AEROMEDICAL BASE

Preliminary Draft – Major Development Plan

Version B | 1 April 2022

Document Control

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A	09.01.2022	Exposure Draft	Dan Hyde	Initial Draft for review by Comm. Department of Infrastructure
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EXECUTIVE SUMMARY

Brisbane Airport Corporation Pty Ltd (BAC) has prepared this Major Development Plan (MDP) for the delivery of an Aeromedical Base and Queensland Government Air (QGAir) facility located within the Airport North Neighbourhood. Aeromedical Base has two development stages (Stage 1 and Stage 2), the total development will be referred to as The Project. The proposed project will deliver a footprint of approximately 4ha for use as aircraft hangars and aprons, office spaces, car parks, cafe, and service roads. BAC, as the Airport Lessee Company (ALC) under the Airports Act 1996 (Airports Act), is responsible for the submission of the MDP.

The project is a State-led initiative that focuses on long-term community wellbeing. The Aeromedical Base will strengthen the current network of aeromedical bases throughout Queensland and will deliver long term serviceability and capacity improvements. This will result in improved connectivity to the major hospitals throughout the State, ensuring Queenslanders – particularly located in regional or remote areas – receive effective medical treatment as quickly as possible.

Key findings

Operational assessment

Aviation operations and safety

Prescribed Airspace, Airservices Communications, Navigation, Surveillance and Air Traffic Control operations, vertical plume rises, lighting, reflections and wind shear have been assessed across the Project site and no adverse impacts to aviation operations and safety have been identified for the construction or operational phases.

Ground transport operations

The construction and operation of the Project will generate additional vehicle movements to and around the Airport North Neighbourhood. The existing road network has been analysed to understand the available capacity within the network. The road network has sufficient capacity to accommodate the estimated additional construction and operational traffic movement without compromising on safety or efficiency.

Environment assessment

The environmental impacts from the construction and operation of the Project were assessed, including soils, ground and surface water, air quality, ecology, noise and vibration, waste, hazardous chemicals and dangerous goods and cultural heritage.

The assessment identified that acid sulphate soils and PFAS in groundwater need to be addressed in the design and construction. BAC and it designers have incorporated line and granular activated carbon trenches to mitigate any impacts.

A Construction Environmental Management Plan (CEMP) will be in place prior to the commencement of construction.

With the implementation of the mitigation and management measures addressed as part of the design and CEMP development, the residual environmental impacts are considered to be low to negligible.

INTRODUCTION

1.1 Background

Brisbane Airport Corporation Pty Ltd (BAC) is the operator of Brisbane Airport which serves as the premier aviation gateway to Queensland. Brisbane Airport currently consists of two runways, two major terminals, and immediately prior to the COVID-19 pandemic accommodated 35 airlines flying to 84 domestic and international destinations.

Brisbane Airport is the second largest capital city airport in Australia by land size with 2,700 hectares of land and is located approximately 12km from the Brisbane central business district (CBD).

BAC's extensive landholding in close proximity to Brisbane CBD offers a unique planning opportunity to capitalise on BAC's aim to become a major multimodal transport base and to provide world class commercial development opportunities.

Over the last three decades, Brisbane Airport has seen growth and diversification of land uses to complement its ongoing aviation development and function.

To support this growth and as documented in the 2020 Brisbane Airport Master Plan (Master Plan), the airport has been organised into definable separate neighbourhoods aligned with the vision of the Brisbane 2022 New World City Action Plan (refer to Figure 1). These neighbourhoods have been designed to create strong complementary communities of interest where businesses located together have the potential to derive benefits from the location in terms of shared or common services and facilities. These neighbourhoods include the Airport North neighbourhood located at the northern end of the airport.

Figure 1 Airport neighbourhoods

The Master Plan describes Airport North neighbourhood as the ideal destination for a logistics base, servicing industrial and aviation-related businesses seeking development opportunities with direct airside

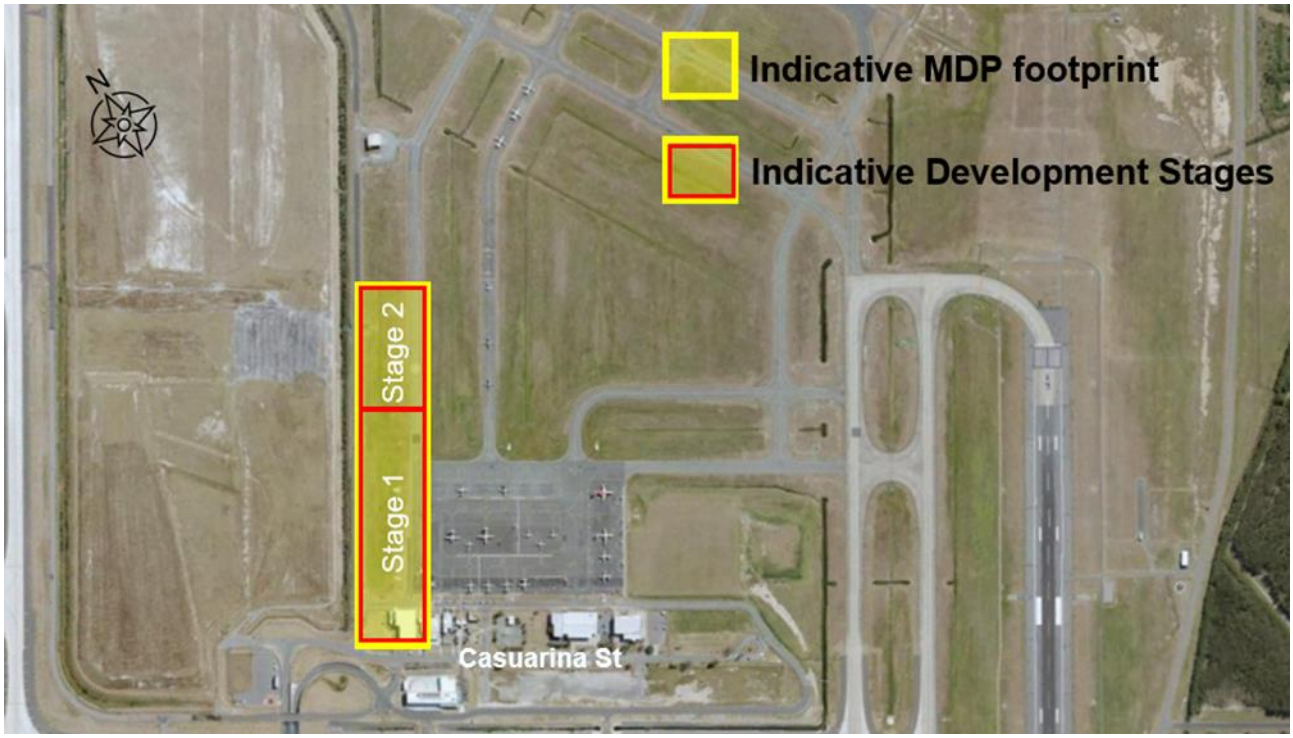
access. Airport North currently provides operational areas for smaller, charter carriers and service providers, including the Royal Flying Doctor Service.

1.2 Development plan

This Major Development Plan (MDP) has been prepared for the development of a proposed Aeromedical Base (the Project), located within the Airport North neighbourhood. Total site area of the development is approximately 4ha.

The Project is expected to be delivered in two (2) stages, however, both stages may be delivered concurrently Stage 1 of the proposed development is approximately 2.9ha and is located directly adjacent to the existing General Aviation (GA) apron. Stage 2 of the development is approximately 1.1ha and is a north-east extension of Stage 1. The indicative development stages are shown in Figure 2.

Figure 2 Indicative development stages



Indicative details of each stage of the proposed development are outlined in Table 1

Table 1 The Project indicative development details

Tenant	Existing Tenants building on Airport [1]	Proposed Building details (The Project)
Stage 1		
Royal Flying Doctor Service[2]	• Aircraft Hangarage, approx. 1200m^2 (two aircraft storage) • Office approx.1200m^2	• Aircraft Hangarage, approx. 3,500m^2 (five aircraft storage) • Office, approx. 3,000m^2 • At-grade car parking, approx. 120 bays
Queensland Health	• Not currently operational at Brisbane Airport	• Office / health facilities, approx. 3,000m2 • At-grade car parking, approx. 70 bays
LifeFlight[3]	• Aircraft Hangarage, approx. 1,400m^2 (two aircraft storage) • Office / ancillary areas, approx. 1,400m^2	• Aircraft Hangarage, approx. 3,500m^2 (four aircraft storage) • Office / ancillary areas, approx. 2,000m^2 • At grade car parking, approx. 70 bays
Café	• Not currently operational at Brisbane Airport	• Café, approx. 175m^2
Stage 2		
QGAir[4]	• Aircraft Hangarage, approx. 1,200 m^2 (three aircraft storage) • Office / admin / ancillary areas, approx. 400m^2	• Aircraft Hangarage, approx. 3,200m^2 (four aircraft storage) • Office / admin / ancillary areas, approx. 2,100m^2 • At-grade car parking, approx. 40 bays

The Project will be developed based on the indicative concept designs. The architectural concepts for Stage 1 are shown in Figure 3 to Figure 6**.** Stage 2 will be developed in a similar architecture style and theme as indicated in Figure 7.

[1] All existing facilities have limited at-grade car parks.

[2] RFDS exists at Airport North. An expanded and modernised RFDS is delivered as part of the Project.

[3] Life Flight is being relocated from Airport East. An expanded and modernised Life Flight is delivered as part of the Project

[4] QGAir is being relocated from Airport East. An expanded and modernised QGAir is delivered as part of the Project

Figure 3 Indicative the Project Layout Plan

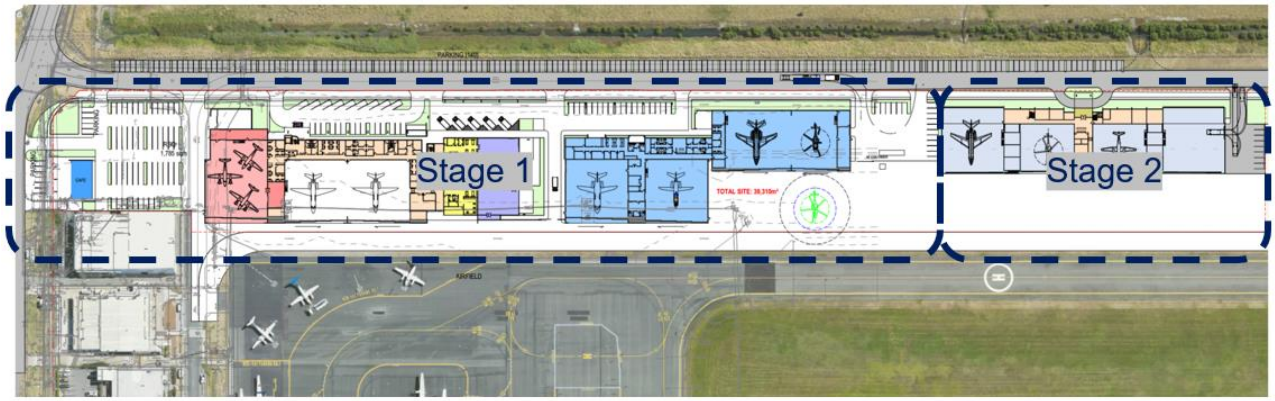
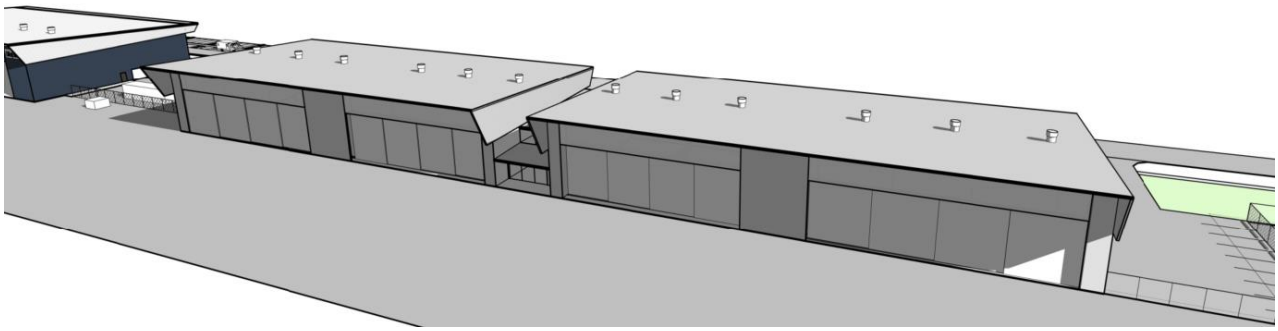


Figure 4 Indicative Aeromedical Base development – Stage 1 (Royal Flying Doctors Service)

Figure 5 Indicative Aeromedical Base development – Stage 1 (LifeFlight)

Figure 6 Indicative Aeromedical Base development – Stage 1 (Queensland Health)

Figure 7 Indicative The Project development – Stage 2 (QGAir)



The Aeromedical Base - Stage 1 is expected to be delivered in three phases:

The timing and delivery phase of Stage 2 is yet to be determined. Stage 2 may be delivered concurrently with the phases of Stage 1, or as an independent stage.

1.3 Project summary

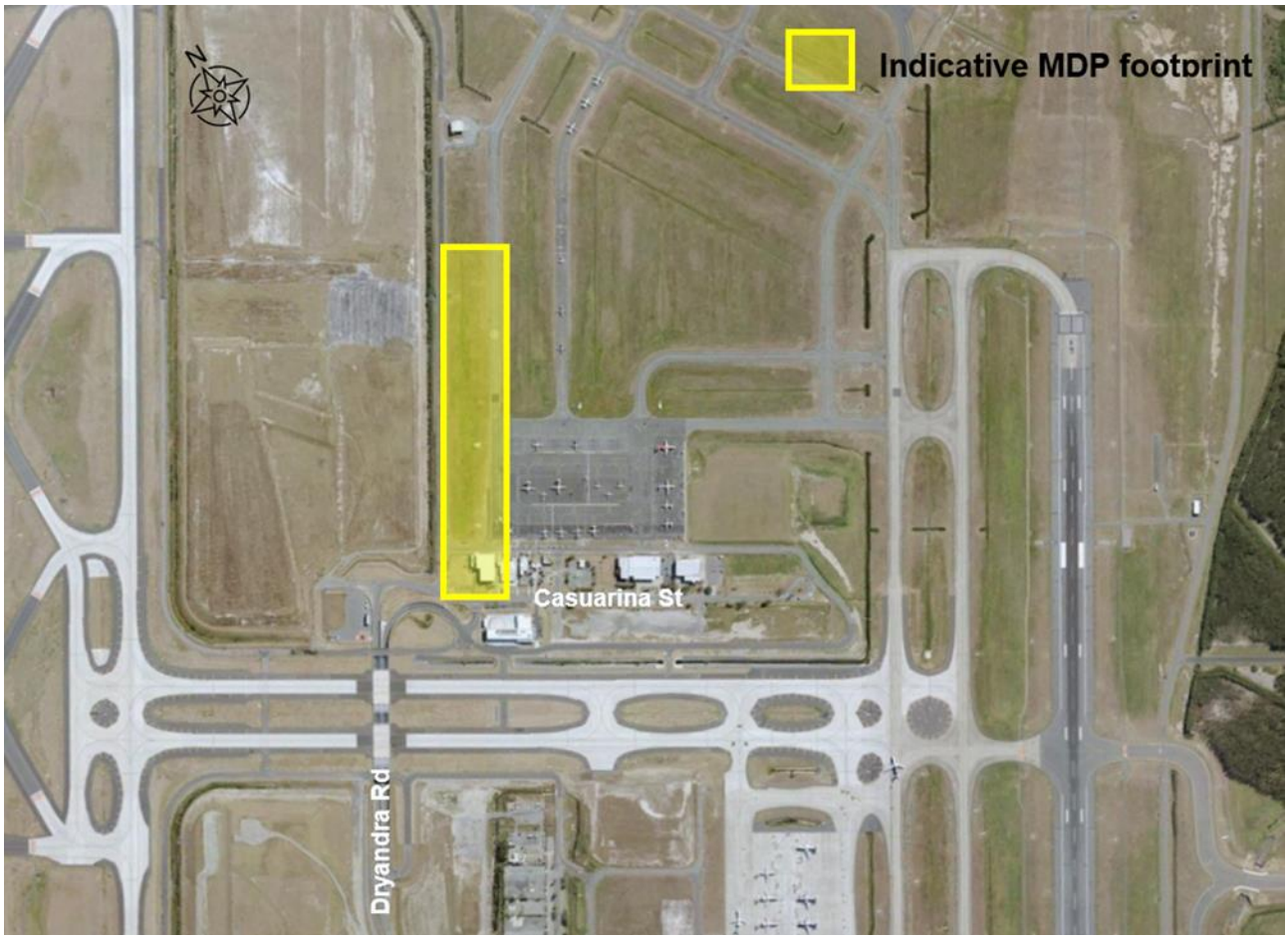
The Airport North neighbourhood is classified as Special Purpose Airport Zone in the Master Plan. This zone provides for airside activities, runways, and infrastructure, the Domestic and International Terminals and landside areas providing necessary, compatible, and complementary land uses.

The project and subject of this MDP is the Aeromedical Base (refer to Figure 8). The Project MDP scope includes:

- Site clearing and filling.

- Building platform and surcharge earthworks.
- Construction of civil infrastructure to service the development.
- Building development.

Figure 8 Indicative Project MDP footprint



Upon completion, the Project development will deliver a cleared, filled, and serviced site within the Airport North neighbourhood and a building comprising approximately 2 ha of gross lettable area for aeromedical facilities as described in Table 1

1.4 Project objectives and justification

The Aeromedical Base is a State-led initiative that focuses on long-term community wellbeing. The Aeromedical Base will strengthen the current network of aeromedical bases throughout Queensland and will deliver long term serviceability and capacity improvements. This will result in improved connectivity to the major hospitals throughout the State, ensuring Queenslanders – particularly located in regional or remote areas – receive effective medical treatment as quickly as possible.

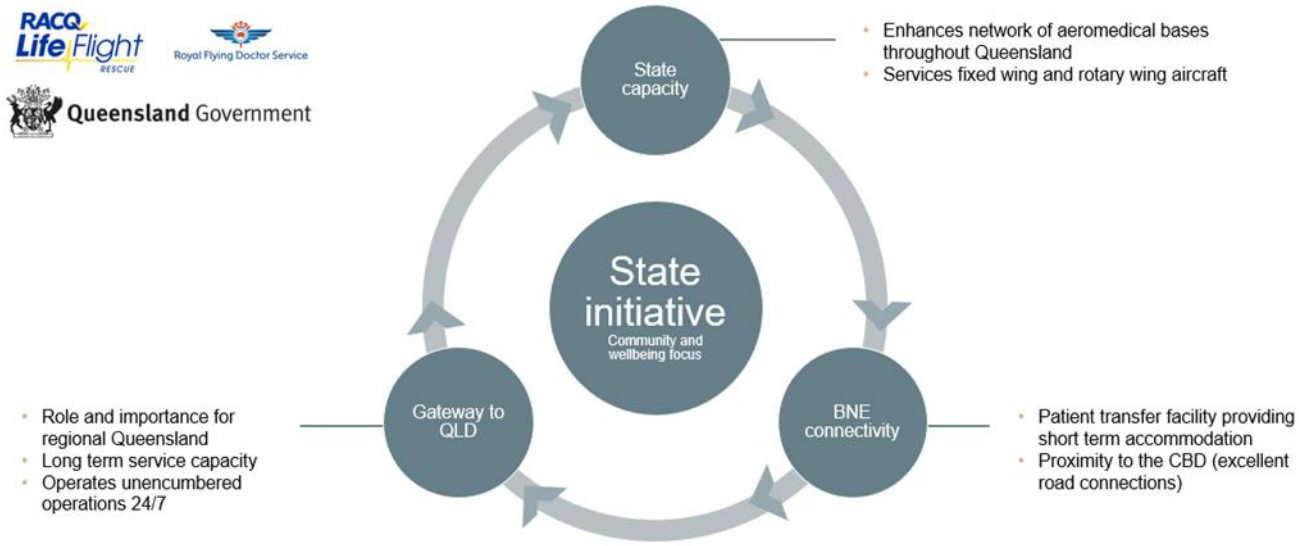
Brisbane Airport operates 24 hours a day 7 days a week and is unencumbered. It is well-serviced by an excellent road network with a series of tunnels providing direct access to major hospitals. The site is unique in that the proposed facility and associated infrastructure can be designed to accommodate both fixed wing aircraft and rotary wing aircraft, providing efficient response times for aircraft departing Brisbane Airport.

The operation of the existing patient transfer facility at the RFDS site will be relocated within the Project. The patient transfer facility is only used for medical stable patients. Medical emergency will be transported via helicopters directly to the hospital or patient transfer will occur on the apron and directly into ambulance.

The patient transfer facility provides short term (typical 1-2 hours with max 10 hour) accommodation to comfortably, safely and efficiently transfer patents from aircraft, ambulance, hospital and vis versa. As the facility allows for short term accommodation this will reduces demand on major hospitals.

The Aeromedical Base at Brisbane Airport will be the epicentre for coordination of patient retrieval operations across Queensland. The location of the proposed Aeromedical Base within Airport North Neighbourhood is ideal. The location enables quick access to both runways with long term capacity that will facilitate the ongoing operations of all tenants that will be based at the proposed facility.

Figure 9 Aeromedical benefits to the state of Queensland



QGAir delivers life-saving, community safety and state support aviation services to the people and government of Queensland. Through the use of Queensland Government aviation assets, the Government provides Transportation and Incident Response.

1.5 Location of proposed development

The Project is located within the Airport North Neighbourhood at the northern end of the airport as shown on Figure 8. The Project footprint consists of a cleared and landscaped parcel of land accessed via Casuarina Street which forms the southern boundary of the development. Airport North is currently home to existing facilities which include:

- Fixed Based Operator (FBO) hangers and buildings that include operations such as Jet Base, Pelair and Royal Flying Doctor Service.
- Freight facilities for private operators such as Toll.
- Airservices Australia (ASA) (closed) Fire Station (for RWY 14/132)
- Airservices Australia (ASA) Fire Station (for RWY 01L/19R)
- General Aviation Terminal

1.6 MDP purpose

This MDP has been prepared for the delivery of the Project by BAC. The Airports Act 1996 (Airports Act), section 91 (1A) states that the purpose of an MDP in relation to an airport is to establish the details of a major airport development that:

a. relates to the airport, and

b. is consistent with the airport lease for the airport and the final Master Plan for the airport.

An MDP must be prepared by the airport-lessee company in accordance with the content requirements outlined in section 91 of the Airports Act and submitted to the Minister for Infrastructure, Transport and Regional Development (the Minister) for approval.

Accordingly, this MDP outlines:

- Details of the development including design considerations, supported infrastructure, and staging.
- Legislative requirements.
- Operational and environment assessment.

1.7 Project proponent

All works associated with the proposed development are on land within the existing boundary of the Brisbane Airport. BAC is an “Airport Lessee Company” under the Airports Act. The proponent for this proposed MDP as defined under the Act is:

Brisbane Airport Corporation Pty Ltd
11 The Circuit
Brisbane Airport Qld 4008

The contact in connection with this proposal is Dan Hyde, Infrastructure Development Principal – Terminals Infrastructure, Telephone: (07) 3406 3256.

