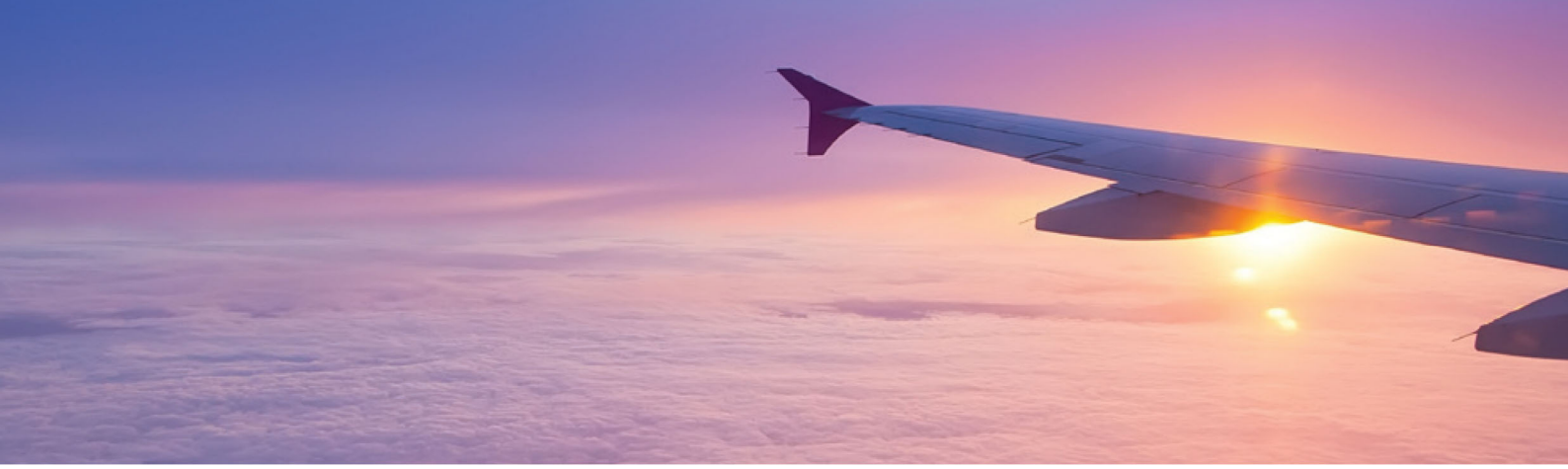

International P2 Multi-Level Car Park
Major Development Plan

December 2019

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BRISBANE AIRPORT AUSTRALIA

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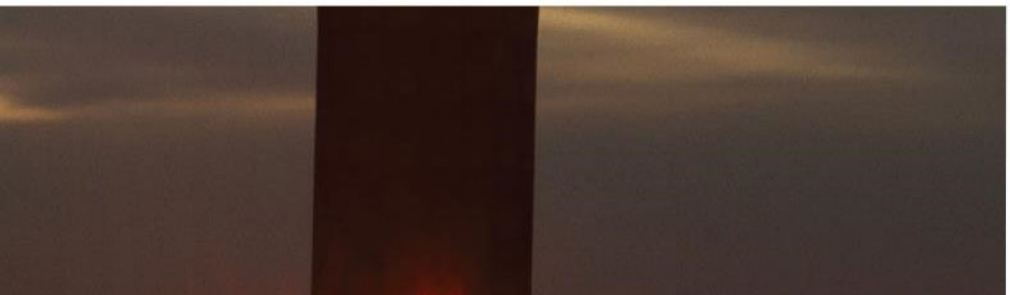
Executive Summary



EXECUTIVE SUMMARY

Purpose

Brisbane Airport Corporation Pty Ltd (BAC) has prepared this Major Development Plan (MDP) for the construction of a new Multi-Level Car Park (MLCP) to be located at the International Terminal at Brisbane Airport, referred to as the International P2 MLCP. The proposed project includes the construction of a new MLCP, and provides vehicle and pedestrian access to the existing International P1 MLCP. Road realignments, on-grade car parks, and a new intersection on Airport Drive are also included within the proposed project. BAC, as the Airport Lessee Company (ALC) under the Airports Act 1996 (Airports Act), is responsible for the submission of the MDP.

Key findings

Operational Assessment

During the construction phase, the loss of existing on-grade car parks may impact parking availability at the International Terminal, resulting in increased pressure on the existing International P1 MLCP. Alternative car parking options within the airport will be used to minimise the impact associated with this loss of existing on-grade car parks. Construction impacts would be mitigated through the staging of the construction works and implementation of a traffic management plan. With the implementation of management and mitigation measures, potential traffic impacts associated with construction activities can be managed. The existing road network has capacity for the predicted increase in traffic volumes and as such, traffic impact associated with the operation of the proposed development will be **negligible**.

BAC has worked with Airservices Australia and the Civil Aviation Safety Authority (CASA) to ensure potential sight line impacts associated with International P2 MLCP can be managed without impacting negatively on airport operations. CASA has issued an exemption which provides an interim management measure until 31 July 2022. A suitable permanent solution will be implemented prior to the expiry of this exemption.

Environmental Assessment

The assessment has identified a number of areas where impacts may be possible during construction and operation of the International P2 MLCP. During the construction phase, fugitive sediments and chemicals or fuels entering local watercourses may have the potential to impact downstream ecosystems and water quality if not appropriately managed. A Construction Environmental Management Plan (CEMP) will be in place prior to the commencement of construction and all site personnel made aware of its requirements. With the implementation of the mitigation and management measures included in the CEMP, the residual impacts on surface water are considered to be **low**.

During operation, runoff from hardstand areas associated with the proposed development has the potential to contain contaminants, such as oils, fuels, hydrocarbon and phosphates, which has the potential to impact Water Quality Objectives and Environmental Values. Schedule 2 of the *Airports (Environment Protection) Regulation 1997* also establishes the accepted limits of contamination and the detailed design of the facility will address measures to ensure these limits are met.

The proposed International P2 MLCP is consistent with the intended land uses identified in the Master Plan. With the implementation of the identified environmental management and mitigation measures, it is considered that the impacts to surrounding land uses will be **negligible**.

This Major Development Plan concludes that the Project will have minimal impact on the operation, environment and heritage matters as a result of the implementation of the proposed mitigation and management measures.

Introduction

1

1. INTRODUCTION

1.1. Background

Brisbane Airport is seeing sustained growth in passenger movements. Over five million passengers passed through the International Terminal in 2017, with passenger numbers expected to grow to over 13 million by 2037 (refer to Figure 1). The increased growth in passenger numbers will place increased pressure on the capacity of existing landside infrastructure, particularly the demand for short and long-term parking facilities.

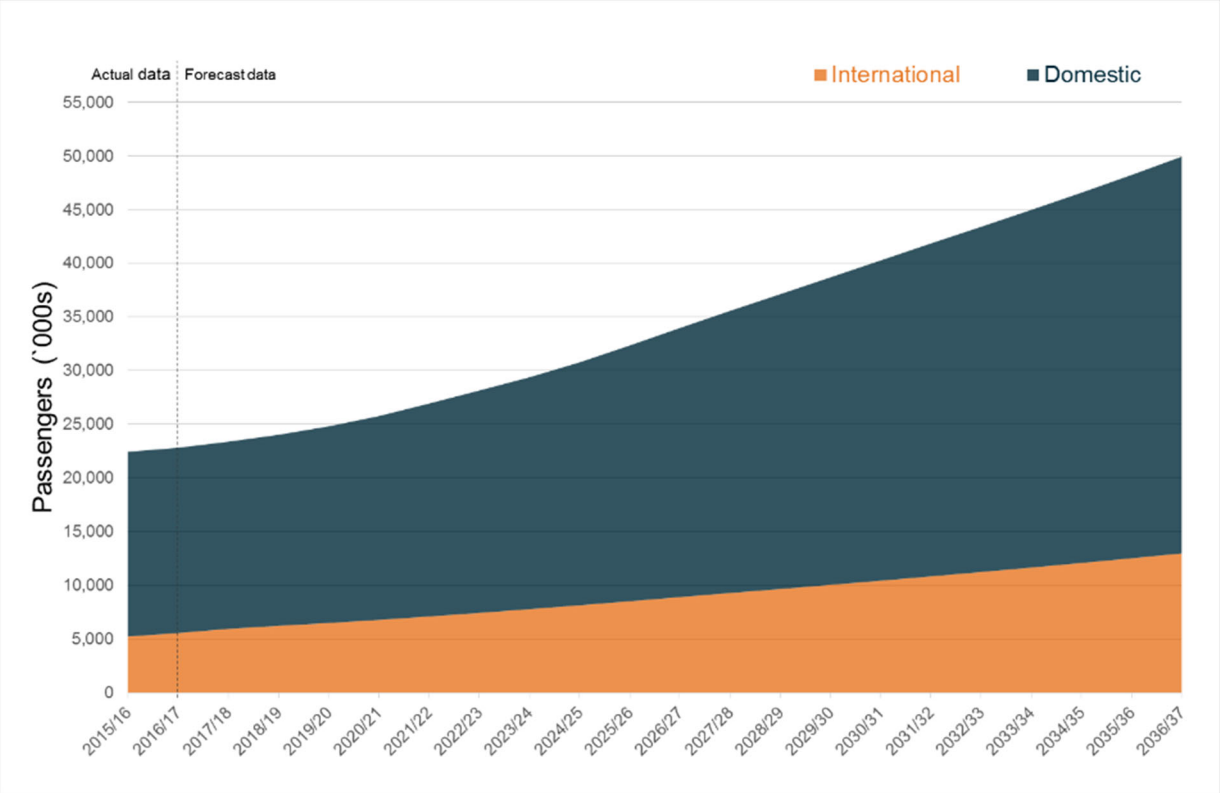


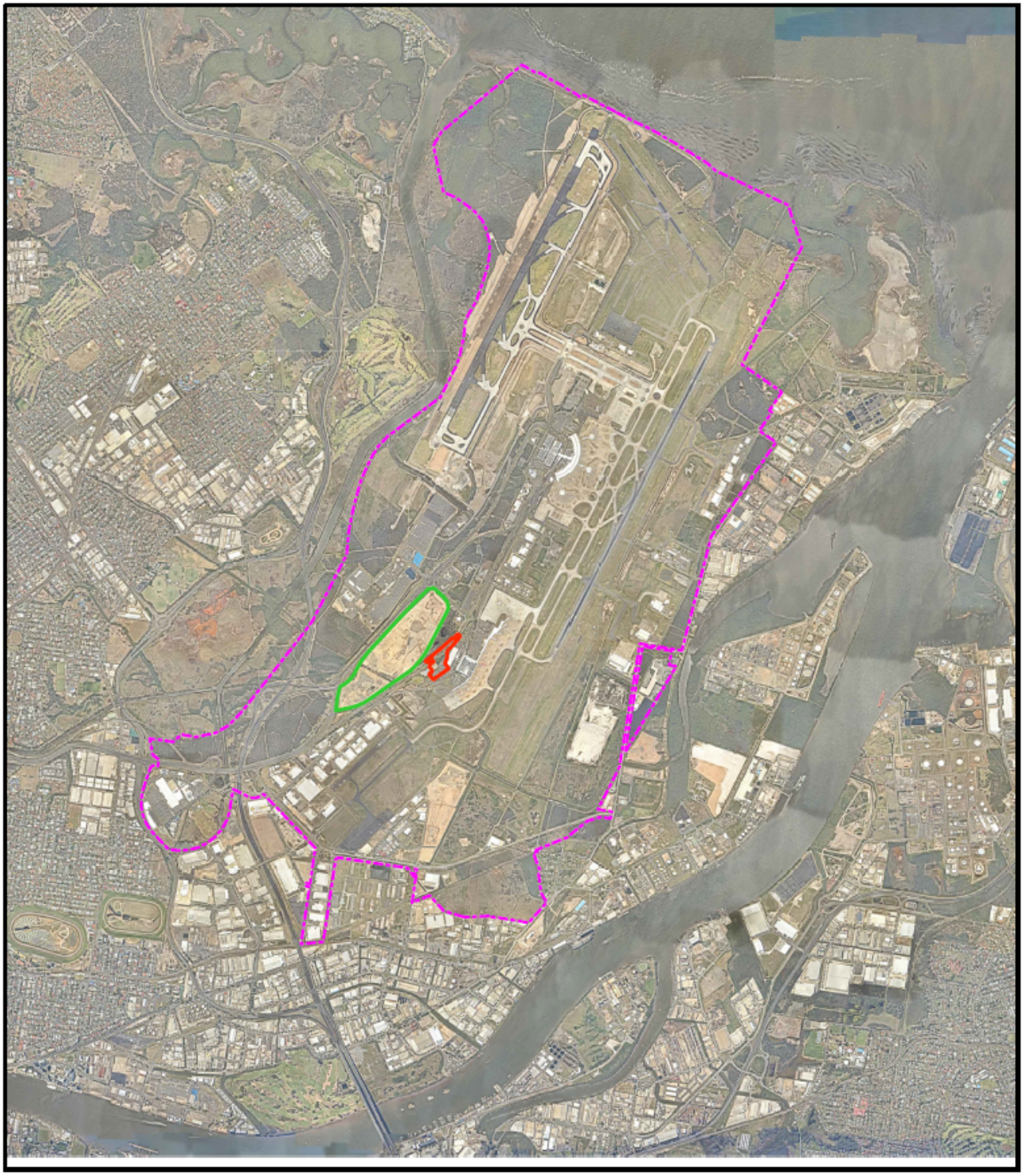
Figure 1: Domestic and international passenger growth forecast

The International Terminal Building (ITB) is currently serviced by the International P1 Multi-level Car Park (MLCP) and on-grade outdoor car parking. During peak travel periods, generally corresponding to the holiday seasons in October, December and January, these parking facilities are experiencing demand in excess of capacity. Continued growth in passenger movements will place pressure on these existing parking facilities.

To address the current and projected growth in short and long-term terminal parking, as well as increasing rental demand, Brisbane Airport Corporation (BAC) is seeking to develop a second MLCP (International P2 MLCP) to service the ITB. The International P2 MLCP will supplement parking already provided by the International P1 MLCP to meet the growing passenger demand for parking and provide up to 2,800 additional parking bays within the precinct. Figure 2 shows the proposed footprint for the International P2 MLCP. The total cost for the International P2 MLCP project is anticipated to be in the order of $90 million.

Based on BAC's current forecast, the International P2 MLCP is likely to be full during peak periods within the first year of operation. To support the ongoing demand for car parks at Brisbane Airport, BAC intends to create over 3000 additional bays at a number of sites (Central Parking Area and Banksia Place) over the next two years. These bays are intended to provide the necessary capacity for staff and valet overflow operations until the International P2 MLCP is available and will ultimately add to the supply of car parking at Brisbane Airport whilst further capacity planning is investigated.

Figure 2: Proposed footprint and site location of International P2 MLCP



1.2. Report Structure

The format of this report is as follows:

- Section 1: Introduction (this chapter) – an introduction detailing the background, project proponent and report structure.
- Section 2: Project description – describes the project that is the subject of this MDP.
- Section 3: Legislative context – outlines the legislative context within which the project is being developed, having regard to relevant federal, state and local legislation and policy.
- Section 4: Operational and Environmental Assessment methodology – defines the scope of the assessment and the methodology used in the assessment of operational and environmental impacts associated with the proposal.
- Section 5: Operational assessment – provides the operational assessment and mitigation measures proposed.
- Section 6: Environmental assessment – provides the environmental assessment and mitigation measures proposed.
- Section 7: Building sustainability – provides a summary of the sustainability elements of the proposal
- Section 8: Summary of operational, environmental and social impacts – summarises the operational, environmental and social effects of the proposal as identified in sections 5 and 6.

1.3. 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 1996*. The proponent for this proposed MDP as defined under the Act is:

Brisbane Airport Corporation Limited
11 The Circuit
Brisbane Airport Qld 4008

The contact in connection with this proposal is David Gunning, Head of Major Projects, telephone (07) 3406 3000.

Project Description

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2. PROJECT DESCRIPTION

2.1. Project Summary

The proposed project includes the construction of a new MLCP, and provides vehicle and pedestrian access to the existing International P1 MLCP. Road realignments, on-grade car parks, and a new intersection on Airport Drive are also included within the proposed project.

The International P2 MLCP will provide secure, undercover parking to meet the future demand for parking associated with increasing ITB passenger movements. BAC has investigated the potential design and siting of the International P2 MLCP to a conceptual level and has used this conceptual design as the basis for this MDP. This MDP is therefore based on a building envelope which has been identified during the conceptual design phase (refer to Section 2.4). Proposed uses to be accommodated by the development include, but are not limited to, public parking, valet operations, car rental operations, ground transport operations and car washing facilities.

Should the final design vary from the project design provided in this report, it may be necessary for BAC to seek further approval from the Department of Infrastructure, Transport, Cities and Regional Development. If the variation is of a minor nature, the *Airports Act 1996* provides a process for the approval of a minor variation to the MDP in accordance with Section 95 of the *Airports Act 1996.*

2.2. Project Justification and Objectives

2.2.1 Project Justification

The existing International P1 MLCP and the adjacent on-grade outdoor car park provide for short and long-term parking associated with passenger movements at the ITB. Increasing passenger movements has resulted in a corresponding increase in vehicle traffic accessing the ITB. An assessment of landside parking in 2015, identified that in peak travel periods (generally corresponding to holiday periods in October, December and January) the existing parking facilities are already experiencing capacity constraints (PSA, 2015).

