Airport East Precinct project

Addendum Review of Environmental Factors

May 2017

BLANK PAGE

Roads and Maritime Services

Airport East Precinct project
Addendum Review of Environmental Factors

May 2017

Prepared by Jacobs Group (Australia) Pty Ltd

Document controls

Approval and authorisation

Title	Airport East Precinct project addendum review of environmental factors
Accepted on behalf of NSW Roads and Maritime Services by:	Liam Sheridan Project Development Manager
Signed:	
Dated:	

Document status

Document status	Date	Prepared by	Reviewed by
Draft 1 (Ch 1-5)	29/06/2016	Minoshi Weerasinghe	Vivira Samuel (consistency)
Draft 1 (Ch 1-5)	30/06/2016	Minoshi Weerasinghe	Bruce Lean (PD)
Draft 2 (complete draft REF)	21/07/2016	Minoshi Weerasinghe	Vivira Samuel (consistency)
Draft 2 (complete draft REF)	21/07/2016	Minoshi Weerasinghe	Lana Assaf (Senior Associate)
Draft 3 (complete draft REF)	21/12/2016	Minoshi Weerasinghe	Bruce Lean (PD)
Draft 4 (complete draft addendum REF)	24/03/2017	Minoshi Weerasinghe	Bruce Lean (PD)
Draft 5 (complete draft addendum REF)	3/05/2017	Minoshi Weerasinghe	Bruce Lean (PD)
Final addendum REF	29/05/2017	Minoshi Weerasinghe	Bruce Lean (PD)

Executive summary

Background

Roads and Maritime Services (Roads and Maritime) propose to upgrade a number of roads east of Sydney Kingsford Smith Airport (Sydney Airport) to improve traffic flow and access to Sydney Airport, Port Botany and the existing and proposed motorway network. These upgrades would be delivered under the Airport East Precinct project (the project). A review of environmental factors (REF) was prepared for the Airport East Precinct project on February 2015 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 16 February and 13 March 2015 for community and stakeholder comment. A submissions report, dated August 2015 was prepared to respond to issues raised.

In addition the following addendum REFs for the Airport East Precinct project have been prepared:

- Airport East Precinct Addendum review of environmental factors (April 2016)
- Airport East Precinct Addendum review of environmental factors (March 2017).

The proposed modification

Roads and Maritime proposes to modify the project by widening the westernmost extent of Joyce Drive and extending the Joyce Drive widening to the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive (proposed modification). Key features of the proposed modification would include:

- Widening about 190 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot and converting two through lanes to three through lanes eastbound, converting two right turn lanes to through lanes westbound and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This would involve widening Joyce Drive to the southern side and relocating the central median to allow for additional through lanes and lane reconfiguration
- Upgrading and adjusting the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection to cater for the additional through lanes
- Removing the existing pedestrian path on the northern and southern sides of Joyce Drive
- Relocation of utilities
- Demolishing an existing drainage pipe and pits on the southern side of Joyce Drive and replacing with a new drainage pipe and pits
- Landscaping and replanting on road verges.

Need for the proposed modification

Sydney Airport and Port Botany are two of Australia's most important international gateways. However, the roads around Sydney Airport and Port Botany are becoming increasingly congested due to rising numbers of passenger, freight and commuter vehicles. The project would address road congestion and improved traffic flow. The proposed modification would further assist in addressing road congestion and improving traffic flow by providing additional traffic capacity and supporting neighbouring projects.

Project objectives and development criteria

The objectives of the proposed modification are consistent with the objectives of the project REF, namely 'to reduce current levels of congestion and improve the flow of traffic'. Another objective of the proposed modification is to support other road upgrades projects in the area. This objective is also consistent with the objectives of the project REF.

Options considered

The following two options were considered against the project objectives and strategic need:

- Option 1 (do nothing): The do nothing option would involve retaining the westernmost extent of Joyce Drive in its current configuration, without widening. Roads and Maritime would continue to carry out maintenance activities along Joyce Drive as part of this option
- Option 2 (the proposed modification): This option would involve widening Joyce Drive for about 190 metres to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot and converting two through lanes to three through lanes in the eastbound direction, converting two right turn lanes to through lanes in the westbound direction and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This would involve widening Joyce Drive to the southern side and relocating the central median to allow for additional through lanes and lane reconfiguration. This option would also tie into other proposed road upgrade projects in the area (including the project, Airport North and the proposed Sydney Airport internal road upgrades).

Option 2 is considered the preferred option, as it would meet the project objectives and the strategic need with no substantial environmental impacts

Statutory and planning framework

The State Environmental Planning Policy (Infrastructure) 2007 aims to facilitate the effective delivery of infrastructure across NSW. Clause 94 of the ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. The project REF was assessed under Part 5 of the NSW Environmental planning and Assessment Act 1979 (EP&A Act). The proposed modification would not change the approval pathway and can therefore still be assessed under Part 5 of the NSW EP&A Act. Development consent from Bayside Council – in whose jurisdiction the proposed modification is located – is not required.

The proposed modification assessed in this addendum REF would be partially located on Commonwealth land and will require a building activity approval from the Airport Building Controller in accordance with section 2.02 of the Airports (Building Control) Regulations 1996. The Airport Building Controller cannot grant a building activity approval until consent is obtained from the airport lessee (i.e. Sydney Airport). Roads and Maritime will seek consent from Sydney Airport through their development application process and will submit an application for a building activity approval from the Airport Building Controller.

An approval from the Commonwealth Minister for the Environment and Energy under the *Environment Protection Conservation Act 1999* (EPBC Act) is not required as the proposed modification would not constitute a significant impact on matters of national environmental significance or on the environment of Commonwealth land (including as a result of impacts outside of Commonwealth land).

Community and stakeholder consultation

Consultation for the proposed modification has been managed as part of the community and stakeholder engagement strategy for the project. Roads and Maritime have been consulting with the community and affected stakeholders on an ongoing basis regarding the road upgrades in the vicinity of Sydney Airport since September 2013.

Specific consultation for the proposed modification was carried out with Bayside Council (then known as Botany Bay City Council) and Sydney Airport in July 2016.

Environmental impacts

The main environmental impacts of the proposed modification are summarised below.

Traffic, transport and access

During construction, the proposed modification would have a minor adverse impact on the road network. This temporary impact would be associated with traffic delays from construction speed zones and construction vehicles and lane closures. During construction, pedestrian access alongside the eastbound and westbound lanes of Joyce Drive would be blocked. However, alternative paths and walking routes would be provided during construction that would reduce the impact of construction on pedestrian connectivity within the project area.

During operation, traffic volumes on Joyce Drive are expected to increase in the morning and afternoon peak. This is attributed to the road network design being better able to accommodate traffic demand. Intersection performance of Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive is also expected to improve as a result of the new road network design. Pedestrian access along Joyce Drive would be permanently removed and replaced with a new shared path along Baxter Road as part of a separate project in the WestConnex Enabling Works packages of work.

Noise and vibration

The proposed modification involves works outside of the project area assessed in the project REF and as a result an additional receiver (the proposed Mantra Hotel) has been identified.

Detailed assessment of the proposed Mantra Hotel indicates that the proposed modification would exceed the adopted internal noise criteria by 12 dBA during construction. No material risk of structural damage to the Mantra hotel as a result of construction vibration effects is anticipated. Construction noise impacts and potential human comfort vibration impacts would be managed in accordance with the project's noise and vibration management plan.

During operation the proposed modification would comply with relevant noise criteria.

Non-Aboriginal heritage

During construction, the proposed modification would require further property acquisition of one lot containing the curtilage of three heritage items. Other potential impacts include indirect impacts from vibration-generating activities near heritage items.

This impact is not considered likely to have a significant impact as none of these items are physically located near the proposed modification and would be managed during construction through the application of safeguards and mitigation measures identified in this addendum REF.

The proposed modification would not impact on any items identified in the Sydney Airport Heritage Management Plan or Sydney Airport Environment Strategy 2013-2018.

Landscape character and visual impacts

Construction activities would result in temporary moderate to high visual impacts to motorists. This is associated with the visibility of construction activities, the presence of construction plant and equipment, light spill from any night work and vegetation clearance along the southern side of Joyce Drive. However, the proposed modification would also provide opportunities for the landscape character in the area to be rehabilitated as part of the project.

Justification and conclusion

The proposed modification as described in this addendum REF best meets the project objectives but would still result in some additional impacts on traffic flow, noise and vibration and temporary impacts to visual amenity. Safeguards and management measures as detailed in this addendum

REF would ameliorate or minimise these expected impacts. The project would address road congestion and improve traffic flow. The proposed modification would further assist in addressing road congestion and traffic flow by providing additional traffic capacity and supporting neighbouring projects. On balance the proposed modification is considered justified.

This addendum REF will form part of an application for consent from Sydney Airport and a building activity approval from the Airport Building Controller.

Contents

1 Introduction

1.1 Proposed modification overview

Roads and Maritime Services (Roads and Maritime) proposes to modify the Airport East Precinct project (the project) by widening the westernmost extent of Joyce Drive and extending the Joyce Drive widening to the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive (proposed modification). Key features of the proposed modification would include:

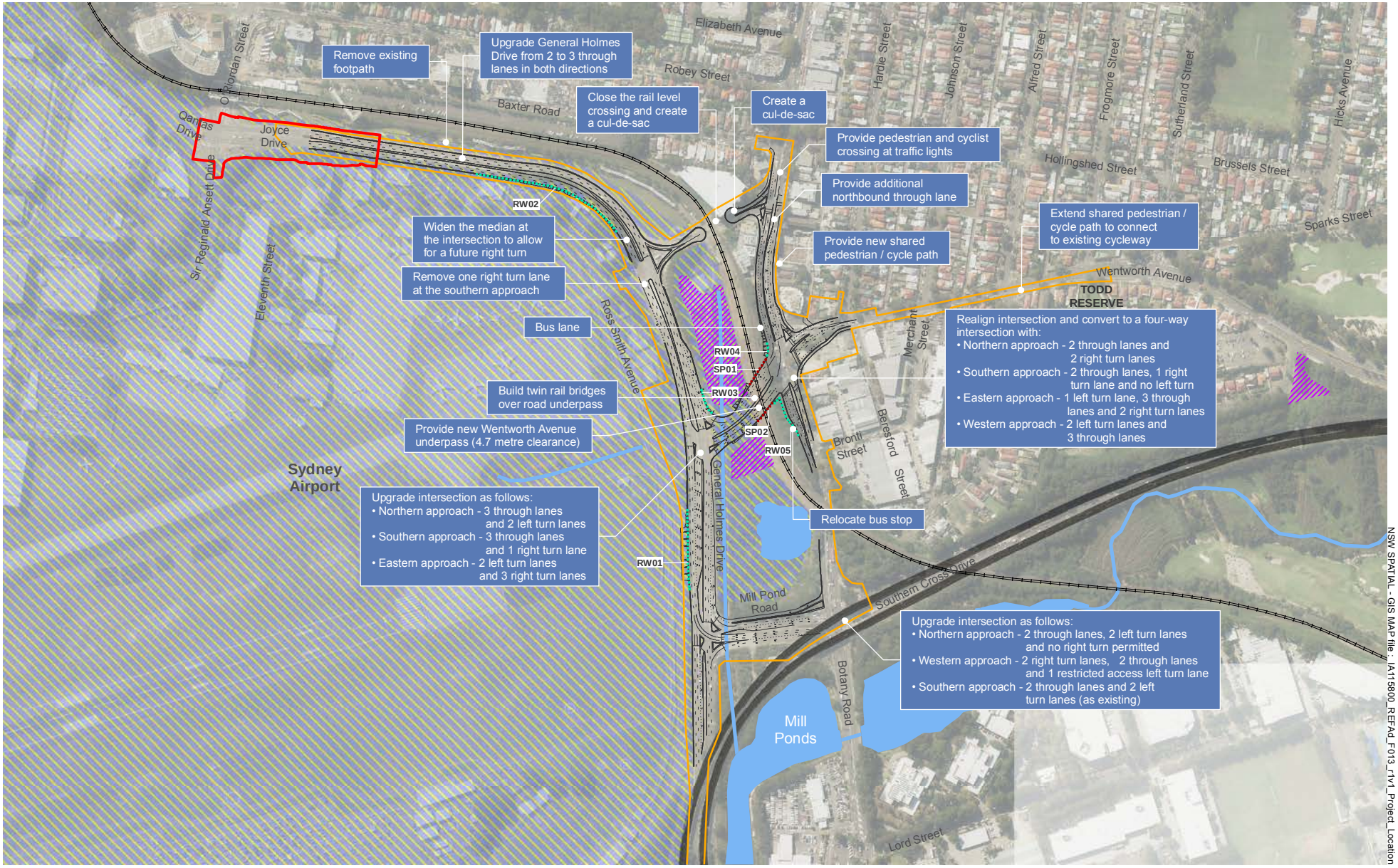
- Widening about 190 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot and converting two through lanes to three through lanes eastbound, converting two right turn lanes to through lanes westbound and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This would involve widening Joyce Drive to the southern side and relocating the central median to allow for additional through lanes and lane reconfiguration
- Upgrading and adjusting the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection to cater for the additional through lanes
- Removing the existing pedestrian path on the northern and southern sides of Joyce Drive
- Relocation of utilities
- Demolishing an existing drainage pipe and pits on the southern side of Joyce Drive and replacing with a new drainage pipe and pits
- Landscaping and replanting on road verges.

The location of the proposed modification is shown in **Figure 1-1** and the proposed modification is shown in **Figure 1-2**. Chapter 3 describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the Airport East Precinct project on February 2015 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 16 February and 13 March 2015 for community and stakeholder comment. A submissions report, dated August 2015 was prepared to respond to issues raised.

In addition the following addendum REFs for the Airport East Precinct project have been prepared:

- Airport East Precinct Addendum review of environmental factors (April 2016) – Changes to lane configuration and lane marking to retain the two left turn lanes from Mill Pond Road to Botany Road and enable vehicles turning right onto Mill Pond Road from General Holmes Drive to turn left onto Botany Road, cut batter and utilities relocations at the intersection of General Holmes Drive and Joyce Drive to support a property access slip lane, relocation of existing Telstra utility infrastructure and construction of two communication pits within the existing pedestrian footpath at the southern end of Hardie Street, open trenching adjacent to Botany Road to allow for a minor realignment of existing sewer main infrastructure, use of an existing building between General Holmes Drive and Botany Road as a site compound and offices during construction, relocation of an illuminated digital advertising sign and installation of a new variable message sign (VMS) on General Holmes Drive
- Airport East Precinct Addendum review of environmental factors (March 2017) – Changes to the Joyce Drive / General Holmes Drive / Ross Smith Avenue intersection to cater for additional traffic movements, provision for a bus stop and bus layover on Botany Road, inclusion of a retaining wall between General Holmes Drive and Ross Smith Avenue, installation of Intelligent Transport Systems (ITS) conduits under Southern Cross Drive and changes to traffic movements at the Wentworth Avenue and Hardie Street intersection.



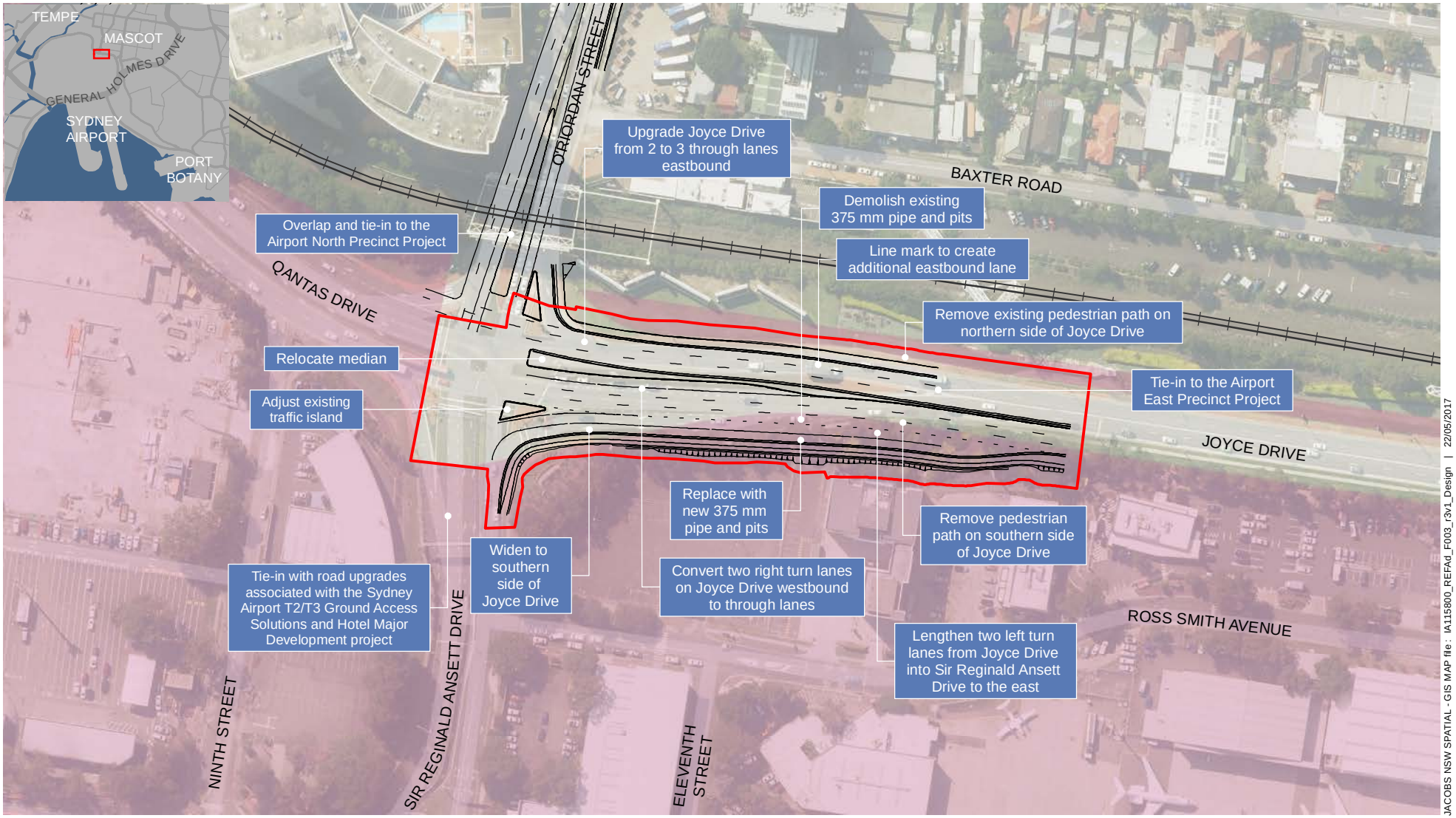
Legend

- Proposed modification
- Proposal area boundary
- Ancillary site
- Sydney Airport Corporation Limited land
- Retaining wall (e.g. RW01)
- Soldier pile wall (e.g. SP01)
- Motorway
- Railway
- Waterway

0 100 200m
1:7,000 @ A4

N

Figure 1-1 | Location of proposed modification



Legend

Proposed modification

Commonwealth of Australia - leased to Sydney Airport Corporation Limited

Railway

Design

0 25 50m
1:2,000 @ A4

N

Figure 1-2 | The proposed modification

1.2 Purpose of the report

This addendum review of environmental factors (REF) has been prepared by Jacobs on behalf of Roads and Maritime, Greater Sydney Program Office. This addendum REF has been prepared to address legislative requirements including:

- Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for activities on New South Wales land
- Commonwealth *Airports Act 1996* (Airports Act) for activities on Commonwealth land.

For the purposes of these works, Roads and Maritime is the proponent and the determining authority under Part 5 of the EP&A Act for the proposed modification on non-Commonwealth land. The Commonwealth-appointed Airport Building Controller and the airport lessee company (being Sydney Airport) are the consent authorities for the proposed modification on Commonwealth land.

