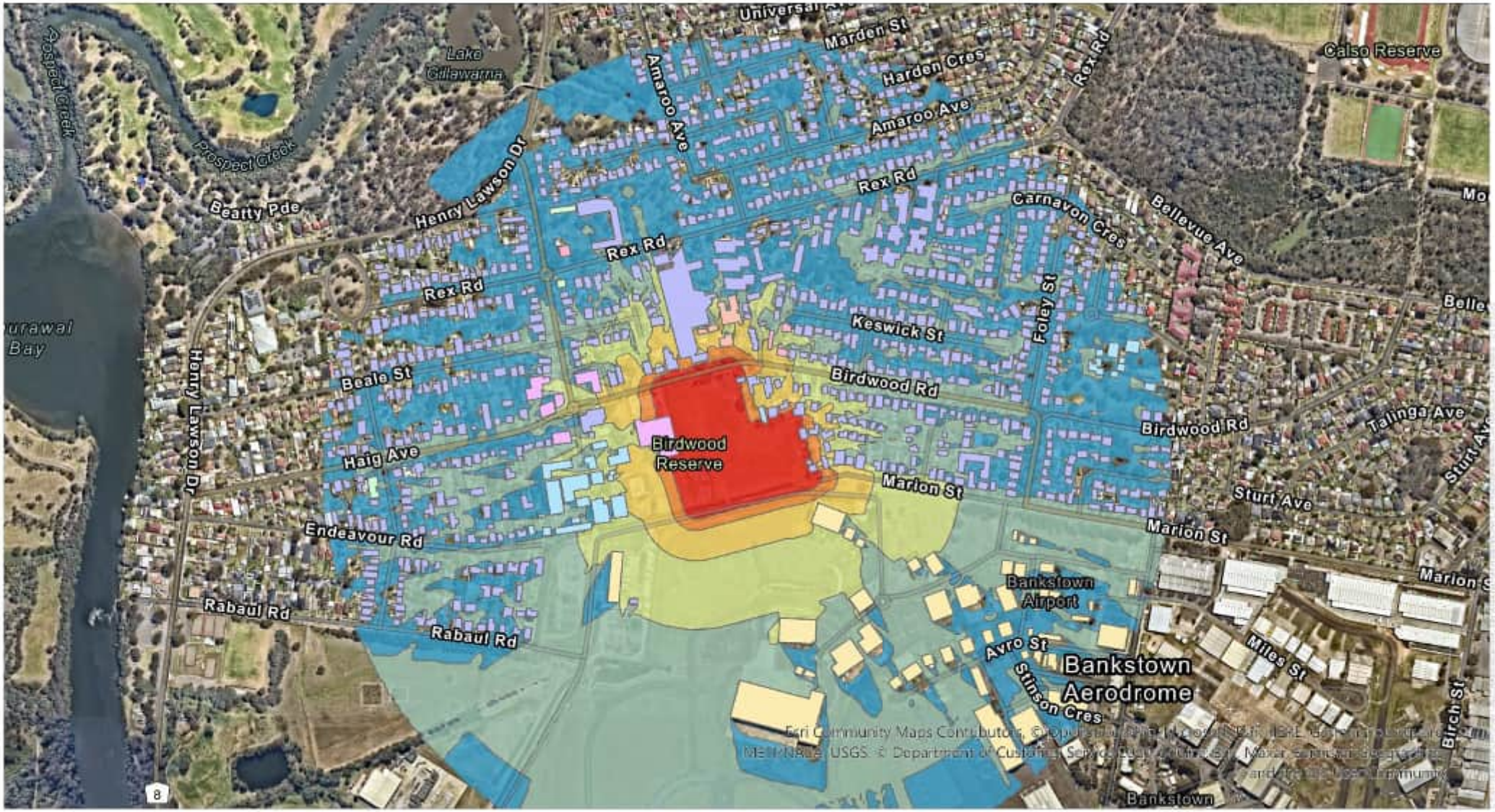
Predicted Noise Level L_{Amax} dB

30 40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential

N

0 125 250 Meters



Bankstown Airport Link Road Mixed Use Precinct
Construction Noise Contours - Scenario 2