The 2014 Master Plan identifies that private vehicles are the choice of transport for 72% of passengers currently using the ITB. While BAC is implementing measures to increase the use of public transport across the airport, improving parking is an initiative promoted by the Ground Transport Plan (BAC, 2015). Continued growth in passenger movements through the ITB will see a corresponding increase in vehicle traffic. To address the current and projected growth in short-term and long-term parking, as well as an increase in rental demand, BAC is seeking to develop a second MLCP (International P2 MLCP).

2.2.2 Project Objectives

The overall project objective is to provide sufficient car parking capacity at the ITB to cater for the expected growth in passenger movements. This is consistent with the overall vision and objectives of the Master Plan, which in relation to ground transport include the following:

- Maximise connectivity and accessibility;
- Facilitate safe and secure movement of people and freight;
- Deliver innovative, efficient and continuous airport services;
- Continue agency partnering which builds on an integrated transport connection plan;
- Timely delivery of a seamless transport system that provides new and improved capacity, and
- Minimise adverse environmental impacts.

2.3. Location of Proposed Development

International P2 MLCP will be located adjacent to the existing International P1 MLCP (refer to Figure 2). The development site is currently used as an outdoor car park, with the proposed International P2 MLCP to resume approximately 460 of these bays. The proposed development is bound by Lobelia Circle, with links to Airport Drive and pedestrian links to the ITB.

Key advantages of locating the proposed development adjacent to the existing International P1 MLCP include proximity to existing parking and the new site remains within walking distance to the airport terminal. The proposed development site is also within close proximity to existing infrastructure such as the International P1 MLCP, the Australian Federal Police building, and the AirTrain.

Access to both the existing International P1 and proposed International P2 MLCPs will be via a new intersection to be constructed on Airport Drive. The proposed new intersection will be south of the Airport Drive/Nancy Bird Way roundabout and positioned between the existing and proposed MLCPs (refer to Figure 3).

2.4. Project Design

BAC has completed a conceptual design and siting study for the International P2 MLCP. The outcomes of this study were the identification of a preferred building envelope and access arrangements for the International P2 MLCP. The study provides for a MLCP building envelope of approximately 52 m wide by 184 m long with a maximum height of 27.905 m AD (26.771 m AHD).

The proposed building envelope takes into consideration efficiency of parking and circulation within the building and the desire to provide natural ventilation throughout the facility. Concept plans that have formed the basis of this building envelope are provided in Appendix B.

To enable access to the proposed development, a new intersection will be constructed on Airport Drive. This intersection will provide a new connection that facilitates movements between the car parking facilities and the Brisbane Airport road network. The details of the proposed intersection with Airport Drive will be confirmed as part of the detailed design. Figure 3 and Appendix B illustrate a potential arrangement for connecting to Airport Drive.

A bridge or bridges to provide vehicle access between the International P1 and International P2 MLCPs may be considered as part of the detailed design.

BAC will work closely with the successful design and construction contractor to develop a detailed design that is generally consistent with the conceptual building envelope defined in this MDP and the objectives of the Brisbane Airport 2014 Master Plan.

2.4.1 Building Materials

The intent for the proposed development is to provide a modern and efficient car parking facility that should complement the adjoining International P1 MLCP and, as much as reasonably possible, other infrastructure surrounding the proposed development. Design considerations will be confirmed as part of the detailed design and will ensure selected materials are non-reflective and will ensure no affect or distraction to approaching or departing aircraft.

Figure 3: Proposed building envelope and road access for International P2 MLCP

2.4.2 Occupational Health and Safety

Occupational health and safety requirements within and adjacent to the proposed development site will be in accordance with relevant BAC, Commonwealth Government Agency Requirements and all applicable statutory requirements including the *Workplace Health and Safety Act 2011* (Qld).

2.4.3 Equity of Access

Accessible car parks will be provided as per the requirements of the National Construction Code. The final number and location of accessible car parks will be confirmed as part of the detailed design, however, they will be located as close as possible to the horizontal pedestrian spine and as close as possible to lifts so as to reduce travel distances. Accessible car parks shall be designed in accordance with *AS/NZS 2890.6: 2009 Parking facilities off-street parking for people with disabilities*.

2.4.4 Energy Efficiency Considerations

Inclusion of energy efficiency measures shall be considered as part of the detailed design. Based on the conceptual design and existing parking facilities offered at the Brisbane Airport, the following energy efficient measures may be considered during the detailed design:

- ***Natural ventilation.*** The width of the building envelope means that there is an opportunity to adopt natural ventilation, reducing the requirement for mechanical ventilation for the general car park area.
- ***Lighting.*** Utilisation of low profile, low glare, energy efficient light-emitting diode (LED) luminaries with the car park and walkway lighting, and auxiliary rooms in accordance with BAC guidelines.
- ***Lighting control.*** The lighting circuitry operated via a lighting control system for energy efficient operation via time clocks, photoelectric cells, motion sensors and programmed sequencing.

2.4.5 Fire Protection and Safety

Detailed assessment of fire protection and safety measures will be carried out at the detailed design phase. As a minimum, the proposed development will comply with the National Construction Code fire safety requirements.

2.4.6 Security

The International P2 MLCP shall provide a safe and secure environment for users to park their vehicles. The detailed security measures will be confirmed during the detailed design phase; however, are likely to be consistent with the principles for car parks contained in the *Crime Prevention Through Environmental Design: Guidelines for Queensland* (Queensland Government, 2007) and are likely to be consistent with the level of security provided in existing MLCPs within the Brisbane Airport. This may include, but not be limited to the following measures:

- Clear and concise signage to assist people in moving around an unfamiliar location with a sense of confidence.
- Closed circuit television (CCTV) surveillance system.
- Car park management system.
- Customer assistance points.
- Lighting, appropriate surveillance and avoiding shadows and glare (where design can respond) which might put people at risk.

Access for law enforcement and emergency services to the ITB will be maintained during the construction and operation of the International P2 MLCP. A stakeholder management plan will be developed as part of the construction management plan.

2.4.7 Landscaping

Construction of the proposed International P2 MLCP will be sympathetic to the design and materials used for the International P1 MLCP. Landscaping around the proposed International P2 MLCP will be consistent with the Brisbane Airport Landscape Setting Strategy and is likely to focus on providing the following characteristics:

- Tree species that provide shade.
- Provide seasonal diversity and be aesthetically stimulating (textural, fragrant or flowering).

- Create a subtropical character.
- Healthy growing conditions for trees planted for amenity and shade purposes in hard stand areas. This would include allowing for sufficient space for tree species to establish rootballs, but may also include consideration of larger tree openings to provide room for root flare, trunk growth, oxygen exchange and rainwater capture.

Post-construction of the new Airport Drive intersection and ITB parking precinct access, the road verge will be appropriately landscaped. Around intersections, it is proposed to establish low level and efficient landscaping or hardscaping to maintain sightlines. This is likely to transition to areas with shrub and tree species that represent South East Queensland and a subtropical landscape.

2.5. Project Development Phases

2.5.1 Road and Services

The proposed development involves the construction of a new intersection and complimentary road infrastructure as shown on Figure 3.

The International P2 MLCP will be connected to the existing infrastructure network, including, electrical power supply, communication system to directly interface with the existing BAC network, sewer, potable water supply, sanitary drainage and trade waste drainage.

2.5.2 Building Works and Site Works

Construction of the proposed International P2 MLCP would likely follow a similar process to the existing International P1 MLCP. As part of the detailed design phase, BAC will work with the design and construction contractor to incorporate measures that maximise yield, minimise cost and minimise the construction schedule. As part of this detailed design process, a range of alternative construction methods will be considered. However, it is anticipated that the proposed development will require a deep piled solution with precast or cast in situ concrete piles. On-grade (level 1) parking may be constructed as asphalt pavement or thin jointed ground bearing slabs.

Construction activities will need to be carefully staged to minimise the impact on normal operations. Current land use in the building envelope is existing on-grade parking and vacant land. Construction activities will result in the loss of some existing on-grade parking (approximately 460 car parking spaces). Construction works may be staged to minimise this loss of parking during construction. Subject to the construction contract, the first stage could involve the new connection to Airport Drive (south-bound) and modifications to Lobelia Circle to provide access to the proposed construction site. Stage 2 could include the construction of the MLCP itself. Where necessary, existing airport parking in other locations is proposed to be used to manage the ongoing requirement for car parking during construction.

2.5.3 Indicative Timing of Proposal

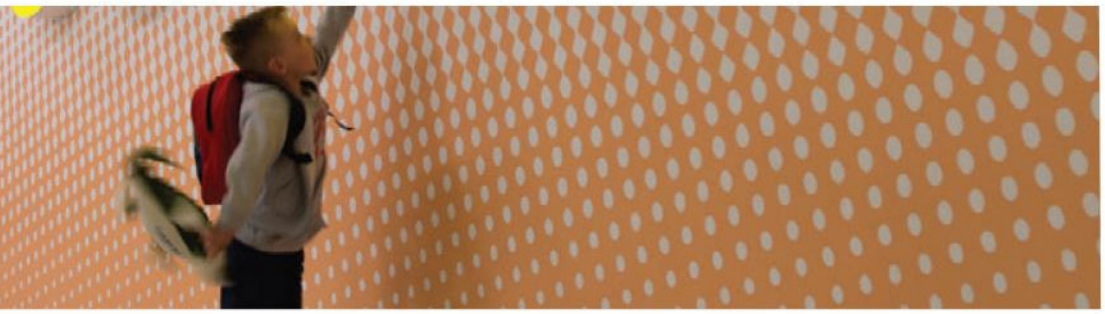
Table 1 provides the indicative timeframes for the detailed design, construction and operation phases.

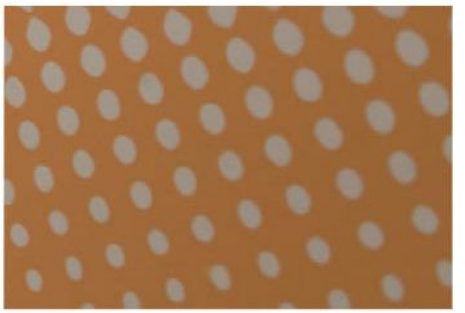
Table 1: Indicative timeframes

Stage	Likely Timing
Detailed design phase	Late 2018 to Late 2019
Construction	Early 2020 to Mid 2021
Operation	Late 2020 onwards

Legislative Context

3





3. LEGISLATIVE CONTEXT

The following sections provide an overview of relevant legislation and policy for the proposed MLCP. As BAC holds a long-term lease over the Brisbane Airport from the Commonwealth Government all building and development activities are regulated by Commonwealth legislation consisting of, but not limited to:

- *Airports Act 1996 (Cth);*
- *Airports Regulations 1997 (Cth);*
- *Airports (Building Control) Regulations 1996 (Cth);*
- *Airports (Environment Protection) Regulations 1997 (Cth);*
- *Airports (Control of On-Airport Activities) Regulations 1997 (Cth);*
- *Airport (Protection of Airspace) Regulations 1996 (Cth);*
- *Environment Protection and Biodiversity Conservation Act 1999 (Cth);*
- *Work Health and Safety Act 2011 (Qld);*
- *Aviation Transport Security Act 2004 and regulations (Cth); and*
- *Civil Aviation Safety Authority Manual of Standards – Part 139 Aerodromes (Cth).*

3.1. Consistency with Commonwealth Legislation

3.1.1 Airports Act 1996

The *Airports Act 1996* requires an MDP to be prepared for each major development at a regulated 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 development' by virtue of Section 89(1)(e), defined as:

> *'constructing a new building where:*
> *(i) the building is not wholly or principally for use as a passenger terminal; and*
> *(ii) The cost of construction exceeds $25 million or such higher amount as is prescribed'.*

Section 90 of the *Airports Act 1996* provides 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 *Airport Act 1996*.

The key steps in the approvals process for an MDP are presented in Figure 4. An MDP checklist is provided in Appendix B to demonstrate the compliance with Section 91 of the *Airports Act 1996*.

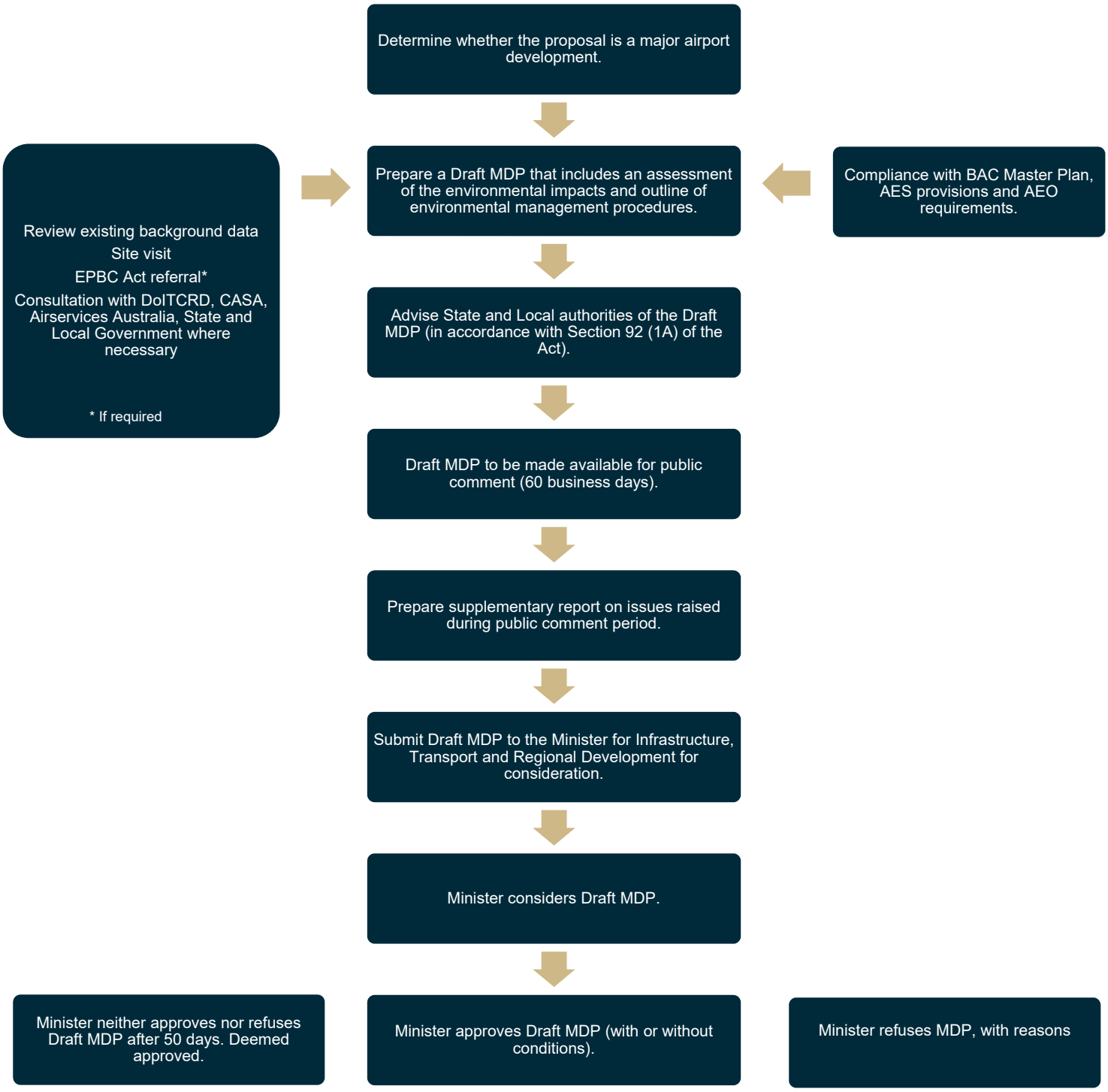


Figure 4: MDP Approval Process

Note: The MDP approval protocols are subject to provisions contained under the Commonwealth *Airports Act 1996*. The Minister is responsible for deciding whether to grant approval or refuse the MDP.

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; and
- 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 and Energy. The Minister would decide if the impacts are significant and whether an approval is required. The Minister's response to the referral would determine the level and nature of environmental assessment required for final approval by the Minister.

Based on the assessment detailed in Section 5, the proposed development, including construction and operation, is not considered to have a significant impact on a MNES or the environment. No referral under the EPBC Act is therefore required.

3.2. Pre-existing Airport Land

When BAC became the Airport Lessee Company for Brisbane Airport in July 1997, it assumed certain pre-existing lessor obligations under various leases. BAC also became the head-lessee under the airport lease subject to a number of other interests in the airport land (such as easements). Some of those contractual and other rights remain in existence. Others have expired.

There are no such contractual or other rights affecting the site of the proposed International P2 MLCP.

3.3. Consistency with Airport Lease

An essential requirement of the lease is that the lessee must comply with all legislation relating to the airport site. In particular, Section 91 (1A) of the *Airport Act 1996* which states that all major development is to be consistent with the airport lease.