This addendum REF is to be read in conjunction with the project REF, submissions report and previous addendum REFs for the project. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail protective measures to be implemented.

The description of the proposed work and associated environmental impacts have been undertaken in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the *Threatened Species Conservation Act 1995* (TSC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of:

- Section 111 of the EP&A Act that Roads and Maritime examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity
- Airports (Building Control) Regulations 1996
- Airports (Environmental Protection) Regulations 1997.

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Part 5.1 of the EP&A Act
- The significance of any impact on threatened species as defined by the TSC Act and/or FM Act, in section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of the Environment for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2 Need and options considered

2.1 Strategic need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to further assist in addressing road congestion and improving traffic flow around Sydney Airport and Port Botany by providing additional traffic capacity and supporting neighbouring projects.

2.2 Project objectives and development criteria

Section 3.1 of the project REF identifies the project objectives and development criteria that apply to the proposed modification.

The objectives of the proposed modification are consistent with the objectives of the project REF, namely 'to reduce current levels of congestion and improve the flow of traffic'.

Another objective of the proposed modification is to support other road upgrades projects in the area. This objective is also consistent with the objectives of the project REF.

2.3 Alternatives and options considered

2.3.1 Methodology for selection of preferred option

As part of the options analysis, each option was reviewed against the project objectives outlined in Section 3.1 of the project REF and the strategic need and plans, as discussed in Chapter 2 of the project REF.

2.3.2 Identified options

The two options that were considered against the project objectives and strategic need are:

- Option 1 (do nothing): The do nothing option would involve retaining the westernmost extent of Joyce Drive in its current configuration, without widening. Roads and Maritime would continue to carry out maintenance activities along Joyce Drive as part of this option
- Option 2 (the proposed modification): This option would involve widening Joyce Drive for about 190 metres to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot and converting two through lanes to three through lanes in the eastbound direction, converting two right turn lanes to through lanes in the westbound direction and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This would involve widening Joyce Drive to the southern side and relocating the central median to allow for additional through lanes and lane reconfiguration. This option would also tie into other proposed road upgrade projects in the area (including the project, Airport North and the proposed Sydney Airport internal road upgrades).

2.3.3 Analysis of options

Option 1: Do nothing

The do nothing option would result in about 190 metres of Joyce Drive remaining in its current state.

Advantages of this option include:

- No costs or funding would be required, except for the cost of periodic maintenance.

Disadvantages of this option include:

- This section of Joyce Drive would be a pinch point on the local network and cause congestion, as the sections of Qantas Drive to the west and Joyce Drive to the east are currently planned to be widened to three lanes in each direction
- The objectives of the project would not be achieved as this option would not reduce current levels of congestion and improve the flow of traffic. In addition, Option 1 would not support proposed road upgrade projects in the area
- The option would not meet the strategic need and the objectives of state plans detailed in Chapter 2 of the project REF**.**

Option 2: The proposed modification

The proposed modification would result in about 190 metres of Joyce Drive being widened. It would involve converting two lanes to three lanes in the eastbound direction, converting two right turn lanes to through lanes in the westbound direction and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This option would also involve new line marking to tie into the proposed upgrades of Joyce Drive, Qantas Drive, O'Riordan Street and Sir Reginald Ansett Drive being carried out by other projects.

Advantages of this option include:

- The project objectives would be met, as Option 2 would reduce current levels of congestion and improve the flow of traffic by providing more capacity for the road network. Option 2 would also tie into and support the other proposed road upgrades in the area
- The potential pinch point at Joyce Drive would be avoided and the proposed modification would tie in with the project, Airport North and proposed Sydney Airport internal road upgrades
- The project would assist in meeting the objectives of the strategic plans and policies as detailed in Chapter 2 of the project REF.

The concept design associated with Option 2 can also be developed with consideration of the following to reduce impacts associated with the proposed modification:

- The need to minimise environmental impacts by developing a design that requires minimal vegetation removal and complements the existing streetscape
- The need to minimise land acquisition and disruption to residents and businesses
- The need to provide an urban design that is consistent with neighbouring projects.

Disadvantages of this option include:

- Minor and temporary environmental impacts would occur during construction including impacts to traffic and amenity (noise, air and visual)
- Upfront costs or funding would be required.

2.4 Preferred option

Option 2 is considered the preferred option, as it would meet the project objectives and the strategic need with no substantial environmental impacts. Option 2 is discussed further in **Chapter 3**.

3 Description of the proposed modification

3.1 The proposed modification

Roads and Maritime proposes to modify the Airport East Precinct project to widen about 190 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot. The proposed modification is shown in **Figure 1-2**.

Key features of the proposed modification would include:

- Widening about 190 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot and converting two through lanes to three through lanes eastbound, converting two right turn lanes to through lanes westbound and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This would involve widening Joyce Drive to the southern side and relocating the central median to allow for additional through lanes and lane reconfiguration
- Upgrading and adjusting the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection to cater for the additional through lanes
- Removing the existing pedestrian path on the northern and southern sides of Joyce Drive
- Relocation of utilities
- Demolishing an existing drainage pipe and pits on the southern side of Joyce Drive and replacing with a new drainage pipe and pits
- Landscaping and replanting on road verges.

3.2 Design

3.2.1 Design criteria

The concept design for the proposed modification was prepared in accordance with a design management system certified under AS/NZS ISO 9001:2008 Quality Management Systems. Other design guides and policies considered were:

- Austroads Guide to Road Design (Austroads, 2009a) and Roads and Maritime supplements to the Austroads Guide
- Austroads Road Safety Audit Manual (Austroads, 2009b)
- Soils and construction – Managing Urban Stormwater, Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008b).

The adopted design criteria are summarised in **Table 3-1**.

Table 3-1 Design criteria

Requirement	Criteria
Design speed	• 70 km/h.
Adopted minimum curve radii	• 350m at Joyce Drive.
Cross-section/lane width	• Traffic lane width: 3.3-3.5m • Auxiliary lane width: 3.5m • Pathway width: 3.0-3.5m. Refer to typical cross section in **Appendix B**.

Requirement	Criteria
Tie-ins	Provided at: • Joyce Drive to the Project design • O'Riordan Street to the Airport North Precinct Project • Qantas Drive and Sir Reginald Ansett Drive to the road upgrades for the Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development project.
Road surface	Preliminary road surface design includes: • Areas of widening: 245mm asphalt, 150mm base gravel and 300 mm selected material • New pavement: 180mm asphalt, 220mm concrete and 300 mm selected material • Heavy patching treatment: 245mm asphalt.
Drainage	• 2-2.5 % crossfall along Joyce Drive • SA gutters
Horizontal sight distance	• Minimum sight distance required is 64m.

3.2.2 Engineering constraints

Roads and Maritime has identified a number of engineering issues and constraints for the design and construction of the proposed modification. The main issues and constraints are:

- The need to relocate existing underground utility infrastructure: An Ausgrid street light cable, a Sydney Water water main and an unidentified Sydney Airport utility located along the southern edge of Joyce Drive. An Optus telephone conduit located across eastern side of the intersection and a Sydney Water water main located across the western side of the intersection
- Major underground utilities such as the South West Suburbs Ocean Outfall Sewer (SWSOOS), a Jemena gas main and 132 kV Ausgrid transmission line located to the north of Joyce Drive
- Maintaining traffic flows during construction: The project would need to be built without reducing the number of traffic lanes during peak periods
- Coordination with proposed road upgrades such as Airport North Precinct Project and the Sydney Airport work. The project would need to be coordinated with these developments to minimise construction impacts such as traffic and noise and vibration.

3.2.3 Main features of the modification

Road widening

Joyce Drive would be widened from 29 metres to about 37 metres to the south at its widest point. The widening would involve providing one additional through lane eastbound and converting two right turn lanes to through lanes westbound and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east.

Intersection upgrade and adjustment

The Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive intersection would be adjusted to accommodate the additional lanes on Joyce Drive and to tie into the proposed modification as follows:

- Adjusting Joyce Drive eastbound from two through lanes to three through lanes from the intersection

- Adjusting Joyce Drive westbound from two through lanes to four through lanes from the intersection
- Providing pedestrian crossing along the eastern leg of the intersection
- Adjusting pedestrian crossing at the corner of Joyce Drive and Sir Reginald Ansett Drive, and southern leg of the intersection to align with new median
- Replacing existing median with new concrete raised median at the corner of Joyce Drive and Sir Reginald Drive, to allow for the tie in to Sir Reginald Ansett Drive
- Demolishing the central median at Joyce Drive and replacing with a new median to allow for widening and additional lanes
- Tie-in of the proposed modification to the existing intersection, such as pavement work.

Drainage infrastructure

The proposed modification would not result in substantial changes to drainage infrastructure within the study area. However the existing 375 millimetre diameter drainage pipe and associated pits located on the southern side of Joyce Drive (J1 to J3 as shown in **Figure 3-1**) would be demolished and replaced with a new 375 millimetre drainage pipe and pits. The new pipe and pits would be aligned to accommodate the widening of Joyce Drive (refer to **Figure 1-2**).

As part of the proposed modification a number of inlet pits would be converted to buried junction pits. The location of these conversions would be confirmed during detailed design.

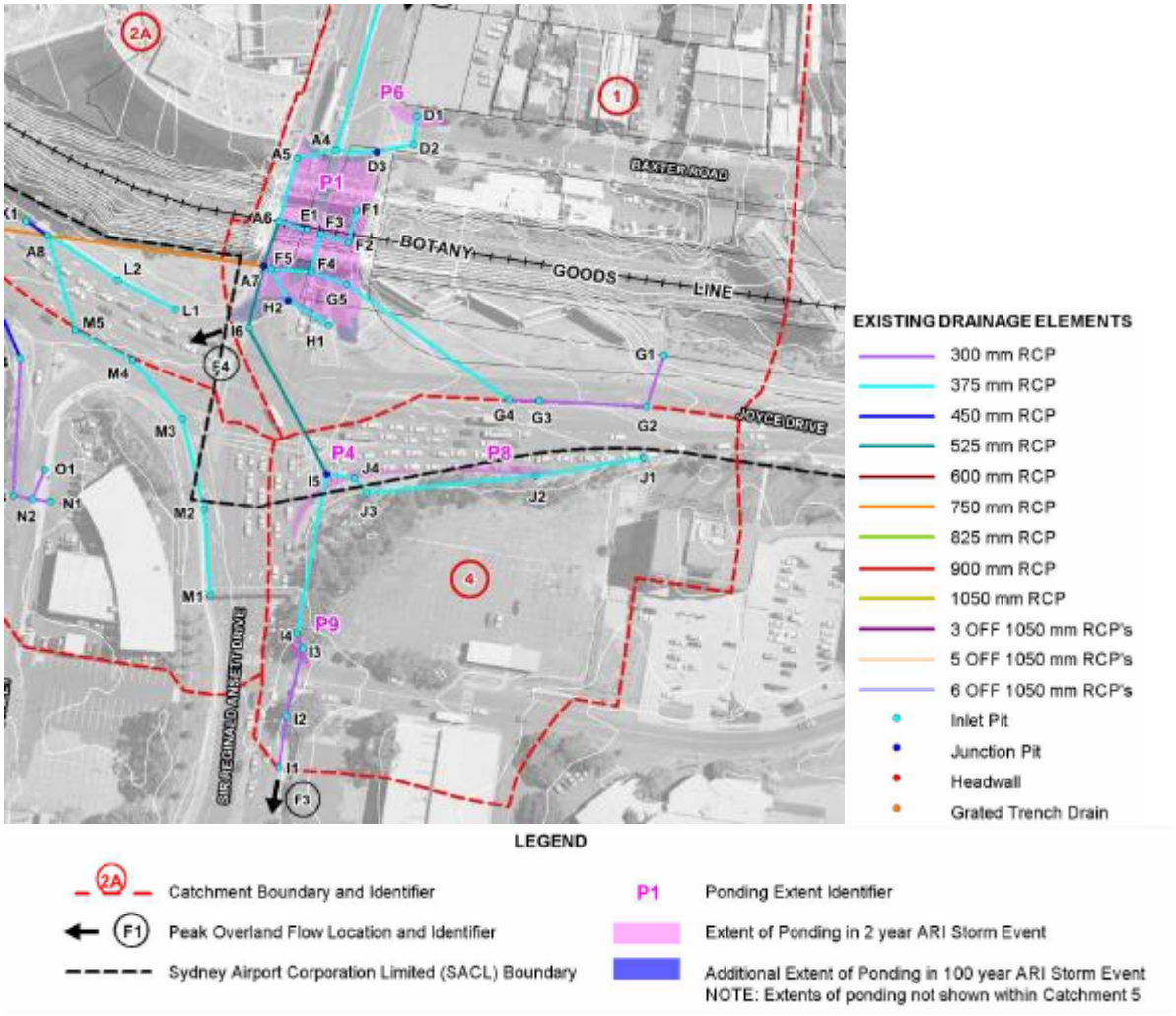


Figure 3-1 Drainage in the western extent of the proposed modification (adapted from Lyall & Associates, 2016)

Pedestrian facilities

The footpath alongside the eastbound and westbound lanes of Joyce Drive would be removed as part of the project. Alternative pedestrian access would be provided along Baxter Road as part of other Roads and Maritime upgrade projects.

Pedestrian access to the Ibis Budget Hotel from Joyce Drive may be temporarily blocked during construction however would be re-instated following the completion of work.

Urban design

The proposed modification would apply relevant urban design principles from the project to ensure a consistent urban design in the area. Urban design principles relevant to the proposed modification are summarised in **Table 3-2**.

Table 3-2 Urban design principles from the project that are relevant to the proposed modification

Urban design strategy	Design principle
Airport East	• Integrate elements of the project with existing features in the corridor to create a context related design • Provide traffic calming and appropriate safety features where road widening occurs • Maintain views to advertising in the corridor • Provide robust, contemporary low maintenance landscape design that responds to the natural and built context of the corridor • Achieve a high quality urban design outcome that responds to the sense of arrival and departure at Sydney Airport.

3.3 Construction activities

This section provides a summary of the indicative construction methodology, staging, work hours, plant and equipment that would be used to build the proposed modification and associated activities. The detailed construction staging plans and methodology would be determined by the construction contractor(s) after detailed design. The actual construction methods may vary from those described in this chapter due to:

- The identification and location of underground utilities and services
- On-site conditions identified during pre-construction activities
- Ongoing refinement of the detailed design
- Feedback and submissions from stakeholders.

The final Construction Environmental Management Plan (CEMP) and methods used for construction would be consistent with statutory requirements, including any Work, Health and Safety (WH&S) regulations, and all conditions issued following determination of the proposed modification.

A construction environmental management framework to manage and mitigate impacts is presented in **Chapter 7**.

3.3.1 Work methodology

The Construction Work Method Statement prepared for the project was used to develop the construction methodology for the proposed modification.

The construction stages and activities are summarised in **Construction staging** would be developed further during detailed design. Staging would be confirmed by the construction contractor before construction begins. Depending on the construction staging and methods determined by the contractors, the stages or sub-stages may be constructed concurrently with other projects in the area.

Table 3-3. Each stage would be dependent on site conditions, stakeholder consultation and traffic management requirements.

Construction staging would be developed further during detailed design. Staging would be confirmed by the construction contractor before construction begins. Depending on the construction staging and methods determined by the contractors, the stages or sub-stages may be constructed concurrently with other projects in the area.

Table 3-3 Proposed construction stages and key activities

Construction stage	Description of work and key activities
Stage 1: Utility relocation and drainage work	This stage would require utilities to be relocated to accommodate the changes to Joyce Drive. The following utilities would require relocation: • Ausgrid street light cables • Sydney Water 150 mm cast iron with concrete lining main and 200 mm ductile iron with concrete lining main • Unidentified Sydney Airport utility • Optus telephone conduit. The type and extent of utility relocations are provided in **Section 3.5**. Drainage adjustments would also be required during this stage, as detailed in **Section 3.2.3**. Generally the following construction activities would be undertaken for the underground utility relocations and drainage work: • Potholing to confirm the location and extent of the utilities to be relocated or other utilities potentially impacted • Excavation of a trench for the new alignment of the relocated utility • Installation of bedding material • Installation of pipelines or conduits • Where power or communication cabling is relocated, cable pulling would be required to install new cable • Excavation and installation of pits • Installation of valves, switches or other infrastructure • Testing and commissioning of the relocated section of utility • Pouring of concrete protection slabs where required • Backfilling and compaction of trenches and around pits • Restoration of ground surface.
Stage 2: Joyce Drive widening	This stage would involve widening to the north and south sides of Joyce Drive and removing the existing median to provide an additional eastbound through lane, conversion of two right turn lanes to through lanes westbound and lengthening of two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. The work would occur within and outside Sydney

Construction stage	Description of work and key activities
	Airport/Commonwealth land. The main activities would be to: • Install traffic controls, temporary barriers and temporary line making • Locate and identify existing utilities • Relocated general and major utilities (see above) • Install erosion and sedimentation controls • Install temporary fencing • Carry out clearing and grubbing • Box out and prepare subgrade • Install new longitudinal drainage • Place and compact pavement layers • Demolish median • Mill and resheet existing pavement layers and replace kerbs and pavement where necessary • Construct a new median • Lay the final asphalt layers. **Construction constraints** During this stage, there would be a need to: • Build the project under live traffic and sometimes congested conditions along Joyce Drive • Limit road closures to short durations (up to four hours) • Retain existing landscaping where possible.
Stage 3: O'Riordan Street and Sir Reginald Ansett Drive intersection upgrade	This stage would include adjusting the Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive intersection to accommodate the additional lanes on Joyce Drive and to tie into the proposed modification. The main activities would be to: • Demolish median • Construct new pavement and median • Temporary traffic switching to accommodate pavement construction work • Tie ins to the existing intersection including pavement work • Adjustment of traffic signals to allow for new traffic movements and pedestrian crossings. **Construction constraints** During this stage, there would be a need to: • Carry out most of the finalisation work at night to minimise impacts on traffic • Adjust traffic movements at the intersection for up to eight hours.
Stage 4: Finalisation work	This final stage would occur both within and outside Sydney Airport land. The main activities would be to: • Install traffic controls and temporary barriers • Place final line marking throughout the proposed modification area • Remove construction traffic controls • Open the project to traffic. **Construction constraints**

Construction stage	Description of work and key activities
	During this stage, there would be a need to: • Carry out most of the finalisation work at night to minimise impacts on traffic • Close some lanes for up to eight hours.

3.3.2 Construction hours and duration

The proposed modification would be constructed as part of the project. Construction of the project has commenced and expected to finish in 2018. The proposed modification would not change the expected construction workforce of the project. The size of the construction workforce for the project would be expected to fluctuate, depending on the stage of construction and associated activities. The workforce would be expected to peak at about 100 personnel per day.

Most construction would occur during night time hours between 11pm and 6am. Working at night would facilitate maintenance of traffic flows during construction and avoid impact to traffic to and from the airport.

The main activities of the proposed modification that would be carried out during night time hours include:

- Tie ins to the existing road network
- Partial closure of Joyce Drive to allow for pavement and linemarking work.

Any work undertaken outside standard construction hours would be in accordance with the Interim Construction Noise Guidelines (DECC, 2009), Construction Noise and Vibration Guideline (Roads and Maritime, 2016). Before construction, the contractor would liaise with the community regarding out of hours works in accordance with the Community Consultation Plan.

Where practical, materials and plant would be removed and delivered outside peak traffic periods to minimise delays to traffic. Traffic control measures would be used to manage any earthworks and the import and export of material.

3.3.3 Plant and equipment

The proposed modification would use the same plant and equipment detailed in Section 4.3.4 of the project REF. Additional plant and equipment that may be used includes:

- Asphalt profiling machines
- Bobcats
- Bulldozers
- Hand tools
- Lighting units
- Scrapers
- Water carts
- Line marker.

Additional equipment to those listed above is likely to be used and would be determined by the construction contractor.