PROJECT DETAILS

2.1 Consistency with Brisbane Airport 2020 Master Plan

The Master Plan considers all aspects of airport operations for the next five years, including the planning framework for new development and aviation activity, environmental management, and transport planning. The Master Plan also considers strategic investment opportunities and initiatives at Brisbane Airport over a 20-year planning horizon.

The Master Plan provides a foundation for BAC to plan for growth and to create Brisbane Airport's future. To create this, the Master Plan focusses on four key areas:

- Growing aviation markets.
- Excellence in customer satisfaction.
- Supporting business growth.
- Driving economic prosperity.

The Aeromedical Base development is consistent with the Master Plan and aligns with the overarching development objectives outlined in Table 2.

Table 2 MDP alignment with development objectives

Development objectives	Alignment
Growing aviation markets: • Increasing connectivity. • Delivering capacity to meet demand. • Secure, safe and efficient airport operation. • Investing in collaborative partnerships.	Aeromedical services have been a feature of operations at Brisbane Airport for many years and this Project will support its ongoing operation of connecting communities across Queensland to key medical services in Brisbane while meeting the needs of the growing regions. Having a dedicated Base for medical transport services is a critical service for communities across Queensland.
Excellence in customer satisfaction: • Smarter journeys. • Better journeys. • Accessibility for all.	The Project will facilitate critical medical support operations for people across Queensland who require medical assistance in Brisbane be that in a medical emergency or for pre-arranged medical appointments. By providing a dedicated facility for patient transfer, the project will enhance customer facilitation for aeromedical services and remove the need for patients to wait inside the aircraft or on the apron for transport connections as what currently happens. A guiding principle for BAC is that facilities are accessible to passengers, staff, and visitors. Site-specific accessibility will be addressed through the development approval process and reflect the operational needs of the specific buildings and uses.

Development objectives	Alignment
Supporting business growth: • Creating collaborative business neighbourhoods. • Maximising ground connectivity. • Investing in sustainability. • Connecting business.	The Project provides a unique opportunity to have medical support operations in a dedicated precinct. This consolidation improves efficiency in operations and promotes opportunities for collaboration between businesses. Being in close proximity to the taxiway and runway network provides the community with the most time-efficient solution for the provision of medical care, including patient retrieval.
Driving economic prosperity: • Enabling growth in economic wealth. • Proactive community engagement. • Enabling long term job creation. • Connecting Brisbane to the world.	The Project will continue to provide direct employment for local communities, during both construction and operational phases, thereby continuing to support long-term job creation in Queensland.

Table 1 sets out a comparison between current infrastructure available to aeromedical suppliers operating at Brisbane Airport and how the development will benefit those suppliers through the supply of additional infrastructure.

2.1.1 Land use and the Airport North Precinct

Airport North is located between the parallel runways and adjacent to the General Aviation apron. This strategic location is ideal for providing operational areas for smaller charter carriers or service providers, such as the Royal Flying Doctors Service, LifeFlight, and other Queensland Government air transport operations.

From a land use perspective, the area covering the Airport North Precinct is zoned as a Special Purpose Airport Zone. This zone allows for a range of possible uses such as:

- Health care services
- Emergency services
- Transport depot or public transport facility
- Aircraft movement areas and associated infrastructure.
- Terminal operations including the International, Domestic and General Aviation terminals.
- Landside areas providing necessary, compatible, and complementary support for aeronautical operations such as food and drink outlets, works depots, office space and .

Given the range of possible uses, Airport North precinct is the preferred precinct for this project to occur.

The Master Plan sets out specific development objectives for the Special Purpose Zone land use which covers Airport North neighbourhood. The development is expected to meet the specific objectives for the Special Purpose Zone outlined in Table 3.

Table 3 Development objectives – Special Purpose Airport Zone

Development objective	Alignment
Development contributes to the function of the Brisbane Airport aeronautical facilities to maximise the operational efficiency of airport infrastructure.	The project will consolidate aeronautical activities for the Queensland Government, Royal Flying Doctor Service and LifeFlight. It will facilitate

Development objective	Alignment
	efficient use of airport aprons and ground support infrastructure.
Development provides housing, servicing, maintenance, and repair of aircraft; landing and departure of aircraft; assembly and dispersal of passengers and goods on or from aircraft.	The project scope consolidates the housing of aircraft, airside activities and facilitation of passengers using aeromedical government airwing services and government airwing at Brisbane Airport.
Ancillary activities serving the needs of workers, passengers, and visitors to an airport, including shops, food and drink outlets; tourism services; freight handling and shipping; training, education and aviation facilities.	Ancillary support including office space, a café and car parking will be included in the project.
Development is appropriately located and has a function, scale, height, and bulk compatible with the aeronautical functions of the airport.	The project fits within the land use and existing operations of the Airport North precinct.
Development provides goods and services to domestic and international travellers at a standard and quality which meets expectations for a world-class transport hub.	Consolidating aeromedical operations at Brisbane Airport will improve efficiency to this operation and thereby increase the capacity, streamline ground transfer to medical services in Brisbane and 24/7 operations at Brisbane Airport allows for aeromedical response at any time.
Development facilitates high quality road, rail, public transport, and active transport connections enabling efficient and safe movement of people, goods and freight.	Given the location and the airside nature of this operation, the primary mode of transport to access the Project is expected to be private and commercial vehicles. The development will consider facilities within the Project to facilitate the safe movement of pedestrians and Active Transport users in and around the Base.
Developments are compliant with aviation standards and relevant regulations and guidelines.	The project will comply with aviation standards. Further information is set out in Section 2.2.3.
Development creates a variety of high-quality building forms, materials and façade treatments that contribute positively to passenger experiences.	The unique design and high-quality materials to be used will provide the necessary versatility to the location, whilst maintaining a contemporary appearance.
Complementary uses are of an appropriate scale to serve the needs to employees, passengers, and visitors within the zone.	The development is designed at a high standard in keeping with adjoining operations and land uses.
Development achieves a high standard of environmental performance by incorporating principles of sustainable and efficient design in both the construction and operational phases.	Section 2.2.1.5 sets out the approach for incorporating sustainability principles in the project.
Development supports efficient movement of goods and freight through the airport to facilitate trade and employment growth.	The focus of this project is to facilitate aeromedical services primarily for people; however, it may also facilitate time sensitive medical freight transfers across Queensland.
Development is designed, constructed, and operated to maintain the safety and security of people and property.	The project will provide a safe and secure environment for visitors, customers, and employees. The specific security measures will be confirmed during the detailed design phase.

Development objective	Alignment
Interim land uses which do not prejudice future development are supported prior to land being needed for its ultimate land use.	There are no interim uses on this site.
Development complies with the National Airports Safeguarding Framework.	The development will comply with the NASAG requirements. Further detail on this can be found in Section 4.1.

2.1.2 Airport Environment Strategy

The Master Plan also contains the Airport Environment Strategy (AES). The AES assesses the environmental values of the airport and provides specific action plans and measurable goals for the ongoing management and improvement of environmental outcomes. The proposed development is not located in the Brisbane Airport Biodiversity Zone, or any Environmentally Significant Areas identified in the AES.

BAC will ensure reasonable and practicable efforts are made to mitigate any environmental impacts identified in this MDP during construction and operation. The design the Project has addressed the ASS and PFAS matters identified during the investigation. During construction, a CEMP will be implemented to mitigate and potential adverse impact. Tenants will develop and implement Operational Environmental Management Plans (OEMP) for their own tenancies with potential environmental impacts during operation.

2.2 Project design

All design elements will be undertaken in accordance with overarching guidelines which include:

- Brisbane Airport Planning Guidelines.
- BAC's suite of technical and design guidelines (Airport Technical Guidelines).

Further to the indicative architectural concept designs prepared, BAC has undertaken engineering assessments to understand the impacts and constraints applicable to the Project. Key considerations to be addressed in future design development are outlined in the following sections.

2.2.1 Building design

All building and hangers will be designed in accordance with:

- All relevant Australian Standards.
- All relevant Design Standards including National Construction Code (NCC) and NFPA
- Brisbane Airport Planning Guidelines.
- Airport Technical Guidelines.

The buildings and hangers will be designed in consultation with each of the tenants to ensure that their specific needs are met within the constraints of the site along with BAC's relevant standards and guidelines.

The Brisbane Airport Planning Guidelines establish the minimum planning requirements for each aspect of a property development. In addition, they outline the details of a series of performance-based planning objectives.

2.2.1.1 Expected building quality and set out

Buildings must achieve a high standard of design and must make a positive contribution to the desired precinct character and amenity. Typical requirements would require that the proposed buildings:

- Should contribute positively to the desired character, urban form, and function of the precinct.

- Be consistent with surrounding development and streetscape.
- Must not compromise existing or future service corridors or infrastructure delivery.
- Will consider and incorporate emergency services access requirements and specific building requirements, particularly fire protection.
- Will not adversely impact the amenity of public spaces.

Minimum building setbacks are detailed in the Brisbane Airport Planning Guidelines. The following setbacks to the building face are generally acceptable:

- Six metres from the front boundary (main street frontage).
- Three metres from the side boundary.
- Three metres from the rear boundary.
- Four metres from a secondary street frontage.
- For a corner site, setbacks maintain sightlines for all road users.

2.2.1.2 Building materials

All prospective developments must comply with all appropriate and relevant BAC guidelines and requirements. Generally, the external building materials will consist of the following:

- External walls to be a mixture of a painted compressed fibre cement, Colorbond metal or painted precast concrete to suit architectural design intent.
- Coloured (standard Colorbond colours) steel sheeting complete with all necessary head and sill flashings and fixings, above paint finished concrete dado wall construction.
- Concrete dado walls to be 2400mm high solid wall, reinforced concrete tilt, externally painted with “light texture finish”.
- Colorbond metal deck roof sheeting with concealed fixings laid over foil backed fibreglass blanket insulation and safety mesh.
- Must have a non-reflective finish to ensure that glare from the buildings do not impact the safe operation of aircraft and air traffic control.

2.2.1.3 Building noise attenuation

The developments must adequately attenuate for noise in buildings to protect the health and wellbeing of occupants and to ensure no adverse impacts from noise affecting adjoining developments.

Developments must comply with Schedule 4 of the *Airports (Environment Protection) Regulations 1997 (excessive noise guidelines)*, and BAC’s Noise Impact Assessment Policy.

A site-specific acoustic assessment will be undertaken during the design development. The assessment will include on-site monitoring to develop background noise levels. These levels will be used to inform the required design for the building to provide suitable noise attenuation accordance with relevant Australian Standard and Building Codes.

2.2.1.4 Building heights

Safe aviation operations rely on maintaining an airport environment as free as practical from obstacles that might impede the safety, efficiency, or regularity of current and future aircraft operations.

Under the Airports (Protection of Airspace) Regulations 1996, the ‘prescribed airspace’ for Brisbane Airport is made up of the obstacle limitation surface (OLS) and procedures for air navigation services – aircraft operations (PANS-OPS) surfaces. To ensure that there is no impact to aircraft and air traffic control

operations the developments must not create a permanent obstruction into the airspace above the OLS and PANS-OPS surfaces.

Proposed developments will be reviewed against the airspace requirements to ensure no impairment of aircraft operations.

2.2.1.5 Building sustainability

Long term environmental sustainability is a fundamental tenet of BAC's operating philosophy and is therefore intrinsically linked to the successful attainment of economic, operational, and social objectives. Consideration of sustainability and environmental responsibility remains at the heart of every investment and development project at Brisbane Airport. BAC manages its growth and operations in a manner that minimises environmental and social impacts and embeds sustainability principles and practices into its operations.

BAC aims to achieve best practice economic sustainability performance for development projects at Brisbane Airport by incorporating principles of sustainable and efficient design in both the construction and operational phases.

Developments are also required to undertake a high-level sustainability assessment as part of concept design. The focus of the assessment is generally:

- Energy efficiency and renewable energy.
- Waste minimisation.
- Climate responsive design.
- Water efficiency and re-use.
- Whole of life costs.
- Indoor environment quality.

At a minimum, any new building developments must conform to the energy efficiency requirements of the Australian Building Code NCC 2022 Energy Efficiency.

2.2.2 Environmental

The Master Plan includes the Airport Environment Strategy (AES). The AES outlines BAC's continuing commitment to world best practice in environmental compliance and sustainability. It also includes details of affirmative measures and actions to be implemented over the next five years at Brisbane Airport to ensure continuous improvement in all aspects of environmental management.

In addition to the AES, the Project will be developed in accordance with applicable standards and guidelines.

While environmental aspects are principally administered by Federal legislation relevant to airports, State laws may be applicable in certain circumstances. In practice, the application of State laws is resolved using two principles:

- Commonwealth legislation is always paramount, and State law is excluded where there is direct or indirect inconsistency between Commonwealth and State law;
- State legislation is applicable in specific circumstances (e.g., where no Commonwealth law exists or where State law can operate concurrently).

Whilst the following list is not comprehensive, relevant standards and guidelines may include:

- *Airports (Environmental Protection) Regulations 1997* (AEPR 1997).
- *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act).
- *AS/NZS 4482.1 – 2005, Guide to the Sampling and Investigation of potentially contaminated soil – Non-volatile and semi-volatile compounds* (Standards Australia 2005).

- *AS/NZS 4482.2 – 1999, Guide to the Sampling and Investigation of potentially contaminated soil – Volatile compounds* (Standards Australia 1999).
- *Environmental Protection Act 1994* (EP Act).
- *Environmental Protection Regulation* 2019.
- *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater* (CRC CARE) (Friebel and Nadebaum 2011).
- *Heads of EPA Australia and New Zealand 2020, PFAS National Environmental Management Plan (PFAS NEMP), Version 2.0*, January 2020.
- *National Environment Protection (Assessment of Site Contamination) Measure 1999 (amendment 1, 2013)* (ASC NEPM 2013).
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018).
- *Guidelines for the Assessment, Remediation and Management of Asbestos – Contaminated Sites in Western Australia 2009.*
- National Acid Sulfate Soils Guidance: National acid sulfate soils sampling and identification methods manual (Sullivan et al. 2018a).
- National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual (Sullivan et al. 2018b).
- National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soils in shallow groundwater environments (Shand et al. 2018).

2.2.3 Aviation

The Project development will be designed to comply with the requirements of the following guidelines and standards:

- National Airports Safeguarding Framework:

  Guideline A: Measures for Managing Impacts of Aircraft Noise.

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

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

  Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation.

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

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

  Guideline G: Protecting Aviation Facilities — Communications, Navigation and Surveillance (CNS).

  Guideline H: Protecting Strategically Important Helicopter Landing Sites.

  Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways.
- Civil Aviation Safety Authority Manual of Standards Part 139 (Aerodromes).
- International Civil Aviation Organisation Annex 14.
- Queensland State Planning Policy.
- Civil Aviation Safety Authority Advisory Circular AC 139-05 Plume Rise Assessments.

2.2.4 Civil infrastructure

The Project development will include the required civil infrastructure to support the aeromedical and government airwing operations within the neighbourhood. All civil infrastructure developed will be consistent with the Master Plan and be designed and delivered in accordance with the relevant Austroads and Australian Standards.

Apron

Aircraft will access the proposed development via the existing GA apron and associated taxiways network. The Project will provide new apron/apron taxilanes areas between the new hangar facilities and the GA apron. The apron areas will be provided for connection between the existing apron and the new hangar, storage, service and refuelling of aircraft via tanker and proposed above ground tanks. The apron will be designed in accordance with relevant Australian Standard and Guidelines including MOS 139 and NFPA.

Access roads

To enable access to the proposed development, the airside access road will be modified to suit the proposed the Project. The landside access road will accommodate all required vehicle movements and supporting civil infrastructure, such as utilities, drainage, and pedestrian facilities. The design will be consistent with the Master Plan, Austroads, relevant Australian Standards and International Air Transport Association Manuals.

Parking

Parking areas are to be provided within the tenancies of the development and will be designed to create a comfortable space for staff, visitors, and customers. Parking will be developed in accordance with the Brisbane Airport Planning Guidelines.

Pedestrian, and active transport network

The primary mode of transport to access the Project is expected to be private and commercial vehicles. The development will consider facilities within the Project to facilitate the safe movement of pedestrians in and around the proposed development. The project will provide a pedestrian network consistent with the Master Plan and active transport strategies. The facilities will be developed in accordance with Brisbane Airport Planning Guidelines and Austroads Guide to Road Design, Part 6A.

Water quality

The design and construction contractors will be required to comply with BAC’s Landside and Airside Stormwater Quality Management Strategy and consider water-sensitive urban design within the scope of the development.

2.2.5 Landscaping

Landscaping around the development will be consistent with the Brisbane Airport Landscape Setting Strategy focusing on providing the following characteristics:

Adopts a use of a naturalistic and limited palette of native species.

The structure of planting is to be used to clearly define and articulate precinct ’gateways’.

Careful consideration of species choice, to:

- Provide shade.
- Minimise wildlife attraction (i.e., non-edible, non-roosting).
- Minimise maintenance requirements.

The Project is located within the 'BNE Business Parklands' zone as defined in the current BAC Landscape Setting Strategy. This designation will guide the landscaping design for the area.

2.2.6 Work health and safety

Work health and safety requirements within and adjacent to the Project will be in accordance with relevant BAC requirements, Federal Government requirements and all applicable statutory requirements including the *Work Health and Safety Act 2011 (Cth), Work Health and Safety Act 2011 (Qld), Electrical Safety Act 2002 (Qld), applicable subordinate legislation* and National and State Codes of Practice.

2.2.7 Equity of access

All proposed buildings will be designed and constructed to meet the applicable requirements of the *Disability Discrimination Act 1992*. Provisions for mobility-impaired people within the building will comply with the applicable codes, including the Disability (Access to Premises – Buildings) Standards of the Building Code of Australia (BCA).

2.2.8 Security

Developments within the Project will provide a safe and secure environment for visitors, customers, and employees. The detailed security measures will be confirmed during the detailed design phase; however, will need to comply with any aviation security requirements and for general property purposes align with the relevant principles contained in the *Crime Prevention Through Environmental Design: Guidelines for Queensland (Queensland Government, 2007), Aviation Transport Security Regulations 2005 (ATSR), Aviation Transport Security Act 2004* and BAC Technical Guidelines related to security.

2.3 Economic and social contribution

2.3.1 Brisbane Airport

Brisbane Airport continues to be an economic driver in Queensland and is home to more than 400 businesses employing thousands of people. The airport's location, combined with 24/7 operations, means Brisbane Airport is a critical enabler for both the Brisbane and Queensland economies. In recent years, Brisbane Airport has contributed $4 billion to the Queensland economy annually. The main components that made up Brisbane Airport's contribution to the economy included:

- Direct inputs (in $) from wages and added business value of the airport businesses.
- Indirect contributions or associated flow-on benefits (in $) from the business transactions between airport businesses and the broader economy.

Just prior to the Covid-19 pandemic, over 23,000 people were employed at Brisbane Airport in aviation, light industry, retail, and freight sectors although employment at Brisbane Airport cover most industries of the Australian economy. Direct employment at Brisbane Airport also has an indirect economic contribution in the supply chain industries that provide goods and services to businesses that operate from Brisbane Airport. This indirect impact occurs both in Queensland and throughout Australia.

The Covid-19 pandemic has had significant impacts on the number of airline services and the number of passenger utilising Brisbane Airport, and it is expected the recovery to pre-pandemic levels will take some years. This will have a flow on effect to the broader economic contribution of Brisbane Airport during the recovery period. Given the medical focus of this development, BAC is not expecting any reduction in demand for aeromedical services at Brisbane Airport. Hence, BAC and the Queensland Government are investing in this development to support aeromedical services for decades to come.

2.3.2 Airport North Neighbourhood

BAC anticipates that the development will create 200 jobs in the construction phase which will likely be filled by local residents. Jobs created by this development will create economic growth in the local community.

2.3.3 Local community

Brisbane Airport is vital to connecting families and local communities across Queensland and Australia. With an estimated 50 per cent of Queenslanders living outside Greater Brisbane, Brisbane Airport provides a vital link for businesses, freight, export, tourism as well as aeromedical services. BAC expect the jobs created during the construction and operation of the Project will be filled by people living in Brisbane. This means the indirect effects of higher employment in the local areas will also be reflected in the local economy.

LEGISLATIVE CONTEXT

3.1 Commonwealth Legislation

3.1.1 Airport Act 1996

The Airports Act requires an MDP to be prepared for each “major airport development” at Brisbane Airport. Section 89 of the Act prescribes those activities that are included as a major airport development. The proposed development outlined in this MDP is defined as a ‘major airport development’ by virtue of Section 89(1)(e), defined as constructing a new building where:

- the building is not wholly or principally for use as a passenger terminal; and
- the cost of construction exceeds the threshold amount (which is currently $25 million).

Section 90 of the Airports Act 1996 states that major airport developments must not be carried out except in accordance with an approved MDP.

This document has been prepared in accordance with and in order to meet the requirements of the Airports Act. The key steps in the approvals process for an MDP are presented in Figure 10. An MDP checklist is provided in Appendix A to demonstrate the compliance with Section 91 of the Airports Act, which sets out the matters which must be included in an MDP.

Section 71A of the Airports Act sets out information and requirements regarding sensitive developments including the development of a hospital. A sensitive development includes:

a) A residential development;

b) A community care facility;

c) A pre-school;

d) A primary, secondary, tertiary or other educational institution;

e) A hospital.

The 2017 Planning Regulations (Qld) as well as the 2014 Brisbane City Plan both define a hospital as the use of a premises for –

a) the medical or surgical care or treatment of patients, whether or not the care or treatment requires overnight accommodation; or

b) providing accommodation for patients; or

c) providing accommodation for employees, or any other use, if the use is ancillary to the use in a) or b).