BAC, as the Airport Lessee Company for Brisbane Airport, has an obligation to ensure all developments on airport land are consistent with the legislation and development to maintain appropriate urban planning and ensure safe and sustainable outcomes. In particular, BAC must confirm that any proposal on airport land is consistent with:

- The final Master Plan for the airport;
- Any approved Major Development Plan for the airport, if applicable (as per *Airports Act 1996*, section 89);
- The approved Airport Environment Strategy;
- BAC's planning objectives for the airport; and
- Transport Security Plan and Critical Infrastructure Protection Specifications and Guidelines.

The proposed International P2 MLCP described in this MDP is deemed consistent with the above documents and in particular the Brisbane Airport Master Plan 2014 and its 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 lease requirements.

3.4. Consistency with the Brisbane Airport Master Plan

3.4.1 Brisbane Airport Master Plan

The Brisbane Airport 2014 Master Plan provides the planning framework for the development of the site to 2034 and beyond. Approved by the Federal Minister on 13 January 2015, the Master Plan sets out land use zonings that reflect the intended uses within the leased airport site.

Development objectives identified in the Master Plan have been developed to support the achievement of BAC's vision for the Brisbane Airport – which is to be world best and the preferred choice for passengers, airlines, business and the community. Development objectives are based on the four pillars of sustainability – economic, operations, environment and social. Table 2 outlines how the construction and operation of the International P2 MLCP is consistent with these development objectives.

Table 2: Master Plan development objectives

Development objective	International P2 MLCP
Economic	
Drive and enable national and state economic wealth and employment growth	As identified in the Master Plan, the ITB provides an important connection for international tourists visiting Queensland. The proposed International P2 MLCP is vital to meeting expectations, improving circulation within the precinct, and providing a product that enhances the experience of passengers and visitors.
Provide aviation infrastructure to accommodate and encourage growth	The proposed development will provide additional capacity that supports growth in passenger movements through the ITB.
Commitment to best practice corporate governance and prudent management of Brisbane Airport for the benefit of Australia.	BAC is committed to addressing current capacity constraints in relation to parking. The preparation of this MDP, as well as future development and building approvals, will meet the necessary legislative and corporate governance requirements.
Operations	
Facilitate the safe and secure movement of people, freight and aircraft	The potential impact to people, freight and aircraft has been considered as part of this MDP and will continue to be a major consideration in the detailed design and construction phases of the proposed development.
Ensure the timely delivery of new and improved airport capacity	The current International P1 MLCP will not provide sufficient car parking to meet the projected growth in demand associated with increasing passenger movements. The proposed development will provide additional capacity to meet this demand.
Deliver innovative, efficient and continuous airport services where customer service is at the core of airport operations	As noted above, the proposed International P2 MLCP is vital to meeting the expectations of passengers and improving traffic circulation within the precinct. Innovative design solutions and construction methodologies are proposed to be explored as part of the detailed design process.
Develop relationships to optimise overall operational performance.	BAC will continue working with parking and transport operators to identify capacity constraints and opportunities for improved customer experience. The development of the International P2

Development objective	International P2 MLCP
	MLCP is integral to optimising the overall operational performance of the parking and transport network and services around the ITB.
Environment	
Achieve a balance between the on-airport built environment and biodiversity values	The proposed development is located outside of the Brisbane Airport's Biodiversity Zone and had been sited so that the majority of the proposed development is located in an area currently used for car parking and a small area of vacant land.
Achieve environmentally sustainable development across the airport	Sustainability initiatives shall be considered as part of the proposed development and are detailed in Section 7.
To be recognised as a leader in the management of energy, water, waste, noise and biodiversity	The proposed development will seek to integrate with existing management, water and energy systems adopted by BAC to maximise energy efficiency and resource reuse wherever possible.
Social	
Contribute to achieving the vision of Brisbane as a new world city that encourages growth while protecting the city's values and lifestyle	Brisbane Airport provides a connection between Brisbane and the rest of the world. The proposed development will support the continued growth in passenger movements and the associated increase in traffic and parking requirements, as well as enhancing passenger experience.
Harness development opportunities to underpin Brisbane Airport as a business and leisure hub to maximise airport accessibility and connectivity	
To build respectful and valued relationships so all people want to be part of, and have pride in Brisbane Airport.	

3.4.2 Ground Transport Plan

The Master Plan contains Brisbane Airport's Ground Transport Plan, the purpose of which is to plan for the on-airport and surrounding road network, facilities for moving people and freight at the airport, car parking infrastructure, public transport services and the ground transport system to support airport operations into the future.

One of the initiatives of the Ground Transport Plan is to improve parking. As part of this, the Ground Transport Plan recognises that the parking strategy post-2019 will include an additional multi-level car park to service the ITB. The development of the International P2 MLCP is therefore consistent with the objectives and initiatives of the Ground Transport Plan.

3.5. Consistency with Brisbane Airport Environmental Strategy

As per Section 71 of the *Airports Act 1996*, the Master Plan also contains the Airport Environment Strategy (AES). The AES assesses the environmental values of the airport and provides action plans and measurable goals for the ongoing management and improvement of environmental outcomes. The proposed development is consistent with the AES and is not located in any biodiversity zones or environmentally significant sites identified in the AES.

BAC accepts responsibility for ensuring the implementation of environmental management measures proposed to mitigate environmental impacts identified in this MDP during construction and operation. This is to be achieved through the submission of this MDP and requiring a construction environmental management plan (CEMP) to be prepared and implemented by the construction contractor. The CEMP will be approved by BAC prior to issue to the Airport Environment Officer (AEO).

3.6. Consistency with State and Local Government Planning

Being Commonwealth land, planning requirements for the airport land are administrated under the *Airports Act 1996* and other relevant legislation such as the EPBC Act. As a result, state and local planning development provisions are not applicable to development occurring at the airport.

The Act, does however, require that an MDP must 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 below demonstrates the proposed development's consistency with relevant planning policies/schemes.

3.6.1 State Planning Policy

In preparing this MDP, consideration has been given to the State Planning Policy (SPP) operating in Queensland and effective at the time of publishing this MDP. The SPP became effective on 3 July 2017. The SPP identifies the Queensland Government state's interests in planning and development and how these interests are dealt with in planning schemes, council development assessment processes and in designating land for infrastructure.

Relevant SPP state interests include:

- Tourism, including that appropriate infrastructure to support and enable tourism development is provided.
- Water quality, including that development is located, designed, constructed and operated to avoid or minimise adverse impacts on environmental values of receiving waters and meets applicable stormwater management design objectives.
- Strategic airports and aviation facilities, including that development and associated activities will not create incompatible intrusions or compromise aircraft safety in operational airspace and avoid increasing risk to public safety in a public safety area.

The proposed development meets the state interests for tourism and strategic airports and aviation facilities. Stormwater design requirements will be part of the detailed design phase. Temporary works required during construction will be included in the CEMP. With the implementation of appropriate stormwater management design, the proposed development will meet the SPP state interests.

3.6.2 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) which is a key centre in the city and provides major air access from the city for passengers and freight.

The objective of the Special Purpose Zone in City Plan is to:

(a) provide for public facilities and infrastructure that are publicly or privately owned or operated; and
(b) ensure that incompatible uses do not encroach on the public facilities and infrastructure.

Overall outcomes of the Airport Zone Precinct of the Special Purpose Zone are:

(a) Development provides areas for:
(i) housing, servicing, maintenance and repair of aircraft;
(ii) landing and departure of aircraft;
(iii) assembly and dispersal of passengers and goods on or from aircraft;
(iv) ancillary activities serving the needs of workers, passengers and visitors to an airport, such as shopping, food and drink outlets and tourism services;
(b) associated training, education and aviation facilities.

The proposed development meets the objective of the Special Purpose Zone in that it will provide infrastructure to support the continued growth of Brisbane Airport and is a compatible use for this area. The proposed development also meets the overall outcomes in the provision of ancillary infrastructure that will service the needs of passengers and visitors.

3.7. Airport Development and Building Approvals

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

The Building Approval cannot be issued by the ABC without written consent from BAC, confirming that the new development is consistent with:

- Brisbane Airport Master Plan;
- Brisbane Airport Environment Strategy;
- Planning objectives for the Airport; and
- An approved MDP.

Operational and Environmental Assessment Methodology

4

4. OPERATIONAL AND ENVIRONMENTAL ASSESSMENT METHODOLOGY

4.1. Assessment Scope

The scope of the assessment includes consideration of the following:

- Operational factors:
  - Ground transport.
  - Aviation operations and safety.
- Environmental and social factors:
  - Geology, soils and topography.
  - Ecology.
  - Hydrology and water quality.
  - Air quality and odour.
  - Noise.
  - Land use.
  - Landscape.
  - Social and economic issues.
  - Cultural heritage.
  - Waste.
  - Hazardous goods.

Information has also been provided regarding the sustainability considerations for the International P2 MLCP including water, energy and materials.

4.2. Assessment Method

Reference has been made to previous studies at the airport site to inform the description of the baseline environment at the proposed development site. This includes analysis of information from previous MDPs and the literature listed in the following section.

4.2.1 Literature

In addition to other BAC studies referenced in this report, this MDP has been prepared using the following information:

- EPBC Act Protected Matters Search Tool (PMST).
- Queensland Globe for matters related to the *Nature Conservation Act 1992* (Qld) (NC Act), *Water Act 2000* (Qld) (Water Act) and *Fisheries Act 1994* (Qld) (Fisheries Act).
- Queensland Heritage Register.
- Australian Soil Resource Information System (ASRIS).
- Department of Infrastructure, Local Government and Planning (DILGP) DA mapping system.
- State Assessment and Referral Agency (SARA) mapping.
- Department of Agriculture and Fisheries (DAF) fire ant biosecurity zone map dated 1 July 2016.
- Department of Environment and Heritage Protection (DEHP) wildlife online database.
- Department of Aboriginal, Torres Strait Islander and Multicultural Affairs (DATSIMA) cultural heritage database.
- PFAS National Environmental Management Plan

A full list of references is provided following Section 8.

4.2.2 Assessment Technique

To assist in the assessment of potential impacts identified in this MDP and to ensure consistency between topics, significance criteria have been defined which follow the generic framework shown in Table 3. The use of significance criteria to assess impacts is a standard technique applied in impact assessments of this nature and is an approach that has been consistently used by BAC in MDP's at Brisbane Airport. BAC has developed the environmental and social-economic significance criteria based on the Australian Standard for risk management (AS/NZS ISO31000-2009) and BAC's experience in managing the Brisbane Airport. This approach enables different topics (i.e. noise and ecology) to be assessed in a consistent manner against the same criteria which are set in an ascending scale of potential impact and ability to mitigate those impacts.

Table 3: Environmental and social-economic significance criteria

SIGNIFICANCE	IMPACT CLASSIFICATION	CRITERIA
High	Impact a major problem	Environmental effects are likely to be important considerations at a local scale. If the environmental effects are adverse, they represent potential concerns to the project, depending upon the relative importance attached to the issue during the decision making process. Considerable adverse change to current amenity, lifestyle and everyday community activities. Mitigation measures and detailed design work are unlikely to remove all the effects upon the affected communities or interests. Residual effects would predominate.
Moderate	Impact moderate but liveable for most people	These effects, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effects of such issues may lead to an increase in the overall effects upon a particular area or on a particular resource. Noticeable adverse change to current amenity, lifestyle and everyday community activities but with scope for mitigation. They represent issues where effects would be experienced but mitigation measures and detailed design work may ameliorate/enhance some of the consequences upon affected communities or interests. Some residual but not significant effects would still arise.
Low	Impact recognisable but acceptable	These effects may be raised as local issues, but are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in evaluating the subsequent design of the project and consideration of mitigation measures. There may be localised or limited noticeable change to current amenity, lifestyle or everyday community activities.
Negligible	Minimal Change	No effects or those which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Note: Potential impact categories above can also be categorised as beneficial.

4.3. Assessment Results and Commitments

The following sections discuss the potential operational, environmental and socio-economic impacts of the proposed International P2 MLCP, during both the construction and operational phases. Mitigation measures for minimising and/or managing these impacts are also included as per the requirements under Section 91 of the *Airports Act 1996*.

Works included in this operational, environmental and social assessment are:

- Construction and operation of the proposed International P2 MLCP.
- Construction and operation of road access to the proposed International P2 MLCP.

BAC accepts responsibility for ensuring the implementation of management measures proposed to mitigate impacts identified in this MDP during the construction and operational phases. This is to be achieved through the submission of the MDP and requires a CEMP to be prepared and implemented by the construction contractor. The CEMP will be reviewed and approved by BAC prior to submission to the AEO.

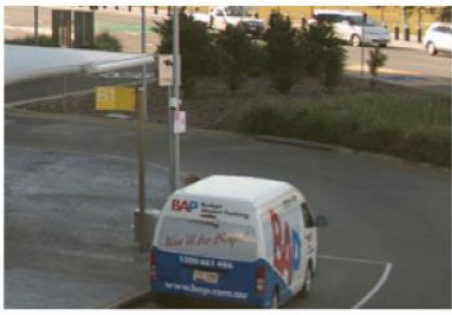
The CEMP will be in place prior to the commencement of construction and all site personnel made aware of its requirements. The CEMP will detail the following:

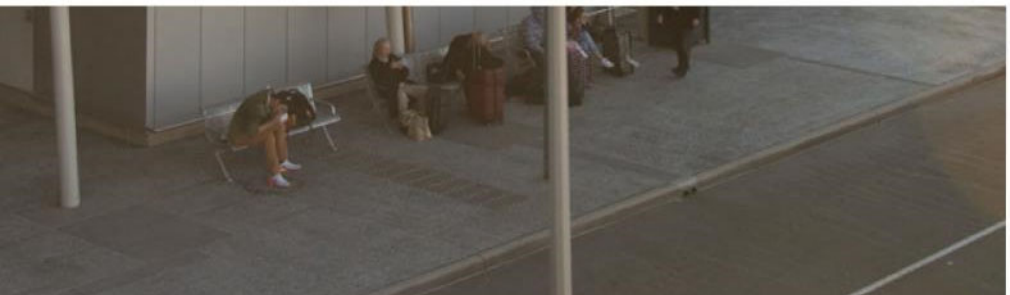
- Responsibility for implementing the requirements of the CEMP and for regular site checks to confirm effectiveness.
- Training and inductions for site personnel.
- Mitigation measures including but not limited to those outlined in this MDP.
- Monitoring, if required, during the construction phase. This may include air quality, surface water and groundwater monitoring during the construction period.
- Emergency management procedures.
- Corrective actions in the event that a non-conformance is identified.
- Reporting requirements, including monitoring results and any non-conformances.

During the operation of the proposed development, BAC is responsible for environmental management, monitoring and reporting.

Operational Assessment

5





5. OPERATIONAL ASSESSMENT

5.1. Ground Transport

5.1.1 Baseline Conditions

ITB Parking and Vehicle Circulation

The ITB is currently serviced by the International P1 MLCP and on-grade outdoor car parking. Access to the International P1 MLCP is via the existing roundabout at the intersection of Airport Drive and Nancy Bird Way. Vehicles accessing the International P1 MLCP use either Moreton Drive or Airport Drive, prior to getting to the roundabout. Vehicles can exit the International P1 MLCP onto either Airport Drive, Lobelia Circle or Qantas Drive.

The Airport Drive/Nancy Bird Way intersection and Moreton Drive ramps/Nancy Bird Way intersection are key to maintaining appropriate road capacity for the traffic demanded by the precinct. Airport Drive, Moreton Drive and Nancy Bird Way are four lane median divided roads. Table 4 provides the current traffic volumes for Airport Drive and Moreton Drive.

Table 4: Approximate traffic volumes for Airport Drive and Moreton Drive

Roads	Traffic volume (vehicles per day)		
	Northbound	Southbound	Total
Moreton Drive	32,500	25,600	58,100
Airport Drive	4,800	9,300	15,100

Note: Moreton Drive volumes were taken just south of Nancy Bird Way, Airport Drive northbound volumes were taken from the exit ramp, Airport Drive southbound volumes were taken from the entry ramp (prior to merge with Moreton Drive)

Staff Vehicle Movements

The existing priority staff car park is located on the northern side of the ITB and has capacity for 598 car parking bays. Vehicle access to the staff car park is via Ficus Way, which is accessed via the roundabout at the intersection of Airport Drive and Nancy Bird Way. Vehicles exit the staff car park onto Ficus Way, travelling between the International P1 MLCP and the off-airport rental car park to Lobelia Circle, finally exiting the ITB via the roundabout at the intersection of Airport Drive and Nancy Bird Way. There is also staff parking available outside of the precinct in the Central Parking Area, located on Bert Hinkler Way, which is accessed via Moreton Drive and Nancy Bird Way.

ITB Public and Active Transport

The AirTrain passes above the existing on-grade car park, with the station platform located between the existing International P1 MLCP and the International Terminal. Services depart the ITB every 15 minutes during the peak departure times and every 30 minutes on weekends, public holidays and during the off-peak period on weekdays.