3.3.4 Earthworks

Earthworks associated with the proposed modification would be generally associated with excavation as no cut or fill is proposed. Activities requiring excavation include utility relocations, installation of drainage infrastructure, minor excavations to widen Joyce Drive and adjustments to existing medians.

3.3.5 Source and quantity of materials

Building the project would require a range of material, including clean fill, quarry products, water and concrete. Additional quantities required for the proposed modification are detailed in **Table 3-4**. The source and quantity of materials required for the proposed modification would be finalised during its detailed design, when a construction materials and resource plan would be developed.

A number of quarries and suppliers of quarry material are located in the local area including at Mascot, Marrickville, Maroubra and Greenacre.

Table 3-4 Estimate of quantities of materials required to build the proposed modification

Material type	Quantity estimate
Asphalt and Bitumen	About 1100m^3 and 2000 litres
Road base	About 1000m^3
Concrete (medians, island and kerb and gutters)	About 200m^3
Drainage Materials (pipes, pits, culverts)	About 300 metres of pipe and about 30 drainage structures.
Diesel, fuels, oils, lubricants	Small quantities
Water	Depends on local site conditions at the time of building

Surplus material

Surplus material that cannot be used on site would be reused or disposed of in the following order of priority:

- Transfer to other Roads and Maritime projects for immediate re-use in accordance with the NSW Environmental Protection Authority (EPA) Excavated Public Road Material resource recovery exemption
- Transfer to an approved Roads and Maritime stockpile site for future re-use only if a specific project has been identified prior to stockpiling and *Protection of the Environment Operations Act 1997* (POEO Act) waste regulatory requirements are met. If a project cannot be identified the material would not be stockpiled
- Transported off-site for re-use by a third party in accordance with a relevant EPA resource recovery exemption
- Disposed of at an approved materials recycling or waste disposal facility
- As otherwise provided for by the relevant waste legislation.

Water use

Water would be required for activities such as the compaction of earthworks and pavement layers and dust suppression. Required quantities of water for the proposed modification are not yet known and would be calculated during its detailed design. Water for the project would be sourced from authorised off-site sources, including recycling or re-used water.

3.3.6 Traffic management and access

This section outlines the likely changes to traffic during construction. Impacts on traffic would be minimised through the management measures outlined in **Section 6.2.3**.

Construction vehicles

Heavy vehicle movements generated as part of construction of the project are estimated to peak at 20 vehicles per hour, while a maximum 50 light vehicles would be required during construction per day.

It is expected that the majority of heavy vehicles would be haulage trucks, concrete trucks and delivery trucks.

In total, there would be about 80 additional vehicles travelling through the study area per day as a result of the proposed modification. This may increase to about 100 vehicle movements during the busiest periods. Traffic counts carried out in 2013 found that average daily traffic volumes on Joyce Drive are about 18,000 in each direction with about seven or eight per cent being heavy vehicles (Jacobs, 2014). The additional vehicles required for this proposed modification is expected to have a negligible effect on traffic volumes as discussed in **Section 6.2**.

Construction vehicle access and haulage routes

Access to the construction site and compound and stockpile sites would be via General Holmes Drive, O'Riordan Street and Joyce Drive. Access to the site would be via:

- Joyce Drive and O'Riordan Street for construction traffic accessing the construction site from the east and north, respectively
- O'Riordan Street, Joyce Drive and General Holmes Drive for construction traffic accessing ancillary facilities.

Any haulage would be in accordance with the construction traffic management plan for the project.

Traffic management, control and signage

The following measures would be implemented to minimise impact during construction:

- Construction would be staged
- Traffic management measures would be used so that traffic flow is maintained in the project area. These measures would be documented in a traffic management plan (TMP) that would be developed in accordance with Roads and Maritime's Traffic Control at Works Sites Manual (RTA, 2010) and Specification G10 – Control of Traffic. Roads and Maritime would review the TMP before it is implemented.

Traffic management and control measures would be developed in consultation with Sydney Airport to minimise cumulative impacts to traffic.

Road and lane closures

Construction would be staged to ensure that no traffic lanes are closed during peak traffic periods. Some short-term lane closures may be required and would be managed through measures identified in the TMP.

Parking

No more than 50 private light vehicles for construction staff use are expected as part of the project. The proposed modification may slightly increase the amount of private light vehicles required however is not expected increase substantially. The project would provide a dedicated parking area for staff as part of the project's ancillary facilities. Potential impacts on parking are discussed in **Section 6.2**. Construction parking impacts would be managed through measures identified in the TMP.

3.4 Ancillary facilities

The proposed modification would not require additional ancillary facilities apart from temporary stockpile areas. Other ancillary facilities to support construction would be provided by those proposed for the project. Temporary stockpile sites may be provided within the project area and their location determined during detailed design.

Proposed ancillary facilities for the project that would be used include the location between General Holmes Drive and Botany Road, on the northern and southern sides of the proposed Wentworth Avenue underpass (refer to **Figure 3-2).** The compound site would be about 500 square metres. The proposed ancillary facilities for the project have been assessed as part of the project REF and addendum REF (April, 2016) and construction of the proposed modification is not anticipated to significantly increase the intensity of use of these ancillary facilities

Any additional locations recommended by the construction contractor would be discussed with the Roads and Maritime Senior Environmental Officer (Sydney Region) before any work is carried out to determine if any additional environmental assessment is required.

Legend

Proposed modification

Proposed ancillary site

Railway

0 50 100m

1:4,500 @ A4

N

Figure 3-2 | Proposed ancillary sites

3.5 Public utility adjustment

The proposed modification would require utilities to be relocated. Most of the utility adjustments would occur at the start of the project (refer to **Table 3-3**).

Table 3-5 details the known public utilities that would need to be relocated (these would be confirmed during detailed design).

Table 3-5 Utilities requiring adjustment

Utility	Description of adjustment
Ausgrid street light cables	Relocate behind new kerbline on southern side of Joyce Drive
Sydney Water (150 mm cast iron with concrete lining and 200 mm ductile iron with concrete lining) mains	Relocate behind new kerbline on southern side of Joyce Drive and western side of intersection
Unidentified Sydney Airport utility	Relocate behind new kerbline on southern side of Joyce Drive
Optus telephone conduit	Relocate behind new kerbline on eastern side of intersection

3.6 Property

3.6.1 Property ownership

Property near the proposed modification is owned by:

- State and local authorities such as Roads and Maritime, Sydney Water, and Bayside Council
- Federal authorities such as Australian Rail Track Corporation (ARTC), Sydney Airport and the Commonwealth of Australia
- Private owners of residential and commercial property.

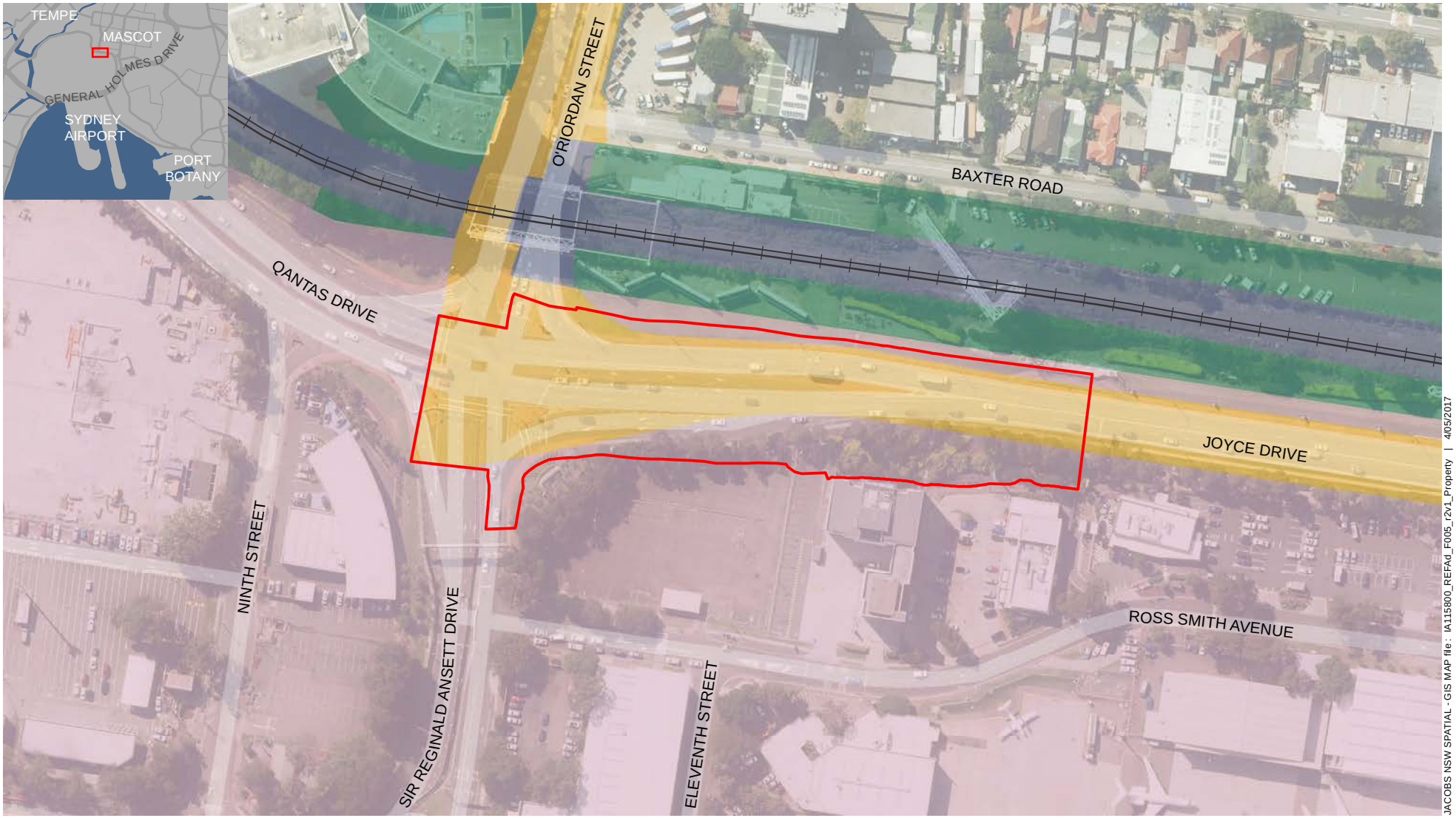
The owners of land near and within the proposed modification are shown on **Figure 3-3**.

3.6.2 Property acquisition

The proposed modification would require additional property acquisition of Commonwealth land. The additional area that would be acquired is listed in **Table 3-6**.

Table 3-6: Proposed property acquisition

Area ID	Description	Total area	Acquisition type	Current owner	Lot and DP	Land use zone (LEP)
1	South of Joyce Drive	1450 m²	Partial acquisition	Commonwealth of Australia	Lot 8 DP1050923	SP2 Infrastructure



Legend

- Proposed modification
- Commonwealth of Australia - leased to Sydney Airport Corporation Limited
- Rail Corporation NSW
- Botany Bay City Council
- Private
- Railway

0 25 50m
1:2,000 @ A4

N

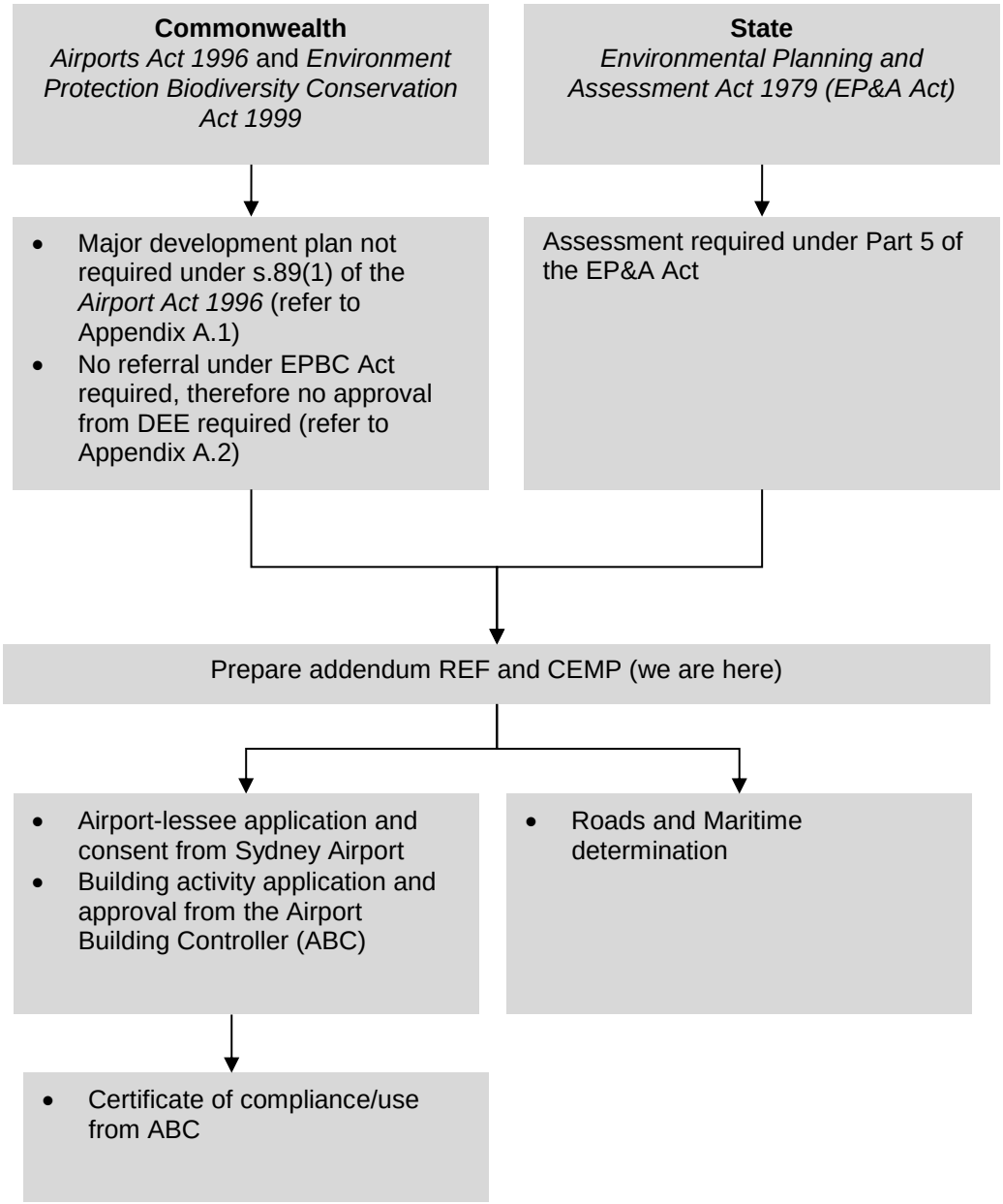
Figure 3-3 | Property ownership

4 Statutory and planning framework

4.1 Approvals framework

As the proposed modification is partially located on Commonwealth land leased to Sydney Airport, and private/State owned land, requirements under the Commonwealth and NSW law apply. **Figure 4-1** summarises the approvals process for the proposed modification.

Figure 4-1 Commonwealth and State approvals process



4.2 Commonwealth legislation

The proposed modification is subject to the Commonwealth *Airports Act 1996* (Airports Act), *Environment Protection and Biodiversity Conservation Act 1999*, and the regulations to these acts.

The requirements of the Commonwealth legislation are detailed below.

4.2.1 Airports Act 1996

Proposals under the Airports Act may require:

- Major development plan: This applies to any major airport development (as defined by section 89(1) of the Airports Act)
- Building permit and development application: This applies to any proposals for building activity, as defined by sections 2.02 and 2.03 of the Airports (Building Control) Regulations 1996.

Major development plan

Sections of the proposed modification would be located on Commonwealth land prescribed in the Airports Act. Sydney Airport development is managed in accordance with the Sydney Airport Master Plan 2033 (refer to **Section 4.5.1**).

Section 89(1) of the Airports Act specifies development on Sydney Airport land that constitutes a 'major airport development.' Sydney Airport major airport development includes construction or modification of runways and taxiways, airport terminal buildings and other airport support facilities.

An assessment on whether the proposed modification is a 'major airport development' under section 89(1) of the Act was carried out, and is provided in full in **Appendix A**.

The assessment confirmed that the proposed modification would not meet the criteria under section 89(1)(j). The estimated cost of construction is not expected to exceed $20 million. The project has been designed to address existing and future traffic congestion and access issues, rather than to significantly increase the capacity of the airport to handle movements of passengers, freight or aircraft.

Section 89(1) also includes environmental, community and sensitive development triggers for 'major airport developments' as follows:

> (m) a development of a kind that is likely to have significant environmental or ecological impact; or
>
> (n) a development which affects an area identified as environmentally significant in the environment strategy; or
>
> (na) a development of a kind that is likely to have a significant impact on the local or regional community; or
>
> (nb) a development in relation to which the Minister has given an approval under section 89A
>
> (o) a development of a kind specified in the regulations.

The assessment confirmed that the proposed modification would not meet the criteria associated with sections 89(1)(m), (n), (na), (nb) and (o) (refer to **Appendix A**).

Based on the assessment it is considered that the activity would not constitute a major airport development and a major development plan is not required.

Building activities approval

Section 2.02 of the Airports (Building Control) Regulations 1996 states that building approval applications are required for the following proposed building activities:

- Construction or alteration of a building (clause 2(a))
- Construction or alteration of works (clause 2(b))
- Demolition, destruction, dismantling or removal of a building, or works (clause 2(c)).

The proposed modification involves the upgrade of a road in the form of widening. In the meaning of the Airports Act, the proposed modification is characterised as 'earthworks or engineering works' as defined in section 98(3)(e). Earthworks or engineering works are building activities as defined by section 98(1)(c) and 98(1)(d), and therefore require a building approval.

A development application for work on Commonwealth land will be submitted to Sydney Airport for the proposed modification in accordance with section 2.03, clause 1 of the regulations. If the application is successful, Sydney Airport consent would be provided to Roads and Maritime with any relevant environmental conditions for the proposed modification.

Roads and Maritime would then seek building activity approval from Sydney Airport's airport building controller, who is independently employed by the Commonwealth Department of Infrastructure and Regional Development.

Consultation carried out with Sydney Airport on 13 December 2013, and subsequent consultation on 22 August 2014 confirmed a single REF would be prepared to address both Commonwealth and State planning requirements for the project. This addendum REF would accompany the development application submitted to Sydney Airport for consent, and the building activity approval from the Airport Building Controller for the proposed modification.

Section 2.05 of the Airports (Building Control) Regulations 1996 lists the information that is required within an application. These requirements are listed in **Table 4-1** together with where they are addressed in this addendum REF.

Table 4-1 Requirements for building activity approval application

Information about proposed building activity		Response and relevant section in the addendum REF
(a)	A description of the proposed building activity, and its location on the airport site	A brief description of the proposed modification is provided in **Section 1.1**. A more comprehensive description of the proposed modification is provided in **Chapter 3**. **Figure 1-1** and **Figure 1-2** show the proposed modification and its relative location to Sydney Airport.
(b)	If there is a final master plan for the airport — a statement describing how the proposed building activity is consistent with the plan	The proposed modification is consistent with the Sydney Airport Master Plan 2033 and the objectives of the zones it affects, as demonstrated in **Section 4.5.1**.
(c)	(c) If the proposed building activity is, or comprises part of, a major airport development (within the meaning of section 89 of the Act) — a statement describing how the proposed building activity is	The proposed modification is not and does not comprise part of a major airport development, as discussed in **Section 4.2.1**.