The intent of the patient transfer facility is to enhance the transfer of patients between the aircraft and medical centre /hospital in Brisbane. It’s anticipated that the facility operations will be defined by -

a) Typical length of stay would be 1-2 hours with a maximum stay of 10 hours;

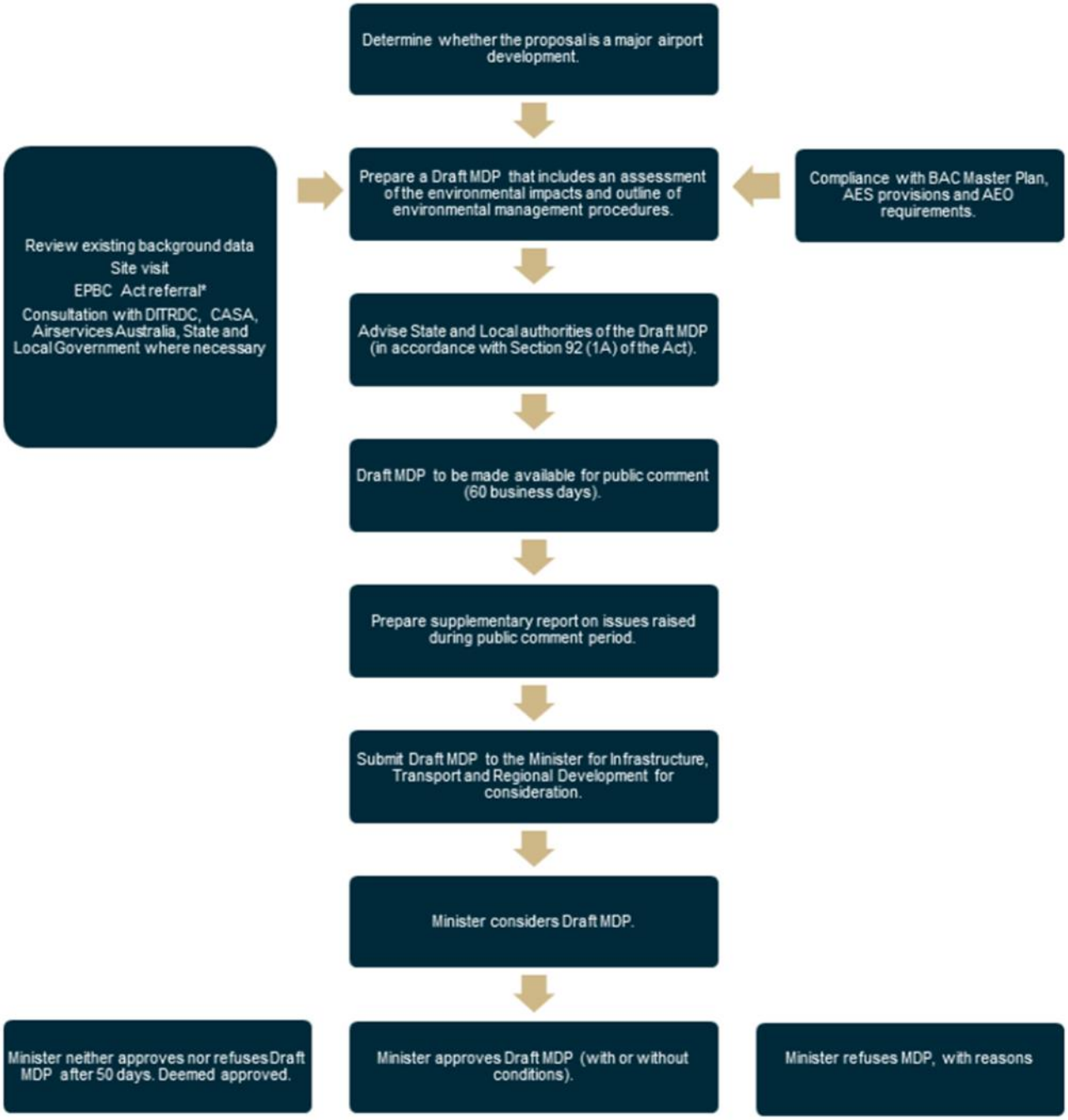
b) The extent of equipment will be limited to beds (design to accommodate 12 beds), monitoring equipment and oxygen;

c) It’s not expected that all beds will be occupied at the same time;

d) The staffing model is likely to be based on one nurse rostered during operational hours.

For these reasons the operation of the facility doesn’t meet the stated definition of a hospital and therefore does not meet the requirements set out in Section 71A.

Figure 10 Key steps in the MDP development process



It is also a requirement of the Airports Act that this MDP address whether the proposed development affects any subleases or other interests which existed prior to the Airport Lease commencing. BAC confirms that there are no such affected leases or interests currently exist.

3.1.2 Environmental Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places – defined in the Act as matters of national environmental significance (MNES). There are nine MNES currently protected under the EPBC Act, these are:

- World Heritage properties.
- National Heritage properties.
- Wetlands of international importance.
- Nationally threatened species and communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions.
- A water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act also protects the environment where actions are on or will affect Commonwealth land and regulates those actions of Commonwealth departments and agencies that may have a significant impact on the environment. As Brisbane Airport is located on Commonwealth land it is subject to the provisions of the EPBC Act.

Under the EPBC Act, if an action will have or is likely to have a significant impact on MNES or is deemed to require approval under Section 26 or 28 of the EPBC Act by nature of a potential significant impact on Commonwealth land or by a Commonwealth agency, a referral should be made to the Minister for the Environment. The Minister decides if the impacts are significant and whether an approval is required. The Minister's response to the referral determines the level and nature of environmental assessment required for final approval by the Minister for Infrastructure, Transport and Regional Development.

Based on the assessment detailed in Section 5.6 the proposed development, including construction and operation, the propose development will not a significant impact on a MNES or the environment. Therefore, no referral under the EPBC Act is required.

3.2 Consistency with Airport Lease

A requirement of the airport lease is that the lessee must comply with all legislation relating to the airport site. This includes sections 91(1A), 91(1)(ca) and 91(1)(d) of the Airports Act which require that all major airport developments must be consistent with the airport lease and the final Master Plan.

BAC, as the airport lessee company for Brisbane Airport, has an obligation to ensure all developments on airport land comply with applicable legislation. BAC must confirm that any proposal on airport land is consistent with:

- The final Master Plan for the airport;
- The approved Airport Environment Strategy contained within the final Master Plan;
- Any approved Major Development Plan for the airport, if applicable.

The Project as described in this MDP, is consistent with the above documents and the Master Plan's land use intents. With BAC's guidance, the development will be constructed in line with the provisions of the Airports (Building Control) Regulations 1996 and Airports (Environment Protection) Regulations 1997 and in accordance with the relevant airport lease requirements.

As to the airport lease, it a requirement of that document that:

- under clause 3, BAC must:
    - use the Brisbane Airport site as an airport;
    - provide for access to Brisbane Airport by interstate and intrastate air transport; and
- under clause 12, BAC must develop the Brisbane Airport site having regard to the anticipated future growth in, and pattern of, traffic demand and in accordance with good business practice.

The development further facilitates interstate and intrastate air transport and is being developed in response to a need for additional health-related aviation facilities to serve the community needs of Queensland. Accordingly, the Project development is consistent with the airport lease for Brisbane Airport.

3.3 Consistency with state and local government planning

Being Commonwealth land, planning requirements for airport land is administrated under the Airports Act and other relevant Commonwealth legislation such as the EPBC Act. Under the Airports Act, state and local planning development provisions are not applicable to development occurring at the airport.

The Airports Act, does however, require that an MDP address where possible, the extent (if applicable) of any inconsistencies with planning schemes in force under a law of a state or territory in which the airport is located. The commentary in the following sections details the Project's consistency with relevant planning policies/schemes.

3.3.1 State Planning Policy

In preparing this MDP, consideration has been given to the Queensland State Planning Policy (SPP) which became effective on 3 July 2017. The SPP outlines the Queensland Government's interests in planning and development, as well as these interests are dealt with in planning schemes, council development assessment processes and in designating land for infrastructure.

Relevant State interest statements include:

- Development and Construction - Facilitating a range of commercial, retail, industrial, and mixed-use development opportunities to support economic growth and employment.
- Strategic Airports - Strategic airports and aviation facilities, including that development and associated activities will not adversely impact existing aviation operations and facilities.
- Water Quality - Water quality, including that the development is located, designed, constructed, and operated to avoid or minimise adverse impacts on environmental values of Queensland waters.
- Natural Hazards, risk, and resilience – The risks of natural hazards, including climate change, are mitigated to protect people and property.
- Infrastructure Integration - the planned infrastructure fits with surrounding infrastructure to achieve efficient and effective use of existing infrastructure, realise economic, social, and environmental benefits as well as considering future needs.

The Project will be developed to ensure that the final design meets these SPP interest statements.

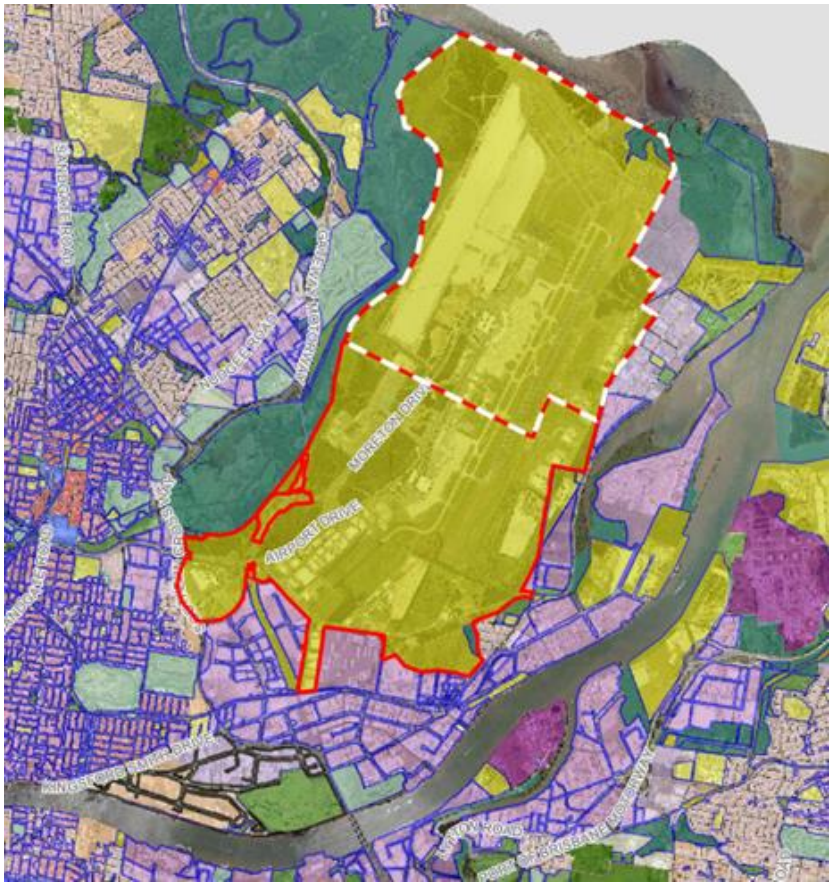
3.3.2 Brisbane City Plan 2014

Brisbane Airport is located within the “Special Purpose (Airport) Zone” under Brisbane City Plan 2014 (City Plan). Council’s Strategic Plan within the City Plan acknowledges the airport as being a major industrial location (as part of the broader Australia TradeCoast region) which is a key centre in the city and provides major air access to and from the city for passengers and freight.

Brisbane Airport (shaded yellow) is broadly surrounded by two different land uses set out in the City Plan and Figure 11:

- Industrial land along the eastern and southern boundaries (shaded purple).
- Conservation land along the western boundary adjacent to the Kedron Brook Floodway (shaded green).

Figure 11 Extract of the 2014 Brisbane City Plan



The objective of the Special Purpose (airport) Zone in the City Plan is to facilitate:

- Housing, servicing, maintenance, and repair of aircraft.
- Landing and departure of aircraft.
- Assembly and dispersal of passengers and goods on or from aircraft.
- Ancillary activities serving the needs of workers, passengers, and visitors to an airport, such as shopping, food and drink outlets and tourism services.
- Associated training, education, and aviation facilities.

The proposed development meets the objective of the Special Purpose (Airport) Zone as it provides aeronautical related facilities for housing, maintenance, and operation of aircraft, to be used by passengers

requiring aeromedical services, government transport, and supply ancillary services to staff such as office areas. Based on this the Project development meets the compatibility requirements outlined in the City Plan.

3.4 Airport development and Building Approvals

In addition to the preparation and approval of an MDP, new development is subject to a Building Approval from the Airport Building Controller (ABC).

The Building Approval cannot be issued by the ABC unless the ABC is satisfied that the proposed development is consistent with:

- The Brisbane Airport Master Plan.
- The Brisbane Airport Environment Strategy.
- An approved MDP.

OPERATIONAL ASSESSMENT

4.1 Aviation operations and safety

Developing land near an aerodrome has the potential to impact aviation operations and safety. In accordance with the requirements of Section 91 of the Airports Act, an assessment of the aviation operational and safety impacts of the Project has been performed.

The Project has been assessed against the National Airports Safeguarding Framework (NASF). The findings of the assessment have been summarised in Table 4.

Table 4 Assessment against NASF Guidelines

NASF Guideline	Comment
Guideline A: Measures for Managing Impacts of Aircraft Noise	Applicable Aircraft noise is discussed in Section 4.1.1.
Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports	Applicable Windshear and turbulence are discussed in Section 4.1.2.
Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports	Applicable Wildlife strikes are discussed in Section 4.1.3.
Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation	Not applicable The Project is not a wind turbine farm.
Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports	Applicable Distraction from lighting and/or reflection are discussed in Section 4.1.4
Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports	Applicable Protected Airspace for operation and construction are discussed in Sections 4.1.5.
Guideline G: Protecting Aviation Facilities — Communications, Navigation and Surveillance (CNS)	Applicable CNS and Air Traffic Control are discussed in Section 4.1.5.3.
Guideline H: Protecting Strategically Important Helicopter Landing Sites	Not applicable The Project is not located within the vicinity of a Strategically Important Helicopter Landing Sites.
Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways	Not applicable The Project is not located within the public safety areas at Brisbane Airport.

4.1.1 Aircraft Noise – Australian Noise Exposure Forecast

The Project is zoned as Special Purpose Airport Zone in the 2020 Master Plan which provides for permitted uses including industry, air services, health care services and freight operations, each of which are permitted up to the ANEF 40 contour interval. The 2020 ANEF contours are shown in Figure 12 and shows that the Project is located within the ANEF 30-35 noise contours. Australian Standard 2021:2015 permits conditional acceptance of commercial, light industrial and industrial buildings for development within the ANEF 30-35 range. As the development is classified as a “conditional acceptance”, the design of the building will be in accordance the noise attenuation as defined in AS 2021:2015

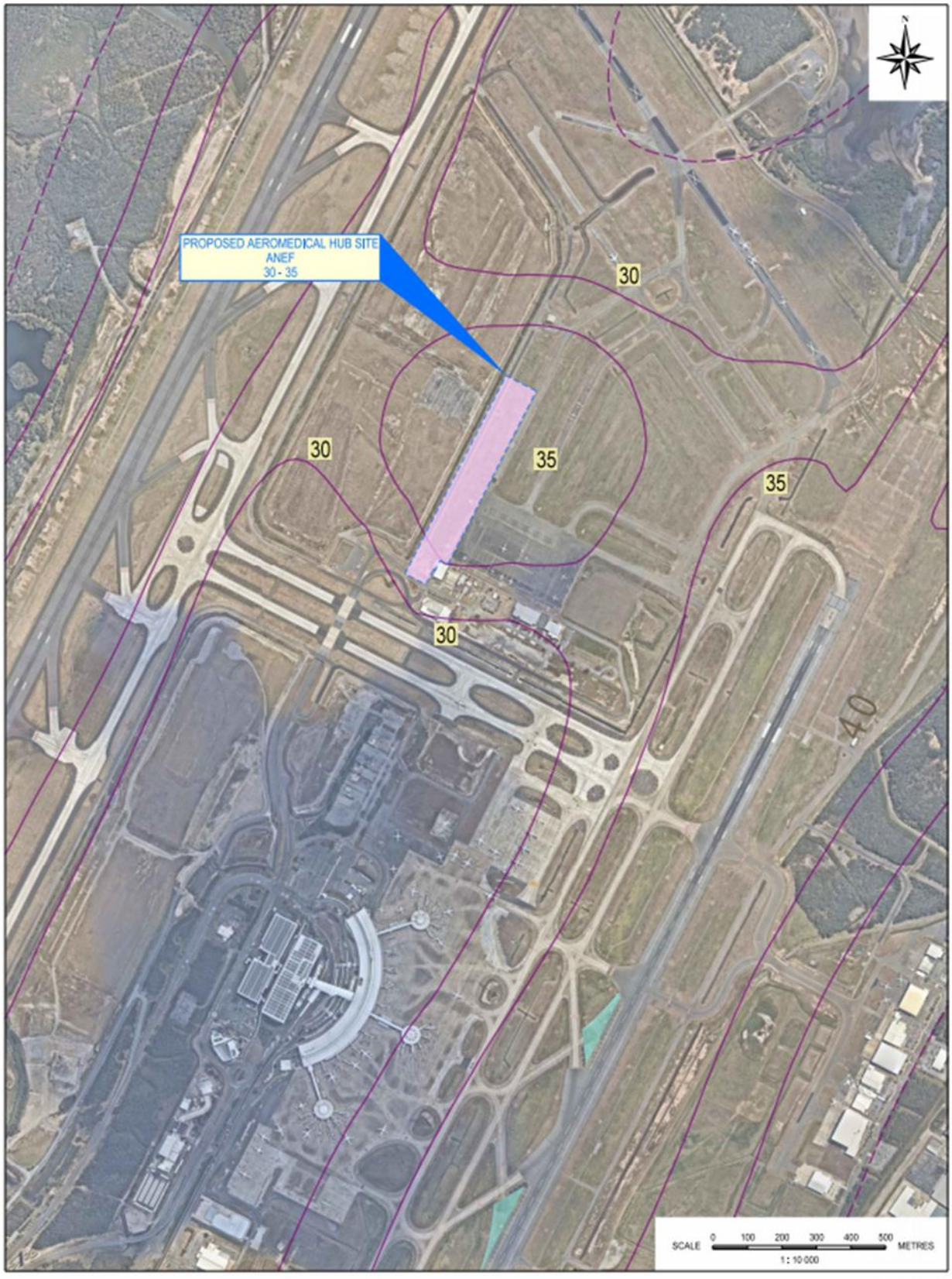
As stated within Section 2.2.1.3, a site-specific acoustic assessment will be undertaken and suitable noise attenuation will be provided in the design and submitted to the ABC for approval.

The Project is the consolidation of existing operation and Brisbane Airport. The existing and forecast aircraft traffic is summarised in Table 5.

Table 5 Project Aircraft Movement

Average Daily Movements	FY19	FY25	FY30	FY35
Brisbane Airport Total	590	718	813	910
RFDS	18 (3%)	20 (3%)	24 (3%)	27 (3%)
LifeFlight	5 (<1%)	4 (<1%)	5 (<1%)	5 (<1%)
QGAir	1 (<1%)	2 (<1%)	2 (<1%)	2 (<1%)

Figure 12 2020 ANEF Contours



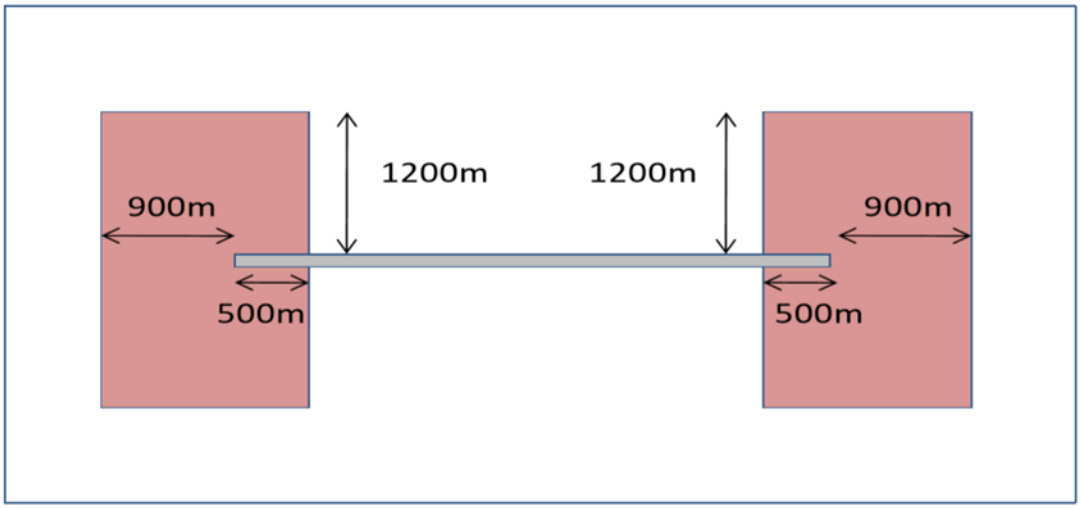
4.1.2 Windshear

NASF Guideline B, 2018 – Managing the Risk of Building Generated Windshear and Turbulence at Airports contains benchmark assessment trigger points for a new building development or building expansion.

The Project has been reviewed against the 'assessment trigger area' defined in NASF Guideline B (Refer Figure 13). The assessment trigger area extends:

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

Figure 13 NASF Guideline B assessment trigger area



The defined assessment trigger area is shown in Figure 14.

The project is located over 1000m from Runway 19R end and therefore is outside of Runway 19R assessment zone. However, the Project is within 1200m of Runway 01R/19L centreline and less then 500m of the R19L end, this places the development within the trigger assessment area. The NASF trigger surface for the Project site is a range RL 32-36m AHD. Due to the height (all proposed structures do not exceed RL 18m) of the Project structures, no expectance of the NASF trigger surface. Therefore no windshear and turbulence impact will occur on Runway 01R/19L.

Figure 14 NASF Guideline B assessment trigger area

4.1.3 Management of Wildlife

As referred to in Section 2.2.5 landscaping around the Project will be consistent with the Brisbane Airport Landscape Setting Strategy. This includes wildlife attraction mitigation measures, such as:

Plant selection to minimise bird and flying fox attraction.

- Maintain grass and groundcover planting at a length which deters birds.
- Minimise available food from outdoor dining and rubbish bins.
- Avoid bird roosting potential.
- Consider addition of products such as Avanex in seed mixes to deter birds.
- The building will have all eaves and soffits sealed and no rooting pocket will be created. This will be detailed in the Architectural design drawings.

The Landscaping Setting Strategy requirements will be addressed in the detailed design stages of the development sites.

4.1.4 Pilot distraction from lighting and reflections

Light emissions near runways are a potential cause for concern to the safe operation of landing aircraft. Potential issues include:

- Pilots momentarily dazzled by bright lights.
- Light patterns that could be confused with approach and runway lighting particularly for pilots unfamiliar with the airport.
- Lighting that may reduce the night vision of air traffic controllers.

There are three potential the Project sources of glint and glare concerns:

1. Solar panels.
2. Building and street lighting.
3. Reflectivity of building materials.

4.1.4.1 Solar panels

The updated MOS 139 now requires any proposed installation of equipment that would reflect sunlight, including solar panels, to be reviewed by CASA to determine that it will not cause a hazard to aircraft operation. The main consideration would be glare towards the air traffic controllers and glare experienced by pilots on approach and take off.

If solar panels are proposed as part of the building design, the following considerations will be included within the detailed design:

Solar panels are to be installed so that their location, orientation, and angle of incidence will avoid glare to air traffic controllers as well as landing, taking off and manoeuvring aircraft.

A glare analysis will be conducted using a recognised assessment tool (e.g., the Sandia Laboratories Glare Assessment Tool) as per US Federal Aviation Administration (FAA) Guidelines. The assessment should consider various solar panel configurations (e.g., tilt, orientation, inclination, shape, and location) to mitigate glare but also maximise energy production.