There are no Translink bus services from the ITB. A number of buses managed by BAC, including the T-Bus, T-Bus Express, AirPark Bus and the S-Bus, currently service the ITB. The T-Bus and T-Bus Express connect the Domestic Terminal, International Terminal and Skygate. With the exception of S-Bus, these services stop at the International Terminal Levels 2 and 4. The S-bus is a staff bus that services both the international and domestic terminals and staff car parking areas. The S-Bus connects the staff car parks with Level 1 of the International Terminal. The T-Bus and T-Bus Express have services every 15 minutes during peak periods. The AirPark Bus operates between the international and domestic terminals and the Central Parking Area.

The designated bicycle route from the Kedron Brook Bikeway to the ITB is via Charlie Earp Bridge, Lakeside Drive and Qantas Drive. The designated bicycle route from the ITB to the Kedron Brook Bikeway is via Airport Drive and Charlie Earp Bridge. Additional cycle paths are planned for construction over the coming years based on the uptake in cycling as indicated in the *Ground Transport Plan* (in the Brisbane Airport 2014 Master Plan). An existing path provides a connection between the AFP building and the ITB for both pedestrians and cyclists. This path runs along the southern side of the proposed development site, and will be affected by the construction of the International P2 MLCP.

Other transport modes

Other modes of transport that service the ITB include public pick up and drop off, taxis, ride sharing (i.e. Uber), coaches and limousines. The public drop off area (at Departures on Level 4) and pick up area (at the northern side of International P1 MLCP) are accessed via Ficus Way. Vehicles exit via Qantas Drive, Airport Drive or Lobelia Circle (towards Moreton Drive).

The taxi rank is located at the northern end of Arrivals on Level 2. Facilities for ground transport operators (coaches, limousines) are located south of the ITB, and is accessed via the Level 2 ramp, with exit onto Qantas Drive. There is also a designated ride-booking service (Uber) pick up zone in this area.

Service Facilities and Service Vehicle Movements

Loading dock facilities for the ITB are currently located on Level 1 of the terminal building. Service vehicles access the ITB via the Airport Drive and Nancy Bird Way roundabout.

Proposed Vehicular Access Arrangements

Access to the International P2 MLCP will be via a new intersection to be constructed on Airport Drive, south of the Airport Drive and Nancy Bird Way roundabout. The proposed new intersection will be positioned adjacent to the existing International P1 MLCP and the International P2 MLCP, and is proposed to provide access to both the International P1 and International P2 MLCP and on-grade parking. During detailed design the positioning of this access point may change, however not the detriment of the car parks nor roads functions.

5.1.2 Assessment of Impacts

Construction

Construction of the International P2 MLCP will see a loss of approximately 460 existing on-grade car parks. This has the potential to put an increased strain on the capacity of the International P1 MLCP, which is likely to result in more periods of over-capacity. Road works associated with the new Airport Drive intersection and access to the ITB parking precinct has the potential to impact traffic on Airport Drive. Potential impacts on Airport Drive during the operation phase are considered unlikely.

During construction the number of construction workforce personnel will fluctuate depending on the level of construction activity occurring at particular stages of construction; however, the workforce numbers are expected to peak at 60 staff on-site during the peak construction period as the number of trades on-site at any one time will be limited. It is expected that construction staff will arrive on-site in their own private vehicle, generating a demand of 60 vehicles. A designated car parking and loading area will be identified in the CEMP and is likely to be in close proximity to the proposed development site.

Construction is expected to take place over a 12 to 18-month period. The peak construction period is expected to occur for a period of two to four months in the second half of the construction program. It is considered that the short term impacts of the construction traffic, when carefully managed, will have a negligible impact due to the landside road network having adequate spare capacity in the near term to cater for small increases in traffic demand.

The permanent works associated with the International P2 MLCP will be located outside of the AirTrain easement (refer to Figure 3). Construction equipment may impact sight lines on the adjacent AirTrain line. This may require additional measures to be put in place to manage any required track maintenance during the construction of the International P2 MLCP. There is a requirement for a 3 m exclusion zone from overhead traction wiring equipment and/or low voltage services without suitable approved controls (including but not limited to a permit to work). International P2 MLCP will not extend into the exclusion zone. Should temporary construction activities be required to extend into the exclusion zone, BAC will comply with all relevant requirements and policies to uphold the safety of its employees and contractors. Following construction, there are not expected to be any impacts on the operation of the AirTrain. AirTrain will be consulted during the detailed design phase to ensure that any impacts are treated and mitigated as required.

Trip Distribution

Currently, the majority of vehicles traveling to the International P1 MLCP are from Moreton Drive (via Nancy Bird Way and Ficus Way) with the remainder travelling from Airport Drive onto Ficus Way (there may be a small volume from the Domestic Terminal; however, this is assumed to be negligible.)

During the operational phase, vehicles could access the International P1 and International P2 MLCPs via the proposed new intersection on Airport Drive. The assumed entry flow proportions from Moreton Drive and Airport Drive are shown in Table 5 for existing conditions and proposed conditions (with the new intersection and the International P2 MLCP).

Table 5: Assumed MLCP entry flow distribution

From	To Int'l P1 MLCP (existing)	To Int'l P1 & P2 MLCPs (proposed)
Moreton Drive	50%	50%
Airport Drive	48%	50%
Qantas Drive	2%	0%

Vehicles could exit the International P1 and International P2 MLCPs either via the new intersection on Airport Drive or via Lobelia Circle, to access Moreton Drive and Airport Drive. The assumed exit flow proportions to Moreton Drive and Airport Drive are shown in Table 6 for existing conditions and proposed conditions. It is noted that the exit points for the International P1 and International P2 MLCPs will be confirmed as part of the detailed design.

Table 6: Assumed MLCP exit flow distribution

To	From Int'l P1 MLCP (existing)	From Int'l P1 & P2 MLCPs (proposed)
Moreton Drive (via new intersection)	–	15%
Moreton Drive (via Lobelia Circle)	20%	5%
Airport Drive (existing egress/via new intersection)	80%	60%
Airport Drive (via Lobelia Circle)	–	20%

Predicted traffic volumes to 2030 have been used to determine the potential impact on the existing road network, as well as the flow proportions shown above. Based on 2017 traffic volumes, it has been assumed that there will be a 5% per annum growth for all traffic associated with the ITB, which is consistent with the projected growth in passenger movements. The peak hour analysed was 7:00 am to 8:00 am, as this had the highest combination of car park entry traffic, exit traffic and background traffic travelling through the intersections.

Table 7 details predicted traffic volumes and modelling results with and without the International P2 MLCP. The modelling results indicate that both the intersections will operate below the maximum practical operational capacity when the International P2 MLCP is operational.

Table 7: Traffic volumes and modelled outputs for Airport Drive intersections

Year	Intersection and scenario	Traffic volumes (veh./hr)	SIDRA model outputs			
			Degree of saturation*	Average delay (s)	95th percentile back of queue	Highest DOS approach
2020	Airport Drive/Nancy Bird Way (without P2)	2,150	0.48	7.2	20m	Nancy Bird Way (W)
	Airport Drive/Nancy Bird Way (with P2)	2,200	0.47	7.5	20m	Lobelia Circle (W)

	Airport Drive/MLCP access (with P2)	1,350	0.29	4.8	10m	MLCP Access (SE)
2030	Airport Drive/Nancy Bird Way (without P2)	3,750	1.0	37	310	Nancy Bird Way (W)
	Airport Drive/Nancy Bird Way (with P2)	3,900	1.0	31	340	Lobelia Circle (E)
	Airport Drive/MLCP access (with P2)	2,150	0.44	5.4	17	MLCP Access (SE)

* <0.85 is satisfactory

The operation of the International P2 MLCP will not result in an additional impact to the existing or future intersection capacity, beyond that already predicted as part of BAC airport planning. Upgrades at the Airport Drive / Nancy Bird Way roundabout are currently under investigation as part of the Ground Transport Plan and Terminal Development Strategy and will be considered in the future when air passenger demands require the upgrades.

External Road Network Connections

The development of the International P2 MLCP will not introduce any additional passengers through the ITB. Rather the proposed development will merely redistribute trips locally around Brisbane Airport. The proposed development will not 'bring forward' any upgrades to external road network connections beyond the existing schedule of road upgrades.

Other potential impacts

During construction, the existing path between the AFP building and the ITB will be severed. To ensure pedestrian connectivity between these two buildings during construction, a new pedestrian connection will be constructed at the southern end of the project footprint (See Appendix B). Passenger access to and from the AirTrain platforms will be unaffected by the construction or operation of the proposed development.

The proposed development will not generate any additional service vehicle traffic to or from the ITB as all routine maintenance associated with the car park, including servicing the parking ticket machines, will be combined with the existing International P1 MLCP.

BAC's roads and intersections have been designed to accommodate the traffic demands associated with parking products during the peak (as dictated by the available bays in the car parks). Capacity analysis completed for this project concludes that the surrounding roads maintain an acceptable level of capacity during and post delivery of International P2 MLCP. Accordingly, it is not anticipated any adverse traffic impacts will be associated with the use of other parking products.

Staff vehicle movements to and from the existing staff car park are unlikely to be affected by the road network modifications resulting from the construction of the proposed development.

5.1.3 Mitigation Measures

The most significant impact during the construction phase is the loss of existing on-grade car parks, resulting in increased pressure on the existing International P1 MLCP. BAC has modelled the capacity of alternative car parking products that service the ITB, such as International P1 MLCP and Airpark. BAC has determined that there will be sufficient capacity to accommodate parking demand for the ITB during the construction period. In addition to the available capacity within the alternative car parking products, BAC can use other demand management techniques as necessary (i.e. yield management, product management, site management etc.). During peak periods, buses transfer passengers from Airpark to the Terminals every 15 minutes. The existing bus service and frequency has capacity to cater for any redirected traffic and there is flexibility to add buses and increase the frequencies of services as demand dictates. The proposed construction methodology will be designed to have a negligible impact on travel times for existing routes.

Potential impacts associated with the construction of the new intersection can also be mitigated through the staging of construction activities.

The conceptual design developed for the International P2 MLCP has considered minimising the potential queuing of vehicles at the access and exit points of the car park. During detailed design, BAC will work with the construction contractor to develop a design that continues to minimise vehicle queuing to and within the MLCPs.

In addition to the above management and mitigations, a Traffic Management Plan will be prepared as part of the CEMP. The Traffic Management Plan will manage potential impacts associated with construction activities. The Traffic Management Plan will be defined by the construction methodology and include management and mitigation measures such as:

- Defined access routes for construction vehicles to minimise impacts to ITB traffic.
- A delivery plan for service vehicles that demonstrates how construction related deliveries could be staggered throughout the day (preferably outside the peak airport operating times) to prevent queuing on surrounding roads.
- Details of how queuing of construction traffic vehicles could be managed at the ITB, including details of designated vehicle holding areas (to be determined prior to construction commencing) during high traffic generating construction activities (e.g. during large concrete pours and major earthworks etc.).
- Details of designated parking areas for construction vehicles and the construction workforce.

Once the International P2 MLCP is operational, a new pedestrian walkway between the AFP building and the ITB will ensure connectivity between these two buildings. The MLCP will remove part of the existing walkway leading from the AFP building to the terminal. Provision of alternative access will be part of the detailed design. The project will aim to provide a level of pedestrian access that is similar to the existing network.

Continued consultation and stakeholder forums have indicated that the Australian Federal Police (AFP) do not have any concerns regarding the additional secondary response times as a result of the new travel route to the International Terminal Building. With the implementation of management and mitigation measures, potential traffic impacts associated with construction activities will be **low**. The existing road network has capacity for the predicted increase in traffic volumes and as such, traffic impact associated with the operation of the proposed development will be **negligible**.

5.2. Aviation Operations and Safety

5.2.1 Obstacle Limitation Surface

An obstacle limitation surface (OLS) is a conceptual surface which is intended to protect aircraft operating in visual meteorological conditions. The OLS defines the height of structures so that they do not pose a significant risk during the initial and final stages of a flight take-off, preparation to land, and the landing itself. During these manoeuvres visibility must be good enough for the pilot to see and maintain visual reference of the airport, and take responsibility for obstacle avoidance and separation from other aircraft.

The Master Plan identifies the proposed International P2 MLCP location as within the inner horizontal surface (47.5 m AHD). The height of the proposed development will be under the inner horizontal surface, and within the constraints of the line of sight (refer to section 5.2.7).

5.2.2 Procedures for Air Navigation Services – Aircraft Operations

Similar to OLS, procedures for air navigation services – aircraft operations (PANS-OPS) 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 such conditions, visibility can be close to zero due to cloud or fog. To avoid collisions, pilots need to know that the airspace they are flying in is free of obstacles. As such, no permanent structures are to extend beyond the PANS-OPS height.

With the International P2 MLCP having a maximum height of 27.905 m AD (26.771 m AHD), the proposed development will not affect any sector or circling altitude, any instrument approach or departure procedures at Brisbane Airport.

5.2.3 Construction Impacts on Prescribed Airspace

During the construction of the International P2 MLCP, operation of plant or cranes may be required. During the detailed design and associated identification of construction method, BAC will confirm if plant or cranes are required and assess the potential impact on prescribed airspace. Extending cranes and other plant into controlled airspace will be a ‘controlled activity’ as per the *Airports (Protection of Airspace) Regulations 1996*. Any activity that may constitute a ‘controlled activity’ will be referred to Airservices Australia for assessment in accordance with Brisbane Airport’s established airspace protection processes and the *Airports (Protection of Airspace) Regulations 1996*.

5.2.4 Airport Navigation Aids and Radar Systems

There are a number of airport navigation aids and radar systems installed within the Brisbane Airport that provide guidance to aircraft and to approaching and landing manoeuvres. These navigational aids and radar systems are an essential element of the air transport system. These systems rely on the transmission of radio waves, the efficiency and reliability of which can be affected by structures such as large buildings.

The International P2 MLCP is located outside of the area of influence for the existing Advanced Surface Movement Guidance and Control System (ASMGCS)/Surface Movement Radar Surveillance System (SMSS) for Brisbane and outside of the proposed ASMGCS/SMSS associated with the new parallel runway. Construction and operation of the International P2 MLCP will not impact on theses airport navigation aids and radar systems. Implementation of building materials that have limited reflectivity and roof colour will be selected to reduce glare.

BAC will continue to engage with CASA and Airservices Australia during the detailed design phase of this development to ensure any impact on navigational equipment is manageable.

5.2.5 CASA Plume Rise Assessment

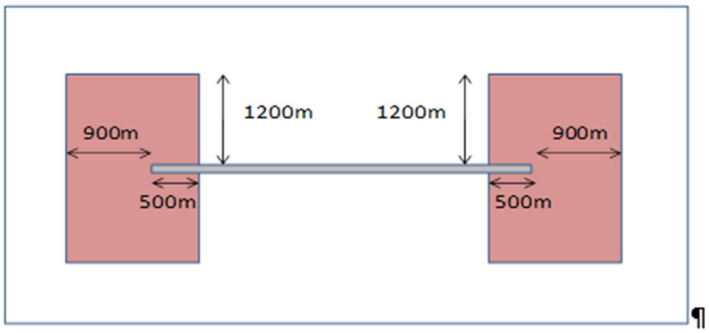
The Civil Aviation Safety Authority Advisory Circular AC 139-5(1) has identified that there is a need to assess the potential hazard to aviation posed by vertical exhaust plumes in excess of 4.3 metres per second (m/s) velocity. The types of activities that are likely to generate such vertical exhaust plumes include, but are not limited to, power stations, smelters or activities requiring the use of pressurised gas systems.

The proposed development does not include infrastructure or activities that would result in a vertical exhaust plume in excess of 4.3 m/s.

5.2.6 Windshear

Figure 6 illustrates International P2 MLCP's location in relation to the existing runway.

According to the National Airports Safeguarding Framework (NASF) *Guideline B: Managing the risk of building generated windshear and turbulence at airports* (Guideline B) (2013), the International P2 MLCP is located within the risk envelope for potential building induced wind shear for the existing runway, but outside the risk envelope for the future parallel runway (refer to Figure 5). As the International P2 MLCP is outside of the risk envelope for the future parallel runway, no further assessment is required for the parallel runway. As the International P2 MLCP is within the risk envelope for the existing runway and as such further assessment of the potential windshear has been carried out.