Information about proposed building activity		Response and relevant section in the addendum REF
	consistent with:	
(i)	The approved major development plan for the airport	
(ii)	Any exemption declared under paragraph 90 (1) (d) of the *Airport Act 1996*.	
(ca)	If the proposed building activity is not, or does not comprise part of, a major airport development — a statement to that effect	The proposed modification is not, and does not comprise part of a major airport development, as discussed in **Section 4.2.1**.
(cb)	If the proposed building activity is, or comprises part of, a draft major development plan — a statement to that effect	The proposed modification is not, and does not comprise part of a draft major airport development, as discussed in **Section 4.2.1**.
(d)	If there is a final environment strategy for the airport — a statement describing how the proposed building activity is consistent with the strategy	The proposed modification is consistent with the Sydney Environmental Strategy (2013-2018), as discussed in **Section 4.5.2**.
(e)	2 copies of the site plan for the proposed building activity, including a depiction of the proposed development resulting from the building activity	**Figure 1-2** and **Appendix B** provide site plans for the proposed modification. Cross sections of the proposed modification are provided in **Appendix B**.
(f)	A copy of any other information about the proposed building activity required by a regulatory authority, or other body having a regulatory function, in relation to the resulting building, works or demolition.	This addendum REF includes information to meet Roads and Maritime obligations under: • Part 5 of the EP&A Act, with regards to environmental assessment • The *Threatened Species Conservation Act 1995* (TSC Act), with regards to impact on threatened species and ecological communities • The Fisheries Management Act 1994 (FM Act) with regards to aquatic environments and species. • The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Airports (Environment Protection) Regulations 1997

The Airports (Environment Protection) Regulations 1997 are made under section 252 of the *Airports Act 1996*. The objects of these regulations are to regulate and hold accountability for activities at airports that generate or have the potential to generate pollution or excessive noise. These regulations also promote improving environmental practices for activities carried out at

airports. The Airports (Environment Protection) Regulations 1997 have been considered in the assessment of the proposed modification in Chapter 6 of this addendum REF.

Airports (Protection of airspace) Regulations 1996

The Airports Act protects airspace at and around airports. Section 182 of the Airports Act defines any activity that intrudes into prescribed airspace as being a controlled activity. The Airports (Protection of Airspace) Regulations 1996 requires that the Commonwealth Department of Infrastructure and Regional Development (DIRD) or Sydney Airport operator to approve long and short term applications to carry out controlled activities and to impose conditions on an approval.

The proposed modification would not result in any changes to airport operations in addition to those described in the project REF and has not been further assessed in this addendum REF.

4.2.2 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval must be obtained from the Commonwealth Minster for the Environment for proposed actions that have the potential to significantly impact on matters of national environmental significance (MNES) or the environment of Commonwealth land. These are considered in **Appendix C** and **Chapter 6** of this addendum REF.

Findings – matters of national environmental significance

This addendum REF has considered the *Significant Impact Guidelines 1.2: Actions on, or impacting upon Commonwealth land, and actions by Commonwealth agencies* (DSEWPaC, 2013) in **Appendix A**. While the proposed modification is partially located on and is adjacent to Commonwealth land, it is not likely to have a significant impact on the environment (including impacts outside of Commonwealth land), as confirmed by the environmental assessment in **Chapter 6**.

The assessment of the proposed modification impact on nationally listed threatened species, populations, endangered ecological communities and migratory species found that there is unlikely to be a significant impact on relevant matters of national environmental significance. **Chapter 6** of this addendum REF describes the safeguards and management measures to be applied. Accordingly, the proposed modification has not been referred to the Australian Government Department of the Environment and Energy under the EPBC Act.

4.3 Environmental Planning and Assessment Act 1979

4.3.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and is to be carried out on behalf of Roads and Maritime, the proposed modification would not change the approval pathway and can therefore still be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

The proposed modification is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not affect land or development regulated by State Environmental Planning Policy No. 14 - Coastal Wetlands, State Environmental Planning Policy No. 26 - Littoral Rainforests, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in **Chapter 5** of this addendum REF.

4.3.2 Local Environmental Plans

Botany Bay Local Environmental Plan 2013

The proposed modification is located within the Bayside local government area (LGA). The principal relevant local environmental planning instrument under the EP&A Act is the Botany Bay Local Environmental Plan 2013 (Botany Bay LEP).

The proposed modification is permissible in all the zones relevant to the proposed modification outlined in **Table 4-2**. However, the proposed modification would be permissible without consent from Bayside Council, in accordance with Clause 94 of the ISEPP (refer to **Section 4.3.1**).

Most of the proposed modification is located within the existing road corridor, so the proposed modification would not substantially impact other land uses. However, some land zonings under the LEP would be affected. **Table 4-2** lists these zones, a summary of their objectives and how the proposed modification is consistent with these objectives. The zones are shown on **Figure 4-2**.

Table 4-2 Local environmental plan zones affected by the proposed modification

Zone	Objective	Consistency of the proposed modification with the objectives
SP2 – Classified Road SP2 - Airport	• To provide for special land uses that are not provided for in other zones • To provide for sites with special natural characteristics that are not provided for in other zones • To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land.	The proposed modification is consistent with the first objective of these zones as it provides special land uses (classified road uses) that are not provided for in other zones. The proposed modification is also consistent with the second objective, in that it keeps with the special characteristics of the area and keeps with its existing and intended use, which is road use.
B5 – Business Development	• To enable a mix of business and warehouse uses, and bulky goods premises that require a large floor area, in locations that are close to, and that support the viability of, centres.	The proposed modification is consistent with the zone's objective by improving traffic flow and reducing travel times within and to/from Mascot and Sydney Airport, thereby improving connectivity with centres.

Note: Consent as described in this table is not required from Bayside Council, in accordance with Clause 94 of the ISEPP (refer to **Section 4.3.1**).

The proposed modification overlaps with the Sydney Airport heritage item (I3, I168, I170) mapped on the Botany Bay LEP. Potential impacts to non-Aboriginal heritage are discussed in **Section 6.4**.

4.4 Other relevant NSW legislation

4.4.1 Heritage Act 1977

The *Heritage Act 1977* aims to protect and preserve items of environmental heritage (natural and cultural) in NSW. The Act provides for the protection of items of local, regional and State heritage significance. It establishes a list of State heritage items and outlines processes for approving development that may impact items of heritage significance. The proposed modification would not disturb or excavate a state heritage listed item, and therefore would not require an approval from the NSW Heritage Council.

The *Heritage Act 1977* protects relics, which can include archaeological material, features and deposits, as defined in Section 4(1) of the Act. Section 139(1) of the Act states that:

> *"A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit."*

The heritage assessment carried out as part of this addendum REF has found that the proposed modification would not have a significant impact on any non-Aboriginal heritage (refer to **Section 6.4**).

4.4.2 Water Management Act 2000

The *Water Management Act 2000* (Water Management Act) controls the extraction of water, the use of water, the construction of infrastructure such as dams and weirs, and any activities in or near water sources in NSW. The Greater Metropolitan Region Groundwater Sources and the Greater Metropolitan Region Unregulated River Water Sources plans apply to the proposed modification. The proposed modification is therefore subject to the Water Management Act.

Section 56 of the Water Management Act establishes access licences for the taking of water within a particular water management area. Under Section 18(1) of the Water Management (General) Regulation 2011, Roads and Maritime, as a roads authority is exempt from the need to obtain an access licence in relation to water required for road construction and road maintenance.

Sections 89 to 91 of the Water Management Act establish three types of approvals which may be required by a proponent. These are water use approvals, water management work approvals and activity approvals.

Water use approvals

Water use approvals allow the holder of the approval to use water for a particular purpose at a particular location in a water management area. Clause 31(1) of the Water Management (General) Regulation 2011 provides that Roads and Maritime, as a roads authority, is exempt from a water use approval in relation to the use of water for roads purposes.

Water management work approvals

Water management work approvals allow the holder to carry out types of water management work at certain locations, including water supply works, certain drainage works and flood works. Roads and Maritime would not carry out any construction work for the project that would require a water management work approval.

Activity approvals

Activity approvals are required when a certain activity is likely to affect waterfront land or interfere with an aquifer. The proposed modification may have a minor impact on groundwater during excavation, utility relocation and potential dewatering activities. However, clause 38 of the Water Management (General) Regulation 2011 provides that Roads and Maritime, as a roads authority, is exempt from requiring controlled activity approval for all controlled activities that it carries out in, on

or under waterfront land. **Section 6.5** discusses the proposed modification potential impact on groundwater.

In September 2012, the NSW Government released the Aquifer Interference Policy which aims to protect groundwater aquifers while balancing different water uses. The *Water Management Act 2000* defines a number of aquifer interference activities including penetration of, interference with and obstruction of water flow within an aquifer. Taking and disposing water from an aquifer are also defined as being aquifer interference activities. Any activity that results in the reduction in the groundwater resource pool of three megalitres per year or more, or at an instantaneous rate of greater than five litres per second will require a groundwater extraction and aquifer interference license.

Groundwater levels are relatively close to the surface. Given the small areas proposed to be excavated and the limited amount of time that excavation would be open, substantial volumes of dewatering are not expected as part of the proposed modification. In addition the NSW Government has not yet enacted the aquifer interference approvals.

Prior to construction, Roads and Maritime would consult with the WaterNSW to confirm licensing and approval requirements in relation to any aquifer interference and any taking and disposing of water from an aquifer.

4.4.3 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) aims to protect, restore and enhance the quality of the environment, to reduce risk to human health and provide information to the public about environmental protection and pollution. The POEO Act is administered by the Environment Protection Authority and provides for the regulation and authorisation of discharges to the environment through issuing of an environment protection licence (EPL) for scheduled developments and activities, as listed on Schedule 1 of the POEO Act.

Schedule 1 lists scheduled activities, including road construction on classified roads. The scheduled activities set out in Schedule 1 that are most relevant to Roads and Maritime include:

- Concrete works (cl 13)
- Crushing, grinding or separating materials (cl 16)
- Land-based or water-based extractive activities, such as extraction, dredging, quarrying, processing or storage (cl 19)
- Dealing with certain types of waste (see below)
- Road construction, widening or re-routing (but not maintenance or operation) where this results in four or more traffic lanes. To activate this clause, the road must be at least one kilometre to five kilometres in length depending on whether it is in a metropolitan or non-metropolitan area and on a freeway, tollway or main road (cl 35).

The project has an EPL for sections of the project. The proposed modification does not meet the criteria outlined in Schedule 1 of the POEA Act therefore an EPL would be not required for the proposed modification.

In addition, the POEO Act and the Protection of the Environment (Waste) Regulation 2005 are the key pieces of legislation that regulate waste in NSW. They contain the requirements for managing, storing, transporting, processing, recovering and disposing of waste. Applying waste to land in NSW (including temporary storage and reusing materials back into the construction of a road for example) may trigger various regulatory requirements such as the need to hold an environment protection licence or pay the waste and environment levy. However, a 'resource recovery exemption' may be applicable if it is a genuine, fit for purpose, reuse of the waste rather than another path to waste disposal.

An exemption facilitates the use of specific waste materials outside of certain requirements of the waste regulatory framework. For each exemption there is a corresponding 'resource recovery order' that specifies the requirements that must be met by suppliers of the material. The EPA has issued general resource recovery orders and exemptions for many materials including:

- Excavated natural material
- Excavated public road material
- Raw mulch
- Reclaimed asphalt pavement
- Recovered aggregate.

These orders and exemptions may be used for the project without seeking approval from the EPA.

4.4.4 Land Acquisition (Just Terms Compensation) Act 1991

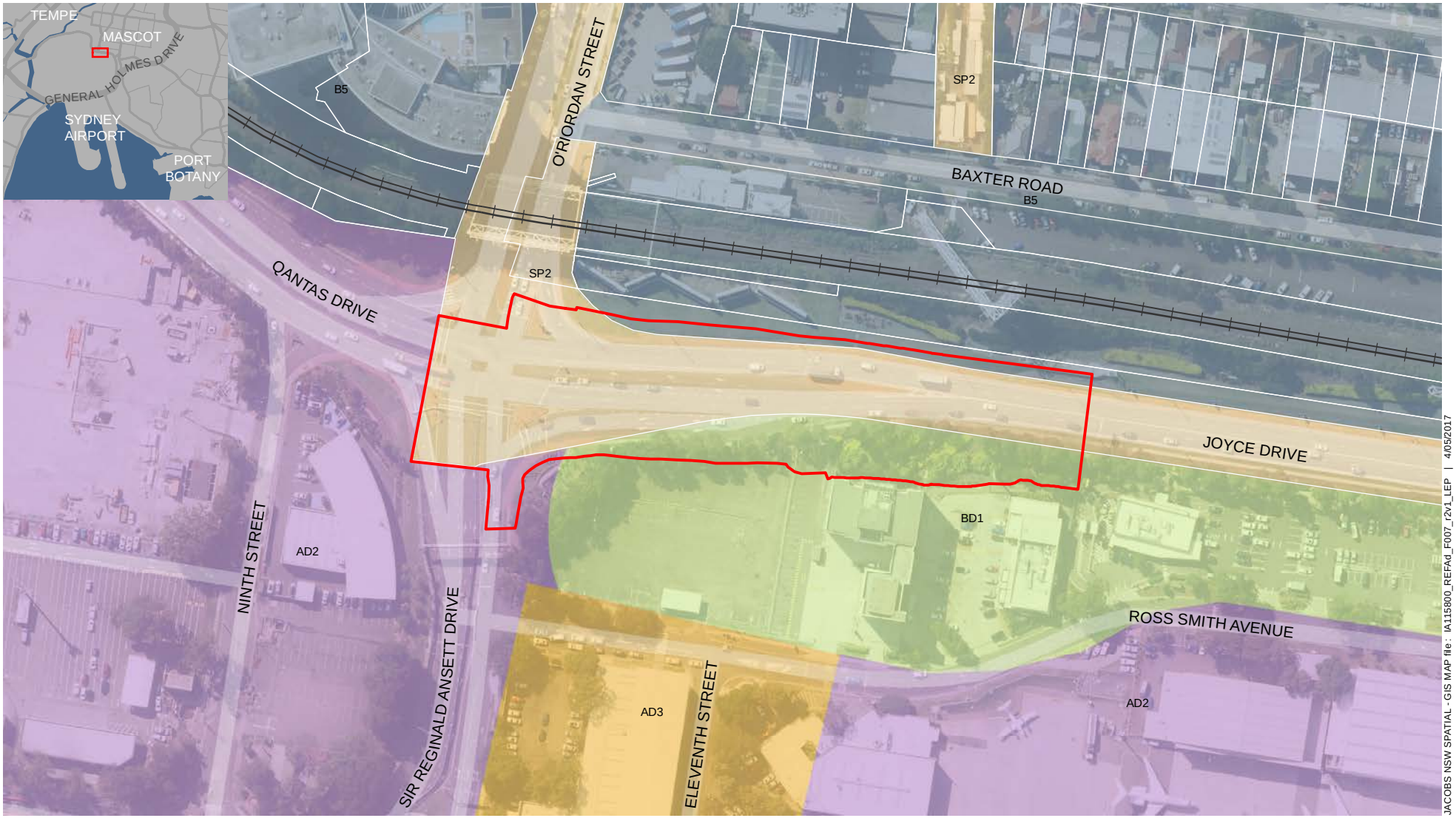
One property would be further impacted and partially acquired as part of the proposed modification.

All property acquisitions would be carried out in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*, which aims to guarantee just compensation terms for land that is acquired by an authority of the State.

Roads and Maritime would continue to consult with affected landowners as part of the project.

4.4.5 Roads Act 1993

Under Section 138 of the *Roads Act 1993*, the proposed modification would require a Road Occupancy Licence (ROL) from the Transport Management Centre as the proposed modification is likely to impact on traffic flow of Joyce Drive which is a classified road during construction. ROLs for the proposed modification would be managed as part of the Project. Approval from Bayside Council would also be required for any local road closures.



Legend

- Proposed modification
- Railway

Sydney Airport Master Plan 2033

- AD2 Airport Terminal and Support Services
- AD3 Airport Logistics and Support
- BD1 Business Development

Botany Bay LEP 2013

- B5 Business Development
- SP2 Infrastructure

0 25 50m
1:2,000 @ A4

N

Figure 4-2 | Zoning under the Botany Bay LEP and Sydney Airport Master Plan

4.5 Policies and guidelines

4.5.1 Sydney Airport Master Plan 2033

The *Sydney Airport Master Plan 2033* (Sydney Airport, 2014) outlines Sydney Airport's plan for the operation and development of Sydney Airport to 2033. The project is identified in the Master Plan's development plan. The Joyce Drive widening is identified as part of the five year ground transport plan for the Terminal 2/3 precinct. The Master Plan recognises the heavy traffic volumes currently on Joyce Drive and that widening Joyce Drive would provide consistent traffic access to the airport and support the forecast growth in traffic. The proposed modification is therefore consistent with the Master Plan. The proposed modification has been found to be consistent with the Sydney Airport Master Plan 2033 planning objectives, which is a requirement for building approvals by persons other than an airport-lessee company (refer to the Airports Act section 99(3)(d)(ii)). **Table 4-3** lists the Sydney Airport Master Plan zones which overlap with the proposed modification area, a summary of their objectives and how the proposed modification is consistent with these objectives.

Table 4-3 Sydney Airport Master Plan zones affected by the proposed modification

Zone	Objective	Consistency of the proposed modification with the objectives
BD1 – Business Development	• To enable a mix of business, retail and industrial uses in locations that are close to and that support the functioning of the airport • To integrate suitable and compatible land uses in accessible locations so as to maximise public transport patronage and encourage cycling • To encourage employment opportunities and promote businesses along main roads • Enable a limited range of other land uses that will provide facilities and services to meet the day-to-day needs of local workforce • To ensure heritage items are appropriately considered and managed • To maximise, where possible, the use of existing access and egress points.	The primary use of the proposed modification is for roads, and is therefore permissible. The proposed modification aims to improve traffic flow, reduce congestion and would tie into other road upgrade projects in the area. The proposed modification is generally consistent with the objectives of this zone.
AD2 – Airport Terminal and Support Services	• To protect the long-term viability and operational efficiency of Sydney Airport for its primary function • Facilitate development of contemporary passenger terminals and related facilities for the handling, transfer and processing of passengers that are capable of meeting the standards expected by international, domestic and regional travellers as well as supporting the needs of	The primary use of the proposed modification is for roads, and is therefore permissible. The proposed modification aims to improve traffic flow, reduce congestion and tie into other road upgrade projects in the area, including road

Zone	Objective	Consistency of the proposed modification with the objectives
	Sydney Airport's workforce • Encourage employment opportunities • Facilitate compatible and ancillary functions within the zone provided that development does not render the land unfit for aviation activities • To ensure heritage items are appropriately considered and managed • Provide for aviation activities and support facilities.	upgrades associated with Sydney Airport. The proposed modification is generally consistent with the objectives of this zone.

4.5.2 Sydney Airport Environment Strategy 2013-2018

The proposed modification is consistent with the Sydney Airport Environment Strategy 2013-2018 which forms part of the Sydney Airport Master Plan 2033.

The proposed modification has been assessed in **Chapter 6** as:

- Not being a development of a kind that is likely to have a significant environmental or ecological impact (section 89(1)(m) of the Airports Act)
- Not being a development which affects an area identified as environmentally significant in the Sydney Airport Environment Strategy 2013-2018.

4.6 Confirmation of statutory position

Roads and Maritime is both the proponent and determining authority for the proposed modification for NSW approvals. Clause 94 of the ISEPP provides that the proposed modification may be carried out without development consent and therefore does not change the approval pathway and is subject to assessment under Part 5 of the EP&A Act. Development consent from Bayside Council is not required. Additional permits and approvals are required for this proposed modification in addition to the Part 5 determination, and these are detailed in **Section 7.3**.

In accordance with section 2.02 of the Airports (Building Control) Regulations 1996 the proposed modification, where on Commonwealth land, will require a building activity approval from the Airport Building Controller. The Airport Building Controller cannot grant a building activity approval until consent is obtained from the airport-leasee company. Roads and Maritime will seek consent from Sydney Airport through their development application process and will submit an application for a building activity approval from the Airport Building Controller.