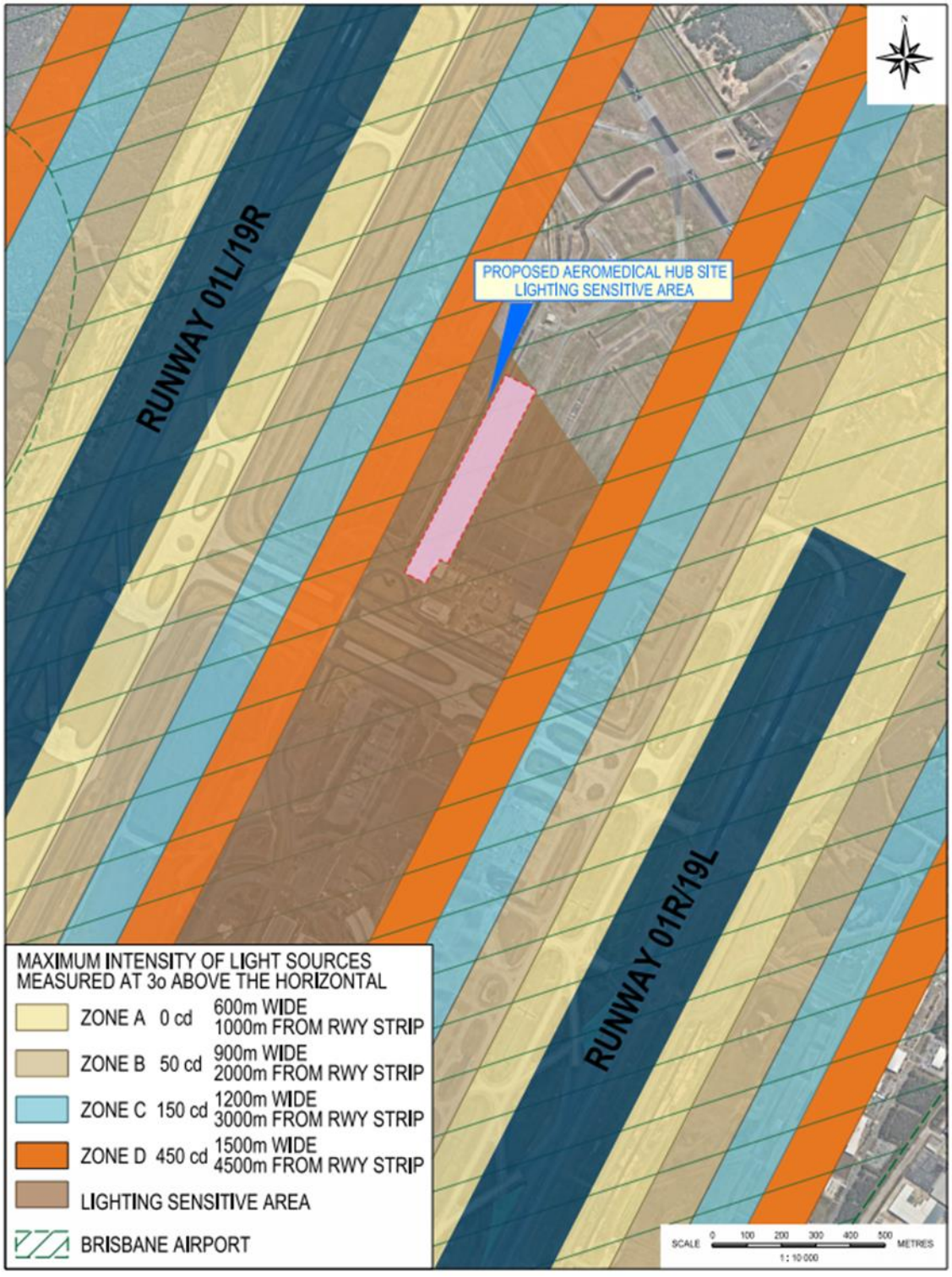
Consideration to use anti-reflective coating or textured glass noting that modern solar panels generally are designed to absorb light rather than reflect it.

Further consultation with the relevant aviation agencies will be undertaken on an as-needed basis during the building detailed design phases.

4.1.4.2 Building and street lighting

The Project site sits outside of Zone A-D outlined within the NASF Guideline, however as the site is located on Brisbane Airport the project will conform to the requirements that all external lighting will be installed in accordance with Regulation 94 of the Civil Aviation Regulations 1988, Part 139 (Aerodromes) Manual of Standards 2019 including Sections 9.143 and 9.144 and Australian Standards.

Figure 15 Maximum Intensity of light sources



4.1.4.3 Reflectivity of building materials

The external surfaces of the Project buildings and structures will be constructed from materials with low reflectivity to minimise the risk of reflected glare impacting the safe operation of aircraft or air traffic controllers. Further consultation with the relevant aviation agencies will be undertaken on an as-needed basis during the building detailed design phases.

4.1.5 Prescribed airspace – operation

The potential impact of the operational phase of the Project to Brisbane Airport's prescribed has been assessed and is detailed in the following sections.

The assessment is based on the operation of the two parallel runway system at Brisbane Airport that includes the possible extension of Runway 01R/19L and Runway 01L/19R and the future airspace surfaces.

The potential runway extension is to create an increased take off length for 01 operations (take off from the southern end) to accommodate future aircraft models. It should be noted that this assessment is a safeguard, and at present there is no known future aircraft models that require an increased take-off length.

The 01R and 01L thresholds is not planned to be moved from its current location for arrivals, and as such, the runways will be become displaced in the future configuration. The proposed airspace extension to the runways is:

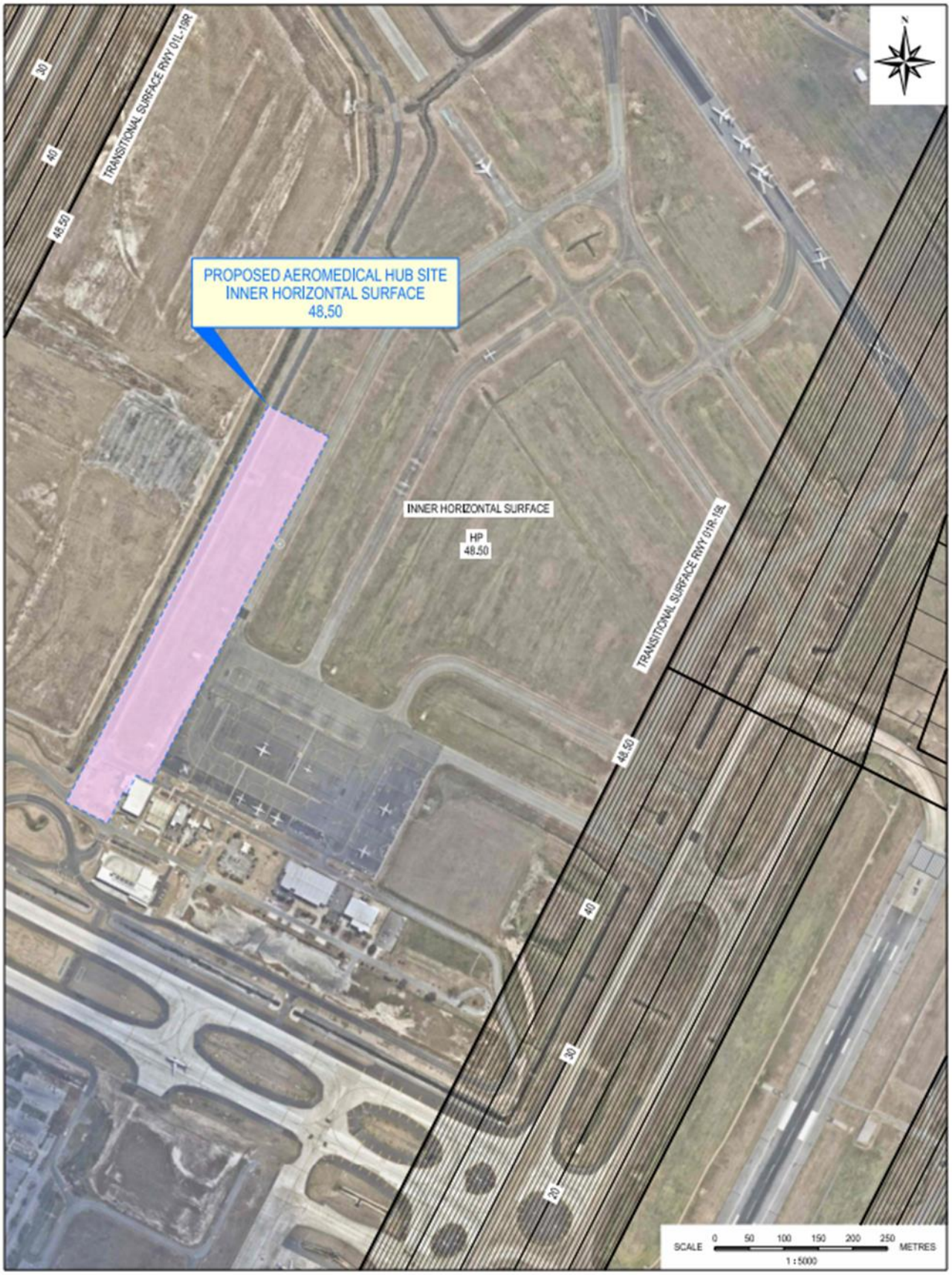
- Runway 01L/19R 300m to the south.
- Runway 01R/19L 500m to the south.

4.1.5.1 Obstacle Limitation Surface

As defined in CASA MOS 139 Chapter 7, an obstacle limitation surface (OLS) is a conceptual surface that sets the maximum height limits of objects within an aerodrome airspace to protect aircraft operations and safety in clear weather conditions. Any object that breaches the OLS will potentially become an obstacle to aircraft operations. The relevant OLS surfaces for the assessment of the Project is the Inner Horizontal Surface.

Figure 16 illustrates the OLS across the Project conceptual site area. The OLS surface at the site is RL 48.5m AHD (Australian Height Datum). At that height, no building or structure within the Project will not impact on the OLS surface.

Figure 16 Potential future runway 01R/19L OLS



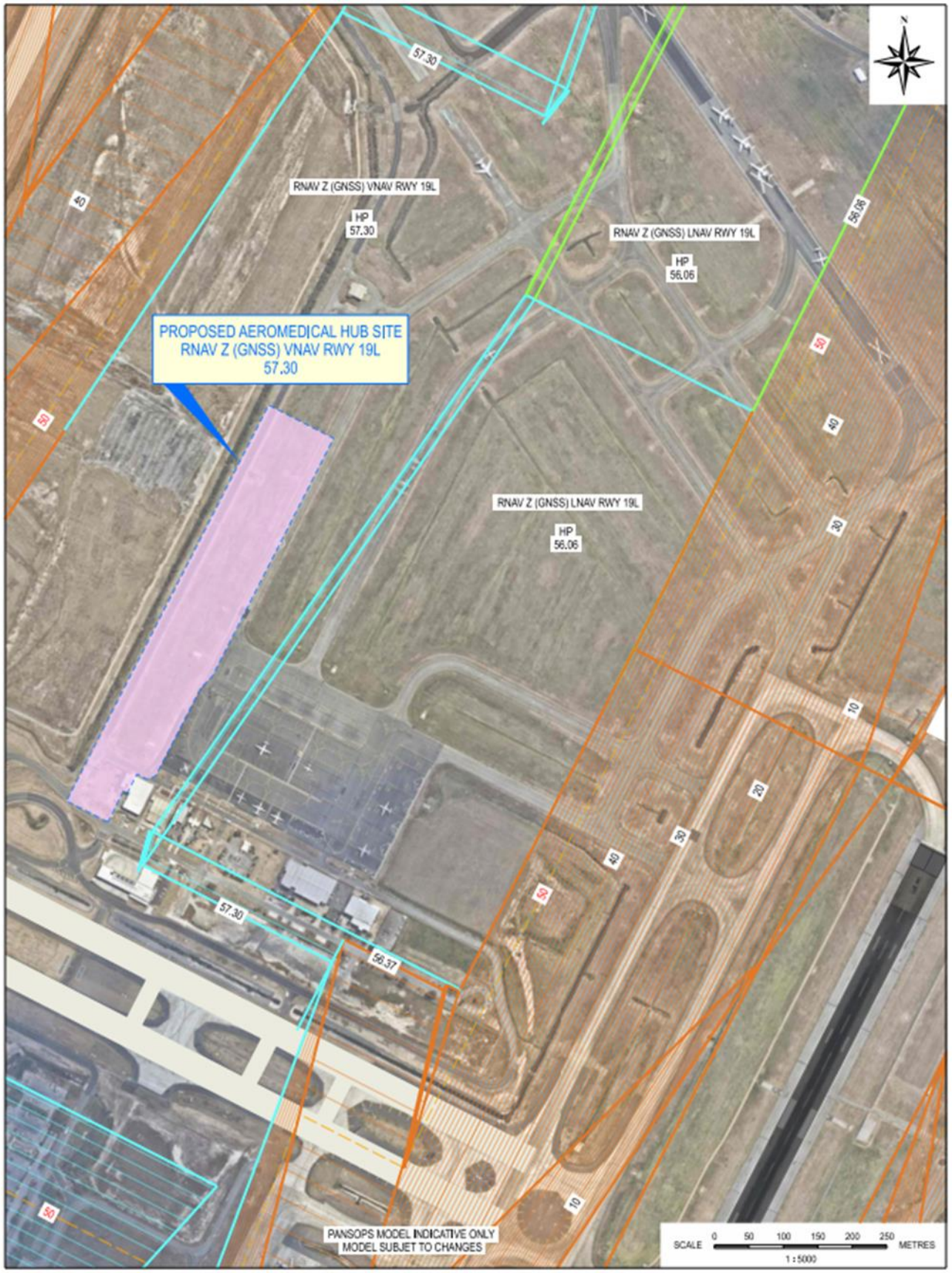
4.1.5.2 PANS-OPS surfaces

PANS-OPS surfaces refers to a conceptual surface which is intended to protect aircraft operations in poor weather or non-visual conditions (i.e. operating in instrument meteorological conditions). In these conditions, visibility can be significantly compromised due to cloud or fog. To avoid collisions, pilots need assurance that the airspace is free of obstacles. This is achieved by ensuring that no permanent structures are to penetrate the PANS-OPS surfaces.

The current PANS-OPS surfaces for Brisbane Airport were established in accordance with the Airports (Protection of Airspace) Regulations 1996, following the procedures published in ICAO Document 8168 OPS-611, Procedures for Air Navigation Services, Aircraft Operations.

The future PANS-OPS surface across the Project site is illustrated in Figure 17. The future PANS-OPS surface is RL 57.3m AHD.

Figure 17 Potential future runway 01R/19L PANS-OPS



4.1.5.3 Communication, Navigation and Surveillance

Communication, Navigation and Surveillance (CNS) systems facilitate the safe management of aircraft flow into, out of and across Australian airspace. The CNS facilities are crucial to the safety of aviation. There are a number of CNS systems installed across Brisbane Airport. These systems are essential tools of the air transport system and rely on the transmission of radio waves. The efficiency and reliability of these systems can be affected by structures such as large buildings.

4.1.5.4 Instrument Landing System and en-Route Surveillance Radar

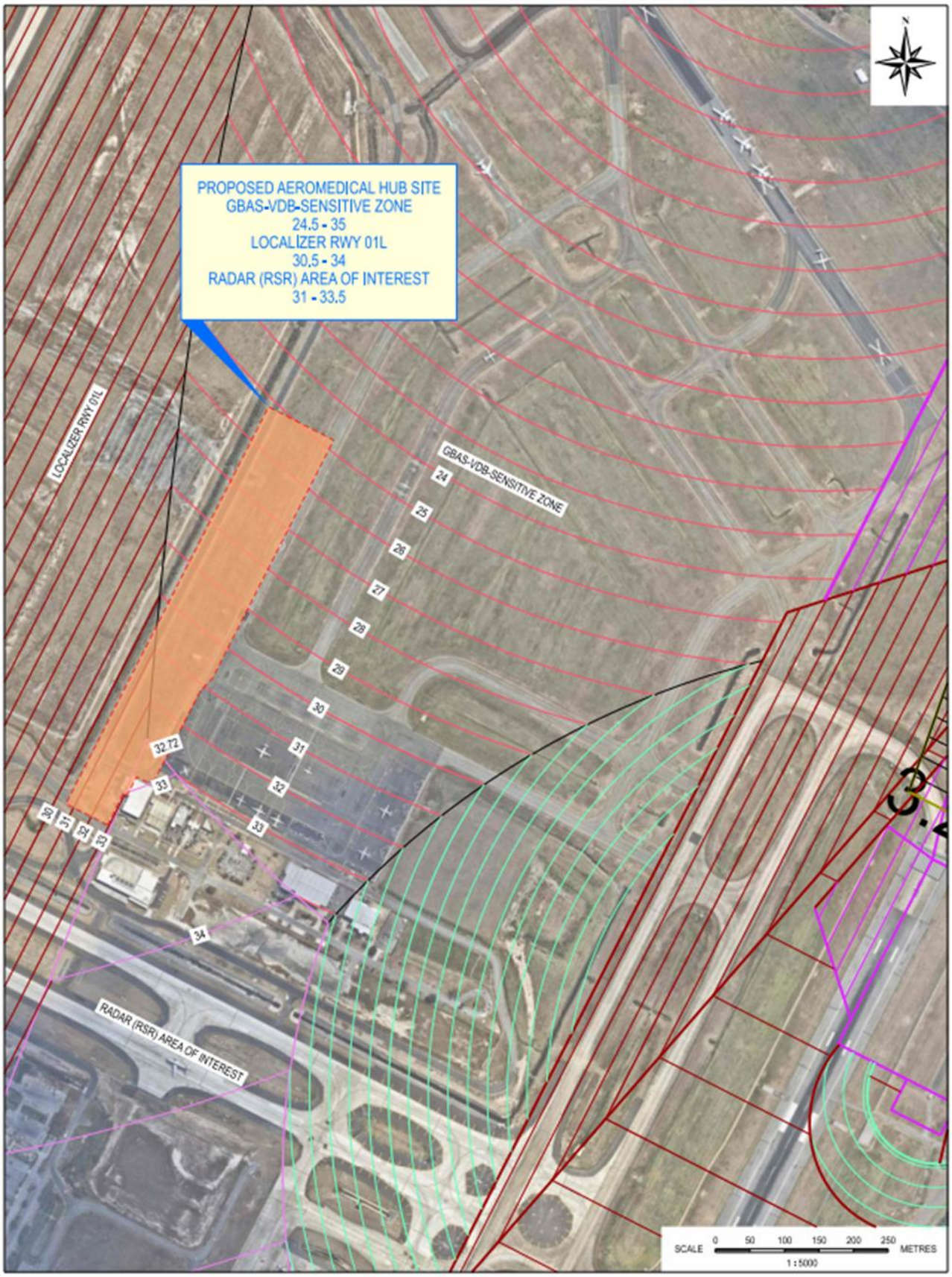
The Project is located within a number of Instrument Landing (ILS) Surfaces and the en-Route Surveillance Radar (RSR). The existing ILS and RSR surfaces cross the Project site are illustrated in Figure 18.

The southwest section of the Project is within the Localizer surfaces for Runway 01L. The surface height is RL 30.5m – 34m AHD.

The RSR surface is of interest to the southeast of the Project. The surface heigh is RL 31m – 33.5m AHD.

In the future Airservices Australia is planning to operate a Ground Based Augmentation System (GBAS) Landing System. The GBAS VHF Data Broadcast (GBAS-VDB) sensitive zone surface crosses the majority of the Project site. The surface is located across the northern section until it meets the Runway 01L Localizer and RSR surfaces to the south. The GBAS-VDB sensitive zone surface height is RL 24.5m – 35m AHD. The project will have no impact as the structure on the site will not exceed RL18m.

Figure 18 Potential future runway 01R/19L ILS and RSR



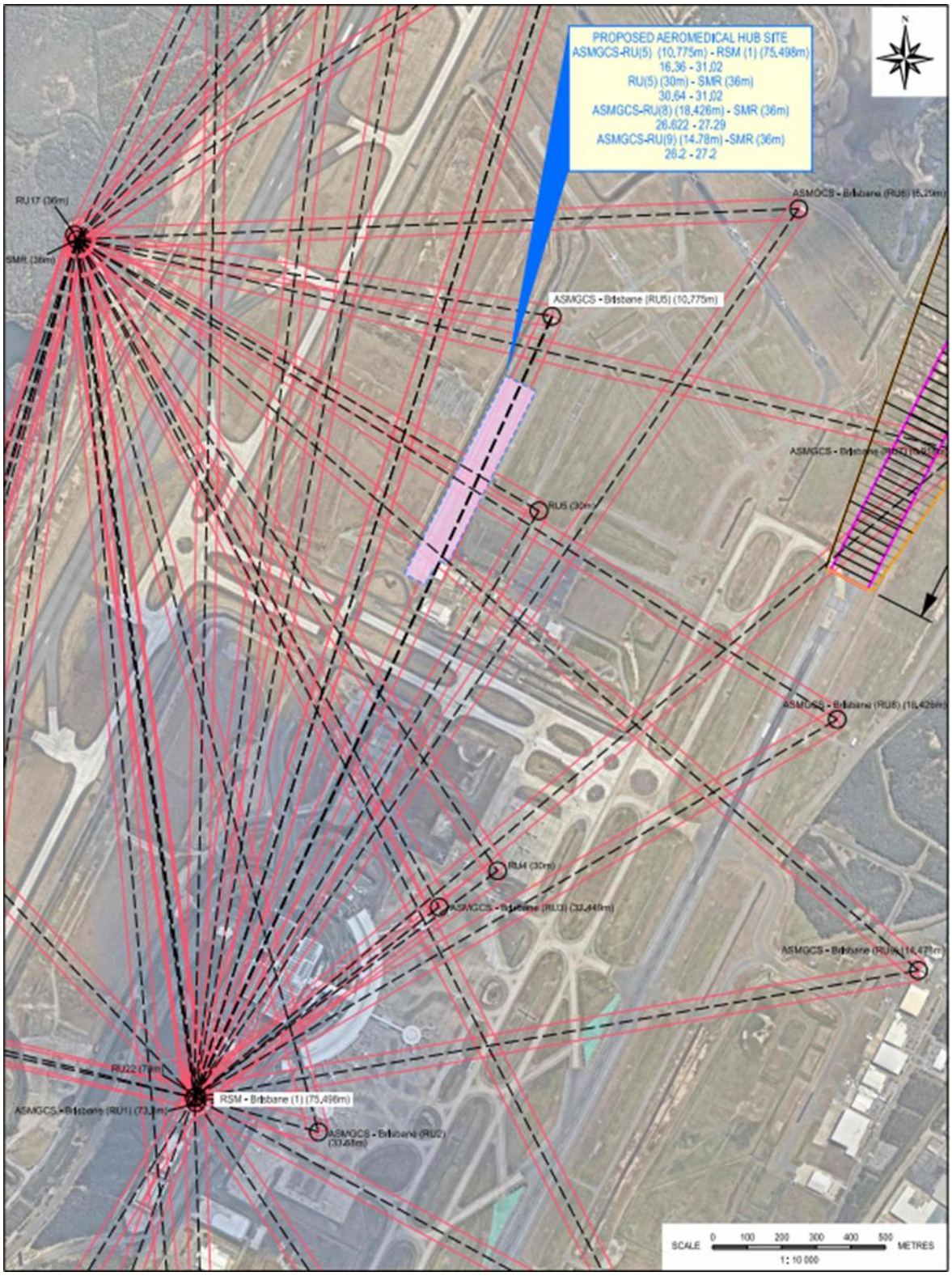
4.1.5.5 Advance Surface Movement Guidance and Control System

Airservices Australia has established an Advance Surface Movement Guidance and Control System (A-SMGCS) at Brisbane Airport. The system operates via a surface movement radar (SMR) with remote units (RUs) to triangulate and manage movements within the aircraft operating areas.

The Project site has a number of transponder communication sight lines that cross the site. Figure 19 illustrates the RU sight lines. The Project design development will consider the RU sight line. If a conflict occurs between the development and a RU sight line, the conflict will be discussed with Airservices Australia, and an agreed mitigation will be agreed prior to finalisation of the Project design development.