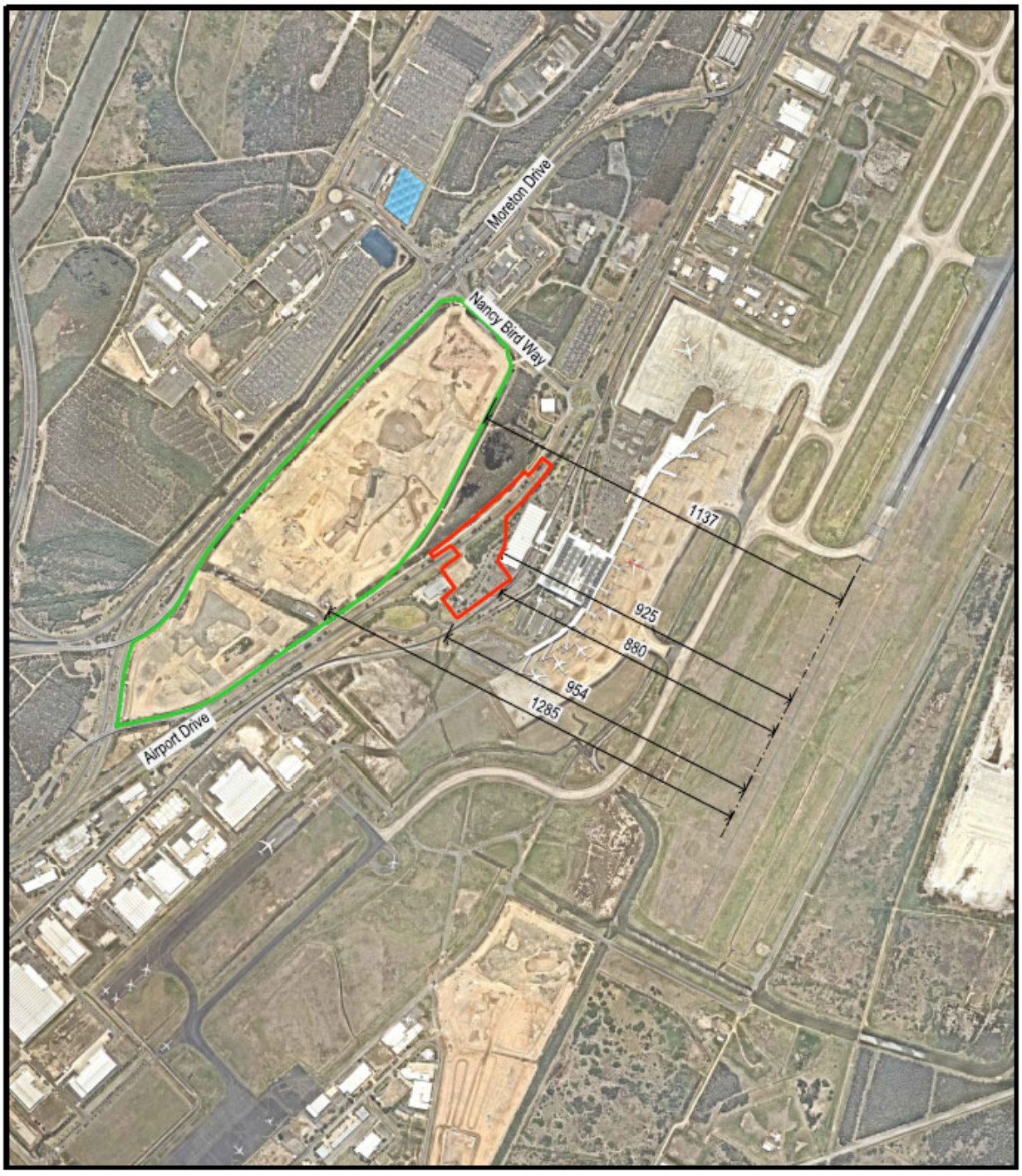
Source: DIRD, 2013

Figure 5: Risk envelope around runways within which buildings should be assessed for windshear and turbulence

Guideline B states that buildings that are more than 35 times their height from the relevant runway centreline (i.e. 1:35 rule) will not pose a risk and do not require aerodynamic modelling. The Department of Infrastructure, Transport, Cities and Regional Development has received advice from the CASA that a quantitative wind study is not required based on a maximum height of 27.905 m AD (26.771 m AHD) for the International P2 MLCP, hence no further assessment is required.

It is also noted that existing structures, such as the International Terminal and the Australian Federal Police Buildings, sit within the zone of wake turbulence influence. BAC has not received advice from CASA, Airservices Australia or pilots that reflect a concern over the current structures and their impact causing wake turbulence.

Figure 6: International P2 MLCP relationship with existing runway



5.2.7 Sight Line from the Air Traffic Control Tower

An assessment has been undertaken for the proposed International P2 MLCP to evaluate potential sight line impacts from the Air Traffic Control Tower (ATCT) to the runways and taxiway networks (refer to Figure 7). The assessment indicates that:

1. Full visual contact can be maintained (by ATCT) on all aircraft exiting and entering the taxiway network that connects directly to the active runways;
2. Full visual contact can be maintained (by ATCT) on all aircraft entering and exiting the logistics apron; and
3. Visual contact to an area of Papa North, Lima Loop and Lima Taxiway will be restricted (this is caused by a shadowing effect – refer to Figure 7).

BAC has worked with Airservices Australia and CASA to ensure potential sight line impacts associated with International P2 MLCP can be managed without impacting negatively on airport operations. CASA has issued an exemption which provides an interim management measure until 31 July 2022. A suitable permanent solution will be implemented prior to the expiry of this exemption.

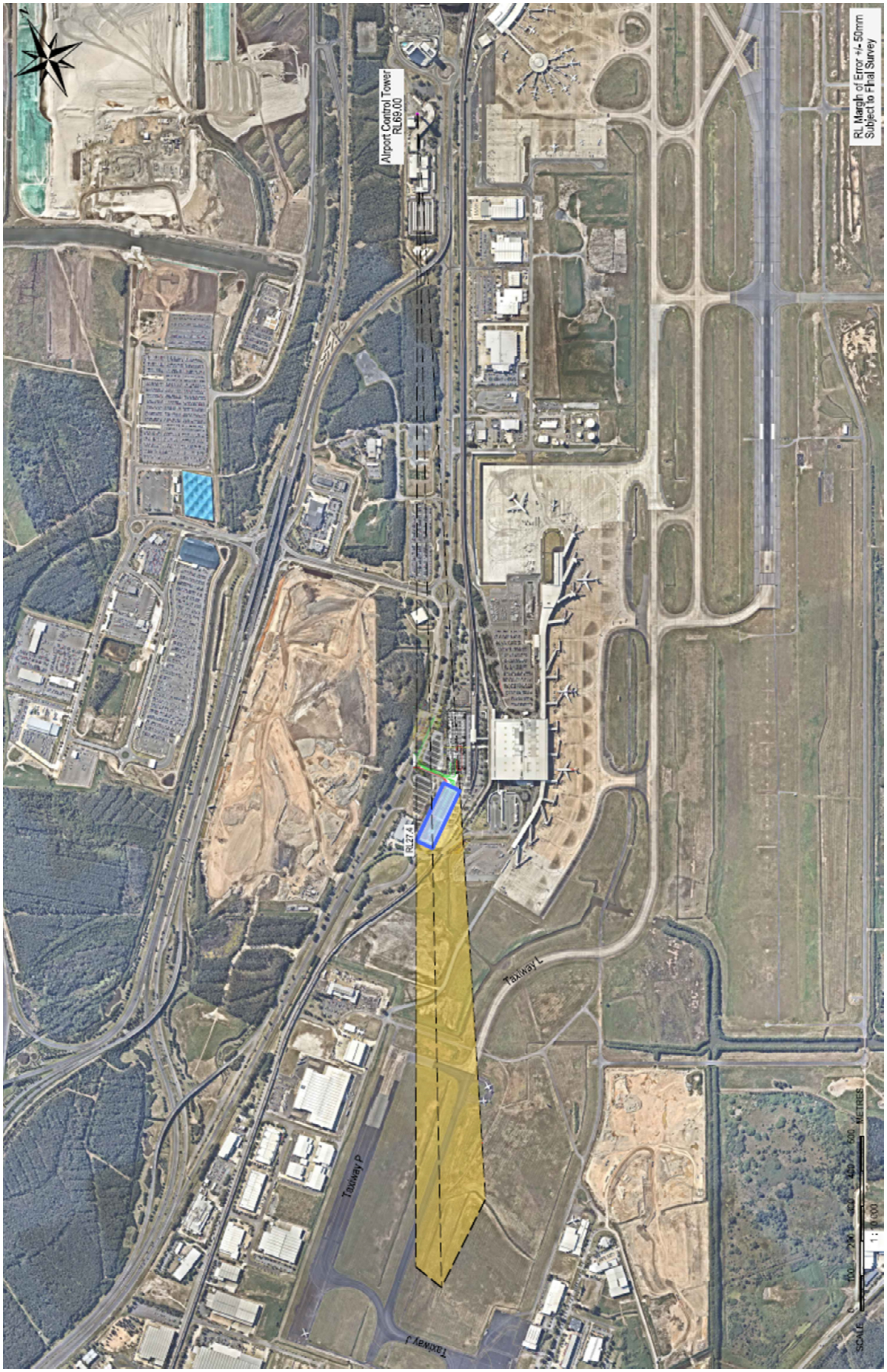


Figure 7: Sight line impacts from the Air Traffic Control Terminal

5.2.8 Other Potential Impacts

Aircraft noise

The International P2 MLCP is approximately located on the 25 Australian noise exposure forecast (ANEF) contour (partly within the 20 ANEF contour and partly within the 25 ANEF contour). Under the Australian Standard for aircraft noise intrusion associated with building siting and construction (AS2021-2015) there are no noise level or siting requirements for car parks.

Lighting distraction

The International P2 MLCP lies partly within Lighting Zone B and partly within Lighting Zone C (as specified in Guideline E of the National Airports Safeguarding Framework and Section 9.21 of the CASA Manual of Standards Part 139). Lighting associated with the International P2 MLCP will be designed and operated in accordance with the relevant requirements for these zones.

During both the construction and operational phases of the project, BAC will ensure there is a **negligible** impact on operational airspace.

Environmental Assessment

6

6. ENVIRONMENTAL ASSESSMENT

6.1. Geology, Soils and Topography

6.1.1 Baseline Conditions

Topography

The site is part of a flat and low-lying landscape, with an elevation of approximately 6 m AHD. The proposed site has previously been graded and is currently used as an on-grade car park.

The closest open water is a channel that runs into Boggy Creek, then into the Brisbane River estuary and into Moreton Bay. The channel passes within 50 m of the project site, on the other side of the railway and the Airport Drive on ramp. Further details regarding hydrology are provided in Section 6.3.

Geology and soils

Geology of the project is mapped as Quaternary alluvium and lacustrine deposits. Broadscale soils mapping identifies this alluvial landscape as forming part of the Woongoolba Landscape, comprising low/coastal plains of alluvium and narrow depressions, with the dominant soil group being humic gleys, peaty gleys and solonchaks. Humic gleys with sandy or clayey profiles are dominant soils in this unit and occur on the higher, flat surfaces, while the peaty gleys typically occupy the swampy depressions and solonchaks generally restricted to saltmarshes (Beckmann et al, 1987). These soil profiles frequently contain moderate to high concentrations of pyritic material and fine organic matter (Aurecon, 2017).

The ASRIS also identifies the majority of the Brisbane Airport as having an Anthroposol soil profile (i.e. 'human made' soils), described as containing sand, loamy sand or clayey sand horizon (<10%) over a light to light medium clay horizon (35%-45%) with a surface/subsurface pH of 3.0 to 4.8 (Aurecon, 2017). The majority of the project site is currently a car park. In this area, the soil profile described above is overlain by the subgrade (stabilised soil), sub-base course (typically a granular layer), base course (typically a granular layer) and weathering course (asphalt).

Acid sulfate soils

Acid sulfate soils (ASS) are generally found at elevations below 20 m AHD, with the probability of encountering ASS increasing in coastal areas lower than 5 m AHD. The Brisbane Airport is located on a coastal plain that is mostly less than 5 m AHD. Queensland government ASS mapping identifies the project site as disturbed land with probability of ASS; however, the type and depth to ASS is not defined (Queensland Globe, 2017).

A number of ASS soil surveys have been conducted in the vicinity of the project site, including at the adjacent Australian Federal Police Building in 2011 and northwest of the project site and Airport Drive in 2016.

The 2016 ASS survey found medium to high levels of ASS and potential ASS (PASS) (Golder, 2016c, 2016d). ASS was also detected below the water table, meaning the groundwater in this region has historically been lower than current levels. Acidity was widespread in the study area, although net acidity was variable. The 2011 ASS investigation, on the site of the Australian Federal Police building, identified soils comprising sand fill and natural silty clay soils. The natural silty clay soils had a net acidity range of <0.02% sulphur (S) to 2.49%S (Precise Environmental, 2011).

Contamination

BAC maintains a contaminated site register for the airport, which ranks known contamination issues as low, medium or high risk; considering both environmental and human health risks.

Contaminated Site 47, which was previously a Service Station, was identified as a high risk contamination site - this site is located on the western portion of the project footprint where the proposed on-grade car park is to be constructed. Remediation works for this contaminated site has been completed and validated with residual contamination to be managed in accordance with the Site Management Plan and the Construction Environmental Management Plan.

Another known contaminated site (designated moderate risk, number 55) is located over 150 m from the proposed development, adjacent to the apron. This site is well outside of the disturbance area for the proposed development and is not considered to be a risk to the development site.

Management and operations of the airport has included use of firefighting foams containing per- and poly-fluoroaklyl substances (PFAS). Airservices Australia (responsible for aviation rescue firefighting service) transitioned to PFAS-free foam in 2010 (Airservices, 2017). However, PFAS products have been widely detected in groundwater across the airport. Groundwater and soil testing in the casuarina plantation to the north of Airport Drive (the proposed Auto Mall location, refer to Figure 2) found minor concentrations of PFAS; however, at levels presenting a low risk to ecosystems and human health (Aurecon, 2017; Golder, 2016a, 2016b).

6.1.2 Assessment of Impacts

Geology and soils

Soils exposed during the construction phase have the potential to be subject to erosion. Fugitive sediments entering local watercourses due to soil erosion related to project activities has the potential to impact downstream ecosystems and water quality if not appropriately managed. Chemical, fuel or oil spills also have the potential to contaminate soils.

Acid sulfate soils

Excavations associated with the proposed development, such as piling and foundations, have the potential to disturb ASS or PASS. Disturbance of ASS and/or PASS can result in the generation of sulfuric acid, which has the potential to impact water quality and the ability for plants and animals to live in the acidic environment. The generation of sulfuric acid also has the potential to impact the life of the infrastructure through increasing corrosion rates of materials such as concrete and steel.

Contamination

A site specific Preliminary Site Investigation for soils and groundwaters has been undertaken for the P2 MLCP project in accordance with the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* and the *PFAS National Environmental Management Plan* (PFAS NEMP).

Excavation of materials during construction has the potential to mobilise contaminants in soil and groundwater, which may impact on aquatic ecosystems and consumers of aquatic species downstream from where groundwater discharges into the receiving environment, as well as construction personnel.

6.1.3 Mitigation Measures

With the implementation of the following mitigation and management measures, the residual impacts associated with geology, soils and topography is considered to be **negligible** for both the operational and construction phases.

Geology and soils

An Erosion and Sediment Control Plan (ESCP) will be prepared as part of the CEMP. The ESCP will be prepared by a suitably qualified and experienced professional, i.e. a Certified Professional in Erosion and Sediment Control (CPESC), or a Registered Professional Engineer of Queensland (RPEQ) with a minimum of two years' experience in erosion and sediment control.

Acid sulfate soils

An ASS Management Plan will be prepared as part of the CEMP. The types of management and mitigation measures may include the following:

- Where excavations extend below 5 m AHD, ASS investigation in accordance with the *Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines* (Dear et al., 2014) to determine the presence of PASS and/or ASS and determine the net acidity and liming rate for any PASS and/or ASS that is to be excavated.
- Excavated ASS materials to be stockpiled in a designated treatment area and neutralised through liming

Contaminated land

Based on the initial results from the Preliminary Site Investigation and with additional groundwater monitoring to be undertaken, a Conceptual Site Model and Risk Assessment will be developed, with management strategies to address potential soil and groundwater contamination – this will be undertaken in accordance with the PFAS NEMP.

It is possible (although unlikely) that unexpected contamination may be encountered during site works. In the event that odours, staining or any other signs of contamination are observed, work procedures shall be implemented (i.e. cease works that resulted in the event, commission a suitably qualified person to investigate the potential contamination, recommend mitigation measures).

Spills on site will be managed to prevent soil and groundwater contamination, through the use of spill kits and user training. Adequate disposal facilities will be provided for all types of construction wastes.

6.2. Ecology

6.2.1 Baseline Conditions

A number of fauna species protected under either State or Commonwealth legislation are known to occur on Brisbane Airport land. In a 2004 survey of the Brisbane Airport, Lambert & Rehbein found:

- 156 bird species.
- 26 mammal species.
- 21 reptiles.
- 8 frogs.
- 50 ant species.
- 45 butterfly species.
- 40 fish and 72 estuarine invertebrate species in mangrove channels, creeks and wetlands associated with the airport site.

Of these species, 45 are considered significant; and include species listed under the Commonwealth EPBC Act, Queensland's NC Act, the China/Australia Migratory Bird Agreement (CAMBA) and Japan/Australia Migratory Bird Agreement (JAMBA); as well as those designated as near threatened by Garnett et al. (2011), or considered locally significant or noteworthy by Brisbane City Council.

The most significant groups of species within the Brisbane Airport are migratory birds. These include the white-bellied sea-eagle (*Haliaeetus leucogaster*) and rank grassland species (including the grass owl (*Tyto longimembris*)), red-bellied black snake (*Pseudechis porphyriacus*) and Lewin's rail (*Lewinia pectoralis*). The airport is also likely used as a transit corridor by grey-headed flying foxes (*Pteropus poliocephalus*).