An approval from the Minister for the Environment under the EPBC Act is not required, as:

- The proposed modification would not have a significant impact on MNES
- The proposed modification is not likely to have a significant impact on the environment of Commonwealth (including as a result of impacts outside of Commonwealth land).

5 Consultation

5.1 Consultation strategy

Consultation for the proposed modification has been managed as part of the community and stakeholder engagement strategy for the project. Roads and Maritime have been consulting with the community and affected stakeholders on an ongoing basis regarding the road upgrades in the vicinity of Sydney Airport since September 2013. The purpose of consultation is to:

- Involve key government agencies and stakeholders in the evaluation of project options
- Seek community feedback on Roads and Maritime's projects
- Receive comments from those affected by the project
- Seek community ideas to be considered in the concept design
- Advise directly affected stakeholders of the project and potential impacts
- Advise the community how they can obtain further information or communicate concerns, complaints or suggestions.

5.2 Stakeholder involvement

The project REF was placed on public display between 16 February and 13 March 2015 for community and stakeholder comment. A submissions report, dated August 2015 was prepared to respond to issues raised. Responses from stakeholders from the Submissions Report about Joyce Drive work are summarised in **Table 5-1**. A response to these issues in relation to the proposed modification has also been provided in **Table 5-1**.

Table 5-1 Summary of issues raised by stakeholders about Joyce Drive work as part of project

Group	Response	Response / where addressed in this addendum REF
Sydney Airport	The current design would impact on Sydney Airport land and assets along Joyce Drive. Sydney Airport suggested that Roads and Maritime adjust the Joyce Drive alignment to be further north of the current Airport East Precinct design.	During the concept design for the project, Roads and Maritime investigated moving Joyce Drive to the north as part of the widening. A substantial shift to the north is constrained by major underground utilities such as the South West Suburbs Ocean Outfall Sewer (SWSOOS), a Jemena gas main and 132 kV Ausgrid transmission line. A detailed response is provided in the Airport East precinct- WestConnex enabling works Submission Report (Jacobs, 2015b). These constraints have influenced the location of the current design of the proposed modification and its location in relation to Commonwealth land leased to Sydney Airport.

Group	Response	Response / where addressed in this addendum REF
Sydney Airport	Request that a comprehensive noise mitigation strategy be developed that considers current and future hotel sites in the Joyce Drive corridor, particularly with reference to planned night works. State that construction noise impacts on the Ibis Budget Hotel should be considered.	Roads and Maritime has considered in further detail potential construction noise impacts as part of the detailed design of the project. This proposed modification has considered the potential noise impacts as a result of construction and operation of the proposed modification, as outlined in **Section 6.3**.
Sydney Airport	Expressed concern that the proposal does not integrate with the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airports North Precinct project. Requested that additional information be provided.	One of the primary objectives of this proposed modification is to consider integration with neighbouring road upgrade projects. The proposed modification also fulfils Roads and Maritime's commitment to integrate the project to the road upgrades associated with the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airport North Precinct project as part of the Submissions Report (Jacobs, 2015b).
Sydney Airport	Noted that airport-leased land would be made available for the construction and operation of Joyce Drive widening at no cost to the State Government (subject to agreement with the Commonwealth).	Roads and Maritime acknowledge Sydney Airport's cooperation in the development of the project. Roads and Maritime note that airport-leased land would be made available by Sydney Airport to the project at no cost to the State Government, subject to agreement with the Commonwealth Government (Roads and Maritime, 2015).

Ongoing consultation with the community and stakeholders for the project has been undertaken since determination of the project REF. Stakeholder and Community involvement has been guided by the Stakeholder and Community Participation Plan prepared by Aurecon in March 2015.

5.3 Aboriginal community involvement

As part of preliminary investigations, a preliminary assessment of impact on Aboriginal cultural heritage was carried out for the proposed modification. It was based on Stage 1 of the Roads and Maritime Services Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime, 2011). This involved a desktop investigation by the Roads and Maritime Aboriginal Cultural Heritage Advisor.

The Aboriginal heritage clearance letter confirmed that the proposed modification is unlikely to have an impact on Aboriginal cultural heritage (refer to **Appendix E**).

5.4 ISEPP consultation

Clause 13 of the ISEPP requires consultation with Bayside Council for development that would impact Council-related infrastructure or services. Because the proposed modification involves the

closure of the northern and southern footpaths along Joyce Drive and relocating Council-owned utilities, Roads and Maritime is required to consult with Council about potential impacts.

Clause 14 of the ISEPP also requires consultation with Council for a development that would have an impact that is not minor or inconsequential on a local heritage item (other than a local heritage item that is also a State heritage item). A number of heritage items listed on the Botany Bay LEP are located within the proposed modification area (refer to **Section 6.4**). The proposed modification has the potential to further impact on these heritage items therefore Roads and Maritime is required to consult with Council about potential impacts.

Clause 15 of the ISEPP states that a public authority must not carry out a development on flood-liable land that would change flood patterns other than to a minor extent, unless the authority has given written notice of the intention to carry out the development to the relevant council. The proposed modification is not located on flood-liable land therefore Roads and Maritime is not required to carry out formal consultation with Bayside Council under this clause.

Clause 16 of the ISEPP states that a consent authority must not carry out specific types of development without giving written notice to the specified authority and taking their responses into consideration. No part of the proposed modification would be located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act), next to a declared marine park, declared aquatic reserve or foreshore area. Further, the proposed modification would not involve development over navigable waters or for the purposes of an educational establishment, health services facility, correction centre, group home or for residential purposes. Therefore, Roads and Maritime is not required to carry out formal consultation with Bayside Council under this clause.

Statutory consultation checklists are provided in **Appendix D**. ISEPP consultation with Bayside Council (then known as Botany Bay City Council) under clauses 13 and 14 was carried out on 19 July 2016. A response was received from Botany Bay City Council on 24 August 2016. **Table 5-2** summarises the issues raised by Botany Bay City Council and notes where these issues are addressed in this addendum REF.

Table 5-2 Issues raised during ISEPP consultation

Agency	Issue raised	Response / where addressed in this addendum REF
Botany Bay City Council	Council would like Roads and Maritime to consider the impacts of the proposal on the 17 heritage items that comprise item I70- Sydney (Kingsford Smith) Airport group.	The impacts of the proposed modification on the 17 heritage items that comprise item I170- Sydney (Kingsford Smith) Airport group are considered in **Section 6.4**.
Botany Bay City Council	Council: • Would like Roads and Maritime to provide amount of tree removal proposed • Would like to highlight whether there is potential for adjustments to the proposed works to retain the more significant trees • Would like to ascertain any replacement landscaping and tree planting	The proposed modification would result in the removal of about 26 trees. Vegetation removal is detailed in **Section 6.7**. The urban and landscape design strategy for the proposed modification involves retaining as many trees as possible and replacement landscaping and tree planting. The urban and landscape design strategy is summarised in **Section 6.6**.

Agency	Issue raised	Response / where addressed in this addendum REF
Botany Bay City Council	Council would like to ascertain what reprovision(s) Roads and Maritime is planning for the proposed removal of the pedestrian path on the northern and southern sides of Joyce Drive.	Roads and Maritime would provide alternative pedestrian access along Baxter Road as part of other Roads and Maritime upgrade projects. This is outlined in **Section 6.2**.

5.5 Government agency and stakeholder involvement

Roads and Maritime contacted Sydney Airport on 19 July 2016 by letter detailing the proposed modification and providing an opportunity to comment. No response was received.

5.6 Ongoing or future consultation

Roads and Maritime would continue to consult with Sydney Airport and Bayside Council during subsequent stages of the project. Roads and Maritime would provide further opportunities for these stakeholders to provide comment in subsequent stages of the project.

During construction, Roads and Maritime would manage consultation as part of the wider consultation with the project. A toll-free information line would be made available to the community or affected road users for any queries or complaints during construction. Roads and Maritime would also continue to update the project websites and issue community update newsletters during construction.

6 Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Airport East project. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of:

- Potential impacts on matters of national environmental significance under the EPBC Act
- The factors specified in the guidelines Is an EIS required? (DUAP 1995/1996) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000 and the Roads and Related Facilities EIS Guideline (DUAP 1996). The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in **Appendix C**.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Issue identification

A number of the potential environmental impacts identified and assessed in the project REF are unchanged by the proposed modification. **Table 6-1** provides a summary of the differences in impact between the project as described in the project REF and the proposed modification described in Section 1.1. Where additional potential impacts or differences in impacts as a result of the proposed modification are identified, further assessment is provided.

The safeguards and management measures developed in the project REF were subsequently modified by the Airport East Precinct – WestConnex Enabling Works Submissions Report (August 2015) and Airport East Addendum REF (April 2016). The implementation of these measures was considered in the context of the proposed modification and where required, additional safeguards and measures were developed.

Table 6-1 Identification of issues for further assessment

Aspect	Further assessment required?	Reasoning
Land transport and access	Yes	The proposed modification would result in alterations to traffic flow and lane changes during operation. These impacts are due to the changes at the Joyce Drive/O'Riordan Street/Qantas Drive/Sir Reginald Ansett Drive intersection and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive. Transport and access impacts are discussed further in Section 6.2.
Airport operations	No	The proposed modification would not require additional construction equipment that would intrude the prescribed airspace associated with Sydney Airport. The proposed modification would not result in any changes to airport operations in addition to those described in the project REF.

Aspect	Further assessment required?	Reasoning
Noise and vibration	Yes	The proposed modification would involve construction works in areas outside the project area assessed for the project REF and as a result an additional receiver (the Mantra Hotel) requires assessment (refer to Section 6.3).
Non-Aboriginal heritage	Yes	The proposed modification would encroach on the curtilage of a listed heritage item (being located on the same property), although no additional impacts to any heritage items beyond those assessed in the Project REF would occur (refer to Section 6.4). No additional non-Aboriginal heritage items are located in areas subject to additional disturbance associated with the proposed modification.
Biodiversity	Yes	The proposed modification would require vegetation clearance on the southern side of Joyce Drive on Sydney Airport land, outside the area assessed for the Project REF (refer to Section 6.7).
Hydrology	Yes	The proposed modification is partly located in a different catchment area than that assessed in the project REF and requires further assessment (refer to Section 6.5).
Landscape character and visual amenity	Yes	The proposed modification would result in localised visual impacts due to vegetation clearance on the southern side of Joyce Drive and a widened road corridor.
Topography, geology, soils and water quality	No	The proposed modification would require minor additional soil disturbance compared to the Project REF. This could result in minor additional erosion and sedimentation impacts during construction. This impact is considered to be minor as the proposed modification would not require large amounts of soil to be exposed and is not located near any waterbodies. Potential impacts on soil and water quality would be adequately managed through implementation of the soil and water management plan that would be prepared by the Construction Contractor (refer to Section 7.8 of the project REF).

Aspect	Further assessment required?	Reasoning
Contamination	No	The proposed modification would require minor additional soil disturbance in roadside locations. The project REF did not identify Joyce Drive as having a high risk of contamination. The project REF states, that contamination represents a minor risk to human and environmental health and can be affectively managed through standard safeguards and management measures. In addition, separate to this addendum REF, further contamination testing is being undertaken. The mitigation measures developed for the project REF would be implemented for the proposed modification and therefore the proposed modification is not likely to increase the risk of impacts associated with contamination.
Air quality	No	The proposed modification would require minor additional soil disturbance compared to the project REF. This could result in minor additional air quality impacts during construction, although these would be adequately managed through implementation of the air quality management plan that would be prepared by the Construction Contractor (refer to Section 7.10 of the project REF)
Aboriginal heritage	No	The project REF determined the potential for impacts on Aboriginal heritage is low. However as part of the proposed modification is located outside the project area assessed in the Project REF, an updated AHIMS search was undertaken on 22 June 2016. This search found no recordings of Aboriginal heritage within additional disturbance areas associated with the proposed modification. As such, there are no further impacts to Aboriginal heritage anticipated for the proposed modification.
Land use and property	Yes	The proposed modification would require further partial acquisition of one property which is owned by Sydney Airport. Refer to Section 7.8 of the project REF.
Socio-economic	No	The proposed modification involves minor overall changes that would not increase the potential socio-economic impacts and benefits of the project, as described in the project REF.

Aspect	Further assessment required?	Reasoning
Greenhouse gas and climate change	No	The proposed modification would not substantially increase the greenhouse gas emissions or climate change risks during construction of operation of the project.
Waste and resource management	No	The proposed modification would result in a marginal increase in the impact of the project on waste and resource management. This would occur through the use of materials for road construction and generation of green waste from vegetation clearing and minor earthworks. Waste and resource management would be adequately managed through the measures described in the project REF.
Cumulative environmental impacts	No	The proposed modification would not increase the cumulative impact of the approved activity.

6.2 Traffic, transport and access

The extent and magnitude of potential impacts of the project on the road network and road users were assessed in the Traffic and Transport Working Paper (Jacobs, 2014), which was included in the project REF.

The proposed modification involves widening the westernmost extent of Joyce Drive and extending the Joyce Drive widening to the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive and was not assessed as part of the project REF.

6.2.1 Existing environment

The project REF considered the project in relation to traffic volumes, congestion, crash history, pedestrian and cyclist access, property access, parking, bus routes and heavy vehicles.

Section 2.3 of the project REF provides a comprehensive overview of the existing road network surrounding the project and Section 7.1 of the project REF provides an assessment of traffic and access impacts.

Compared to the project, the proposed modification would result in changes to traffic flows through the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection. The Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection has been assessed as part of the Airport North Precinct project. Existing traffic volumes of the intersection are summarised in **Table 6-2**.

Table 6-2 Existing traffic volumes and heavy vehicle flows at the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection (Transport Modellers Alliance, 2015)

Road	Location	Direction	Morning peak hour (veh/hr)	Evening peak hour (veh/hr)	Heavy vehicles as % of morning peak hour volume	Heavy vehicles as % of evening peak hour volume
Joyce Drive	Between O'Riordan Street and General Holmes Drive	WB	1610	1284	8%	6%
		EB	1339	1439	8%	5%
O'Riordan Street	Between Robey Street and Sir Reginald Ansett Drive	SB	707	1127	12%	4%
		NB	1325	969	8%	6%
Qantas Drive	Between Robey Street and Joyce Drive	EB	1111	789	8%	6%
		WB	944	894	9%	7%
Sir Reginald Ansett Drive	Between Ross Smith Avenue and Joyce Drive	NB	1209	1443	3%	2%
		SB	1386	1763	6%	2%

Note: NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound

The performance of the Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive intersection is summarised in **Table 6-3**. Intersection performance can be measured using the level of service (LoS) scale, which grades performance from A (good) to F (poor). An LoS of A applies when traffic is delayed for an average of less than 14 seconds. A LoS of F applies when traffic is delayed for more than 75 seconds.

The Joyce Drive, Sir Reginald Ansett Drive and O'Riordan Street intersection operates over capacity in both the morning and afternoon peak periods with an average intersection delay of 90 seconds in both peak periods (equating to a LoS F). Joyce Drive experiences its longest delays during the morning peak period.

Table 6-3 Existing intersection level of service (Transport Modellers Alliance, 2015)

Intersection	Approach	AM peak			PM peak		
		D	V	LoS	D	V	LoS
Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive	O'Riordan Street	30	670	C	29	1060	B
	Joyce Drive	116	1609	F	105	1304	F
	Sir Reginald Ansett Drive	115	1206	F	114	1443	F
	Qantas Drive	57	1120	D	117	799	F
	Total	**89 (average)**	**4605**	**F (overall rating)**	**92 (average)**	**4606**	**F (overall rating)**

D: delay (seconds), V: number of vehicles, LoS: level of service

6.2.2 Potential impacts

Construction

Construction traffic volumes and road performance

As discussed in **Section 3.3.6**, there would be about 80 additional vehicles travelling through the study area per day as a result of the proposed modification.

Potential impacts caused by construction vehicle traffic would include:

- Increased travel times on roads within the proposed modification area due to construction speed limits near the site
- Increased travel times for motorists due to construction vehicles on roads and construction vehicles accessing the construction site
- Temporary partial closure of Joyce Drive
- Traffic switching and temporary partial closure of Joyce Drive where the proposed modification would tie into the existing road surface.

The temporary increase in vehicle numbers during construction of the proposed modification is not expected to result in a substantial increase in existing vehicle numbers or change in LoS for the roads in the study area. Construction traffic would not impact significantly on current heavy vehicle volumes on the roads within the study area. Most traffic generated during construction would occur outside of peak traffic hours.

Partial road closures and construction speed limits

During construction, short-term lane closures of one to eight hours may be required during roadwork near live traffic. This would occur in construction stages involving Joyce Drive widening activities, tie-ins to the existing road network and during the finalisation of work. Lane closures would result in short-term delays for vehicles during traffic switching or when vehicles are diverted to other lanes. This impact is expected to be minimal, as through traffic would be maintained with minimal lane closures for the majority of the work.

During construction, motorists travelling through Joyce Drive would experience short-term delays due to construction speed zones. The posted speed along Joyce Drive would be dropped from 70 kilometres per hour to 40 kilometres per hour.

Emergency vehicle access would be maintained at all times for the duration of construction.

Parking and access

The footpath alongside the eastbound and westbound lanes of Joyce Drive would be blocked during construction and eventually removed as part of the project (see below for operational impact). However, alternative paths and walking routes would be provided during construction which would reduce the impact of construction on pedestrian connectivity within the project area. The proposed ancillary facilities for the proposed modification have been assessed as part of the project REF and addendum REF (April 2016) and construction of the proposed modification is not anticipated to significantly increase the intensity of use of these ancillary facilities.

Operation

Traffic volumes and network performance

Traffic modelling for 2018 indicates an increase in traffic volumes across all roads in the study area due to standard growth. The project and surrounding road upgrades would provide capacity for anticipated traffic demands.

Modelling results show that Joyce Drive eastbound traffic volumes are expected to increase by 90 per cent during the morning peak period and 45 per cent during the afternoon peak period by 2018. Modelled westbound traffic volumes show an increase of 36 per cent during the morning peak period and 15 per cent during the afternoon peak period by 2018 (Transport Modellers Alliance, 2015).

Intersection performance

Table 6-4 summarises the LoS for the Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive intersection for the current, no build and proposal scenarios. Traffic modelling indicates that the Airport North Precinct project together with the project would improve the LoS for the Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive intersection. The overall LoS for the intersection would improve from LoS F to LoS E during the morning peak period and from LoS F to LoS D in the afternoon peak period.

Table 6-4 Intersection level of service for current, no build and proposal scenarios (Transport Modellers Alliance, 2015)

Intersection	Scenario	AM peak			PM peak		
		D	V	LoS	D	V	LoS
Joyce Drive, O'Riordan Street, Qantas Drive and Sir Reginald Ansett Drive	Current (2015)	89	4605	F	92	4606	F
	No build (2018)	117	6710	F	113	6783	F
	Proposal (2018)	66	7315	E	54	6004	D

D: delay (seconds), V: number of vehicles, LoS: level of service

Access

The footpath alongside the eastbound and westbound lanes of Joyce Drive would be permanently removed as part of the project and replaced with a new shared path along Baxter Road as part of a separate project in the WestConnex Enabling Works packages of work.

The project is consistent with the Sydney Airport Environment Strategy 2013-2018 for ground transport. The Sydney Airport Environment Strategy 2013-2018 forms part of the Sydney Airport Master Plan 2033 which identifies Joyce Drive widening as part of the five year ground transport plan for the Terminal 2/3 precinct. The project is consistent with the objectives of the strategy for ground transport as the project, together with the adjacent road upgrades, would improve traffic flow and access to Sydney Airport, Port Botany and the existing and proposed motorway network. The proposed modification would provide additional traffic capacity and would help address the environmental effects associated with congestion.