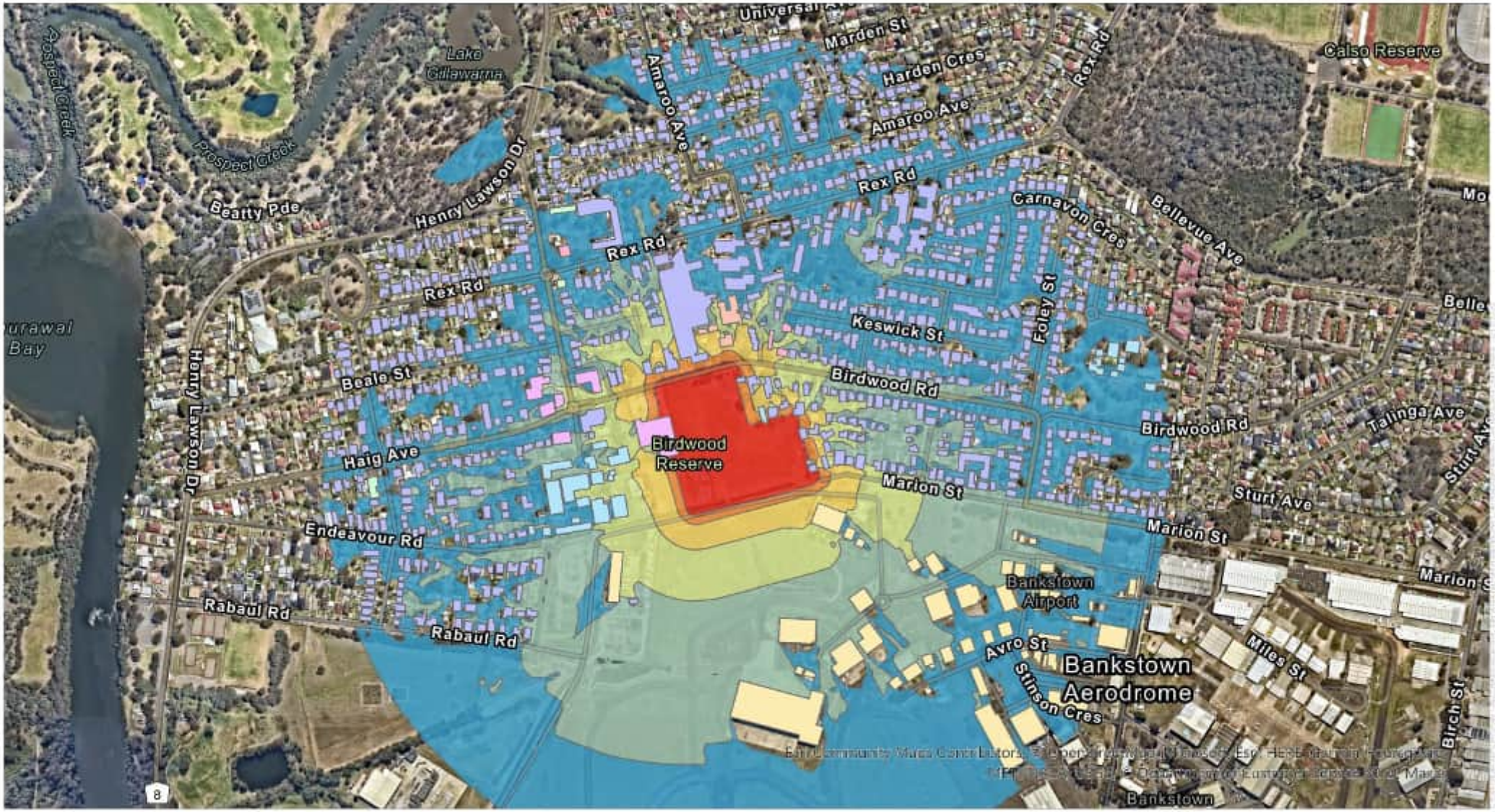
Predicted Noise Level L_{Amax} dB

30 40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential

N

0 125 250 Meters



Bankstown Airport Link Road Mixed Use Precinct
Construction Noise Contours - Scenario 3

Predicted Noise Level L_{Amax} dB

30 40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential

N

0 125 250 Meters

Appendix D

Operational Noise Contour Maps

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Daytime
(Standard Weather)

Predicted Noise Level $L_{Aeq,15min}$ dB

40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Evening
(Standard Weather)

Predicted Noise Level $L_{Aeq,15min}$ dB

40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Night
(Standard Weather)

Predicted Noise Level $L_{Aeq,15min}$ dB

40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Daytime
(Noise Enhancing Weather)

Predicted Noise Level $L_{Aeq,15min}$ dB

40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Evening
(Noise Enhancing Weather)

Predicted Noise Level $L_{Aeq,15min}$ dB

40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Night
(Noise Enhancing Weather)

Predicted Noise Level $L_{Aeq,15min}$ dB

40 50 60 70 80

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Bankstown Airport Link Road Mixed Use Precinct
Operational Noise Contours - Sleep Disturbance
(Noise Enhancing Weather)

Predicted Noise Level $L_{A,1min}$ dB

50 60 70 80 90

- Childcare Centre
- Commercial
- Community
- Education
- Industrial
- Place of Worship
- Residential
- Assessment Receiver

N

0 80 160 Meters

Aeria
Management
Group