The project site is cleared and largely paved with some amenity trees, and a small area of lawn. Turf and grass species are present on the western portion of the site which is the location of the proposed on-grade car park – this existing vegetation was part of the site stabilization undertaken as part of the Service Station remediation works. The nearest large area of vegetation is the casuarina plantation on the northern side of Airport Drive, most of which was recently cleared to facilitate the development of the proposed Auto Mall (refer to Figure 2). Although the plantation contained some mangrove communities, these were fractured and disturbed. A 2017 assessment of the plantation concluded that the block of land was unlikely to contain conservation significant fauna or flora (Aurecon, 2017).

6.2.2 Assessment of Impacts

As the site is not considered to support any significant conservation species, removal of the trees and lawn within the project site will not have any adverse consequences on the viability of any such species, or their movement through the landscape.

Dust generation from construction activities (e.g. demolition of existing pavement, earthworks) has the potential to affect the amenity trees lining airport drive, and the adjacent casuarina plantation and the mangrove communities it contains. Excessive dust deposition on leaves can result in decline in plant health.

There is the potential for fauna mortality during tree removal and as a result of ASS exposure.

Machinery and equipment used for construction may facilitate the spread of weeds to and from adjacent areas. The project site is also within the Fire Ant Biosecurity Zone 3 (DAF, 2016). Movement restrictions in this zone state that a biosecurity instrument permit must be obtained if moving soil out of Zone 3. As no soil will be removed from the airport property, such a permit will not be required. Movement of fire ant carriers (including mulch and turf) from the property would require the contractor to follow the procedures set out in the *Biodiversity Regulation 2016* (Qld) (mulch and turf only), to a waste facility within Zone 3, or within 24 hours of the material being on the property; otherwise a biosecurity instrument permit must be sought.

6.2.3 Mitigation Measures

With the implementation of the following mitigation and management measures, the residual impacts on flora and fauna are considered to be **negligible** for both the operational and construction phases.

Mitigation and management measures proposed to be implemented include the following:

- All site works are to be undertaken in accordance with the site specific ASS Management Plan (see Section 6.1.3).
- Fauna management procedures will be provided in the CEMP.
- Implementation of procedures to be followed if an animal is encountered during construction, including dealing with injured animals. Procedures to include reporting to the BAC Environmental Advisor if an animal is injured during construction.
- Light fittings used and positioned to minimise dispersion of light outside of the project site during construction, while being consistent with aviation safety requirements (Section 5.1).

A pest and weed management plan will be provided in the CEMP and is likely to include guidance on the following matters:

- Procedures for removal of any declared weed and pest species as per the *Biosecurity Act 2014* (Qld).
- Reporting of suspected outbreaks of declared weed species and pest animals to the BAC Environmental Advisor.
- Waste management procedures to avoid attracting pests and opportunistic native fauna.

Mitigation measures outlined in the following sections are also relevant to protecting flora and fauna:

- Erosion and sediment control (Section 6.1.3).
- ASS management (Section 6.1.3).
- Water quality management (Section 6.3.3).
- Air quality (dust, Section 6.4.3).
- Noise management (Section 6.5.3).
- Waste management (Section 6.10.3).

6.3. Hydrology and Water Quality

6.3.1 Baseline Conditions

Surface water

Under the *Environmental Protection (Water) Policy 2009* (EPP (Water)), DEHP has developed environmental values (EVs) and water quality objectives (WQOs) for protecting surface water in the region. The airport lies within the area covered by the EPP (Water) Plan WQ1423: Bramble Bay (DERM 2010a), with EVs and WQOs detailed in DERM (2010b). This Plan identifies that the runoff from the airport enters a freshwater creek, which feeds into the Kedron Brook Floodway.

However, drainage from the existing International P1 MLCP discharges to a concrete lined drain on the eastern side of Airport Drive via three 600 mm diameter reinforced concrete pipes. Some of the existing on-grade parking adjacent to International P1 MLCP drains to the same concrete drain; however, surface water also drains to another concrete drain to the south via a pit and pipe system. These drains discharge into Boggy Creek, which in turn feeds into the Brisbane River estuary and Moreton Bay.

EVs for Boggy Creek and Kedron Brook Floodway and its tributaries are aquatic ecosystems, secondary recreation, visual recreation, with cultural and spiritual values. Table 8 lists the WQOs for this site (lowland freshwater system, comprising lowland streams, wallum/tannin stained streams and coastal streams) for a moderately disturbed aquatic ecosystem, such as the project site.

Table 8: EPP WQO: Bramble Bay and Brisbane River Estuary

Parameter	Bramble Bay (Kedron Brook Floodway)	Brisbane River Estuary (Boggy Creek)
Turbidity (NTU)	<50	<50
Suspended solids (mg/L)	<6	<6
Chlorophyll a (µg/L)	<5	<5
Total nitrogen (µg/L)	<500	<500
Oxidised N (µg/L)	<60	<60
Ammonia N (µg/L)	<20	<20
Organic N (µg/L)	<420	<420
Total phosphorus (µg/L)	<50	<50
Filterable reactive phosphorus (µg/L)	<20	<20
Dissolved oxygen (% saturation)	85-110	85-110
pH	6.5 – 8.0	6.5 – 8.0
Secchi depth	n/a	n/a
Conductivity (µS/cm)	600	600

Source: DERM, 2010a

Groundwater

Based on the 2016 surveys of the adjacent casuarina plantation (Golder, 2016a, 2016b), groundwater at the site may contain low concentrations of nickel, zinc and PFAS.

6.3.2 Assessment of Impacts

Surface water

As with soils, construction activities have the greatest potential to impact on water quality. Fugitive sediments and chemicals or fuels entering local watercourses have the potential to impact downstream ecosystems and water quality if not appropriately managed.

During operation, runoff from hardstand areas associated with the proposed development has the potential to contain contaminates, such as oils, fuels, hydrocarbon and phosphates, which has the potential to impact WQO and EVs. Schedule 2 of the *Airports (Environment Protection) Regulation 1997* also establishes the accepted limits of contamination.

Changes to overland flow paths or increased runoff due to an increase in hard surfaces during construction and operation has the potential to impact the existing velocity, flow discharge and water levels.

Groundwater

Deep excavations for footings have the potential to expose PASS materials to oxygen and result in acidification of groundwater. Mobilisation of contaminants due to excavations also has the potential to impact groundwater through reducing the existing groundwater quality.

6.3.3 Mitigation Measures

The objective of mitigation and management measures will be to minimise the potential for sediments and contaminates to be released from the proposed development. The final drainage management system will be developed as part of the detailed design process, but will achieve WQOs and protect EVs. Accordingly, the risk to human and ecosystem health during the operational phase is considered to be **negligible**.

Surface water

Through the implementation of the ESCP (refer to section 5.1.3), potential impacts associated with fugitive sediments is considered to be negligible. Any storage of chemicals and fuels at the site will be stored in a designated, bunded area to prevent spills from entering stormwater channels. Refuelling of vehicles during construction will be conducted away from drainage lines and a spill kit kept on site to appropriately mitigate any spills. With the implementation of these mitigation and management measures, the residual impacts on surface water during the construction phase is considered to be **low**.

Groundwater

As part of the ASS Management Plan (refer to Section 5.1.3), the potential for disturbance of ASS and/or PASS material, including groundwater will be identified and managed in accordance with the treatment requirements.

PFAS within groundwater will be managed in accordance with the PFAS NEMP.

With appropriate mitigation measures, the risk to human and ecosystem health is considered to be **low**.

6.4. Air Quality and Odour

6.4.1 Baseline Conditions

The Brisbane Airport is located close to a number of major industrial precincts that support activities such as waste water treatment, oil refineries, chemical manufacturers and the Port of Brisbane. These industrial activities contribute to the air quality and odour emissions in the vicinity of the airport.

DEHP previously maintained an air quality monitoring station at Pinkenba (closed November 2015). Pollutants monitored at this site include ozone, nitrogen oxides and sulphur dioxide, and PM_{10}. The Pinkenba monitoring station has not recorded an event that exceeded the *Environmental Protection (Air) Policy 2008* (Qld) objectives or (for the pollutants that were monitored by DEHP) the ambient air quality objectives listed in Schedule 1 of the *Airports (Environment Protection) Regulations 1997* (Cth).

6.4.2 Assessment of Impacts

During construction there is potential for dust and vehicle emissions to result in an impact in air quality. Activities such as general vehicle movements across exposed surfaces or wind erosion from exposed surfaces are likely to be the most significant activities in relation to dust emissions. During operation, vehicle emissions are the most likely source of emissions that have the potential to result in an impact to air quality.

It is considered unlikely that the proposed development will result in any odour emissions that may impact either air quality or amenity.

6.4.3 Mitigation Measures

With the implementation of the following management and mitigation measures, the potential impacts associated with air quality and odour is considered to be **negligible** during the construction and operational phases:

- Construction activities may be staged to reduce the area of exposed surfaces.
- Using wetting of exposed surfaces/dust generating areas as required during construction to minimise dust.
- 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.

6.5. Noise and Vibration

6.5.1 Baseline Conditions

The Brisbane Airport is a high noise environment, with major point source for noise being the movement of aircraft (including take-off, landing and idling). Other noise sources include rail and road traffic and current construction activities, including the new parallel runway.

The *Environmental Protection Act 1994* (Qld), and associated Environmental Protection (Noise) Policy 2008, identifies specific environmental values relevant to noise impacts as public amenity, public safety and ecological health. These values relate to qualities of the acoustic environment that are conducive to protecting the health and biodiversity of the ecosystem. In relation to human health and wellbeing this includes places where people sleep, study or learn, or recreate. The closest noise sensitive receptors to the proposed development site are as follows:

- Places of worship include the multi-denominational prayer room in the ITB, located approximately 200 m from the proposed development site. Outside of Brisbane Airport, the closest place of worship is located in Northgate approximately 3.5 km north west.
- Kingsford Smith Memorial, approximately 500 m north-north east.
- Residences, approximately 2 km south east.
- Domestic Terminal Hotels, approximately 2 km north.
- Skygate Hotel, approximately 2.7 km south west.
- Child care centres, approximately 3 km south west.
- Northgate State School, approximately 3.6 km west.
- Hospital, approximately 8 km west.

There are a number of commercial enterprises in the vicinity of the proposed development site. While these places are not recognised as noise sensitive receptors, the closest office (AFP Building) is 50m from the proposed development site.

An assessment of background/existing noise levels was carried out as part of the assessment associated with the new parallel runway Environmental Impact Statement (EIS)/MDP (BAC, 2006). Monitoring locations closest to the International P2 MLCP were within Pinkenba, Ascot, Nundah and Banyo. Table 9 provides a summary of the measured noise levels at these locations.

Table 9: Summary of measured noise levels

Site	min$L_{A90,\ 1hr}$ (dB(A))			$L_{Aeq,\ Period}$ (dB(A))		
	Daytime 7 am –6 pm	Evening 6 pm – 10 pm	Night-time 10 pm – 7 am	Daytime 7 am –6 pm	Evening 6 pm – 10 pm	Night-time 10 pm – 7 am
17 McBride Rd, Pinkenba	42	37	34	57	52	51
29 Brassey St, Ascot	38	38	34	55	52	50
33 Franklin St, Nundah	44	42	36	57	50	49
St Pauls Theological College, Approach Road, Banyo	36	33	30	56	51	54

Source: BAC, 2006

6.5.2 *Assessment of Impacts*

Potential noise vibration impacts will be associated with construction activities. Activities that will generate noise relate to removal of existing structures within the proposed project site, machinery movements associated with excavation and earthworks, piling for foundations and footings, and building activities and road works. During operation, noise emissions are likely to be associated with road traffic.

Schedule 4 of the *Airports (Environment Protection) Regulations 1997* (Cth) identifies excessive noise guidelines. Table 10 lists the relevant excessive noise guidelines for activities relevant to the construction and operation of the International P2 MLCP. Noise nuisance is generally determined by the noise increment above background noise levels. While a person's tolerance to 'nuisance' noise will vary from person to person, generally the sound intensity increases 10 times for every 10 dB increase.

Table 10: Excessive noise guideline triggers for relevant activities and example of similar noise levels

Noise generating activity	Excessive noise guideline decibel level at sensitive receptors dB(A)	Example of similar noise source	Decibel effect
Construction, maintenance of demolition of a building or other structure	Should not exceed 75 dB(A) at a sensitive receptor*	Busy lunchtime restaurant/dishwasher	Constant sound. Upper 70 dBs are annoyingly loud to some people
Noise associated with road traffic	Should not exceed 60 dB(A) for a 24 hour period^	Normal conversation/standing about 30 m from air conditioning unit	Audible. About half as loud as 70 dB.
	Should not exceed 55 dB(A)for an eight hour period from 10 pm – 6 am^	Percolating coffee-maker	Limited sound. About one-fourth as loud as 70 dB

Source: IAC Acoustics, 2017

* As per Schedule 4 of the Airports (Environment Protection) Regulations 1997 (Cth) – if exceeded for 10% of a period of at least15 minutes, adjusted to take account of tonal character and impulsiveness (if any) of the noise.
^ calculated as the equivalent continuous A-weighted sound pressure level

Noise above these limits is taken to be a noise impact resulting from the proposed development. A number of factors will result in a decrease in the noise level from the source to the sensitive receptor, including distance, terrain, vegetation, build barriers and air absorption. Individual responses to noise can also vary from person to person. Factors that can influence individual response include the loudness, frequency, time pattern, the amount of background noise present before an intruding noise and the nature of the activity at the sensitive receptor (e.g. sleeping vs watching television).

The closest sensitive receptor is located approximately 200 m away in the ITB. The ITB lies in between the proposed development site and the existing runway. While there may be an incremental increase in noise, it is unlikely that this increase will be noticeable from within the ITB. Noise emissions during construction are unlikely to result in a discernible change in current noise conditions experienced at the other sensitive receptors (at least 2 km from the proposed development site). During operation, it is considered unlikely that the increase in traffic volume associated with the MLCP will result in a discernible change in current noise conditions experienced at the other sensitive receptors.

6.5.3 *Mitigation Measures*

While it is expected that the impact of the project noise during the construction and operational phases will be **negligible** (noting that no noise complaints have been received through our public feedback channel for the Northern Concourse Expansion project**),**, the following mitigation and management measures will be implemented to minimise noise during construction to as low as reasonably possible:

- Provide advance notice to, and regular communication with, existing potential affected tenants before and throughout the construction period. This consultation will discuss the proposed project works and potential noise generating activities, and identify mitigation measures to be implemented to manage the potential for noise generation. Noise management measures, which have been implemented successfully on other projects and will be considered for the International P2 MLCP, include noise attenuation barriers, equipment silencers and mufflers, and the selection of alternative/industry leading equipment.
- Noise monitoring to be undertaken to collect information that can inform consultation with neighbouring tenants, if required, and to provide a benchmark to assess construction noise monitoring results against. Undertake baseline noise monitoring at the ITB and the AFP Building at least two weeks prior to the commencement of construction (refer Figure 7.1). The following should be undertaken:
    - A battery powered noise logger should be used
    - Noise data collection and analysis to be done in accordance with AS 1055.1 Acoustics – Description and measurement of environmental noise
    - To be undertaken in accordance with the Noise Measurement Manual (EHP 2013)
- Where possible and practicable, noise machinery should have appropriate mufflers, silencers and/or enclosures fitted to reduce noise transmission
- Avoid noisy plant/machines working simultaneously close together and adjacent to sensitive receivers
- Install and maintain standard noise abatement devices (e.g., mufflers) on machinery and vehicles.
- Where possible, locate and operate any constant noise sources (ie generators) as far as possible from adjacent or nearby premises
- Excessively noisy machinery should preferably not operate during sensitive night time hours (ie between 10 pm and 7 am), and should be located as far as possible from the noise-sensitive premises. Wherever possible, restrict usage to daytime hours
- Equipment used during Project works are to be operated and maintained in a proper and efficient manner to minimise noise levels
- Equipment/machinery should be shut down when not in use
- Keep a register of noise related complaints and record the time and nature of the alleged incident to aid in complaint verification
- If required, (e.g. a validated complaint is received or an exceedance of the limits set out in this MDP are confirmed), an investigation will be undertaken to determine the source of an exceedance/complaint.
- Within seven days of the noise complaint, report the results of the investigation and the actions taken to ‘close out’ the complaint to the complainant and BAC Environmental Advisor
- Where noise complaints persist, undertake noise monitoring 1.0 m from the façade of affected properties to assess noise levels against the EPP (Noise) criteria and to assist with future management of noise complaints. Outside the hours of 7am to 7pm Monday to Saturday (excluding public holidays), if noise at sensitive receptors off Airport land continues to exceed the EPP (Noise) criteria, the noise generating activity on the Project site will cease operations

6.6. Land Use

6.6.1 Baseline Conditions

The project site is highly disturbed. Current use of the site is an on-grade car park, with some amenity trees, a small lawn, and pedestrian access to the terminal. The site is in close proximity to the existing International P1 MLCP, the AirTrain elevated rail corridor, the Australian Federal Police (AFP) building, and the ITB. On the other side of Airport Drive is Kingsford Smith Memorial and the proposed site for the Auto Mall development (currently subject to bulk earthworks and land preparation activities).