6.2.3 Safeguards and management measures

The safeguards and management measures identified in **Table 6-5** have been based on those provided in the addendum REF (March 2017). No additional safeguards and management measures are required for traffic and access as a result of the proposed modification.

Table 6-5 Safeguards and management measures for traffic and transport

ID	Impact	Environmental safeguards	Responsibility	Timing
TR-1	General traffic impacts	A Traffic Management Plan (TMP) will be prepared as part of the Construction Environmental Management Plan (CEMP). The TMP will be prepared in accordance with Roads and Maritime's Traffic Control at Work Sites (RTA, 2010), Australian Standard AS1742 and the worksite manual Roads and Maritime Specification G10. The TMP will outline: • Traffic controls to regulate traffic movements and minimising traffic switching • Coordination of: – General traffic flows at major construction work areas, such as the tie-ins for the Wentworth Avenue extension – Delivery of construction materials and movement of construction plant and equipment to and from the site to limit traffic delays – Other Roads and Maritime roadwork and any work by other agencies that affect traffic	Construction contractor	Detailed design

ID	Impact	Environmental safeguards	Responsibility	Timing
		flow – Schedules, abnormal loads and other specific aspects of transport with transport operators – Consultation with local councils to identify, evaluate and document alternative routes – Incident response with emergency services. • Maintenance of continuous, safe and efficient movement of traffic for both the public and construction crew • Haulage routes and access arrangements to minimise impacts on local routes • Construction traffic zones around work areas • Access provisions for local roads and properties • Maintenance of pedestrian access • Provision for appropriate warning and signposting • Requirements and methods to consult with and inform the local community of impacts on the local road network and traffic, as well as impacts on individual property access. A Vehicle Movement Plan will be prepared as part of the overall TMP. The Vehicle Movement Plan will assess construction-related heavy vehicle movements per shift into and out of the construction sites, and provide guidelines for limiting impacts on traffic using the road network.		
TR-2	Impact to traffic from construction site access	All access points to the construction site and site roads will: • Have safe intersection sight distance • Accommodate the turning movements of the largest heavy vehicles • Provide painted median	Construction contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		treatments for vehicle delineation • Provide suitable intersection layouts.		
TR-3	Impact on access to bus stops during construction	Local bus operators will be consulted during detailed design regarding location and provision of access to bus stops during construction.	Roads and Maritime	Detailed design
TR-4	Building rail bridges during scheduled rail possessions	Roads and Maritime will consult with Port Botany and ARTC during detailed design to confirm that the proposal will avoid disturbance and impact on operations during construction where practicable.	Roads and Maritime	Detailed design
TR-5	Impact on access for emergency services	Consultation with emergency service authorities will be carried out during development of the detailed design including with NSW Fire Rescue.	Roads and Maritime	Detailed design
TR-6	Impact on pedestrian and cyclist access during construction	Pedestrian and cyclist access will be maintained throughout construction. Appropriate signage communicating diversion routes to pedestrians and cyclists will be displayed during construction. Advance notification will be provided of any construction works that affect pedestrians and cyclists.	Construction contractor	Construction
TR-7	Impact on property access	Vehicular property access will be maintained including at places of worship and to all commercial premises. Should property access be affected by the proposal, residents will be consulted before any work begins.	Construction contractor	Construction
TR-8	Impact on access to bus stops	The community will be provided with ongoing updates on locations and access to bus stops during the construction period to ensure that disruption is minimised.	Construction contractor/ Roads and Maritime	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
TR-9	Alternate linemarking strategies	Roads and Maritime will consider alternate linemarking strategies on the Southern Cross Road off-ramp (westbound).	Roads and Maritime	Detailed design
TR-10	Dedicated left turn lane from Southern Cross Drive onto Botany Road	Roads and Maritime will confirm the viability of upgrading the left turn slip lane on Southern Cross Drive to a dedicated left turn lane at the intersection with Botany Road (southbound).	Roads and Maritime	Detailed design
TR-11	Optimisation of the cycleway	Roads and Maritime will continue to investigate optimising the cycleway within the proposal area, including reducing crossings where feasible.	Roads and Maritime	Detailed design
TR-12	Access to Port Botany Freight Line easement from the General Holmes Drive cul-de-sac	Roads and Maritime will continue to consult with ARTC regarding the provision of access to the Port Botany Freight Line easement from the General Holmes Drive cul-de-sac.	Roads and Maritime	Detailed design
TR-13	Austroads Guide to Road Design (2009)	Cyclist facilities for the proposal will be designed with reference to the Austroads Guide to Road Design (2009)	Roads and Maritime	Detailed design

6.3 Noise and vibration

A noise and vibration assessment was undertaken as part of the detailed design of the project. This study found that the noise management levels would be expected to be exceeded during construction at many receivers during both standard and outside of standard hours. Around nine of the closest residential receivers to the works are predicted to be “highly noise affected”.

Nine sensitive receivers were predicted to have noise levels in excess of the noise criteria, all of which are identified as being acutely impacted. Noise mitigation measures would be considered for these receivers.

The proposed modification involves works outside of the project area assessed in the project REF and as a result an additional receiver (the proposed Mantra Hotel) has been identified. A detailed assessment of the impacts of proposed modification on this receiver was undertaken (Wilkinson Murray, 2016) and is provided in **Appendix F**.

6.3.1 Existing environment

Section 7.3 of the project REF provides a comprehensive overview of the existing noise environment surrounding the project. The project REF found that the noise environment surrounding the project can be described as an urban-industrial interface which is dominated by noise from local road traffic, rail traffic and aircraft movement.

As the proposed modification involves works outside of the project area assessed in the project REF, the proposed Mantra Hotel has been identified as an additional receiver. The proposed Mantra Hotel is currently under construction is located to the south of the proposed modification and is shown in **Figure 6-1**.

Legend

Proposed modification

Mantra Hotel (currently under construction)

Railway

0 25 50m
1:2,000 @ A4

N

Figure 6-1 | Location of proposed Mantra Hotel

6.3.2 Assessment criteria

Internal noise criteria for the Mantra Hotel

The noise criteria for the Mantra Hotel were developed in accordance with the Australian/New Zealand Standard *AS/NZS 2107:2000 Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors*.

The Australian/New Zealand Standard AS/NZS 2107:2000 recommends that the following internal noise limits are not exceeded due to extraneous noise sources in hotel situated near major roads:

- Sleeping Areas - L_{Aeq} 35 dB(A) satisfactory and L_{Aeq} 40 dB(A) maximum

The maximum internal design standard of L_{Aeq} 40 dB(A) was adopted for the assessment.

Based on review of the proposed hotel's external façade, it would be expected that an outside to inside reduction of 36 dB (for typical urban traffic) and 34 dB (for low frequency sources such as construction plant and equipment) would be achieved due to a combination of fixed substantial double glazed windows and precast concrete panels.

Construction vibration criteria

The assessment of vibration requires the consideration of two components namely, human exposure to vibration and the potential for building damage from vibration.

Assessing Vibration: A Technical Guideline provides guidance for assessing human exposure to vibration. This publication is based on British Standard BS 6472:1992. The human comfort criteria adopted for the assessment is based on Vibration Dose Value (VDV) specified in the guideline and is shown in **Table 6-6**.

Table 6-6 Human comfort criteria – VDV ($m/s^{1.75}$)

	Day (7.00am – 10.00pm)		Day (10.00pm – 7.00am)	
Place	**Preferred**	**Maximum**	**Preferred**	**Maximum**
Residences	0.20	0.4	0.13	0.26

There are currently no Australian Standards or guidelines on assessing the potential for building damage for vibration. British Standard BS 7385:1993 and German Standard DIN 4150:1999 both provide goal levels below which vibration is considered insufficient to cause building damage. Of these, DIN 4150 is the more stringent.

Airport (Environmental Protection) Regulations 1997

Section 2.02 and 2.03 of Schedule 4 of the Airport (Environmental Protection) Regulations 1997 provides the base criteria for noise from construction activities and operation of roads on airport land for commercial and sensitive receivers. The criteria adopted in the noise assessments for the project is more stringent criteria than those identified in the Airport (Environmental Protection) Regulations 1997.

6.3.3 Potential impacts

Construction

The results of the assessment show that the proposed modification would exceed the internal noise criteria of the Mantra Hotel by 12 dBA. No material risk of structural damage as a result of construction vibration effects is anticipated.

Construction noise impacts and potential human comfort vibration impacts would be managed in accordance with the project's noise and vibration management plan.

Operation

The predicted 2018 external noise levels for the Mantra Hotel are summarised in **Table 6-7** and comply with the adopted internal criteria.

Table 6-7 Year 2018 'build' predicted $L_{Aeq, Period}$ traffic noise levels for the Mantra Hotel

Receiver	$L_{Aeq, Period}$ (dBA) Year 2018 'build'		Internal noise level $L_{Aeq, Period}$ (dBA)		Internal noise criteria $L_{Aeq, Period}$ (dBA)		Compliance	
	Day	Night	Day	Night	Day	Night	Day	Night
Proposed Mantra Hotel	73	67	<40	<35	40	40	Yes	Yes

6.3.4 Safeguards and management measures

The safeguards and management measures identified **Table 6-8** have been based on those provided in the addendum REF (March 2017). Additional safeguards and management measures as a result of the proposed modification are in **bold**.

Table 6-8 Additional safeguards and management measures for noise and vibration

ID	Impact	Environmental safeguards	Responsibility	Timing
NV-1	Noise and vibration impacts on sensitive receivers	During the detailed design stage of the proposal, further investigations of potential noise impacts and all feasible and reasonable mitigation options will be carried out for affected receivers in accordance with the Road Noise Policy (DECCW 2011) and Roads and Maritime's Environmental Noise Management Manual Practice Note 4 (RTA 2001).	Roads and Maritime	Detailed design
NV-2	Noise and vibration impacts on sensitive	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared as part of the CEMP. The CNVMP	Construction contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
	receivers during construction	will include (as a minimum): • A map indicating the locations of sensitive receivers • A quantitative noise assessment in accordance with the EPA Interim Construction Noise Guidelines (DECCW, 2009) • Management measures to minimise potential noise impacts • A risk assessment to determine construction activities likely to affect sensitive receivers • Mitigation measures to avoid noise and vibration impacts during construction activities • A process for assessing the performance of mitigation measures • A process for documenting and resolving issues and complaints • A construction staging program incorporating noise and vibration monitoring for sensitive receivers • Identification in toolbox talks where noise and vibration management is required.		
NV-3	General vibration during construction	Building condition surveys will be carried out for buildings identified in the CNVMP. A copy of the report will be sent to the landholder.	Construction contractor	Pre-construction
NV-4	General vibration during construction	A vibration assessment will be prepared and included in the NVMP. The vibration assessment will include (as a minimum): • Identification of potentially affected properties/receivers • A risk assessment to determine the potential for	Construction contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		discrete work activities to affect receivers • A map indicating the locations considered likely to be impacted and those requiring building condition surveys • A monitoring program • A process for assessing mitigation measures • A process for resolving issues and conflicts, including additional noise and vibration monitoring where required.		
NV-5	Noise impacts on sensitive receivers from operation of stockpile and compound sites	Construction compound layout will be arranged so that primary noise sources are at a maximum distance from sensitive receivers (primarily residential receivers), with solid structures (sheds and containers) placed between sensitive receivers and noise sources (and as close to the noise sources as is practical).	Construction contractor	Pre-construction Construction
NV-6	Noise impacts from construction machinery	Compressors, generators, pumps and any other fixed plant will not be located near residences where possible	Construction contractor	Construction
NV-7	Noise and vibration induction	An environmental induction program will be developed to include specific noise and vibration awareness training.	Construction contractor	Construction
NV-8	Construction noise impacts on Airport buildings	Detailed design will further investigate construction noise impacts, including impacts on sensitive receivers, Airport buildings, and current hotel sites. Reasonable and feasible mitigation measures will be identified.	Roads and Maritime	Detailed design
NV-9	Noise mitigation	Roads and Maritime will consider noise mitigation at the church on Botany Road and a residence of Hardie Street, during detailed design. In addition, receivers in the	Roads and Maritime	Detailed design

ID	Impact	Environmental safeguards	Responsibility	Timing
		proposal area which currently experience exceedances of the NSW Road Noise Policy (RNP) (DECCW, 2011) will be considered for noise mitigation in accordance with the provisions of the Noise Mitigation Guidelines (Roads and Maritime, 2014). Properties which qualify for noise mitigation treatment will be contacted by Roads and Maritime during detailed design.		
NV-10	General vibration during construction	Where construction work near the Breckenham Memorial Church is within the minimum safe working distances (structural damage) for vibration intensive plant, vibration testing of equipment on site would be carried out prior to their commencement of site operation to determine acceptable buffer distances to the building. If this buffer distances cannot be complied with, measures such as using smaller equipment or (if required) time restrictions for the most excessive vibration activities.	Construction contractor	Pre-construction
NV-11	**General noise and vibration impacts**	**Mitigation measure to be implemented as part of the proposed modification will be consistent with the Airport East EPL requirements**	**Construction contractor**	**Pre-construction Construction**

6.4 Non-Aboriginal heritage

The extent and magnitude of potential impacts of the project on non-Aboriginal heritage were assessed in the Statement of Heritage Impact (Stedinger Associates, 2014), which was included in the project REF.

6.4.1 Methodology

Register searches

A search of the following non-Aboriginal heritage registers was carried out in July 2016 to identify heritage places within or near the proposed modification. The following data registers and databases were searched:

- NSW State Heritage Register
- Botany Bay Local Environmental Plan 2013
- Section 170 heritage and conservation registers
- National Heritage List
- Commonwealth Heritage List
- Register of National Estate (non-statutory).

The Sydney Airport Heritage Management Plan (June, 2009) and Sydney Airport Environment Strategy 2013-2018 was also reviewed in March 2017.

6.4.2 Existing environment

Section 7.4 of the project REF provides a comprehensive overview of non-Aboriginal heritage in surrounding the project.

Heritage items within the proposed modification

There are three listed heritage items which overlap with the proposed modification (refer to **Figure 6-2** and **Table 6-9**). These include the Sydney (Kingsford Smith) Airport Group, Ruins of the former Botany Pumping Station and Commonwealth Water Pumping Station and Sewage Pumping Station. The Ruins of the former Botany Pumping Station and Commonwealth Water Pumping Station and Sewage Pumping Station are heritage items contained within the curtilage of the Sydney (Kingsford Smith) Airport group but are listed as separate heritage items on the Botany Bay LEP and State Heritage Register. These heritage items are described below.

Sydney (Kingsford Smith) Airport Group

The curtilage of Sydney (Kingsford Smith) Airport Group is bounded by the entirety of the Sydney Airport precinct. The Sydney (Kingsford Smith) Airport Group is listed on the Botany Bay LEP as having local heritage significance and is on the non-statutory Register of the National Estate. It is also registered as an 'indicative place' on the Commonwealth Heritage List. As such, it has not yet been listed as an item of Commonwealth heritage significance.

There are 17 items located within the curtilage of the Sydney (Kingsford Smith) Airport group (Artefact Heritage, 2016). These include:

- Botany Water Pumping Station Ruins and Chimney Ruins
- Engine and Mill Ponds and Mill Stream from Botany Road to the point where it enters Botany Bay
- Sewage Pumping Station No. 38
- Main North-South Runway and East-West Runway
- The left bank of Alexandra Canal extending from its confluence with Cooks River to the railway bridge
- The left bank of Cooks River extending from its confluence with Alexandra Canal to the point where it enters Botany Bay
- Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) No. 1 & 2, comprising that section extending from Cooks River to General Holmes Drive
- Former ANA Terminal and Control Tower (Building 60)
- Third Control Tower & Fire Station (Building 119)
- The Fourth Control Tower (Building 239)
- Sydney Airport Control Tower (Fifth Control Tower) Building 496

- Buildings 108, 109, 110, 111, 112, 113 and 114, 128 and 143 between Sixth and Seventh Streets
- Electricity Substation (Building 325) Ninth Street
- Building 92 Mechanical/Maintenance Workshop
- Fifteen figs associated with the former Ascot Racecourse, located near the helicopter facilities
- Keith Smith Avenue layout, comprising the horse shoe shaped access road to the domestic terminals west of 5th Street
- The Lauriston park sub-division layout.

Ruins of the former Botany Pumping Station

The ruins of the former Botany Pumping Station is located near Mill Pond, on the outer south-western boundary of the Sydney Airport Precinct. Its curtilage is listed as the entirety of the Sydney Airport Precinct. This item is contained within the heritage curtilage of the Sydney (Kingsford Smith) Airport group but is listed as a separate heritage item on the Botany Bay LEP as an item of local heritage significance. This item consists of portions of brick remains of the ruins of the former Botany water pumping station.

Commonwealth Water Pumping Station and Sewage Pumping Station (no. 38)

The Commonwealth Water Pumping Station and Sewage Pumping Station are located on Ross Smith Avenue, about 70 metres north-west of Engine Pond. Its curtilage is listed as the entirety of the Sydney Airport Precinct and is contained within the heritage curtilage of the Sydney (Kingsford Smith) Airport group. This item is also listed as a separate heritage item on the Botany Bay LEP as an item of state heritage significance, the State Heritage Register and the Sydney Water s170 Register. The site consists of the pumping station, electrical substation and grit/silt arrester building.

Sydney Airport Heritage Management Plan and Sydney Airport Environment Strategy 2013-2018

The Sydney Airport Heritage Management Plan (HMP) (June, 2009) also lists the built, landscape and archaeological elements at the airport that contribute to the overall heritage value of the airport. A total of 49 items are identified in the HMP as having exceptional (3), high (14), moderate (19) or little (13) heritage value. The three items identified in the HMP as having exceptional heritage value are also identified in the Sydney Airport Environment Strategy 2013-2018 and include:

- Sydney Airport Wetlands (including Engine Ponds East and West, Mill Pond and Mill Stream)
- Main north-south and east-west runways
- Keith Smith Avenue (location and form).

None of the items identified in the HMP are located in the proposed modification. The closest heritage item is Lauriston Park Estate street layout, located about 80 metres south of the proposed modification and is identified in the HMP as an item of high heritage value.

Listed heritage items near the proposed modification

Five registered heritage items near the proposed modification (within a 200 metre radius from the proposed modification) were also considered (refer to **Table 6-9)**. These are:

- House ‘Daktari’, 114 High Street
- Mature Ficus, 112 High Street
- House, 96 High Street
- Mascot (O’Riordan Street) Underbridge
- Mascot (Robey Street) Underbridge.