The proposed site has a number of RU sight lights that cross the site. The lowest of these is the sight line between ASMGCS RU(5) – RSM (1) having a height that crosses the sight between 16.36m AHD and 31.02m AHD. The Project structure are location on the western side of the site, therefore the development will not impact or interfere with the A-SMGCS.

Figure 19 Runway 01R/19L A-SMGCS sight lines



4.1.5.6 Emergency access

Emergency access will be considered and maintained in the development of the Project. Emergency access will be maintained along the relocated section of the Perimeter Road (Diamond Road).

The Project will not impede existing emergency response routes for ARFF.

4.1.6 Prescribed airspace – construction

The construction methodologies proposed for the Project will be assessed as they are developed to ensure the approved methodologies do not materially impact aviation operations and/or safety. The main aviation impacts from construction are anticipated to be:

- Dust generated during the earthworks phase of the project.
- Operational impacting with construction activities adjacent to GA Apron and taxiways.
- Maintaining of the Perimeter Road (Diamond Road) for emergency and airfield vehicles.
- Construction craneage activity in proximity to the operating airspace surfaces.

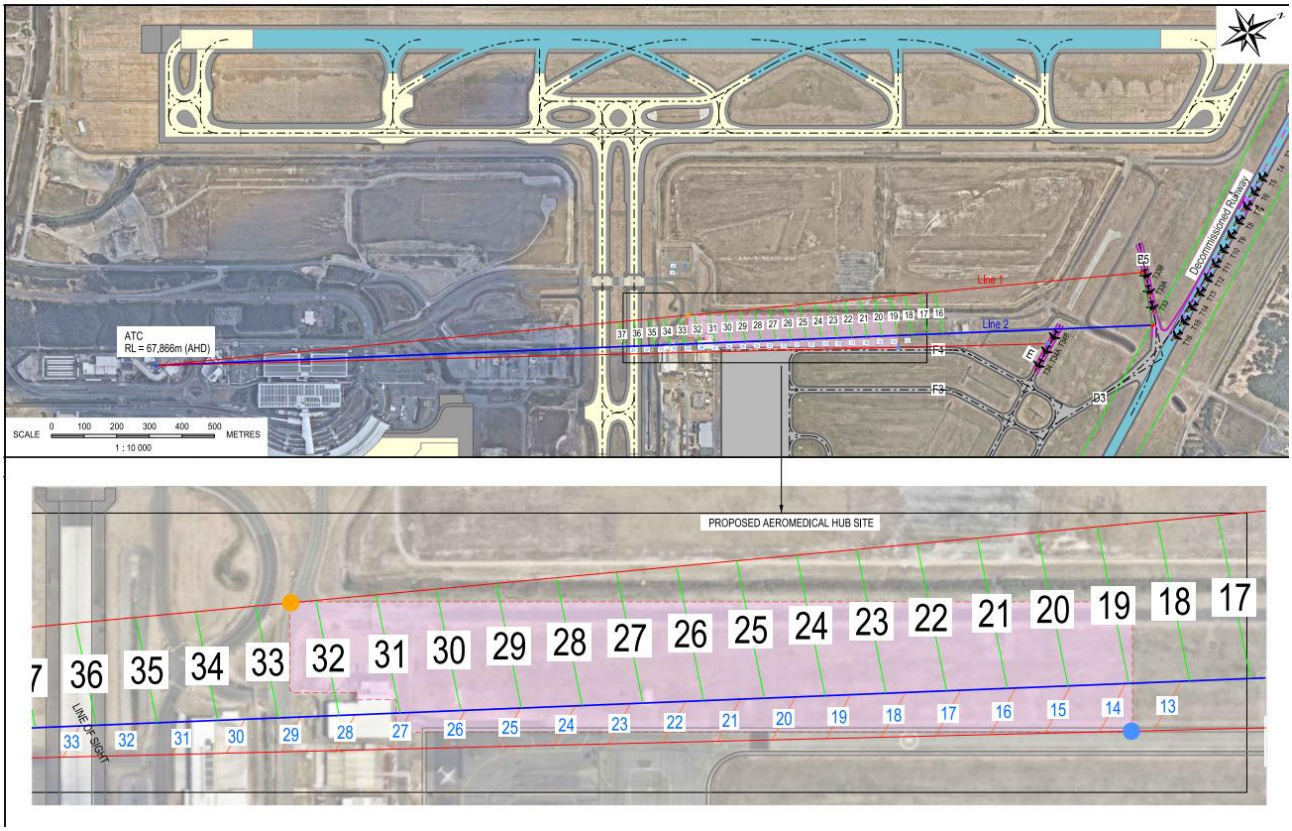
Following consultation and approval, BAC will monitor construction activities to ensure there are no material impacts to airport operations. Any such impacts will be limited in time and extent and will be agreed with BAC Airfield Operations and other relevant stakeholders.

4.1.7 Air traffic control line of sight

A review of the air traffic control tower line of sight against the Project site has indicated no impacts to the line of sight to existing manoeuvring area of Taxiway E and E5 within the airfield.

The air traffic control tower line of sight against the Project is illustrated in Figure 20 and ranges from RL 13.5 – 33.5m AHD across the site.

Figure 20 Air traffic control tower line of sight



As the structure are located on the westerns side of the development and will not exceed 18m there will be no impact from the development on the air traffic control tower line of sight.

4.1.8 Vertical gas plume rise and dust

Regulation 139.180 of the Civil Aviation Safety Regulations 1998 (along with Civil Aviation Safety Authority Advisory Circular AC 139-5(v3.0)) and the Airports (Protection of Airspace) Regulations 1996 identify the need to assess potential hazards to aviation posed by vertical exhaust plumes greater than 4.3 metres per second (m/s) velocity. The types of activities that are likely to generate such vertical exhaust plumes include power stations, smelters or activities requiring the use of pressurised gas systems.

The Project development is not expected to include infrastructure or activities that would generate vertical exhaust plumes greater than 4.3m/s. During the development of every site within the Project, the potential for vertical gas plume rise will be assessed to ensure that there is no impact to the safe operation of aircraft or air traffic controllers.

Any proposed site that may generate vertical exhaust plumes greater than 4.3m/s will be assessed in consultation with CASA.

During construction, dust suppression will maintain line of sight and visibility for aircraft and air traffic controllers.

4.1.9 Public Safety Area

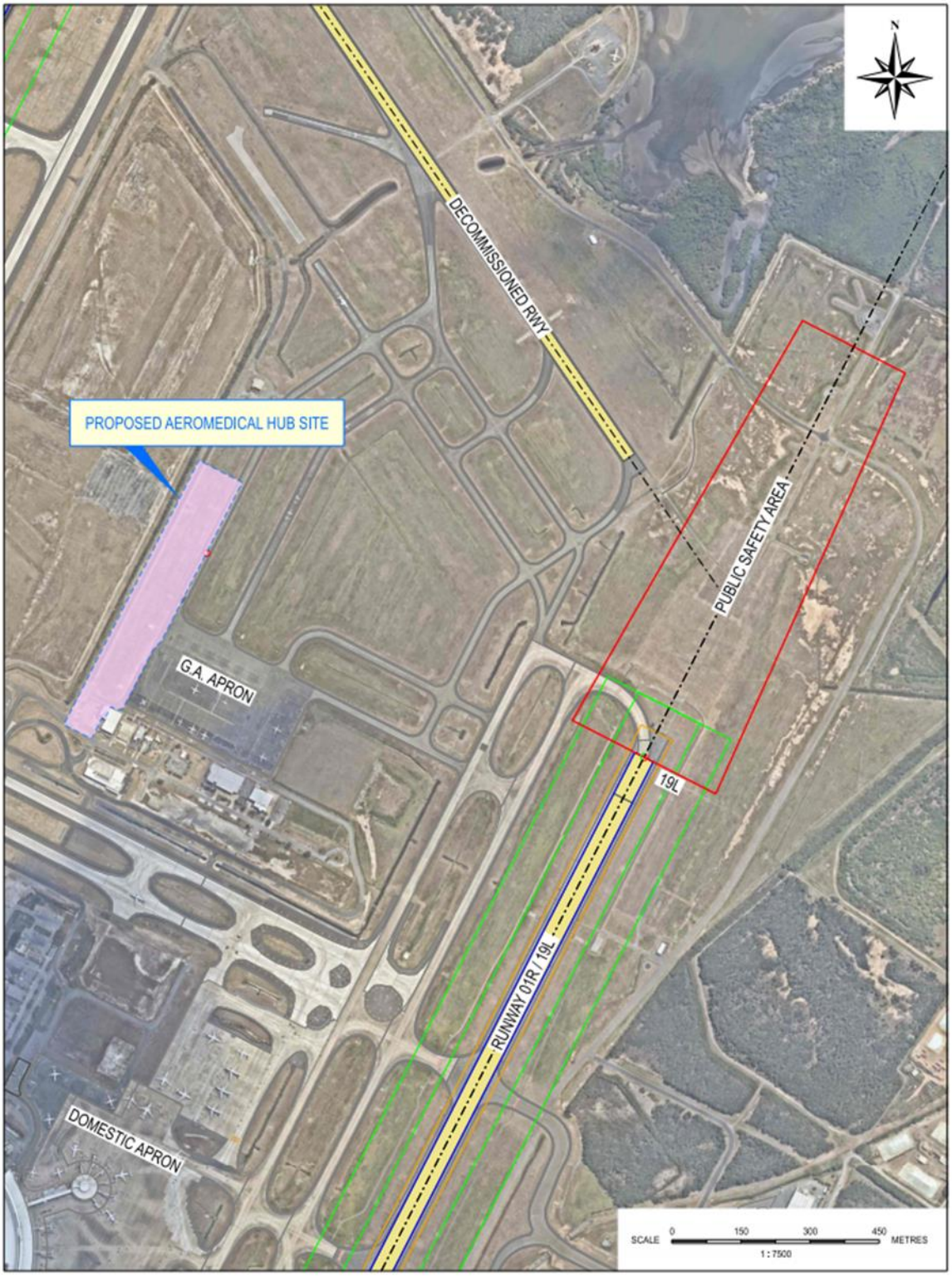
Public Safety Area (PSA) is a designated area of land at the end of an airport runway where development may be restricted to minimise risk to the public in the event of an aircraft accident on take-off or landing.

The PSA implemented at Brisbane Airport is based on the Queensland State Planning Policy (SPP), Public Safety Area (PSA) definition documented in the SPP guidance document for strategic airports and aviation facilities. This model applies a single defined PSA template and is shown for runway end 19L in Figure 21.

Figure 21 Queensland Public Safety Area

The Project site is located outside of the 19L and 19R the PSA. Figure 22 shows the Project position against the 19L Runway PSA.

Figure 22 Public Safety Area



4.1.10 Constraining surface

The aviation operational and safety assessment of the Project has considered all aeronautical surfaces and sight line. The assessment has identified that the most constraining surface to site is the air traffic control line of sight to the existing manoeuvring area of Taxiway E and E5.

Table 6 Aviation operational and safety constraints

Assessment Surface	Constraining Surface Level (AHD)	Status
Air traffic control line of sight	13.5 - 30m	Constraining Surface
Windshear (NSAF 1:35 Trigger Surface)	32 - 36m	Non-Constraining Surface
Obstacle Limit Surface	48.5m	Non-Constraining Surface
PANS-OPS	57.3m	Non-Constraining Surface
ILS and RSR Surfaces	24.5 - 35m	Non-Constraining Surface
A-SMGCS RU Sight Lines	16.36 – 31.02m	Non-Constraining Surface

A detailed assessment will be undertaken as part of the future building development approvals to ensure the proposed development does not impact this constraining surface. Any buildings or structures within the Project that infringes the air traffic control line of sight surface will not be permitted without consent/approval from Airservices Australia.

4.1.11 Mitigation measures

The Project building height restrictions vary across the site and are driven by the air traffic control tower line of sight to taxiway E and E5 and CNS systems across the airfield. The buildings within the Project site will not exceed CNS systems and control tower line of sight surfaces and will be subject to detailed review as part of the respective building approval submissions. The building heights for each development will be finalised in close consultation with Airservices Australia.

Other mitigation measures related to aviation operations and safety include:

- BAC will continue to liaise with Airservices Australia during the detailed design phase to ensure there will be no disruption to existing or future communications, navigation, and surveillance systems (CNS) equipment, Navigational Aids (NAVAID) protection surfaces and the continuous line of sight for air traffic controllers (both current and future).
- BAC will engage with CASA and Airservices Australia as the various construction stages are progressed to ensure that any crane or elevated plant operations comply with the maximum operating height requirements on airport. Should any proposed construction methodology consider that cranes will penetrate the prescribed airspace, approvals under the Airports (Protection of Airspace) Regulations 1996 (APAR) will be sought.
- If required, a vertical plume assessment will be undertaken in close consultation with CASA.
- Dust suppression activities will be undertaken throughout construction to maintain line of sight and visibility for aircraft and air traffic controllers.

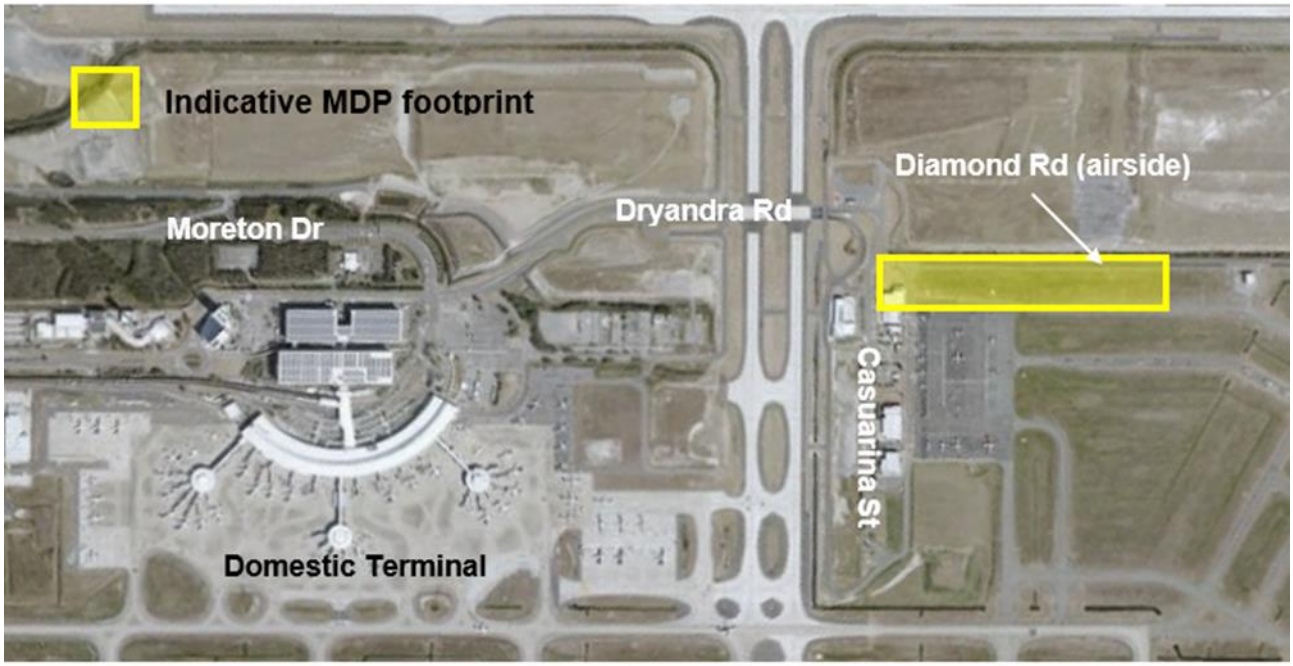
4.2 Road network

The development and operation of the Project has the potential to generate traffic and transport impacts within the road network surrounding the development. As part of the MDP process, a traffic impact assessment has been completed by PSA Consulting to assess the impact of this Project and ensure that the Project will meet the requirements of Section 91 of the Airports Act.

4.2.1 Baseline conditions

The Project is located north of Casuarina Street, east of Dryandra Road and adjacent to Diamond Rd (airside road). Figure 23 outlines the site location relative to the existing road network.

Figure 23 The Project locality plan



All roads in the surrounding road network are under the jurisdiction of BAC, with a summary of the road characteristics in the vicinity of the development site, including posted speed limits, shown in Table 7.

Table 7 Road network characteristics

Road	Geometry	Posted speed limit (km/hr)
Moreton Drive	Varies along length. In vicinity of development site, 5-lane one-way undivided carriageway	40
Dryandra Road	2-lane, 2-way divided carriageway	60
Casuarina Street	2-lane, 2-way undivided carriageway	40
Diamond Road (airside)	2-lane, 2-way undivided carriageway	40

4.2.1.1 Existing background traffic volumes

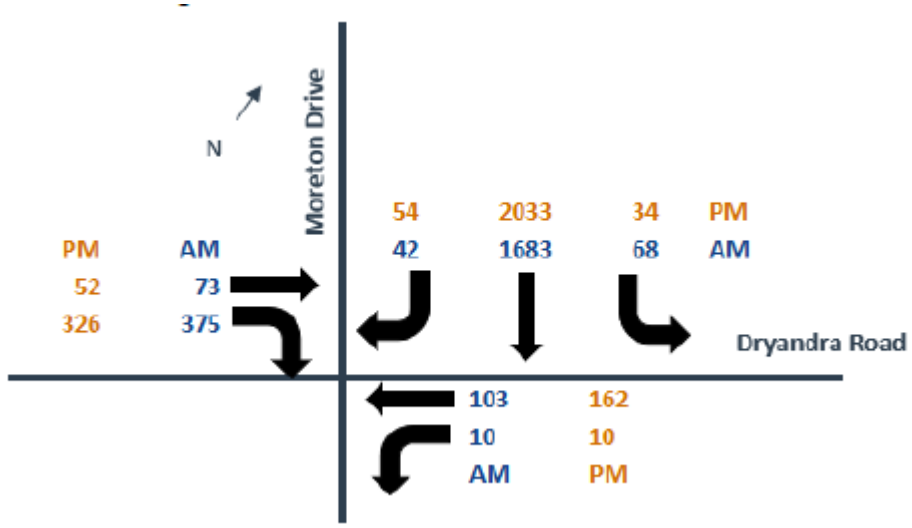
Owing to a reduction in vehicle traffic across the airport due to the impacts of the COVID-19 pandemic, it was not possible to accurately collect recent traffic counts for the Casuarina Street or the intersection between Moreton Drive and Dryandra Road. Instead, background traffic volumes have been obtained from the most recent available counts and studies undertaken between 2015 and 2017.

Moreton Drive and Dryandra Road Intersection

The data showed that the busiest day at the Domestic Terminal precinct is typically a Friday with over 40,000 vehicles per day travelling through the intersection on the Friday of each week. Analysis found that the AM peak hour occurred between 8am and 9am, with the PM peak hour occurring between 4pm and 5pm.

2014 AM and PM peak hour background traffic volumes at the intersection between Moreton Drive and Dryandra Road are shown in Figure 24.

Figure 24 Existing 2014 Background Traffic Volumes

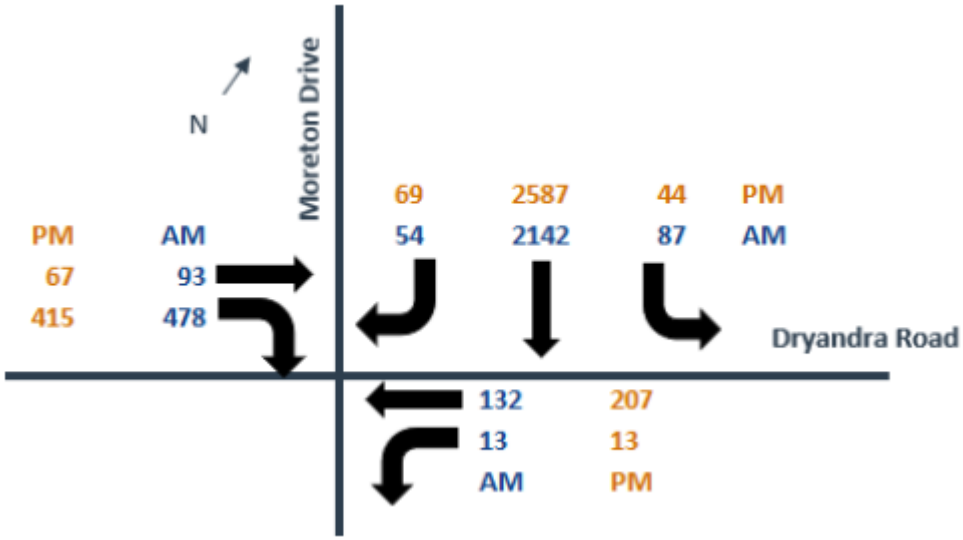


4.2.1.2 Traffic Growth

The background traffic growth ranged from 2.5% to 5.0% per annum based on previous investigations. For the purpose of this analysis, a compound annual growth rate of 3.5% per annum has been adopted and applied to all background traffic volumes to obtain future year traffic volumes. This is considered to be a conservative assessment

This growth rate has been used to grow the 2014 background traffic volumes forward to the current year (2021) as shown in Figure 25.

Figure 25 Existing 2021 Background Traffic Volumes



Existing intersection performance

The results of the SIDRA analysis indicate that the Moreton Drive and Dryandra Road intersection is currently operating above acceptable DoS parameters during the PM peak hour, but within total capacity. 95%ile back of queue lengths on all approaches are able to be accommodated within the existing geometry of the intersection

Figure 26 Moreton Drive and Dryandra Road – 2021 background traffic intersection analysis results

INTERSECTION APPROACH	DEGREE OF SATURATION		AVERAGE DELAY (s)		LEVEL OF SERVICE		95%ile BACK OF QUEUE (m)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Dryandra Road north-east	0.752	0.911	64.4	69.4	C	D	43.8	73.0
Moreton Drive	0.845	0.915	28.4	30.1	C	D	295.8	424.1
Dryandra Road south-west	0.827	0.898	45.6	60.7	C	C	212.4	214.6
INTERSECTION	**0.845**	**0.915**	**33.4**	**37.0**	**C**	**D**	**295.8**	**424.1**

4.2.2 Assessment of construction impacts

Construction is expected to take place in stages in line with the target development program. The traffic impact assessment undertaken for this project has indicated that there is capacity within the existing network to allow for construction traffic.

Prior to construction works commencing a traffic assessment will be undertaken to ensure that the construction works do not have a negative impact on the road network. Peak construction traffic generation is expected to occur during the earthworks phase where previous projects have recorded approximately 160 heavy vehicles per day, or approximately 16 vehicles per hour inbound (towards Airport North) and outbound (leaving Airport North). The construction traffic is expected to access the project site via Moreton Drive, Dryandra Road and Casuarina Street.

It is considered that the short-term impacts of the construction traffic, when carefully managed, will not have a material impact due to the landside road network having adequate spare capacity in the near term to cater for the expected construction traffic demand.

4.2.3 Assessment of operational impacts

The Project will be accessed via Moreton Road, Dryandra Road and Casuarina Street as demonstrated in Figure 27.

Figure 27 The Project base access roads

The estimated traffic generation is shown in Table 8.

Table 8 Estimated the Project base traffic generation

Site	Estimated GFA (m^2)	Adopted trip generation rates / 100m2 GFA	Peak hour vehicle trips
Hanger	46,660	0.5	33
Office	15,925	2	144
		TOTAL Peak Hour Vehicle Trips	**177**

Trip generation of the proposed development has been based on generation rates provided in the *NSW RTA Guide to Traffic Generating Developments*. For the purposes of this assessment, it has been assumed that the hanger spaces will generate traffic at a rate equivalent to a warehouse use. The café space is considered to be ancillary to the primary function of the development and as such has been assumed to not generate any additional traffic.