Existing services located within the project site include:

- Electrical – LV
- Telecom
- Communications
- Water
- Service ducts
- Drains
- Irrigation

6.6.2 Assessment of Impacts

The Brisbane Airport 2014 Master Plan identifies the preferred development site is part of the Airport Central (International T1) precinct. This precinct is zoned as Special Purpose Airport, Mixed Use. Intended uses for this precinct include:

- Public administration building
- Office
- Aviation support facility
- Car park.

The proposed project is consistent with the precinct's land use zoning as defined in the Master Plan.

The proposed project aligns with Initiatives in the Ground Transport Plan to improve parking. It also ties in with initiatives proposed as part of the Transport and Land Use Five-Year Integration Strategy:

- Consolidation of parking sites in precincts, connected by walking and cycling paths
- Continued road capacity improvement projects to facilitate efficient transport connections.

Site preparation works could include removal of existing pavement and amenity trees prior to construction. There is potential for construction activities to disrupt surrounding land uses, through temporary occupation of car parking spaces, noise, vibration, dust, and the visual impact due to construction. Assessment and mitigation of these issues are discussed in Sections 5.1 (parking), 6.5 (noise and vibration) and 6.4 (air quality).

Construction of the facility has the potential to impact the existing services crossing the project site. Confirmation of types and locations of services will occur and impacts on these managed during detailed design.

Construction activities are not expected to significantly disrupt traffic in the area (refer to Section 5.1).

Overall, it is considered that construction and operation of the project will have minimal disruption to surrounding land uses and is consistent with the intended land use of this area identified in the Master Plan.

6.6.3 Mitigation Measures

The proposed International P2 MLCP is consistent with the intended land uses identified in the Master Plan. With the implementation of the following management and mitigation measures it is considered that the impacts to surrounding land uses will be **negligible** during both the construction and operational phases:

- Construction impacts, including dust and noise, will be managed according to the project's CEMP to minimise the disturbance to surrounding land uses.
- Services within the site will be protected and managed in consultation with their owners.
- Detailed design will consider future pedestrian and cycleway connections that are displaced by the proposed development.

Changes to parking and any impacts on traffic managed as per Section 5.1.

6.7. Landscape

6.7.1 Baseline Conditions

The majority of the proposed development site is currently used for on-grade car parking, with some amenity plantings and roadside vegetation. There is a small area that is currently lawn that will also form part of the development. While this lawn area is undeveloped, it provides limited impact on the overall visual amenity of the area, which is dominated by infrastructure such as the AFP building, existing International P1 MLCP, the elevated AirTrain line and the existing ITB.

6.7.2 Assessment of Impacts

During construction the site is likely to be visible from the surrounding buildings and AirTrain. It is anticipated that there will be a change in the visual amenity of the area for the construction phase.

6.7.3 Mitigation Measures

With the implementation of the following management and mitigation measures, it is considered that impacts to the surrounding landscape and visual amenity will be **low** during both the construction and operational phases:

- Low level screening of the construction area for the International P2 MLCP).
- The detailed design will seek to be sympathetic to the design and materials used for the International P1 MLCP.
- Landscaping will be consistent with the Brisbane Airport Landscape Setting Strategy and likely to focus on providing the following characteristics:
    - Tree species that provide shade.
    - Provide seasonal diversity and be aesthetically stimulating (textural, fragrant or flowering).
    - Create a subtropical character.
    - Healthy growing conditions for trees planted for amenity and shade purposes in hard stand areas. This would include allowing for sufficient space for tree species to establish rootballs, but may also include consideration of larger tree openings to provide room for root flare, trunk growth, oxygen exchange and rainwater capture.

6.8. Social and Economic Issues

6.8.1 Baseline Conditions

As previously described, the ITB is seeing sustained growth in passenger movements. Passenger numbers for the ITB are expected to grow from the approximate five million passengers currently using the terminal to 12 million by 2035. The ITB is currently serviced by the International P1 MLCP and existing on-grade outdoor car parking. In peak travel periods (generally corresponding to holiday periods in October, December and January) the existing parking facilities are already experiencing capacity constraints (PSA, 2015). Existing capacity constraints are likely to be exacerbated with the predicted increasing passenger movements.

6.8.2 Assessment of Impacts

Construction of the MLCP will see a loss of existing on-grade car parks during construction. This has the potential to put an increased strain on the capacity of the International P1 MLCP, which is likely to result in more periods of over-capacity. Changes to both road and pedestrian access for staff and passengers during construction may also impact the satisfaction of airport customers.

However, positive socio-economic impacts during the construction phase include economic and employment opportunities. During the operational phase, the proposed development will have a positive impact on alleviating the current capacity constraints at the ITB.

6.8.3 Mitigation Measures

The most significant impact during the construction phase is the loss of existing on-grade car parks, resulting in increased pressure on the existing International P1 MLCP. BAC has modelled the capacity of alternative car parking products that service the ITB, such as International P1 MLCP and Airpark. BAC has determined that there will be sufficient capacity to accommodate parking demand for the ITB during the construction period. In addition to the available capacity within the alternative car parking products, BAC can use other demand management techniques as necessary (i.e. yield management, product management, site management, and on-line booking etc.). These techniques, combined with traditional responses (i.e. manually redirecting vehicles during peak periods) will be adopted to manage demand with the intention that a staged construction will enable some bays to be brought online earlier (i.e. when available).

During construction and once the International P2 Multi-level Car Park is operational, BAC will continue to model and investigate parking and transport solutions to ensure safe, reliable and high quality ground transport services. BAC will seek to maximise potential economic and employment opportunities by supporting the use of local businesses and contractors wherever possible.

Impacts associated with the construction phase are likely to be **low**, but will reduce to **negligible** during the operation phase.

6.9. Cultural Heritage

6.9.1 Baseline Conditions

The region is part of the ancestral homelands of the Turrbal people, and the site is part of a landscape with cultural and spiritual significance. A number of sites of Indigenous cultural heritage significance have been identified on the Brisbane Airport, including artefact scatters, a burial site, and a potential Bora ring. Since European settlement of the area, the site was used for agricultural and residential purposes until construction of the airport in the 1970s. Several items of listed and potential historic heritage are located in and near the property, including the Kingsford Smith Memorial, 460 Squadron Memorial, and remnants of use of the site during World War II (Converge, 2016).

No cultural or historical heritage sites or items are known to occur within the proposed development envelope. The closest historical site to the development is the Kingsford Smith Memorial, located approximately 500 m north-north east of the proposed project site. There may be additional items of Indigenous cultural heritage that have not been identified during previous surveys (i.e. chance finds).

6.9.2 Assessment of Impacts

While ground disturbance has the potential to unearth chance finds, given the disturbed nature of the proposed development site, the risk associated with chance finds is considered to be negligible.

The proposed development will not have any direct impacts to the Kingsford Smith Memorial as it is well outside of the building envelope. Indirect impacts may be associated with increased noise emissions during the construction phase. Baseline noise and vibration monitoring at the Kingsford Smith Memorial will be carried out as pre-construction activities associated with the proposed Auto Mall. Given the distance to the Kingsford Smith Memorial, it is unlikely that piling activities will have an impact on the memorial.

6.9.3 Mitigation Measures

Heritage at Brisbane Airport is managed through the Heritage Management Plan, with which all works on the site are required to comply (Converge, 2016). Section 5.3 of the Heritage Management Plan lists the strategies in place to mitigate the risk of damage to cultural heritage at the airport.

The key strategy from the Heritage Management Plan relevant to this project is strategy 8, which states '*in the event of any unforeseen discoveries during site work, works should cease immediately and the 'Stop Work Procedure'…should be followed'.*

The CEMP will incorporate aspects of the management and mitigation measures contained in the Heritage Management Plan that are relevant to the type of activities that are proposed, particularly the stop work procedures and training and provision of cultural heritage information to contractors (strategies 13 and 14 of the Heritage Management Plan).

With the implementation of management and mitigation measures during construction, the potential impacts to cultural heritage are considered to be **negligible**. Given the **negligible** impact on cultural heritage during the operational phase, no specific management and mitigation measures are proposed.

6.10. Waste

6.10.1 Baseline Conditions

The proposed development site is currently used as an on-grade car park and is covered in asphalt. Amenity plantings are also present within the proposed development site.

Waste is defined in the *Airports (Environment Protection) Regulations 1997* (Cth) and includes waste oil and oil containers, surplus or spent chemicals, paints and solvents and their containers, sewage, and waste paper, litter and food scraps. No waste is currently generated at the site (i.e. activities directly producing waste); however, general litter can be present within the site.

6.10.2 Assessment of Impacts

During construction and operation, a number of waste products are likely to be generated, these include:

- Demolition wastes – including asphalt, drainage infrastructure and amenity trees required to be removed from the site prior to construction commencing.
- Fill – if existing fill is unsuitable for use during construction, it may be removed to another location on Brisbane Airport for stockpiling or reuse.
- Packaging materials – includes any packing materials such as pallets, crates, cartons and plastics delivered with materials used during construction and operation.
- 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.
- General wastes – this includes office wastes, scrap materials and biodegradable wastes.

Potential impacts associated with waste could include contamination of soils, surface water and groundwater due to inappropriate management of waste generated from construction equipment, regulated waste, fill and demolition wastes.

6.10.3 Mitigation Measures

Management and mitigation measures that could be included in the CEMP include the following:

- Develop a waste management plan that avoids the generation, reuses waste products where possible, recycle and recover resources where possible and finally disposal.
- Provide and maintain waste bins for disposal of general litter.
- Detail waste management procedures for contaminated materials.
- Develop emergency response plan (including spill response).

With the implementation of these management and mitigation measures, the impacts associated with wastes will be **negligible** during both the construction and operational phases of the project.

6.11. Hazardous Materials and Dangerous Goods

6.11.1 Baseline Conditions

All airport tenants are responsible for appropriate management and disposal hazardous goods in accordance with the *Work Health and Safety Act 2011* (Qld). There are currently no hazardous goods stored or used in the proposed development area.

6.11.2 Assessment of Impacts

The storage of dangerous or hazardous materials during the operational phase is unlikely. Hazardous waste that could be generated during the construction phase includes waste oils from machinery or equipment, waste paint products and fuel. During the construction phase, the contractor will be responsible for any licences required under the *Work Health and Safety Act 2011* (Qld) for the storage or disposal of hazardous or dangerous goods at the site. Inappropriate storage and handling of hazardous or dangerous goods has the potential to impact ecosystems and human health, through potential contamination of soils, water or air.

6.11.3 Mitigation Measures

With the implementation of the following management and mitigation measures, impacts associated with hazardous materials and dangerous goods will be **negligible** during both the construction and operational phases of the project:

- Develop and implement spill control procedures and provide all project staff with training in the procedures.
- Establish a suitable area, including bunding, for the storage of dangerous goods or hazardous materials in accordance with the *Work Health and Safety Act 2011* (Qld).

Building Sustainability

7

7. BUILDING SUSTAINABILITY

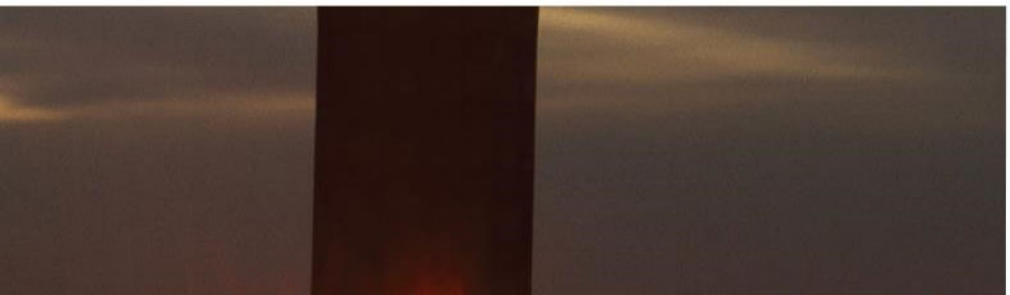
The key sustainability initiatives that are being investigated as part of the design of the MLCP include the following:

- The incorporation of renewable energy, such as Solar PV.
- The installation of movement sensor LED lighting.
- Climate change resilience assessment.
- Allowance for electrical vehicle charging.
- Identification of the potential re-use of rainwater.

The detailed design phase will be used to further refine sustainability initiatives through an Ecologically Sustainable Design assessment.

Summary of Impacts

8



8. SUMMARY OF IMPACTS

The assessment component of the MDP has been 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	OPERATION
5.1	Traffic and Parking	Low	Negligible
5.2	Aviation Safety	Negligible	Negligible
6.1	Geology, Soils and Topography	Negligible	Negligible
6.2	Ecology	Negligible	Negligible
6.3	Hydrology and Water Quality	Low	Negligible
6.4	Air Quality and Odour	Negligible	Negligible
6.5	Noise and Vibration	Negligible	Negligible
6.6	Land Use	Negligible	Negligible
6.7	Landscape	Low	Low
6.8	Social and Economic Issues	Low	Negligible
6.9	Cultural Heritage	Negligible	Negligible
6.10	Waste	Negligible	Negligible
6.11	Hazardous Goods	Negligible	Negligible