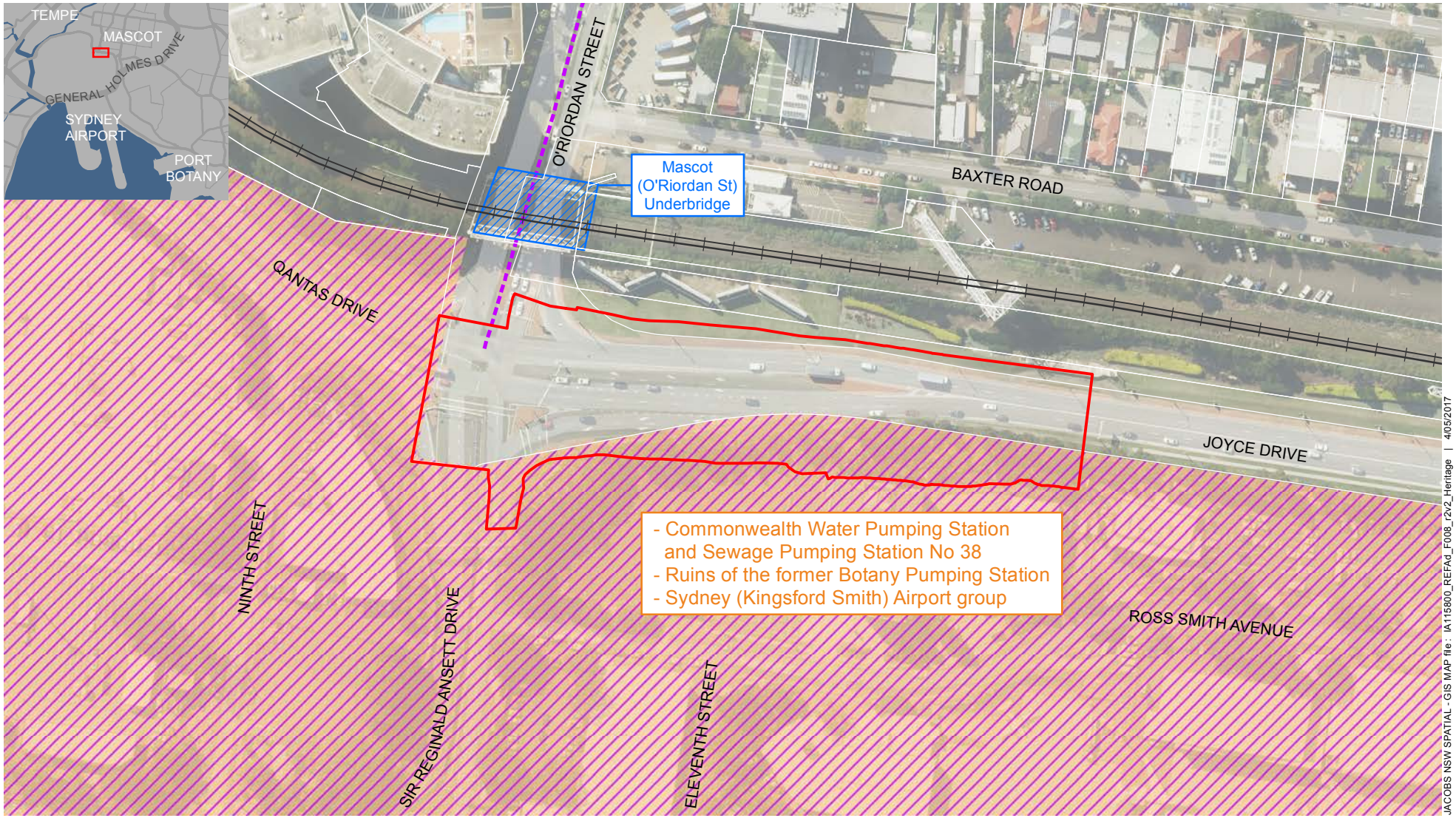
Table 6-9 Heritage items within and near the proposed modification

Item	Register listings(s)	Significance	Relationship to the proposed modification
Sydney (Kingsford Smith) Airport group	Botany Bay LEP Item No. I170 Register of the National Estate Indicative place on Commonwealth Heritage List	Local/ national	Curtilage within the proposed modification area, closest heritage item (Lauriston Park Estate street layout) is located about 80 metres south
Ruins of the former Botany Pumping Station	Botany Bay LEP Item No. I168	Local	Curtilage within the proposed modification area, heritage item located over one kilometre south
Commonwealth Water Pumping Station and Sewage Pumping Station No 38	Botany Bay LEP Item No. I3 State Heritage Register Sydney Water s170 Register	State	Curtilage within the proposed modification area, heritage item located over one kilometre south
House 'Daktari', 114 High Street	Botany Bay LEP Item No. I131	Local	Near the proposed modification, about 220 metres north
Mature Ficus, 112 High Street	Botany Bay LEP Item No. I130	Local	Near the proposed modification, about 210 metres north
House, 96 High Street	Botany Bay LEP Item No. I129	Local	Near the proposed modification, about 210 metres north
Mascot (O'Riordan Street) Underbridge	State Heritage Register RailCorp s170 Register	Local	Near the proposed modification, about 16 metres north
Mascot (Robey Street) Underbridge	State Heritage Register RailCorp s170 Register	Local	Near the proposed modification, about 240 metres north-west

Archaeological potential

Areas of archaeological potential were identified at Sydney Airport and Old Botany Road, which follows the same alignment as O'Riordan Street between Joyce Drive and Gardeners Road. There is very little material evidence of Old Botany Road. The archaeological significance of Old Botany Road has been lost over time due to successive road upgrades and ground disturbances (Artefact Heritage, 2016).

Mill Pond and Mill Stream and Botany Water Pumping Station ruins and chimney ruins have been identified in the Sydney Airport HMP as having archaeological potential.



Legend

- Proposed modification
- S170 Register RailCorp
- Botany Bay LEP 2013 heritage item
- Areas of archaeological potential
- O'Riordan Street
- Sydney Airport
- Railway

The Sydney (Kingsford Smith) Airport group is also listed on the Register of the National Estate (non-statutory) and as an indicative place on Commonwealth Heritage List. This heritage item comprises many individual items. Refer to Section 6.3 for further detail

0 25 50m
1:2,000 @ A4

N

Figure 6-2 | Heritage items within and near the proposed modification

6.4.3 Potential impacts

Construction

Potential impacts associated with construction of the proposed modification are discussed below.

Direct impacts

The proposed modification would further impact on the heritage curtilage of three heritage items than what was assessed in the project REF. The proposed modification would require property acquisition of one lot containing the curtilage of the Sydney (Kingsford Smith) Airport Group, which also includes the Ruins of the former Botany Pumping Station and the Commonwealth Water Pumping Station and Sewage Pumping Station (refer to **Table 6-10**). These three items share a common curtilage defined by the Sydney Airport Precinct.

Construction would encroach inside the heritage-listed curtilage for about 25 metres to the south of Joyce Drive at its furthest point. The exact distance that the proposed modification would encroach into heritage-listed curtilage would be determined during detailed design. The Ruins of the former Botany Pumping Station and the Commonwealth Water Pumping Station and Sewage Pumping Station are both physically located over one kilometre south of the proposed modification and would not be impacted by the proposed modification. The Sydney (Kingsford Smith) Airport Group contains 17 heritage items, none of which are located near the proposed modification. Therefore construction is not anticipated to have a physical or visual impact on any heritage items of the Sydney (Kingsford Smith) Airport Group.

The proposed modification would not impact on any items identified in the Sydney Airport HMP or Sydney Airport Environment Strategy 2013-2018 and therefore is consistent with the objectives of the strategy.

Table 6-10 Property acquisition of listed heritage item

Item	Significance	Lot	DP	Acquisition area (m^2)	Type of acquisition
Sydney (Kingsford Smith) Airport group, Ruins of the former Botany Pumping Station and Commonwealth Water Pumping Station and Sewage Pumping Station	Local/ State/ National	8	DP1050923	1450	Partial

Archaeology

Given that the proposed modification is located in a previously disturbed road corridor and the depth of construction is shallow (up to 1.5 metres), it is not anticipated to impact on any archaeological remains.

Other potential impacts

Other potential impacts include indirect impacts from vibration-generating activities near heritage items. Safeguards to reduce the risks of damage to these items are outlined in **Section 6.4.4**.

Operation

Heritage items and associated curtilages near or overlapping the proposed modification are not anticipated to be negatively impacted during operation, provided that all relevant safeguards and management measures are addressed (refer to **Table 6-11**).

6.4.4 Safeguards and management measures

The safeguards and management measures identified in **Table 6-11** have been based on those provided in the addendum REF (March 2017). No additional safeguards and management measures are required for non-Aboriginal heritage as a result of the proposed modification.

Table 6-11 Safeguards and management measures for non-Aboriginal heritage

ID	Impact	Environmental safeguards	Responsibility	Timing
NA-1	Landscaping to improve visual amenity of Beckenham Memorial Church	Landscaping surrounding the Beckenham Memorial Church will be investigated during detailed design in consultation with church owners and heritage officers from Botany Bay City Council.	Roads and Maritime	Detailed design
NA-2	Removal of heritage relics	An exception under Section 139 of the Heritage Act will be obtained for impacts to identified relics within the proposal area, if required.	Roads and Maritime	Pre-construction
NA-3	Impact to heritage items	A condition survey will be carried out before the start of work by a qualified contractor and a building condition report prepared for nearby heritage items which may experience indirect impact from construction, including Beckenham Memorial Church.	Roads and Maritime	Pre-construction
NA-4	General impact to heritage	A Non-Aboriginal Heritage Management Plan will be prepared and included in the CEMP. The plan will include but not limited to: • A map identifying locations of heritage items (including curtilages) which are to be protected and those which are to be destroyed • Identification of potential impacts to heritage items due to construction • Implementation of mitigation measures to protect identified heritage items	Roads and Maritime	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		• A stop works procedure in the event of actual or suspected potential harm to a heritage item • Requirement to comply with Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds (2012).		
NA-5	Disturbance, removal or demolition of non-Aboriginal heritage items	A photographic archival recording will be made of the following items before any disturbance or demolition, in accordance with OEH guidelines: • House (house and allotment), 1289 Botany Road • House (house and allotment), 1291 Botany Road • Beckenham Memorial Church School Hall (hall and allotment), 1293 Botany Road • Beckenham Memorial Church (church frontage only), 1295 Botany Road • Mascot (Botany Road) Underpass (bridge and its approaches) • Sandstone kerb along Botany Road near Wentworth Avenue • Botany Road tram tracks.	Roads and Maritime	Pre-construction
NA-6	Non-Aboriginal heritage	Non-Aboriginal heritage awareness training will be provided for all contractors and personnel before the start of construction to make aware of retained heritage items within the vicinity of the works and required management measures and to ensure understanding of the procedure required to be carried out in the event of discovery of non-Aboriginal heritage materials, features or deposits, or the discovery of human remains.	Construction contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
NA-7	Protection of non-Aboriginal heritage items from inadvertent damage	The following items will be temporarily fenced and appropriate signage displayed and/or noted on a plan as a heritage item to avoid indirect impacts or encroachment, where necessary: • Mascot (Botany Road) Underbridge • Sandstone kerb and alignment pin at Botany Road, near McBurney Avenue • Botany Water Reserve • Mascot (O'Riordan Street) Underbridge • Electricity Substation 163, at 42 Wentworth Avenue • Commercial Building Group, 1209–1223 Botany Road • Single Storey Terrace Group, 1239–1245 Botany Road • House, 71 Frogmore Street • House, 87 Hardie Street • House, 90 Johnson Street.	Roads and Maritime Construction contractor	Pre-construction Construction
NA-8	Discovery of non-Aboriginal heritage features or deposits	If at any time during construction of the project, non-Aboriginal heritage materials, features and/or deposits are found and are not covered by an issued approval (generally s139 excavation permit, exception or s60 approval or exemption) then the Roads and Maritime Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime 2015) will be followed.	Construction contractor	Construction
NA-9	Discovery of tram tracks and additional road fabric	A photographic archival recording will be made of additional road fabric or other unanticipated finds if found during construction. This will be carried out in accordance with Roads and Maritime's Standard Management Procedure: Unexpected Archaeological Finds (2012).	Construction contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
NA-10	Rebuilding of Beckenham Memorial Church fence	The front boundary wall of Beckenham Memorial Church will be rebuilt in the same style and with similar materials as the existing wall, in consultation with church owners and heritage officers from Botany Bay City Council.	Construction contractor	Construction

6.5 Hydrology

The extent and magnitude of potential impacts of the project on hydrology were assessed in the Hydrologic and Hydraulic Assessment Report (J. Wyndham Prince, 2014). The hydrology of the proposed modification has been assessed as part of the project and the Airport North Precinct project (Lyall & Associates, 2016).

6.5.1 Existing environment

Catchment, surface water and flooding

The proposed modification area is located over three hydrology catchments. The drainage investigation prepared for Airport North (Lyall & Associates, 2016) identifies that the proposed modification is located in the Botany Bay catchment within catchment areas 1 and 4 (refer to **Figure 3-1**), both of which drain to Alexandra Canal, about 1.3 kilometres away. Runoff from O'Riordan Street and Joyce Drive drains to a low point located beneath the Botany Goods Line opposite Sir Reginald Ansett Drive. The low points are controlled by an existing Sydney Airport owned stormwater drainage system which run in a westerly direction through Sydney Airport, where it discharges into the Northern Ponding Area located about 800 metres west of the intersection of Robey Street and Qantas Drive (Lyall & Associates, 2016). The Northern Ponding Area drains into the Alexandra Canal, the Cooks Rivers and eventually into Botany Bay.

Some areas along the southern edge of Joyce Drive may surcharge the drainage system ponds, and escape along the eastern gutter of Sir Reginald Ansett Drive. The flow discharges to the south through Sydney Airport land.

Runoff from the easternmost extent of the proposed modification area on Joyce Drive is collected via drainage pits along the southern side of Joyce Drive. The drainage pits discharge to a grassed swale connected to a detention basin on Sydney Airport land. This detention basin collects stormwater from the west of General Holmes Drive and Joyce Drive. It is connected to a stormwater channel that runs parallel to General Holmes Drive via a culvert. This culvert allows for flows to and from the stormwater channel, effectively attenuating flows during flood events.

Groundwater

Two groundwater systems operate in the area. These include a deep and confined groundwater system that forms the bottom of the Botany Basin and a shallow unconfined system contained within the Hawkesbury Sandstone forming the Botany Sands aquifer (JBS&G, 2014). The groundwater depth ranges between one to two metres below the ground level (Parsons Brinkerhoff, 2015). A search of the PINNEENA on 25 July 2016 identified that the groundwater depth in the proposed modification area is about two metres.

The Botany Sands aquifer is currently managed by the NSW government due to groundwater pollution from contaminated sites. The proposed modification is not located in management zone in which groundwater extraction and domestic groundwater use is banned.

Groundwater dependent ecosystems

The nearest groundwater dependent ecosystem is the Botany Wetlands located about 880 metres south-east of the proposed modification.

6.5.2 Potential impacts

Construction

Surface water and flooding

The construction phase of the proposed modification presents a risk to the water quality of receiving watercourses if management measures are not implemented, monitored and maintained throughout the construction process. The following activities have the potential to impact on surface water quality through the mobilisation of sediment or contaminants into stormwater infrastructure:

- General earthworks, including stripping of topsoil and excavation
- Movement of heavy vehicles across exposed earth
- Accidental spills or leaks of fuels, oils or other potentially harmful substances during construction could also result in localised contamination of soils and pollution of downstream waterways. However, the risk of this impact would be minor as the project would not involve the storage of large quantities of fuels, oils or other potentially harmful substances on site.

Groundwater

During construction, the proposed modification may reach the groundwater table, given how shallow it is in the proposed modification area. Construction activities that are likely to impact on groundwater include excavation for road widening and utility relocation. Dewatering may be required for the proposed modification during excavation activities. Given the small areas proposed to be excavated and the limited amount of time that excavations would be open, substantial volumes of dewatering are not expected as part of the proposed modification.

Further, the proposed modification is not expected to reduce the groundwater resource pool by three megalitres per year or more, or at an instantaneous rate of greater than five litres per second, and therefore an aquifer interference licence is not expected to be required for the proposed modification (refer to **Section 4.4.2**).

Water extracted during dewatering activities may be contaminated from spills or erosion and sedimentation. During dewatering there is a risk of introducing contaminants (through spills or sedimentation) into the aquifer. The likelihood of this occurring is minimal given that any groundwater extracted for dewatering would be managed such that there would be minimal interaction with construction areas. This would avoid contamination through entrainment of fine sediment, hydrocarbons (oil and grease) or other potential contaminants.

Schedule 2 of the Airports (Environment Protection) Regulations 1997 sets out accepted limits for water pollution. The proposed modification is not located near fresh water or marine water. During construction of the project, appropriate safeguards would be implemented to minimise water pollution.

Operation

The proposed modification is not anticipated to have an operational impact on hydrology.

6.5.3 Safeguards and management measures

The safeguards and management measures identified in **Table 6-12** have been based on those provided in the addendum REF (March 2017). No additional safeguards and management measures are required for hydrology as a result of the proposed modification.

Table 6-12 Mitigation measures for impacts on soils and water quality

ID	Impact	Environmental safeguards	Responsibility	Timing
HY-1	Flood impacts on adjacent properties due to altered flood behaviour	Further flood modelling, including a detailed afflux assessment, will be carried out during detailed design to confirm impacts on surrounding land uses.	Roads and Maritime/ Detailed design contractor	Detailed design
HY-2	Licensing for dewatering	The NSW Office of Water will be consulted during detailed design to confirm licensing requirements for the various stages of the proposal.	Roads and Maritime	Detailed design
HY-3	Impact to groundwater levels	Roads and Maritime, in consultation with NSW Office of Water, will carry out a bore census to confirm the status of the groundwater works identified as part of the groundwater assessment.	Roads and Maritime	Detailed design
HY-4	Dewatering	A procedure will be prepared for any dewatering activities to be included as part of the SWMP. The dewatering procedure is to comply with Roads and Maritime Technical Guideline – Environmental Management of Construction Site Dewatering. The procedure will include at a minimum: • A map showing areas of the proposal that will require dewatering • Detailed description and justification of all selected dewatering methods • Description of onsite water reuse requirements • A map showing proposed discharge locations for any offsite discharge • Design requirements for each offsite discharge location to prevent erosion at the discharge location or in the receiving environment • Water quality objectives relevant to the type of dewatering activity • Description of the water quality treatment techniques to be used • Water sampling and testing regime to validate water quality prior to and (if required) during dewatering, including to establish appropriate waste disposal methods • Description of the method for dewatering	Roads and Maritime	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		• Requirements to manage encounters with groundwater or contaminated water.		
HY-5	Flooding of construction site	A contingency plan will be prepared to manage a potential flood event during construction and will outline: • Procedure for communication and notification associated with contingency plan • Procedures to reduce risk including removal of all plant/equipment, stabilising exposed areas and maintaining existing flood flow paths through the site • Evaluation of what flood event will trigger the plan • Evacuation procedures • A map indicating the area that is flood prone and the locations where to evacuate.	Roads and Maritime	Pre-construction
HY-6	Impact to groundwater levels and quality	A Groundwater Monitoring and Management Plan will be prepared to accompany the Soil and Water Management Plan for the proposal. It will include: • Measures to manage groundwater during construction • Location of piezometers • Monitoring and sampling frequency for groundwater levels and groundwater quality • Evaluate any drawdown during construction • Reporting frequency • Timing of activities associated with monitoring. For instance, monitoring of flow, level and quality will continue for 12 months after the project is complete.	Construction contractor	Construction
HY-7	Higher than expected inflow volumes	The NSW Office of Water will be advised if the expected inflow volume is observed, or deemed likely to exceed 3 ML/y. Measures to rectify drawdown may include installation of a second, outer containment structure, or reinjection, down-gradient on the other side of containment.	Construction contractor/ Roads and Maritime	Construction
HY-8	Operational	The capacity of the Sydney Airport	Roads and	Detailed

ID	Impact	Environmental safeguards	Responsibility	Timing
	impact on capacity of Sydney Airport detention basin	detention basin will be further investigated in detailed design	Maritime	design
HY-9	Impacts on groundwater	An assessment will be carried out to confirm the potential groundwater impacts due to the proposed option/s chosen to manage groundwater for the new underpass. The following will be considered for the assessment: • The potential impacts due to the proposal on the groundwater level. • The potential impacts due to the proposal on Mill Ponds • Management methods of groundwater during construction • Management methods of groundwater during operation.	Roads and Maritime	Detailed design
HY-10	Groundwater Management and Monitoring Plan	The Groundwater Management and Monitoring Plan will be made available to SACL. Detailed design will investigate groundwater management and groundwater monitoring for the proposal area and any indirectly affected areas. The groundwater monitoring strategy will also provide detail about monitoring before and after construction within the vicinity of the Wentworth Avenue underpass.	Roads and Maritime	Detailed design
HY-11	Hydrology	Roads and Maritime will carry out further hydrology investigations as part of the detailed design. These investigations will consider in more detail surface water flows within the proposal area, as well as drainage conditions upstream of the Ascot Drain.	Roads and Maritime	Detailed design

6.6 Landscape character and visual impacts

6.6.1 Existing environment

A Landscape Character and Visual Amenity Assessment was prepared for the project by Corkery Consulting and Studio Colin Polwarth (2014) in accordance with Roads and Maritime's Environmental Impact Assessment Practice Note EIA-N04-Guidelines for Landscape Character and Visual Impact Assessment (2013).