4.2.3.1 Trip Distribution

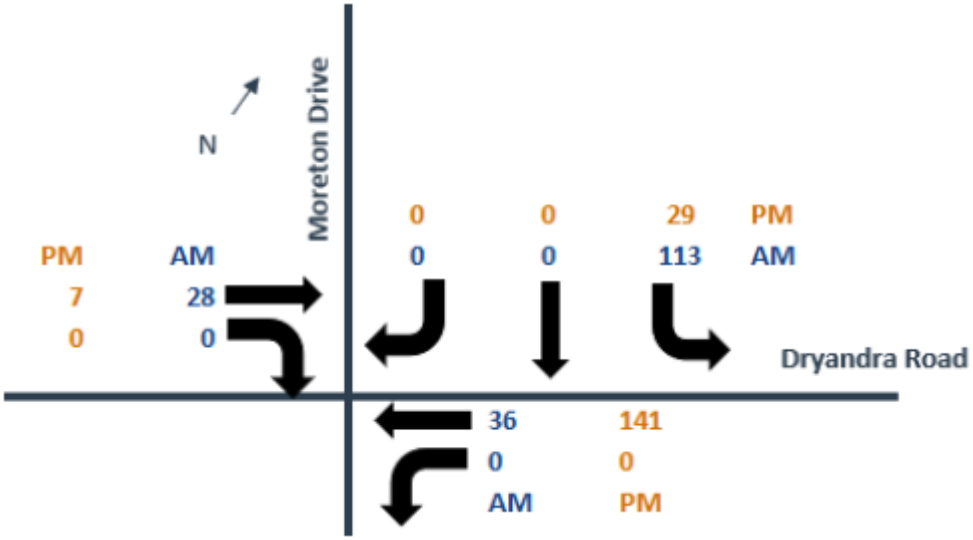
It has been assumed that 80% of traffic movements during the AM peak hour are entering the development, with the remaining 20% of traffic movements assumed to be exiting the development. In the PM peak hour, it has been assumed that 20% of traffic movements are entering the development, with the remaining 80% of traffic movements assumed to be exiting the development.

Vehicles traveling to the proposed development can either turn left from Moreton Drive onto Dryandra Road or travel straight along Dryandra Road at the intersection between Moreton Drive and Dryandra Road. Based on the existing traffic volumes and the most efficient routes for vehicles to take, it has been assumed that 80% of traffic accessing the proposed development will travel via Moreton Drive with the remaining 20% travelling via Dryandra Road. All traffic exiting the development will travel straight through the Dryandra Road intersection to avoid travelling towards the domestic terminal building and set down / pick up area.

4.2.3.2 Development traffic turning movements

Based on the trip generation and distribution assumptions made for the proposed development, Figure 28 shows the development traffic volumes for the intersection between Moreton Drive and Dryandra Road

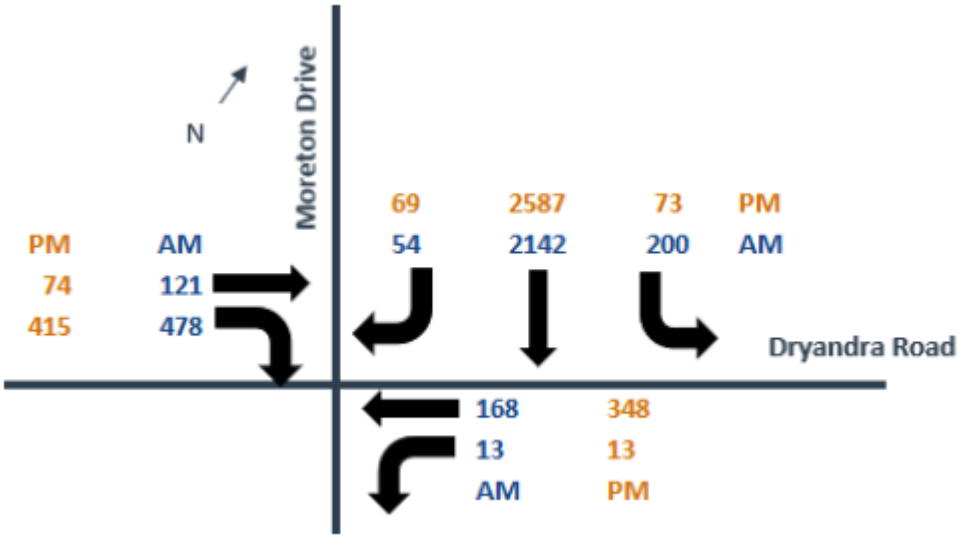
Figure 28 Development traffic volumes



4.2.3.3 Traffic Impact Assessment

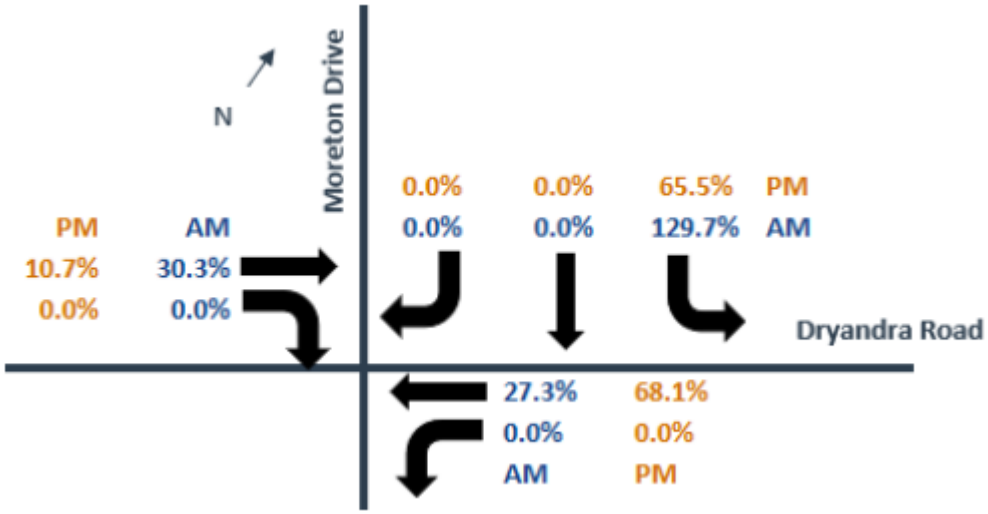
Design traffic volumes have been calculated by adding the development traffic volumes to the background traffic volumes. Figure 29 shows the design traffic volumes as a result of the proposed development.

Figure 29 Design traffic volumes



The proposed development is expected to increase the volume of traffic at the intersection between Moreton Drive and Dryandra Road for some turning movements as shown by the actual percentage increase in traffic volumes shown in Figure 30

Figure 30 Percentage increase in vehicle movements



To quantify the impact of the proposed development on the intersection between Moreton Drive and Dryandra Road, SIDRA analysis has been undertaken with a summary of the results shown in Figure 31.

Figure 31 Moreton Drive and Dryandra Road – Design traffic intersection analysis results

INTERSECTION APPROACH	DEGREE OF SATURATION		AVERAGE DELAY (s)		LEVEL OF SERVICE		95%ile BACK OF QUEUE (m)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Dryandra Road north-east	0.833	0.972	65.3	80.0	C	E	56.1	138.2
Moreton Drive	0.858	0.986	27.8	46.9	C	E	40.7	598.1
Dryandra Road south-west	0.848	0.958	47.0	79.4	C	E	220.7	256.5
INTERSECTION	**0.858**	**0.986**	**33.6**	**54.7**	**C**	**E**	**40.7**	**598.1**

The analysis shows that the intersection continues to operate within total capacity.

The existing Moreton Drive and Dryandra Road intersection has sufficient capacity for the estimated the Project generated traffic. No upgrades to this intersection are expected to be required from impacts of the Project.

Based on the design traffic volumes for Dryandra Road shown in Figure 29, the existing intersection of Casuarina St and Diamond Rd has sufficient capacity for the estimated Project generated traffic.

Based on how vehicles are travelling to and from Brisbane Airport presently, the estimated traffic generation is not expected to materially increase the traffic on Moreton Drive or Airport Drive.

4.3 Other infrastructure and services

4.3.1 Stormwater

The Project development site is located within the Airside Drain catchment of Brisbane Airport. Master drainage planning across the airport has been carried out which considers the proposed long-term development across the site and identifies trunk drainage requirements and associated Minimum Development Levels (MDLs). MDLs are set to ensure an appropriate level of flood immunity is achieved and maintained over the design life of the proposed development.

The Project site is drained through a series of constructed channels to the discharge point into Moreton Bay at Serpentine Inlet. The drainage requirements for the development have been assessed to determine the trunk drainage requirements and MDL (based on 1per cent Annual Exceedance Probability at 2100) for the Project. This information will be used to inform and guide the detailed design, ensuring it remains compliant.

4.3.2 Utility requirements

The supply requirements of energy, water, sewer services and telecommunications for the Project will require an extension of the existing distribution networks.

The intended extensions are consistent with the projected rate of utilities network development at the airport and the key objectives contained in the 'Plan for Utilities Development' as part of the Master Plan. The objectives include:

- Ensuring distribution networks meet the required future demand and continue to improve network performance.
- Promote energy efficiency and sustainability by harnessing available technologies and encouraging tenants to adopt sustainable operations.
- Active engagement with utility suppliers to ensure that the development is in line with agreed future plans.
- Establish collaborative relationships with the local, state, and federal governments if required.
- Meet all legal, compliance and corporate governance obligations.

ENVIRONMENT ASSESSMENT

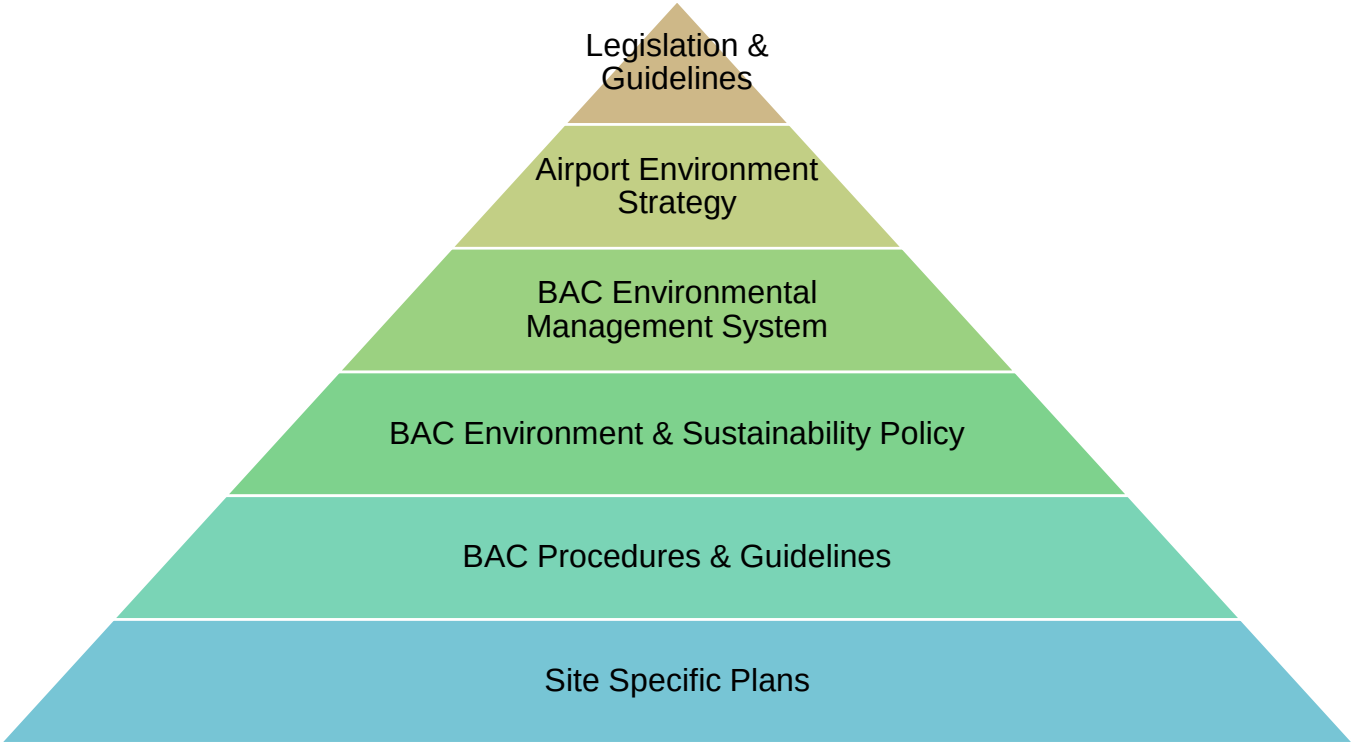
5.1 Environment management overview

Primary environmental compliance at Brisbane Airport is governed by the *Airports Act 1996 (Cth)*, the *Airports Regulations 1997 (Cth)* and the *Airports (Environment Protection) Regulations 1997 (Cth)* (AEPR). Locally, the Airport Environment Officer (AEO), appointed by the Department of Infrastructure, Transport, Regional Development and Communications is responsible for administering the AEPR.

The Brisbane Airport Master Plan includes the Airport Environment Strategy (AES) that covers all environmental matters arising from the operation and ongoing development of the airport. The AES outlines BAC's commitment to best practice in environmental compliance and sustainability with documented affirmative measures to ensure continuous improvement in all aspects of environmental management.

The hierarchy of environmental guidance for development plans including MDPs is illustrated in Figure 32.

Figure 32 BAC environmental overarching framework



BAC's commitment to environmental responsibility extends beyond ensuring strict compliance with regulatory standards and controls. Maintaining long-term environmental sustainability is a fundamental tenet of BAC's operating philosophy. The AES includes specific and detailed plans of action across several categories, including:

1. **Cleaner air**: Reducing the sources of ground-based air quality emissions and supporting sustainable transport and active living options.
2. **Best practice water quality management**: Protecting surrounding waterways and ecosystems from adverse stormwater run-off and pollution.
3. **Soil and groundwater management**: Driving improvements in soil and groundwater quality through research, tenant engagement and risk management.

4. **Minimising ground-based noise**: Ensuring sources of ground-based noise have minimal impact on airport workers, the local community and the environment through appropriate planning, design, and operations.
5. **Sustainable development**: Minimising the impact on the environment, local community, and airport workers from airport development through responsible planning, construction, and procurement practices.
6. **Reducing greenhouse gas emissions**: Reducing carbon emissions and taking steps to manage related issues across all airport operations.
7. **Climate change adaptation**: Addressing climate change impacts across all levels of normal airport operations and development activities.
8. **Water conservation**: Ensuring the reduction and efficient use of potable water and increased use of recycled water on airport.
9. **Reducing waste**: Reducing waste to landfill by encouraging recycling and the reuse of resources.
10. **Protecting biodiversity**: Maintaining the airport's biodiversity values and contributing to Brisbane's biodiversity.
11. **Preserving and promoting our heritage**: Ensuring that the airport's heritage values are maintained and promoted.
12. **Tenant and contractor obligations**: Ensuring airport tenants and contractors are aware of their obligations to develop and implement Operational Environment Management Plans.

The AES principles are considered and headline the Project environmental assessment sections.

5.2 Airport site environmental context

Brisbane Airport is situated on a reclaimed portion of a river delta at the mouth of the Brisbane River. The area surrounding Brisbane Airport is largely industrialised. With a coastal location the airport also contains and is adjacent to some areas of environmental importance.

More than 10 per cent of the 2,700-hectare Brisbane Airport site is dedicated to biodiversity conservation, including the foreshore, mangrove and saltmarsh communities, casuarina plantations and Phragmites wetlands/unmanaged grasslands that are home to locally significant bird species, the Lewin's Rail, Eastern Grass Owl and King Quail.

Areas of environmental value within and adjacent to the airport (Figure 33) include:

1. Moreton Bay Marine Park – a wetland of international importance under the Ramsar Convention on Wetlands.
2. The Brisbane Airport foreshore – feeding grounds for international migratory shorebirds.
3. Mangrove and saltmarsh communities under Serpentine Inlet, Jackson's Creek, Jubilee Creek and Pinkenba.
4. The Boondall Wetlands – listed under the Ramsar Convention as an internationally important wetland for international migratory shorebirds.
5. Bulwer Island and Boggy Creek wetlands.

Figure 33 Areas of environmental value withing or adjacent to the airport

The airport site is also seen as culturally and spiritually significant to the Traditional Owners of the land and also has European historic heritage significance.

Aboriginal cultural and spiritual significance within and adjacent to Brisbane Airport include Dreaming Tracks and Dreaming Sites (an integral part of Aboriginal people's connection to country), the Nudgee to Eagle Farm Pathway (which connected ceremonial sites, hunting grounds and camp sites in the local area), ceremonial grounds, food and water resources, temporary campsites, isolated archaeological finds, and a former burial site.

European historic heritage sites at Brisbane Airport include remnants of the former Cribb Island residential community, the former Cribb Island school site, the Kingsford Smith Memorial, Southern Cross aircraft, a memorial to the 460-bomber squadron from WWII, and an unofficial memorial garden for the scattering of ashes.

There are no Aboriginal or European cultural sites on or adjacent to the Project site.

Significant industrial neighbours include the Port of Brisbane, the Luggage Point Wastewater Treatment Plant, the BP jet fuel import terminal at Bulwer Island, the Viva Energy fuel storage and distribution terminal at Pinkenba, Caltex oil refinery at Lytton and heavy industries including fertilizer and concrete manufacturing plants.

The Project is located adjacent to the General Aviation (GA) Apron and has commercial buildings that primarily service the GA Apron and its operations.

Currently, the Project site is predominantly grassed with the airside Perimeter Road and a drain on the western portion of the site. The site is bounded by an open drainage swale on the western perimeter, which flows into Serpentine Inlet which ultimately drains to Moreton Bay.

5.3 Groundwater and surface water

AES focus – best practice water quality management
Protecting surrounding waterways and ecosystems from adverse stormwater run-off and pollution.

AES Focus – soil and groundwater management
Driving improvements in soil and groundwater quality through research, tenant engagement and risk management.

5.3.1 Baseline conditions

Site history

A review of historical aerial imagery of the Project site was undertaken to document the site history – aerial photographs from 1946, 1958, 1969, 1978, 1987, 1994, 2002 and 2020 were available. Select images are included below in Figure 34, Figure 35 and Figure 36 for reference.

Key milestone observations

From 1946 significant development had occurred around the site, with the establishment of the Cribb Island community and clearing for agricultural activities, however the site remained as the mangrove ecosystems until the establishment of Brisbane Airport in its currently location in the 1980s. Refer Figure 34 for site footprint in 1946.

Figure 34 1946 historic aerial, the Project site (source: Department of Natural Resources, Mines and Energy, 2020)

During the construction of the current Brisbane Airport, aerial images shows (Figure 35) by 1987 the site had been cleared and filled and an airfield established.

Figure 35 1987 historic aerial, the Project site (source: Department of Natural Resources, Mines and Energy, 2020)

Adjacent to the site GA facilities were constructed, however the site remained relatively undisturbed from the grass airfield established by 1987.

Figure 36 2020 aerial (source: Nearmap, 2020)

Groundwater conditions

Groundwater monitoring was performed by both Aurecon (2021a) and Douglas Partners (2021) with two monitoring rounds in total from five groundwater wells across the Project site. Groundwater quality is summarised as follows:

- Average groundwater level at the site was 0.6 m bgl (2.5 m AD). A level logger recorded tidal influence over one week during a spring tide of up to 0.12 m
- The pH in the groundwater indicated neutral conditions
- Groundwater acidity ranged from 6 mg/L to 130 mg/L while alkalinity ranged from 200 mg/L to 2,000 mg/L
- Groundwater electrical conductivity indicated freshwater to brackish conditions
- Dissolved iron concentrations were relatively low and ranged between 0.07 mg/L and 0.34 mg/L
- The chloride:sulfate ratio (Cl:SO42-) ratio of the groundwater samples (Round 2 only) identified that the groundwater was not influenced by past oxidation of ASS

Arsenic, chromium, lead, and nickel concentrations were detected in groundwater, although at low concentrations below adopted screening criteria. Copper and zinc concentrations were detected in four samples above the adopted screening criteria for 95% species protection and AEPR 1997 limits for marine waters. It should be noted that groundwater underlying the Project site is subject to tidal influence and multiple studies have found metals including copper, zinc, nickel, chromium and lead in the waters and sediments of Moreton Bay, particularly Bramble Bay which is immediately adjacent to the Brisbane Airport site (Arakel and Hongjun, 1992; Brady 2015; Morelli and Gasparon, 2019). Queensland soils are also well known to contain relatively elevated levels of various metals/metalloids (Brady, 2015) and it is highly likely

that this is significantly contributing to the levels of metals/metalloids detected in the groundwater at the Brisbane Airport.

All groundwater samples detected PFOS concentrations above the adopted ecological screen criteria for 99% species protection for fresh and marine water while four groundwater samples contained PFOS concentrations above the adopted ecological screen criteria for 95% species protection for fresh and marine water. All groundwater samples contained PFAS concentrations below the human health (recreational water) screening criteria.

Surface water conditions

Surface water monitoring was performed by both Aurecon (2021a) and Douglas Partners (2021) with two monitoring rounds in total from three locations along the existing drainage channel (upstream, downstream and adjacent to the Project site). Surface water quality is summarised as follows:

- Arsenic, cadmium and lead were detected in the surface water but at concentrations below the adopted screening criteria
- Copper concentrations were above the adopted screening criteria for 95% species protection and AEPR 1997 limits for marine waters in all three sampling locations
- A single nickel concentration was above the adopted screening criteria for AEPR 1997 limits for marine waters
- Zinc concentrations from two sampling locations were above the adopted screening criteria for 95% species protection and AEPR 1997 limits for marine waters
- All samples from all three surface water sampling locations detected PFOS concentrations above the adopted ecological screen criteria for 99% species protection for fresh and marine water while three samples contained PFOS concentrations above the adopted ecological screen criteria for 95% species protection for fresh and marine water
- All surface water samples contained PFAS concentrations below the human health (recreational water) screening criteria.

5.3.2 Assessment of impacts

Groundwater

A geotechnical and groundwater model was developed for the Project site to estimate the changes in groundwater levels calculated to occur during surcharging of the site. This model was based on a worst-case scenario that included the placement of fill and surcharge material for a period of 6 months, without the addition of piling using controlled modulus columns (CMCs). It is anticipated that the impact to groundwater from piling using CMCs will be much lower than that of surcharging due to the minimal settlement and consolidation of compressible material.

The results of the groundwater modelling indicate that if the site is fully surcharged, with no CMC piles, the groundwater table will rise during surcharging up to the existing ground surface level and into the imported fill material/surcharge during the first month. Given the imported fill material is predominately sand, which has a high permeability, the groundwater is anticipated to rise no more than 0.5 m into the imported fill material. The groundwater table will also rise to the existing ground surface outside the surcharge footprint, up to 20 m away in all directions.

The groundwater modelling estimates that the rise in the groundwater table will increase the flow rate into the existing adjacent drain along the western boundary above the current rate. Following completion of consolidation and the removal of surcharge, the groundwater flow rate is expected to reduce with time although levels will remain elevated in comparison to pre-construction groundwater levels.