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- Golder Associates (2016c) Acid Sulfate Soil Assessment – Auto Mall Precinct Stage 1, Brisbane Airport, Queensland, Prepared for Brisbane Airport Corporation, December 2016.
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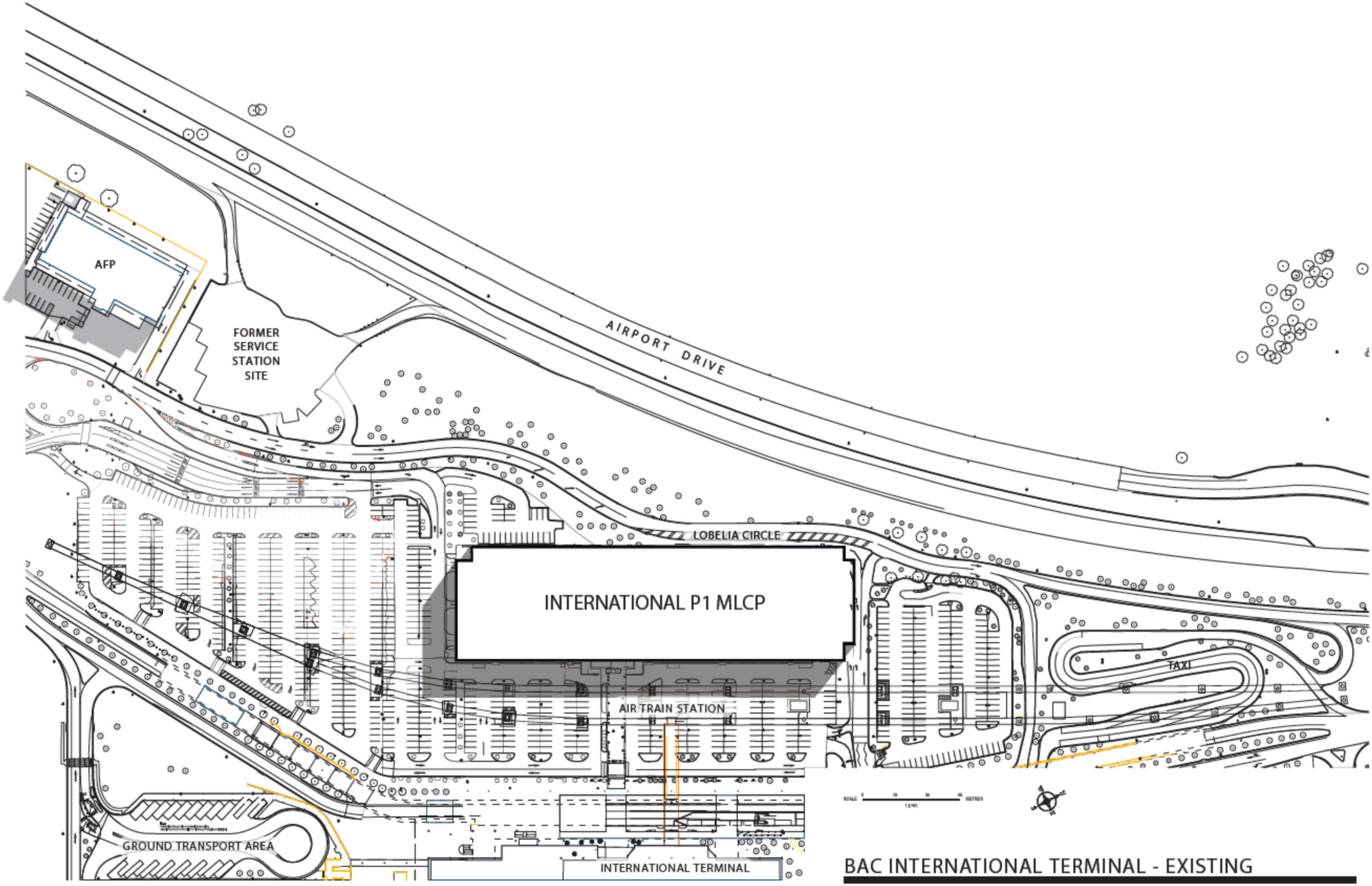
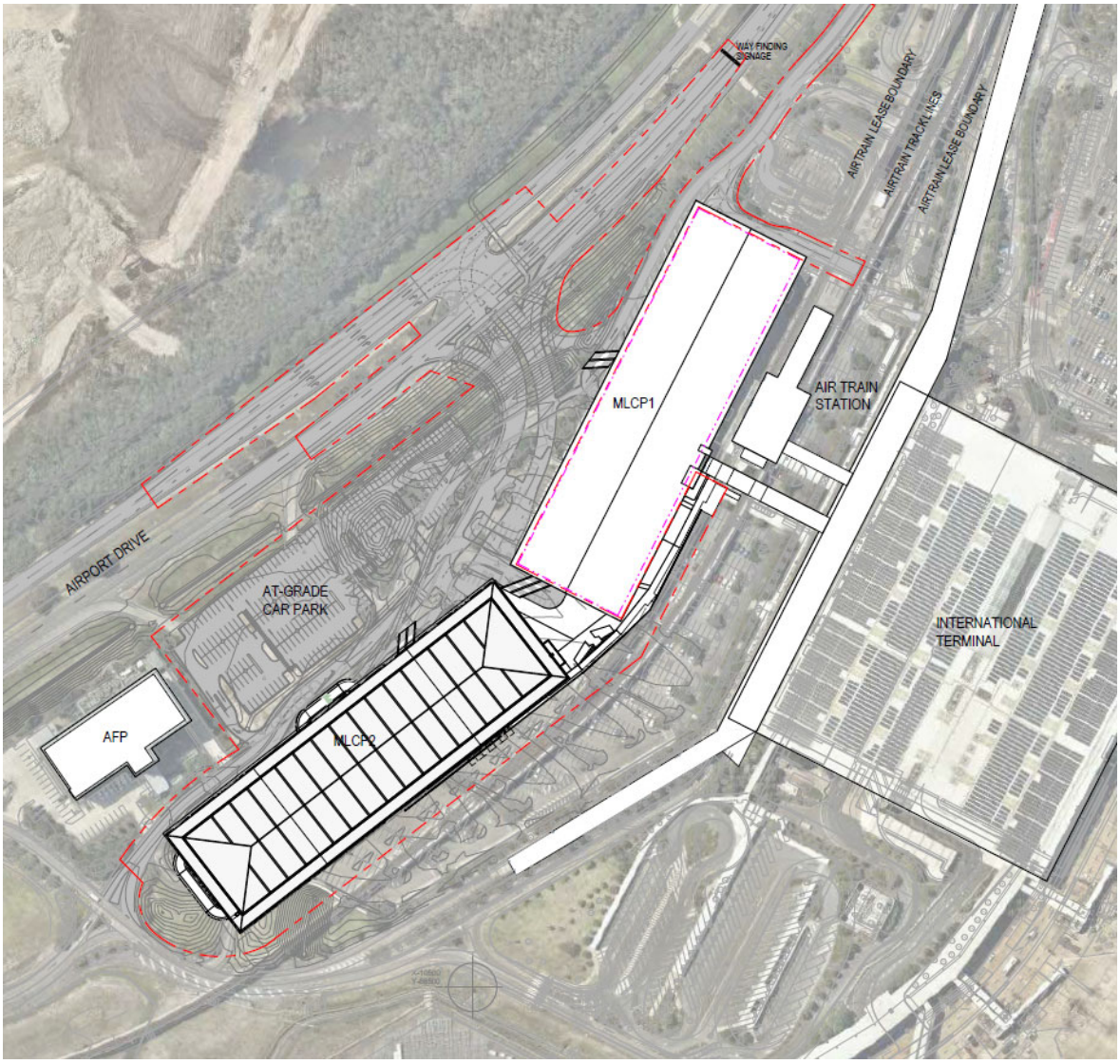
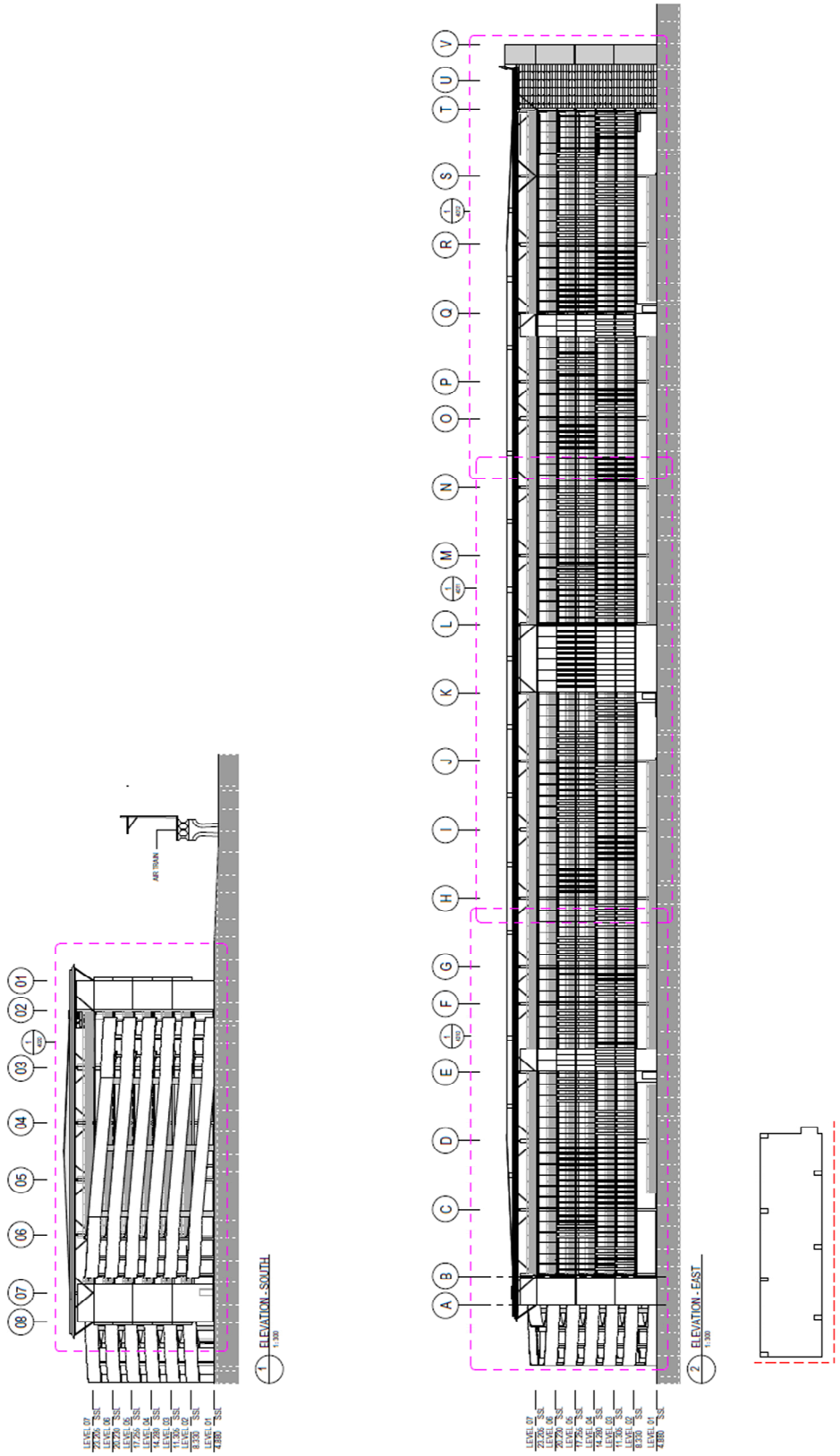
APPENDIX A : EXISTING SITE PLAN

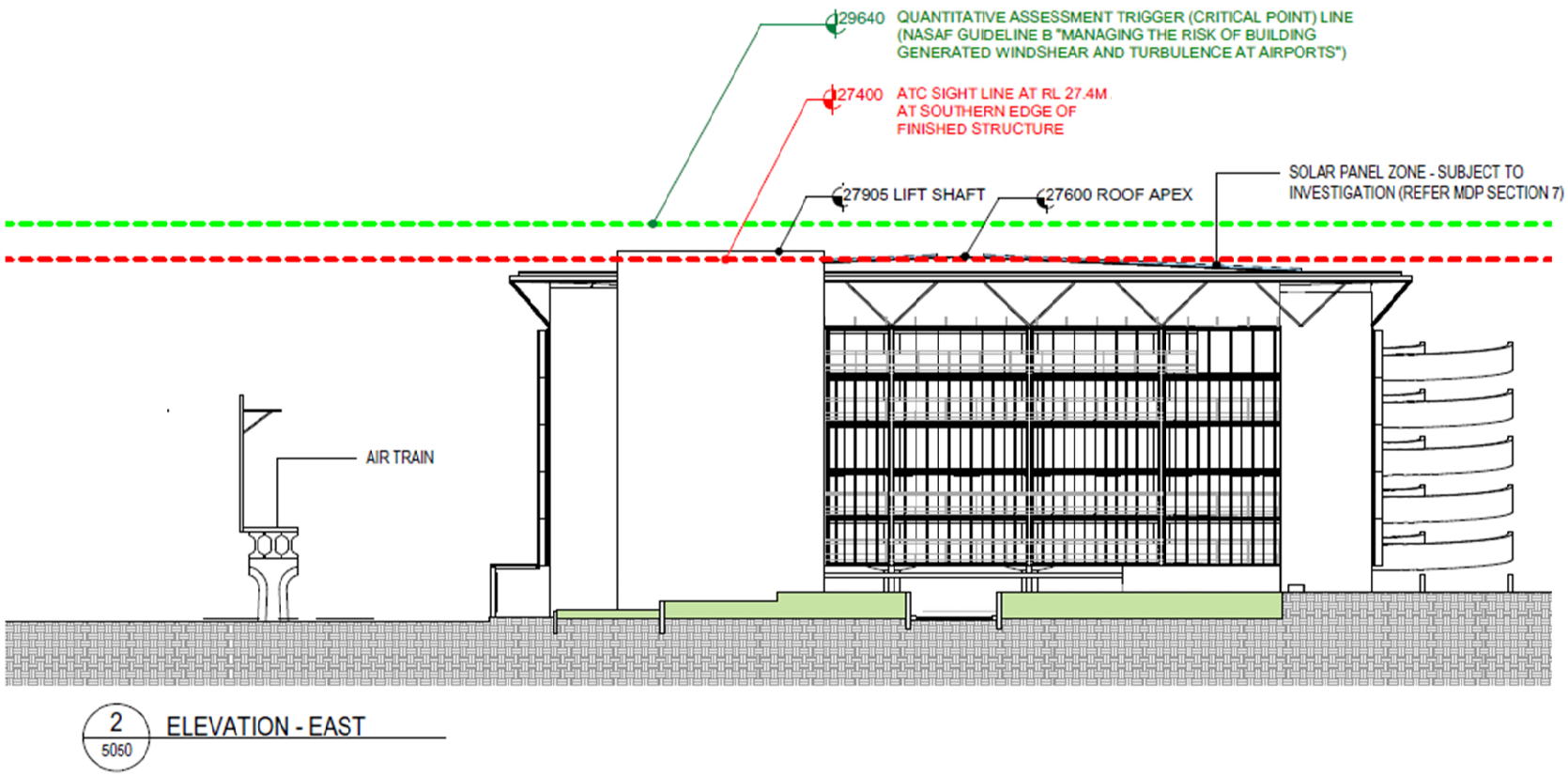


BAC INTERNATIONAL TERMINAL - EXISTING

APPENDIX B : PROPOSAL PLANS

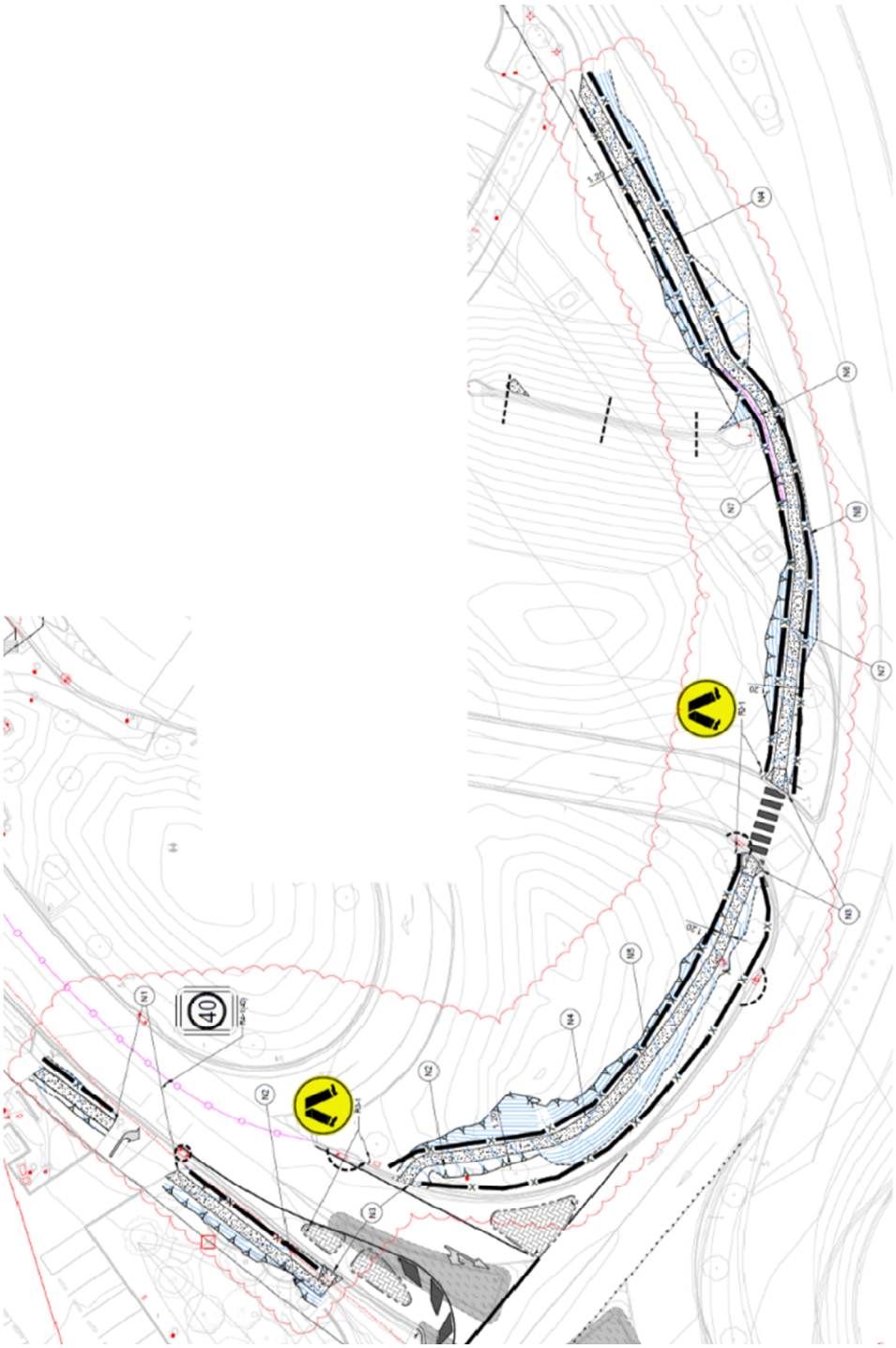

WAY FINDING SIGNAGE
AIRTRAIN LEASE BOUNDARY
AIRTRAIN TRACK LINES
AIRTRAIN LEASE BOUNDARY
MLCP1
AIR TRAIN STATION
AIRPORT DRIVE
AT-GRADE CAR PARK
INTERNATIONAL TERMINAL
AFP
MLCP2


ELEVATION - SOUTH
ELEVATION - EAST



The maximum height of the building is not to exceed 27.905 m AD (26.771 m AHD). The heights represented in this drawing are in AD.

Pedestrian access during construction from the Australian Federal Police (AFP) Building to the International Terminal



APPENDIX C : AIRPORTS ACT REQUIREMENTS

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
(1A) The purpose of a major development plan in relation to an airport is to establish the details of a major airport development that: a) relates to the airport; and	1.1 2.2
b) is consistent with the airport lease for the airport and the final master plan for the airport.	3.2; 3.4
(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	2.2.2
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	2.2.1
c) a detailed outline of the development; and	2.3 2.4
ca) whether or not the development is consistent with the airport lease for the airport; and	3.3
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	3.4 3.5 6.6
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	6.5
ea) if the development could affect flight paths at the airport— the effect that the development would be likely to have on those flight paths; and	5.2.2
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 Department of Defence, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels; and	N/A
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	3.7
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 (ii) employment levels at the airport; and (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	 5.1 6.8 6.8
(h) the airport-lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development; and	6
(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	6
(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	N/A
(3) Consistent with section 5.04 of the Airports Regulation relating to obligations from pre-existing interests.	3.2
(4) 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.	3.6
(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.	N/A