Surface water

Surface water quality impacts that have potential to occur during construction and operation of the Project Base development include:

- Stormwater run-off and resultant sedimentation of the western drain and downstream aquatic ecosystem during construction activities if erosion and sediment control measures are inadequate, particularly during heavy rainfall events.
- Potential disturbance of ASS and migration of acidic groundwater, resulting in a decline in water quality in the western drain and downstream aquatic ecosystem.
- Migration of PFAS impacted groundwater resulting in an increase in the PFAS load in the western drain and downstream aquatic ecosystem.
- Hydrocarbon and chemical spills during construction and operation due to inadequate storage and handling.
- Poor waste management resulting in litter and rubbish entering the western drain.

5.3.3 Mitigation measures

Groundwater

Given the shallow nature of the groundwater at the site, there is potential for groundwater to enter any excavations during construction. Dewatering of groundwater will be managed under a Dewatering Management Plan, which will include requirements for testing groundwater quality (i.e., pH, acidity, metals/metalloids, PFAS) and will consider options for management, including reinjection of extracted groundwater. Treatment of groundwater will also be considered where required to prevent unacceptable and / or increased risks to the environment and human health. Dewatering of groundwater that has seeped into excavations will be undertaken within minimal timeframes to allow recharge as soon as practicable.

In addition, the surcharging and consolidation of the site will result in a rise in the groundwater levels within the site and up to 20 m away in all directions, which will likely increase the acidification of the groundwater and increase groundwater concentrations of metals and PFAS. This groundwater will also discharge at a greater rate into the receiving environment, through the adjacent western drain. This groundwater will be passively treated for both PFAS and acidification prior to migrating into the receiving environment.

The treatment will be described in detail in the Construction Environmental Management Plan (CEMP) and Detailed Design documentation. A multi-step passive groundwater filtration barrier system will to be placed along the western and northern boundary of the site where the groundwater flows through a pre-treatment filter (combined with a liming trench) and through PFAS filter/s (eg using granular activated carbon) prior to entering the western drain. This passive filtration barrier system will reduce the contaminant levels in the groundwater to within the appropriate acceptable limits (i.e. screening criteria adopted from the PFAS NEMP).

Maintenance of these passive treatment systems may be required to replace the filters for the duration of the Project Base development. Frequency of maintenance will be determined through bench trials, based on site conditions, PFAS concentrations, acidity, and flow rates.

Surface water

An Erosion and Sediment Control Plan will be developed as part of the Construction Environmental Management Plan (CEMP) for each construction stage to manage potential erosion and sedimentation impacts. Mitigation measures relating to erosion and sediment control are further detailed in Section 5.4.3.

On-going monitoring

A surface and groundwater monitoring program will be established to monitor concentrations of PFAS, metals/metalloids and acidity throughout the construction phase of the Aeromedical Base to monitor

the effectiveness of mitigation measures. The monitoring will be undertaken in accordance with the PFAS NEMP (2020), and ASC NEPM and the minimum requirements are outlined in Table 9.

Pre-construction monitoring is required to establish baseline groundwater and surface water conditions. Monitoring frequency during and post-construction to be revised as per changes in the site conditions, failure of performance criteria and /or if after 12 months, monitoring demonstrates that levels are consistently below performance criteria, then reduction of the frequency of monitoring should be considered.

Table 9 Ongoing monitoring requirements

Monitoring	Parameters	Frequency	Monitoring locations
	In-situ: pH, dissolved oxygen, electrical conductivity, turbidity and total suspended solids	Weekly	Existing western drain: • One upstream location • One downstream location • One location adjacent to the site
	PFAS, metals/metalloids, acidity parameters (pH, total titratable acidity, total alkalinity, chloride, sulfate, dissolved aluminium and dissolved iron	Monthly and following heavy rainfall (20 mm in a 24-hour period)	
	In-situ: groundwater level, pH, dissolved oxygen, electrical conductivity, turbidity and total suspended solids	Monthly	New groundwater wells are required should be positioned as follows: • One upstream location (south of the site) • At least three located downstream of the Project, between the passive filtration system and the existing western drain.
	PFAS, metals/metalloids, acidity parameters (pH, total titratable acidity, total alkalinity, chloride, sulfate, dissolved aluminium (filtered) and dissolved iron (filtered))	Monthly	

5.4 Soil and land contamination

AES focus – soil and groundwater management
Driving improvements in soil and groundwater quality through research, tenant engagement and risk management.

5.4.1 Baseline conditions

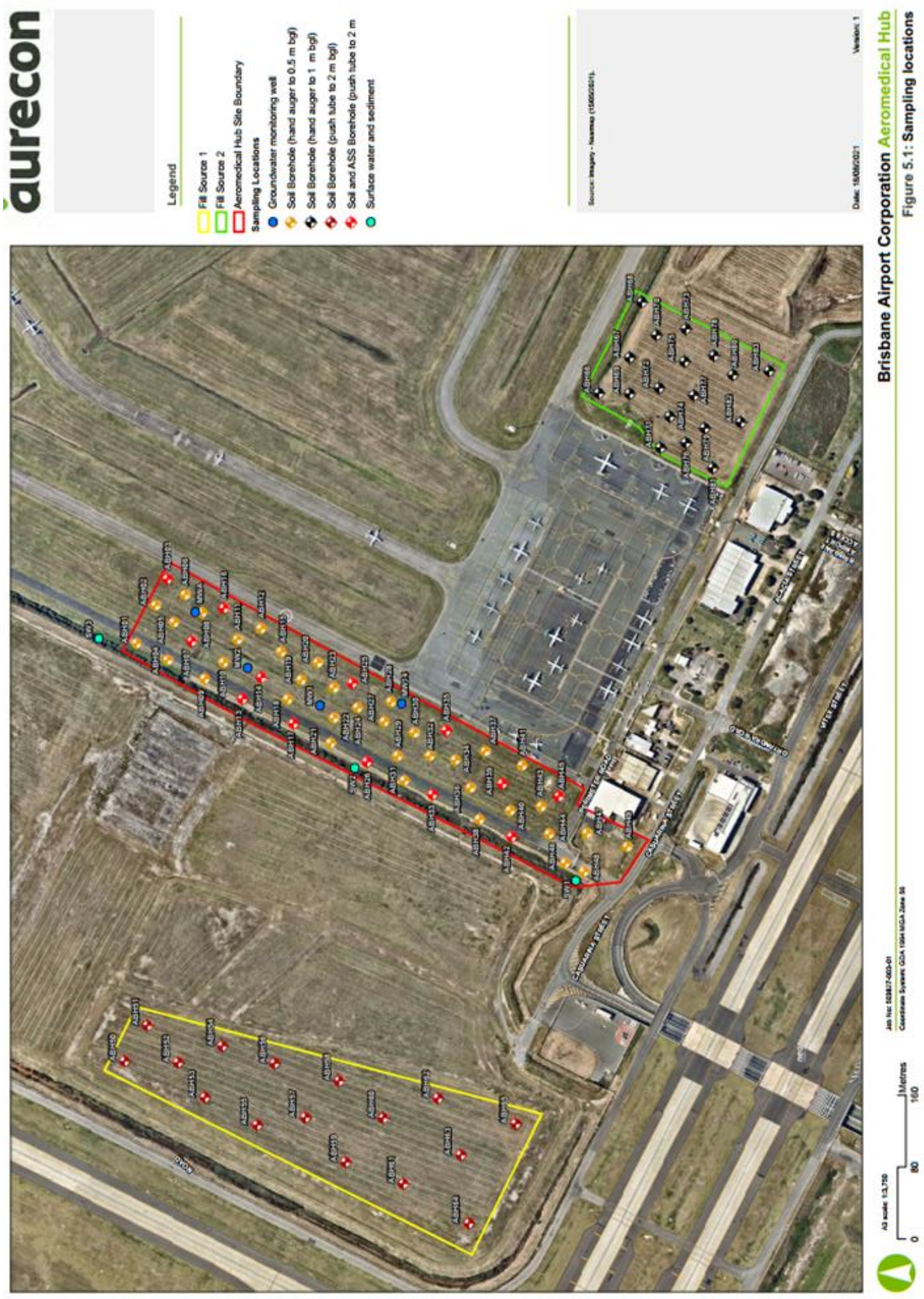
Topography, geology and soils

The overall site is relatively flat with an elevation for the un-surcharged footprint ranging from 2.5m to 3.7m Airport Datum (AD). Based on geological mapping, the site is mostly underlain by Holocene alluvial soils comprising undifferentiated alluvial plains consisting of highly compressible clay soils and loose sand. The Upper Holocene was underlain by moderately compressible clay of the Lower Holocene to depths of between 10.9m and 14.1m, then over consolidated Pleistocene clay and sand to between depths of 20.2m and 24.5m.

Fill source

The fill material proposed to be imported to the Project site are from fill source areas 1 and 2, which are located within 500 m of the site (refer Figure 37). Fill source 1 and fill source 2 are fill material from construction of the new parallel runway that has been stockpiled. The fill sources material originated from Moreton Bay, from where it was dredged in 2013 for the New Parallel Runway. This material was removed in 2017/2018 as part of the removal of excess sand surcharge.

Figure 37 Fill source



Contamination Status

A total of 166 primary soil samples were collected across 71 sampling locations within the Project site during the three investigations from Aurecon (2021a) and Douglas Partners (2019, 2021). Sampling density is in accordance with AS4482.1-2005 to characterise the nature and extent of contamination on site. Soil samples were analysed for PFAS, metals/metalloids, TRH, BTEXN and PAH. There were two soil samples that contained arsenic concentrations above the screening criteria for areas of environmental significance but below the screening criteria for areas of an airport generally (the more relevant comparison for the Project site). All other metal/metalloid concentrations were below the screening criteria for human health and ecological protection. It should be noted that background levels of arsenic in Queensland soils are naturally elevated, with concentrations of up to 30 mg/kg for urban soils and up to 50 mg/kg for rural soils being common and considered normal (AusIMM, 2011).

Minor TRH concentrations were also detected within twelve samples; however, the results were all below the screening criteria and do not pose a risk to human health and the environment. The source of these trace hydrocarbon concentrations is unknown and may be from Airport activities within the General Aviation precinct. However, trace hydrocarbons are not uncommon in fill material sourced from dredging activities and may be attributed to industrial activities within Moreton Bay and its catchments.

Approximately 30% of primary soil samples contained PFAS concentrations above the laboratory limit of reporting. Nine of those samples contained PFOS concentrations above the adopted screening criteria for indirect ecological exposure. There were no exceedances of the human health investigation levels for PFAS in soils for commercial/ industrial land uses. Soil leachate analysis for PFAS identified leachable concentrations of PFOS above the adopted screening criteria for protection of the environment (99% and 95% species protection criteria).

Fill Source

The fill material proposed to be imported to the Project site are from fill source areas 1 and 2, which are located within 500 m of the site (refer Figure 30). Fill source 1 and fill source 2 are fill material from construction of the new parallel runway that has been stockpiled. The fill sources material originated from Moreton Bay, from where it was dredged in 2013 for the New Parallel Runway. This material was removed in 2017/2018 as part of the removal of excess sand surcharge.
A total of 102 soil samples were collected from the fill source areas with a sampling density and methodology determined in general accordance with the ASC NEPM. Results from both areas were screened against the adopted human health and ecological risk assessment criteria. There were no exceedances of the adopted screening criteria for human health or the environment, with the exception of a single sample from Fill source area 2, which contained a TRH concentration above the adopted NEPM ecological screening levels (ESLs) for commercial / industrial land uses.
There were only two soil samples where PFAS concentrations were detected above the laboratory limit of reporting, although below the adopted screening criteria for protection of human health and the environment.

Acid sulfate soils

ASS investigations conducted within the Aeromedical Hub site included the Aurecon (2021a) investigation, as well as three locations from two previous Golder (2011, 2013) investigations. The sampling density outlined in the National Acid Sulfate Soil Guidelines (Sullivan et al. 2018) has been adopted, where, for large volumes of disturbance, 10 initial boreholes for the first 4 ha plus 2 boreholes per additional hectare are required. For the 6.4 ha Project site, this equates to 16 boreholes.

The presence of potential acid sulfate soils (PASS) was identified in 10 of the 16 boreholes drilled across the Project site, predominately within the natural alluvium. There was no evidence of actual acid sulfate soils (AASS) within the Project site.

5.4.2 Assessment of impacts

Topography, geology, and soils

The earthworks and surcharging activities will elevate the site above predicted future flood levels and consolidate the soil material to provide a suitable foundation for the Project. Up to 142,500 m^3 of material will be transported from their current locations at Fill source areas 1 and 2 and used to build up the site for construction of the Project Base.

Following consolidation, any excess surcharge material will be removed from the Project site and re-used elsewhere at Brisbane Airport, in a location to be determined.

Potential impacts relating to the proposed land development works on topography, geology and soils include:

- Erosion of the adjacent western drain and proposed open drains, particularly during rainfall events.
- Sedimentation due to stormwater runoff during high rainfall events, with impacts to the adjacent drain and downstream aquatic ecosystems.
- Tracking of sediment along the Airport access roads (e.g., Casuarina Street) during construction vehicle movement (particularly during import of fill material).
- Dust generation of any exposed surfaces, which will impact sensitive receptors and adjacent airfield operations.

Acid sulfate soils

The ASS investigation undertaken by Aurecon (2021b) across the site to a depth of 2.0m below ground level identified both natural soils and imported fill across the Project that contained ASS with limited actual ASS present (AASS) and potential ASS (PASS) present at varying depths. Any excavations within the Project have the potential to disturb ASS and create acid generation and as such, an ASS Management Plan will be developed.

During surcharging and consolidation, the groundwater aquifer may rise to the existing surface and migrate towards the adjacent western drain. It is possible this groundwater will result in oxidation of PASS, resulting in acidification of the groundwater and resultant stripping and mobilisation of metals, such as iron and aluminium. The groundwater will also flow towards the adjacent western drain, resulting in the potential subsequent acidification of the receiving environment, posing a potential risk to receiving aquatic ecosystems in Serpentine Creek and Moreton Bay.

Acidified groundwater also poses a risk to built infrastructure, where concrete and steel building materials are susceptible to acid attack and degradation. Groundwater intrusion into excavations will also need to be managed and the water neutralised under an ASS Management Plan.

5.4.2.1 Contaminated soils

Fill sources

As noted above, the fill material proposed to be imported to the Project site are from fill source areas 1 and 2, which are located within 500m of the site (refer

Figure 37). These fill source areas have been characterised for potential contamination in general accordance with the ASC NEPM, which references the Environment Protection Authority (EPA) Victoria Industrial Waste Resource Guidelines for Soil Sampling (IWRG702).

There is minimal PFAS and other contamination present within the soil at both fill source areas and PFAS concentrations are all below the limit of reporting with exception of two results that are determined to be statistical outlining results. As such, it is considered that transporting soil from the two fill source areas onto the Project site will not increase the PFAS load of the site and will not increase the mass of PFAS that migrates off site through surface water and/or groundwater.

The Project base in-situ soil

The contamination investigations undertaken by Aurecon (2021b) and Douglas Partners (2021, 2019) identified PFAS within the soils at the Project site at concentrations that do not pose a risk to human health for commercial/industrial land uses. However, the soil contained PFOS concentrations above the adopted screening criteria for ecological direct and indirect exposure. In addition, the soils have a high leachate potential for PFAS, with concentrations above the ecological screening criteria for both 95% and 99% species protection.

Leachable metals (chromium, copper, lead, nickel, and zinc) were also identified by Douglas Partners during their investigation in 2021 to be above the adopted screening criteria for protection of marine waters (AEPR 1997). These metal/metalloid concentrations are likely reflective of natural background conditions, although industrial and waste management activities within the wider region may have contributed (Morelli and Gasparon, 2019).

While the risk of ecological exposure to metals and PFAS in the soils is currently considered to be low, given the site does not contain flora (other than landscaped grass) and/or fauna foraging and nesting habitat, the construction of the Project and the likely rise in the groundwater aquifer could potentially result in the mobilisation of PFAS and metals within the soils into the groundwater aquifer. Groundwater will also flow towards the adjacent western drain, potentially resulting in an increase in the contaminant load of the receiving environment, posing a risk to receiving aquatic ecosystems in Serpentine Creek and Moreton Bay.

The leachable PFAS within the soil is at concentrations higher than the surrounding groundwater and surface water, however it should be noted that available PFAS in soil will undergo dilution as it leaches into groundwater and/or surface water.

The Project development may result in the following potential impacts relating to contamination:

- Surcharge and consolidation activity at the project site will potentially result in a rise of the groundwater aquifer, which could interact with the contamination (ie PFAS and metals) and ASS present within the soils. This will potentially result in an increase in contamination and acidity movement from the soils and groundwater at the Project site into the surface water drains and ultimately the receiving aquatic ecosystems of Serpentine Creek and Moreton Bay.
- Given the widespread presence of PFAS on-site, any excavated material into the existing soil at site has the potential to be contaminated and will require management if being moved elsewhere on Brisbane Airport or off-site.
- Dewatering of excavations is likely to be required during the construction of the Project. This groundwater may be acidic and may contain elevated metals/metalloids and PFAS concentrations.

It is anticipated that operation of the Aeromedical Base may involve storage and use of fuels, oils, solvents, and other potentially hazardous chemicals as a result of testing and maintaining aircraft and equipment. The storage and use of these potential contaminants may result in soil and/or groundwater contamination.

5.4.3 Mitigation measures

Topography, geology and soils

Erosion and sedimentation impact during construction will be managed through an erosion and sediment control plan and will form part of the CEMP. Specific mitigation measures relating to erosion and sediment control will include:

- Minimise exposure of disturbed soils at any time and progressive stabilisation of earthworks as practicable.
- Divert 'clean' stormwater run-off from undisturbed areas around disturbed areas.
- All erosion and sediment control measures will be constructed and maintained as per International Erosion Control Association (IECA) (2008) standard drawings.
- All erosion and sediment control devices will remain in place until site stabilisation has been achieved and approved by the BAC Environmental Advisor.
- Any potentially sediment-laden stormwater runoff will pass through a sediment control device prior to entering the adjacent western drain.
- Uncontaminated sediment removed from erosion and sediment control devices may be stockpiled and reused in landscaping or other fill projects, otherwise must be disposed of in an approved environmentally safe manner.
- Maintenance of erosion and sediment control measures should continue until the Project site has been suitably stabilised and further disturbance of soil by erosion is prevented.

Movement of fill material from Fill source areas 1 and 2 will be managed through the CEMP. Vehicles transporting fill material will be adequately covered to reduce the generation of dust while in transit. In addition, site access/egress points from both the fill source areas and the Project site during construction may include rock surfaced roadways, rumble/shaker grids and/or asphalt surfacing to limit tracking of soil onto airport roads. Further information relating to dust suppression and control is outlined in Section 5.5 (Air Quality).

Acid sulfate soils

An ASS Management Plan is required to be developed and implemented in accordance with the Queensland Acid Sulfate Soils Technical Manual – Soils Management Guidelines (v4.0) (Dear et al. 2014) to ensure that any adverse impacts caused by disturbance of ASS and/or an increase in acidity in groundwater and stormwater run-off are avoided. The ASS Management Plan will ensure any generated acidic leachate, runoff or groundwater is treated to ensure there is no acidic material leaving the site. The ASS Management Plan will set-out measures for construction phase to ensure any generated acidic leachate, runoff or groundwater is treated prior to leaving the site. The ASS Management Plan will aim to limit the mobilisation of metals to downstream receiving water through neutralisation by lime treatment.

Soil material is assumed to be ASS until proven otherwise and is to be managed by stockpiling within a nominated location (as agreed by the BAC Environmental Advisor) and neutralised by lime treatment in accordance with the ASS Management Plan. Liming rates for the soils analysed have been calculated and will be incorporated into the ASS Management Plan to ensure appropriate treatment of soil material.

Detailed design of the Aeromedical Base will also consider potential impacts upon built infrastructure resulting from potential increased acidity in the soil and groundwater in the event of PASS oxidation.

Contamination

During excavation works, if any unexpected contamination is encountered (e.g., odours, staining, asbestos, or other signs of contamination), a suitably qualified consultant will be engaged to assess the potential

impact and recommend additional sampling and analysis, impact/risk assessment, and management strategies, if required.

An EMP will be developed and implemented for the relevant stages of the Project development. The EMP will include procedures for assessing and managing contaminated soil, groundwater, and surface water.

The CEMP to be developed by construction contractors prior to the commencement of any construction stages will be developed in accordance with the overarching EMP and the BAC CEMP guidelines.

In alignment with the BAC CEMP guidelines, any EMP and CEMP will address the relevant guidelines including the PFAS NEMP and BAC PFAS Framework. Key areas of focus will be determined by a site-specific risk assessment.

Any soil material already present within the Project site will be considered to contain PFAS contamination and will be re-used elsewhere within the Project site if required. Existing soil will not be taken off site without a site-specific risk assessment to ensure it does not increase the risk at the receival site. The risk assessment will be undertaken in accordance with the PFAS NEMP.

Any soil material imported to the site from Fill source areas 1 and 2 (as fill material and/or surcharge material) is characterised as a very low risk from PFAS contamination. However, once imported to site, there may be interaction with PFAS-impacted and acidic groundwater as the groundwater rises up during construction. Any excavation work and/or interaction with this soil will consider PFAS and this material will be handled appropriately and managed through the CEMP to minimise the mass of PFAS that has the potential to enter the receiving environment.

Given the high permeability of the imported fill material, it is considered highly unlikely that the groundwater will rise into the surcharge material and as such, the surcharge material will remain a very low risk from contamination. A tracking system of the imported fill material from fill source areas 1 and 2 may be implemented to ensure this material can be re-used elsewhere on Airport land once surcharging is complete, without the need to re-test the material.

Storage, transport and use of any chemicals following construction such as fuels, oils and solvents must be carried out according to environmental legislative requirements and guidelines.

5.5 Air quality and odour

AES focus – cleaner air
Reducing the sources of ground-based air quality emissions and supporting sustainable transport and active living options.

5.5.1 Baseline conditions

Brisbane Airport is surrounded by heavy industry including the Port of Brisbane, Viva Energy fuel storage and distribution terminal at Pinkenba, the Caltex oil refinery, and an Advanced Wastewater Treatment Plant at Luggage Point. Major roadways (including the Gateway Motorway) also border the site, impacting the local air quality.

Within the airport boundary, local air quality impacts associated with ground-based operations are regulated by the *Airports (Environment Protection) Regulations 1997 (AEPR)*. Air quality associated with emissions from aircraft (excluding aircraft ground-running and idling on aprons) is regulated under the Air Navigation *(Aircraft Engine Emissions) Regulations (AEPR) 1995*.

Air quality outside the boundary is regulated by the Queensland Government in accordance with the National Environment Protection (Ambient Air Quality) Measure with the nearest air quality monitoring stations located in the Wynnum area (including Lytton).

Regional air quality monitoring results are reviewed annually by BAC with assessment undertaken in accordance with the regulations. There has been no recent exceedance of Schedule 1 of the AEPR limits from nearby monitoring stations.

Air quality goals are to be defined based on legislation and approved as part of any CEMP or OEMP.

5.5.2 Assessment of impacts

The Project site is located adjacent to the operating airfield apron (GA Apron). Dust created by high wind could impact operations on the apron.

The potential environmental impact of dust is reduced visibility and operational impacts on live apron.

5.5.3 Mitigation measures

The following mitigation measures will be implemented to manage any potential air quality and odour impacts:

- Dust generated during the construction phases will be controlled through a CEMP for each construction contracts. Example control measures in the CEMPs may include dust monitoring, dust suppression techniques and plant maintenance.
- Project equipment, machinery and vehicles will meet exhaust air quality standards in the normal manner for all vehicles sold in Australia and will be maintained to relevant standards to reduce emissions to as low as reasonably practicable.
- The Project will be assessed for air quality to ensure minimum criteria to be considered acceptable and meet.
- The Project buildings will be responsive to the subtropical climate of the region.

Subject to the implementation of the above mitigation measures, the risk of air quality impact from Project is not considered to be material for both construction and operations.

5.6 Ecology

AES focus – protecting biodiversity
Maintaining the airport's biodiversity values and contributing to Brisbane's biodiversity.

5.6.1 Baseline conditions

The current condition of the Project site is illustrated in Figure 36. The site was filled with sand in the early 1980s and since this placement has been maintained as airfield grassland.

The desktop review of potential threatened fauna, flora and vegetation communities associated with the Project site identified a no species/communities predicted to be impacted by the development.

5.6.2 Assessment of impacts

Flora

As there are no significant flora species identified within the Project site, the development will not have any adverse consequences to significant flora.

Fauna

As there are no significant fauna species identified within the Project site, the development will not have any adverse consequences to significant fauna.

5.6.3 Mitigation measures

The primary ecological impacts are expected to occur during the earthworks phase of the Project however all construction works will consider ecological impacts.

A CEMP is to be developed by each head construction contractor that will identify the ecological impact risks and mitigation measures to be implemented to manage and minimise any ecological impacts to the site. These include consideration to:

- Undertaking works in accordance with a site-specific ASS Management Plan as part of the CEMP.
- Development and implementation of a pest and weed management plan as part of the CEMP including reporting of suspected outbreaks of declared weed species and declared pest animals (as listed under the provisions of the EPBC Act and NC Act). The works management should also not deliberately introduce declared weed and/or pest species as listed under the provisions of the EPBC Act and/or Biosecurity Act. Measures are to be implemented to ensure that all plant and materials brought into the AIP2 development are certified free of declared pests.
- Waste management measures are to be planned and implemented to avoid increased abundance of pests and opportunistic native fauna.

5.7 Noise and vibration

AES focus – minimising ground-based noise
Ensuring sources of ground-based noise have minimal impact on airport workers, the local community and the environment through appropriate planning, design, and operations.

Ground-based noise sources associated with Brisbane Airport are regulated principally by the *Airports Act 1996* and the *Airports (Environment Protection) Regulations 1997* (AEPR).

The AEPR defines commercial and sensitive receptors and provides guidelines for excessive noise for a range of noise sources including from construction, road traffic and airport operations.

The AES recognises that any noise issues, if unmanaged, can potentially have an impact on the local community, airport tenants and the environment. Activities identified in the AES and relevant to the Project as potential sources include:

- Road traffic.
- Construction activities.
- Operation of plant and equipment.
- Operation of alarms and warning systems.

Regulation 2.04 of the AEPR defines offensive noise as noise that 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.”

- The determination of an offensive noise includes consideration of the following:
- The volume, tonality, and impulsive character (if any) of the noise.
- The time of day, and duration, of the noise.
- Background noise levels at the time the noise is generated.

- The location, in relation to the source of the noise, of:
    - Sensitive receptors, or
    - If there is no affected sensitive receptor — commercial receptors.
- The excessive noise guidelines in Schedule 4 of the AEPR.

A commercial receptor is defined in the AEPR as “a business operation, whether for profit, or not”.

A sensitive receptor “means:

- A dwelling; or
- An impermanent dwelling in a place designed, or reserved, for impermanent dwellings (for example, a caravan park or residential marina); or
- A hotel, motel, or hostel; or
- A childcare institution, kindergarten, school, college, university, or other educational institution; or
- A hospital, medical centre, or nursing home; or
- A building that is a church or similar place of worship.”

As the patient transfer facilities and will not provide medical procedures to transiting patient it would meet the definition of a sensitive receptor. However, the development will address noise attenuation within the building as described within Section 2.2.1.3.

No vibration related goals are discussed in the AEPR.

The Australian Standard AS 2436 “Guide to noise and vibration control on construction, demolition and maintenance sites” also does not provide vibration goals. However, it provides guidance on how vibration control should be undertaken on construction sites.

AS 2436 recommends implementing time restrictions on processes involving exposure to potentially hazardous vibration, low-vibration plant, and equipment, and signposting of vibration hazardous areas. AS 2436 identifies monitoring as an essential component in the effective control of vibration from construction sites.

The Queensland Department of Transport and Main Road (TMR) Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration (2016) provides ground vibrations and recommends safe vibration levels that should be used in construction activities.

5.7.1 Baseline conditions

The Project site is located within a high noise environment with high levels of daytime, evening, and night-time ambient noise from a variety of sources including aircraft movements and the existing operational activities within the precinct.

The Project site is directly adjacent to the existing GA Apron and the existing tenancies adjacent to GA Apron.

For the purposes of any noise assessment, the closest commercial receptors are:

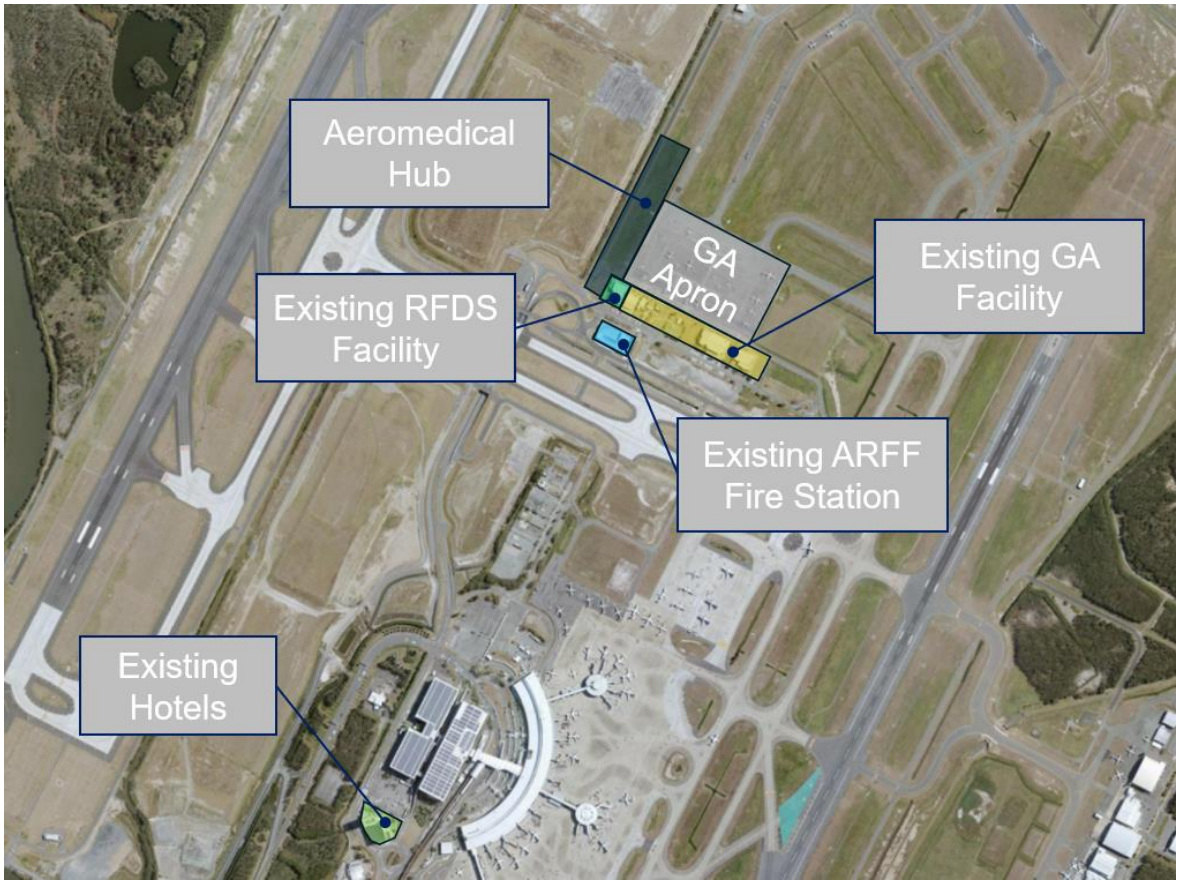
- To the east:
    - The existing GA apron and supporting facilities are located to the east of the site. The closest GA facilities and therefore the closest commercial receptor are the Royal Flying Doctors Service aircraft hangar and offices. The Project site and the existing RFDS site share adjoining property boundaries.
- To the south:

- The closest commercial receptor to the south of the site is ARFF Fire Station. The site is located 90m from the Project site.

The closest sensitive receptor is the two hotels located within the domestic precinct. The Ibis and Pullman Brisbane Airport hotels are located approximately 1.4km south of the Project site.

These key receptors for noise and vibration are shown in Figure 38 below.

Figure 38 Key Aeromedical Base noise and vibration receptors



5.7.1.1 Australian noise exposure forecast contours

The ANEF noise assessment is outlined in Section 4.1.1 with the Aeromedical development site located within the ANEF 30 – 35 contours.

As the site and surrounding commercial receptors are located within or in close proximity to the high noise levels associated with these ANEF contours, this will influence the level of sensitivity to additional noise generated during construction and future operations relating to the development.

5.7.2 Assessment of impacts

5.7.2.1 Potential noise Impact

The likely noise producing activities arising from the construction of the Project include construction traffic, piling and building activities. Given the existing background noise at the development site, noise emissions from the construction of the proposed development are manageable and do not constitute a discernible change in current noise conditions experienced at the site.

Noise during construction is required to meet the requirements of Schedule 4 of the *Airports (Environment Protection) Regulations 1997*, as presented in Table 10. Construction noise will be managed through the

measures outlined in the following section. Construction noise is highly unlikely to exceed 75bB(A) at the site of the nearest sensitive receptor, located more than 1.4 km for the site of the proposed development.

Table 10 Noise limits

Noise source	Maximum allowable noise levels at sensitive receptors
Construction, maintenance, and demolition	75dB(A) L10 (15 min)
Road traffic	60dB(A) Leq (24 hour) 55dB(A) Leq (24 hour)
Rail traffic	87dB(A) Lmax (15 min) 60dB(A) Leq (24 hour) 55dB(A) Leq (24 hour)
Other airport operations	7:00am to 10:00pm background noise level plus 5dB 10:00pm to 7:00am background noise level plus 3dB

5.7.2.2 Potential vibration impacts

Annoyance to sensitive receptors from vibration is possible during construction. Construction activities have the potential to generate ground vibration, the effects of which are influenced by proximity to the vibration source, the energy output of the equipment used and local geological conditions.

The ground vibration levels due to construction work are difficult accurately predict due to the dependence of vibration transmissibility on soil type (soft or hard), intervening geology (i.e., the coupling loss between the soil and the building foundation), the nature of the building foundations and the location of the construction equipment.

The Transport and Main Roads Technical Note 03, Measurement of Ground Vibrations and Airblast (2013) references a user guide applicable to a vibrating roller which approximates the recommended limit of 5 mm/sec.

Due to the proximity of the existing Royal Flying Doctors Service facilities and adjacent facilities along the GA Apron, the contractor will be required to provide a plan to assess, monitor and manage any works that generate vibration.

5.7.3 Mitigation measures

5.7.3.1 Construction

A Construction Noise and Vibration Management Plan (CNVMP) is considered to be the best practicable option to mitigate the construction noise and vibration effects on the adjacent receptors and to minimise disruption to existing airport facilities and operations.

The CNVMP should, as a minimum, identify the following:

- Proposed construction activities and associated noise and vibration levels.
- Days and hours of site operation.
- Identification of affected neighbours.
- Noise mitigation measures.
- Construction noise monitoring requirements.
- Procedures for community liaison (e.g., distribution of site contact information etc.).

- The CNVMP should adopt mitigation measures outlined in AS2436, Guide to noise and vibration control on construction, demolition, and maintenance sites.

5.7.3.2 Operation

Operational activities at the Project with the potential to general excessive noise include:

- Movement of traffic to and from the facility; and
- Aircraft and helicopter line maintenance.

These operational activities are consistent with the existing operational activities undertaken on the GA Apron and in the tenancies adjacent to that apron. The extension of these activities is unlikely to cause additional nuisance to surrounding airport users.

5.8 Waste

AES focus – reducing waste
Reducing waste to landfill by encouraging recycling and the reuse of resources.

5.8.1 Baseline conditions

Waste is defined in the AEPR and includes refuse of any form, discarded or disused plant or equipment, and industrial by-products. Examples include waste oil and oil containers, surplus or spent chemicals, paints and solvents and their containers, sewage, and wastepaper, litter, and food scraps.

In the AES (BAC 2020), the key objectives for 2020-2025 include:

- Reducing waste to landfill by encouraging recycling and the reuse of resources.
- Supporting Government policies on sustainable waste management.
- Progress towards zero waste and circular economy operations.

5.8.2 Assessment of impacts

During construction and operation of the Project , a number of waste products are expected to be generated, including:

- Packaging materials – any materials used on site that are delivered in packaging material. This includes pallets, crates, cartons, plastics and wrapping materials. All packaging material will need to be disposed of once the product has been used.
- Wastes from construction equipment maintenance – various heavy vehicles and construction equipment will be used during the construction phase. Liquid hazardous wastes from cleaning, repairing and maintenance of equipment may be generated. Leakage or spillage of fuels/oils within the site needs to be managed and wastes disposed of appropriately.
- Regulated wastes – including hydrocarbon waste such as waste oil, oily water, oily sludge, grease, coolant, oily rags, oil filters, drums, detergent, solvents, batteries, tyres, paints, and resins.
- Clinical waste – this includes animal waste, discarded sharps, human tissue waste and laboratory waste.
- General wastes – this includes retail waste, scrap materials and biodegradable wastes.

Additional waste likely to be generated during construction includes vegetation, fill material and construction equipment waste.

Potential impacts associated with the inappropriate management of waste generated from the above can include, if not managed, contamination of soils, surface water and groundwater.

5.8.3 Mitigation measures

Collection, storage, and disposal of waste will be managed under a EMP to avoid impact or nuisance on and off the identified development site. Appropriate measures will be employed to satisfy the sustainable management of waste generation and disposal in accordance with the AES.

Mitigation measures relating to waste management to be addressed in an EMP include:

- Vegetation wastes from site clearing should be mulched and used in on site landscaping and erosion and sediment control activities.
- Identify possible secondary uses for construction wastes prior to and during construction.
- Designate location of construction compounds and areas for each waste stream to allow for waste segregation and directed into recycling waste streams for recycling or re-use.
- Ensure construction and industrial waste is stored in industrial covered skips/bins.
- Contain and capture runoff from designated waste areas.
- No waste is to be burnt on site.
- Ensure waste bin lids are closed and work sites kept tidy to avoid littering and attraction of birds, vermin, and other wildlife.
- Any packaging materials to be collected separately and re-used or recycled including timber, paper, cardboard, pallets and plastics.
- Waste disposal is to occur at approved facilities.
- Engage the services of a licensed waste contractor and recycler if removing regulated wastes from the Project.

To align with the AES, a KPI of “no waste impacting surrounding environment” will be included in the EMP. The EMP mitigation measures will need to consider the hierarchy of waste management.

During the operation of the proposed Project, the facility is expected to generate a number of waste streams. Waste generated is anticipated to be typical of the facility and will include:

1. General waste.
2. Recyclable wastes.
3. Wastewater and sewage.
4. Food scraps.
5. Clinical waste.

Subject to the implementation of mitigation measures, the potential impact of the development with regard to the management of waste is not considered to be material.

5.9 Hazardous chemicals and dangerous goods

5.9.1 Baseline conditions

The management of hazardous chemicals must be in accordance with the *Work Health and Safety Act 2011* (Qld) *(WHS Act), Work Health and Safety Regulation 2011* (Qld) *(WHS Regulation)* and relevant Australian Standards.

In addition, storage and the use of petroleum products is to comply with the Brisbane City Plan SC6.28 storage and dispensing of petroleum products planning policy and other guidelines and standards/codes that apply.

5.9.2 Assessment of impacts

Due to the nature of the activities to be carried out in the hangers, office, and café, the operation and maintenance at these facilities will involve storage and the use of fuels, oils, solvents, and other potentially hazardous chemicals. Construction activities for each of the development stages will also likely involve the storage and use of hazardous chemicals.

In addition to potential fire and explosion impacts to neighbouring businesses, the storage and use of potential contaminants could result in soil and/or groundwater contamination.

During operations, the Project tenants will be responsible for the appropriate management and disposal of hazardous chemicals, and compliance with any licences required under the WHS Act. Compliance with these requirements is monitored by BAC authorised personnel.

5.9.3 Mitigation measures

For both construction and operations, the storage of fuels and hazardous chemicals shall be conducted in accordance with AS1940:2017: The storage and handling of flammable and combustible liquids. These include requirements that:

- A detailed risk assessment be completed according to the nature and scale of hazardous chemicals present and submitted to BAC (including identification of any hazardous areas and ignition sources).
- All hazardous chemicals will be stored with an up-to-date Australian safety data sheet (SDS), Prepared according to WorkSafe Queensland Codes of Practice. A SDS register will be maintained adjacent to the hazardous chemical storage area with the location clearly signed.
- Contractors and tenants are responsible for any licences and/or registrations required under the WHS Act.
- Hazardous chemicals and dangerous goods will be handled, stored, and disposed of in accordance with the WHS Act, WHS Regulation, relevant Australian Standards and the Brisbane City Plan SC6.28.
- A register of hazardous chemicals stored and used by each tenancy will be kept by BAC, and BAC will undertake an audit and hazard assessment at least every two years (dependent on the level of risk associated with the facility) to determine the cumulative impact of hazardous material being distributed across the site.

  New tenants operating at Brisbane Airport must only use fluorine free firefighting foams as per BAC Airport Environment Strategy and Firefighting Foam Management Plan Guidelines.
- Tenants operating at Brisbane Airport are classified in accordance with BAC Tenant Environmental Management Toolkit into Tenant Risk Categories based on their operations. The tenant risk classification with require the tenant to perform specific duties (OEMP and Reporting).

5.10 Cultural heritage

AES focus – preserving and promoting our heritage
Ensuring that the airport's heritage values are maintained and promoted.

5.10.1 Baseline conditions

Brisbane Airport is located on Commonwealth land and is therefore subject to Commonwealth legislation. For Culture heritage, this includes the *Environment Protection and Biodiversity Conservation Act 1999*, the *Airports Act 1996*, and the *Airports (Environment Protection) Regulations 1997*.

The Brisbane Airport Heritage Management Plan was finalised in March 2016 in consultation with Traditional Owners and heritage consultants, outlining Aboriginal cultural heritage and European historic heritage of the airport site, compliant with the EPBC Act.

The 2020 Airport Environment Strategy summarises the sites with known cultural or historic heritage significance at Brisbane Airport. Based on this review, there are no known heritage sites identified within the Project site.

A review of historic aerial photography detailed in section 5.3.1 outlines that the Project site has been subject to extensive impacts from past land filling.

While the site is identified as having little to no heritage value, it has the potential to contain items or sites that may be unearthed during construction.

5.10.2 Assessment of impacts

The construction phase will involve the clearing, filling, and surcharging of the site that has been disturbed as part of past land management. The excavation requirements are expected to be limited as most of the site will require filling. There will be Nil impact on cultural heritage.

5.10.3 Mitigation measures

Not required.

SUMMARY OF IMPACTS

The assessment component of the MDP has undertaken to meet the requirements of Section 91 (1) (h) of the *Airports Act 1996* (Cth). Table 11 provides a summary of the potential operational, environmental, and social impacts considered in the assessment.

Table 11 Sustainable, responsible and impact investing objectives and commitments

Section	Environmental and social factors	Impacts	
		Construction	Operations
4.1	Aviation operations and safety	Nil	Nil
0	Traffic and parking	Negligible	Negligible
5.1	Geology, soils, and topography	Low	Negligible
5.1	Contamination	Negligible	Negligible
5.1	Hydrology and water quality	Low	Negligible
5.5	Air quality and odour	Negligible	Negligible
5.6	Ecology	Nil	Nil
5.7	Noise and vibration	Negligible	Negligible
5.8	Waste	Negligible	Negligible
5.9	Hazardous chemicals and dangerous goods	Negligible	Negligible
5.10	Cultural heritage	Negligible	Negligible

REFERENCES

Douglas Partners (2018)	Proposed Aeromedical Base, Geotechnical Investigation, September 2018
Douglas Partners (2019)	Aeromedical Base, Detailed Site Investigation for Contamination, July 2019
Douglas Partners (2021)	Aeromedical Base, Additional Contamination Investigation, March/April 2021
Aurecon (2021)	Brisbane Aeromedical Base, Gap Analysis of Previous Investigations, June 2021.
Aurecon (2021)	Aeromedical Base, Environment Protection and Biodiversity Conservation Act Self-Assessment of Impacts, July 2021
Aurecon (2022)	Aeromedical Base, Contaminated Land Factual Report, April 2022
Aurecon (2022)	Aeromedical Base, Contaminated Land Assessment Report, April 2022
BAC (2018)	Landscape Setting Strategy
BAC (2020)	2020 Brisbane Airport Master Plan
BAC Airport Technical Guidelines	
BAC Noise Impact Assessment Policy	
Brisbane Airport Planning Guidelines	
PSA (2021)	Aeromedical Hub MDP Traffic Impact Assessment, May 2021
BAC 2020	2020 Airport Environment Strategy
BAC 2021	BACEMS-PRO-044 Firefighting Foam Management Plan Guidelines V2
BAC 2021	BAC Tenant Environmental Management Toolkit V1.2

APPENDIX A MDP CHECKLIST

This Appendix indicates the requirements under Section 91 of the Airports Act 1996 for the contents of an MDP and demonstrates that this MDP is consistent with these requirements:

Contents of a Major Development Plan			Section(s) of MDP
Airports Act, Section 91			
(1A)	The purpose of a major development plan in relation to an airport is to establish the details of a major airport development that:		1
(a)	relates to the airport; and		
(b)	is consistent with the airport lease for the airport and the final master plan for the airport.		2.1 2.2 3.2
(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		1.4
(b)	the airport-lessee company's 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; and		1.1 1.4
(c)	a detailed outline of the development; and		1.3
(ca)	whether or not the development is consistent with the airport lease for the airport; and		3.2
(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		2.1
(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		NA
(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		4.1
(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 ANEF levels; and		NA
(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		3.4 4.1
(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:		
	(i)	traffic flows at the airport and surrounding the airport; and	4.2
	(ii)	employment levels at the airport; and	2.3.1
	(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	2.3.3

Contents of a Major Development Plan		Section(s) of MDP
(h)	the airport-lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development; and	5
(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	5
(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	NA
(4)	In relation to paragraphs (1)(a), (e) or (ga) above, the extent (if any) of consistency with planning schemes in force under a law of the State in which the airport is located; and if the major development plan is not consistent with those planning schemes—the justification for the inconsistencies.	NA
(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.	4.4.1
Airports Regulations 1997, Regulation 5.04		
	A major development plan must address obligations arising under pre-existing property interests in the airport.	3.1.1