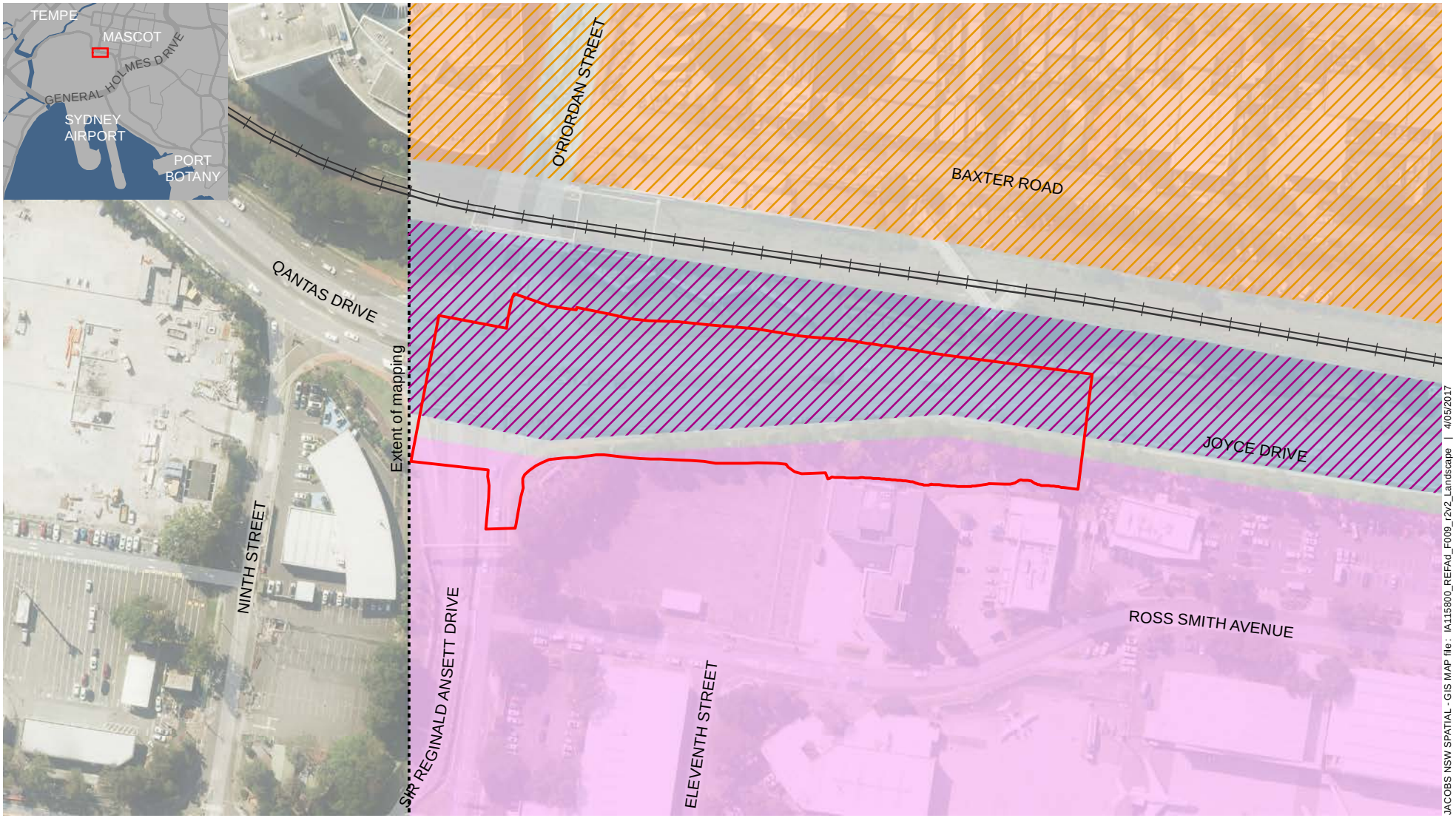
The assessment found that the area around the project is visually dominated by Sydney Airport and located between the interface of Sydney Airport and suburb of Mascot. Urban areas are separated from the airport by the road network and railway to Port Botany. Open spaces, parklands and gold courses near the project are of significant scenic value.

The assessment divided the area surrounding the project into six landscape character zones. The proposed modification is located in landscape character zone one 'General Holmes Drive/Joyce Drive streetscape' and landscape character zone six 'Sydney Airport' based on its existing landform, vegetation, buildings and infrastructure (refer to **Figure 6-3**). A description of landscape character zones in and around the proposed modification area is provided in **Table 6-13**.

Table 6-13 Landscape character zones

	Commonwealth land leased to SACL			
Landscape character zone	**Within**	**Outside**	**Description**	**Relevant to proposed modification**
Landscape character zone 1: General Holmes Drive/Joyce Drive streetscape 	✓	✓	This is a visually enclosed, busy road corridor connecting to Sydney Airport and Port Botany Freight Rail Line. Mature trees are located along Sydney Airport side of Joyce Drive, and a variety of commercial buildings and structures that are partly visible to motorists. The corridor also includes exotic and indigenous plantings, large billboards and grassed areas.	Majority of the proposed modification is located in this zone.
Landscape character zone 5: Urban development of Mascot and Botany 		✓	Botany Road is visually dominated by commercial and industrial buildings. The built form includes larger scale structures including industrial buildings south of the Wentworth Avenue intersection and adjoining the rail level crossing at General Holmes Drive, and smaller post-war	This zone is located to the north of the proposed modification.

	Commonwealth land leased to SACL			
Landscape character zone	**Within**	**Outside**	**Description**	**Relevant to proposed modification**
			detached cottages along Robey Street and Baxter Road. Between Botany Road and O'Riordan Street, urban development is mainly residential. Baxter Street includes a large surface car park, large buildings and residential development. Street trees commonly form part of the visual character.	
Landscape character zone 6: Sydney Airport 	✓		The northern portion of Sydney Airport is dominated by large-scale buildings and structures with extensive paved areas for aircraft use. The southern portion has a distinct visual character resulting from the flat landform, extensive areas of paved runways and taxiways with grassed aprons allowing long distance views. Views to the west from the adjoining section of General Holmes Drive extend to the western edge of Sydney Airport. A key component of the visual character is the movement of large aircraft on the ground and in the air as they take off and land.	The southern extent of the proposed modification is located in this zone.



Legend

- Proposed modification
- Railway

Landscape character zones

- Zone 1 - Joyce Drive
- Zone 5 - Urban development of Mascot and Botany
- Zone 6 - Sydney Airport

Landscape character strategy

- General Holmes Drive/Joyce Drive Corridor
- Urban Sydney

0 25 50m
1:2,000 @ A4

N

Figure 6-3 | Landscape character zones

6.6.2 Potential impacts

Construction

The construction footprint associated with the proposed modification would require an additional 1500 square metres of vegetation (including 22 trees) to be cleared on Sydney Airport land. Revegetation and rehabilitation would occur along Joyce Drive after construction as part of the urban design strategy for the project. All vegetation (excluding weeds) that would be removed on Sydney Airport land as a result of the proposed modification would be valued in terms of ecological or monetary value and offset accordingly.

Operation

Landscape character assessment

The potential impacts of the proposed modification on landscape character were assessed for each landscape character zone in terms of the zone's sensitivity to change and the magnitude of the proposed changes in that zone.

The proposed modification would impact on two landscape character zones (1 and 6). Impacts would stem from the removal of trees, the widening of roads, increase in paved areas and intersection upgrades. These impacts are summarised in **Table 6-14**.

Table 6-14 Potential impacts on landscape character zones

Landscape character zone	Sensitivity	Magnitude	Impact
1. General Holmes Drive/Joyce Drive streetscape	Low Visually dominant large advertising signs, commercial development and large number of vehicles moving along corridor road.	High Proposed widening would remove existing roadside trees and increase the paved area of the roadway.	Moderate
6. Sydney Airport	Low Dominance of built form and traffic.	High Proposed widening would remove existing roadside trees and increase the paved area of the roadway.	Moderate

Landscape character change

The urban and landscape design strategy prepared for project's detailed design (Hassell, 2015) has been extended and applied to the proposed modification area. Landscaping for the proposed modification is not anticipated to substantially alter the existing landscape character zones. The urban and landscape design strategy for this zone involves retaining as many trees as possible, considered for a combination of built structure and landscape screening plants along the southern side of Joyce Drive would be investigated during design development and planting the central median with low maintenance native grasses and sedges.

Visual impact

The key visual viewpoints in the area would be traffic travelling along Joyce Drive and through the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection. As outlined above the sensitivity of the proposed modification area is considered to be low however the magnitude of the proposed modification would be high as the Joyce Drive widening would result in a wider road corridor and a reduction of roadside vegetation in the short term. Therefore it is anticipated that the visual impact of the proposed modification would be moderate. The visual impacts would be reduced over time as mitigation strategies, such as screen planting, new tree planting and other landscape work progress.

6.6.3 Safeguards and management measures

The safeguards and management measures identified in **Table 6-15** have been based on those provided in the addendum REF (March 2017). No additional safeguards and management measures are required for landscape character and visual amenity as a result of the proposed modification.

Table 6-15 Safeguards and management measures for landscape character and visual amenity

ID	Impact	Environmental safeguards	Responsibility	Timing
LC-1	General	The detailed design will incorporate the landscape and urban design strategy and objectives described in Section 3 of the Landscape Character and Visual Impact Assessment (Corkery Consulting + Studio Colin Polwarth, 2014). The landscape and urban design strategy for detailed design will be prepared in consultation with SACL. Roads and Maritime will also liaise with Botany Bay City Council and owners of the Beckenham Memorial Church regarding landscaping on their property.	Roads and Maritime	Detailed design
LC-2	Landscape design	During detailed design, the landscape design principles and streetscape (planting) will be reviewed to ensure that they are consistent with the outcomes of the biodiversity assessment. This will be done in consultation with Roads and Maritime environment and urban design staff.	Roads and Maritime	Detailed design
LC-3	Visual impacts of construction	To reduce the potential visual impact of construction activities:	Construction contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
	activities	• Work sites will be left tidy at the end of each work day • Where appropriate, fencing with material attached (e.g. shade cloth) will be provided around the construction compound to screen views from adjoining properties • Lighting for night-time work will comply with relevant Australian Standards, including AS4282-1997 (Control of the obtrusive effects of outdoor lighting).		
LC-4	Visual impacts of compound, stockpile and storage areas	Following construction, temporary compound, stockpile and storage areas will be removed, cleared of all rubbish and materials, and rehabilitated.	Construction contractor	Post-construction
LC-5	Landscape and urban design strategy	A detailed urban design and landscape strategy will be prepared as part of the detailed design of the proposal and will consider: • The impact of removing existing landscaping and its current amenity and value • Airport operational issues in the selection of replacement vegetation, roadside furniture and other urban design elements. The landscape and urban design strategy will be made available to SACL for comment when it is complete. Roads and Maritime will continue to consult with SACL regarding landscaping in the area between General Holmes Drive and the Port Botany Freight Rail Line.	Roads and Maritime	Detailed design

6.7 Biodiversity

6.7.1 Existing environment

The extent and magnitude of potential impacts of the project on biodiversity were assessed in the Biodiversity Assessment (SMEC, 2014), which was included in the project REF.

Section 7.5 of the project REF provides a comprehensive overview of the existing environment surrounding the project. Vegetation in the proposed modification area is limited to urban native and exotic cover, including linear roadside planting of native and exotic species. A dead tree was also identified in the proposed modification area. Urban native and exotic species in the proposed modification area include:

- Spotted Gum (*Corymbia maculata*)
- Exotic decumbent conifer (*Cupressus sp.)*
- Coastal Banksia (*Banksia integrifolia*)
- *Gazania sp.* (*cultivar*)
- *Grevillea sp.* (*cultivar*)
- Tuckeroo (*Cupaniopsis anacardioides*)
- Spiny-mat Rush (*Lomandra longifolia*)
- Swamp Oak (*Casuarina glauca*)
- Gymea Lily (*Doryanthes excelsa*)
- Cabbage Tree Palm (*Livistona australis*).

The project REF identified that habitat in the project area is highly modified and its capacity to support threatened and migratory fauna is low.

6.7.2 Potential impacts

Construction

The construction footprint of the proposed modification would require an additional 1500 square metres of vegetation clearance (including 26 trees) on Sydney Airport land. Vegetation clearance would comprise urban native and exotic cover. The proposed modification would not remove any good quality native vegetation, threatened ecological communities or threatened species.

Vegetation clearing would result in minor loss of foraging habitat for the migratory Fork-tailed Swift and White-throated Needletail as part of the removal of planted street trees. The Biodiversity Assessment for the project concluded that the loss of this habitat would not have a significant impact on these species as the proposed modification area provides only an intermittent suitable habitat.

The proposed modification is not anticipated to impact on the Sydney Airport Wetlands given its distance to the proposed modification. The proposed modification would not impact on the habitat of threatened species given the unsuitable habitat identified in the project area. Therefore the proposed modification is consistent with the *Airport Act 1996* and in the Sydney Airport Environment Strategy 2013-2018.

All vegetation (excluding weeds) that would be removed on Sydney Airport land as a result of the proposed modification would be valued in terms of ecological or monetary value and offset accordingly. The offset amount would be determined during the approval process and subject to agreeance by Sydney Airport and Roads and Maritime. Revegetation and rehabilitation would occur along Joyce Drive after construction as part of the project.

Conclusion on significance of impacts

The proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the *Threatened Species*

Conservation Act 1995 or *Fisheries Management Act 1994* and therefore a Species Impact Statement is not required.

The proposed modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*.

6.7.3 Safeguards and management measures

The safeguards and management measures identified in **Table 6-16** have been based on those provided in the addendum REF (March 2017). Additional safeguards and management measures as a result of the proposed modification are in **bold**.

Table 6-16 Safeguards and management measures for biodiversity

ID	Impact	Environmental safeguards	Responsibility	Timing
BI-1	Potential impact to Coastal Freshwater Wetland TEC during construction	• A buffer zone of 5 m will be established around the wetland to avoid physical impact • The area within the wetland buffer area will be rehabilitated as part of the proposal area, including weed control, landscaping and site rehabilitation works with locally indigenous species • Relocate woody debris recovered from the construction footprint to the wetland buffer to provide shelter sites for the Green and Golden Bell Frog.	Construction contractor	Pre-construction, construction
BI-2	Vegetation and habitat removal	Pre-clearance surveys will be carried out by an experienced ecologist to: • Identify and mark fauna habitat features and roosting sites (if any exist) to be protected during construction • Confirm the presence of the Green and Golden Bell Frog and the level of management commitment required during construction • Identify nearby habitats within the proposal area that are suitable for the release of fauna that may be encountered during the pre-clearing process or habitat removal • Select appropriate locations for construction access tracks, ancillary facilities and construction areas in previously cleared and disturbed areas, wherever possible.	Construction contractor	Pre-construction
BI-3	Vegetation and habitat removal	A Biodiversity Management Plan (BMP) will be included in the CEMP. It will include: • Procedures for a site walk with	Construction contractor	Pre-construction, construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		appropriate site personnel including Roads and Maritime representatives to confirm clearing boundaries and sensitive locations before work begins • The exclusion zones to be installed before clearing, to avoid damage to native vegetation and fauna habitats and prevent the distribution of pests, weeds and disease. Temporary fencing, flagging tape or other appropriate method will be installed to indicate the limits of the exclusion fencing. The location of exclusion fencing will be identified on plans in the CEMP and the function and importance of the exclusion zones communicated to construction personnel • Maps showing vegetation clearing boundaries, identifying drainage areas that run towards the Coastal Freshwater Wetland TEC • A procedure to manage stormwater in the proposal to ensure that hydrology of the Coastal Freshwater Wetland TEC is maintained, including periodic drying to prevent colonisation by Gambusia (*Gambusia holbrookii*) • The establishment of a 5 m buffer area/ exclusion zone around the Freshwater Wetland TEC to avoid construction impacts on the TEC, as discussed in BI-1 • A detailed clearing process in accordance with the Roads and Maritime Biodiversity Guidelines (Roads and Maritime, 2011) including requirements of Guide 1, 2 4 and 9 • An unexpected threatened species finds procedure, as outlined in the Biodiversity Guidelines (RTA, 2011a) • Specific details for the re-establishment and rehabilitation of native vegetation on cut faces, batters, the wetland buffer and other areas disturbed during construction • Guidance for the relocation of woody debris from the construction footprint to the wetland buffer to provide shelter for the Green and Golden Bell Frog, if required.		

ID	Impact	Environmental safeguards	Responsibility	Timing
BI-4	Spread of weeds	A weed management plan will be developed as part of the BMP and incorporated into the CEMP. The plan will detail: • Weed management priorities and objectives • Identification of weeds on the construction site • Sensitive environmental areas within and next to the proposal area, such as the wetland to the south of the Wentworth Avenue underpass • Location of weed infested areas • Mechanical weed control methods such as slashing or mowing, as well as a range of herbicides to avoid the development of herbicide resistance • Procedures to control the use of pesticides, particularly near waterways and immediately before or during wet weather • Measures to prevent the spread of weeds • Procedures for the appropriate disposal of weed-infested materials and soils • Monitoring program to measure the success of weed management • Communication protocol with Botany Bay City Council noxious weed representative.	Construction contractor	Pre-construction
BI-5	Introduction or spread of pests and disease	Measures to confirm the presence of pathogens and disease-causing agents will be carried out before construction. Should pathogens or disease-causing agents be found, measures will be implemented to prevent their introduction and/or spread to the proposal area. These measures are provided in the Biodiversity Guidelines and will include, where appropriate: • The provision of vehicle and boot wash-down facilities to ensure vehicles and footwear are free of soil before entering or exiting the site • Procedures to ensure that the risk of spreading pathogens and the mitigation measures required on site are regularly communicated to staff and contractors during inductions and toolbox talks	Construction contractor	Pre-construction, construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		• The programming of construction activities so they move from uninfected areas to any known infected areas • The restriction of vehicles to designated roadsides and parking areas • Specific measures for treating *Phytophthora cinnamomi* and chytrid fungus.		
BI-5	**Tree valuation**	**Provide the monetary, ecological and aesthetic value of trees which will require removal within the proposed modified area of the Airport East Precinct works on Commonwealth Lands at Sydney Airport.** **The report is to:** • **Identify tree species, size and number required to be removed for the road extension.** • **Provide a monetary valuation for each tree to be removed.** • **Provide tree locations and context.**	**Roads and Maritime**	**Pre-construction**

6.8 Land use and property

6.8.1 Existing environment

Existing land uses in and around the proposed modification include:

- Advertising corridor
- Airport infrastructure
- Road infrastructure
- Railway infrastructure
- Commercial.

As outlined in **Section 3.6**, property within the proposed modification is owned by Bayside Council, Sydney Airport and the Commonwealth of Australia. Surrounding areas are owned by ARTC and private owners of residential and commercial property. Refer to **Figure 3-3** for property ownership.

6.8.2 Potential impacts

Construction

The proposed modification would require further partial acquisition of one property which is owned by Sydney Airport. **Section 3.6** provides a summary of the properties that would be impacted and describes the estimated area of acquisition. These property acquisitions would be confirmed during detailed design. All affected landholders would be consulted during the detailed design and construction stages of the project. Consultation carried out to date with affected landholders is discussed in **Section 5.2**.

Pedestrian access to the Ibis Budget Hotel from Joyce Drive may be temporarily blocked during construction of the proposed modification however would be re-instated following the completion of work.

A new pedestrian crossing would be provided along the eastern leg of the intersection and the existing pedestrian crossing along southern leg of the intersection would be adjusted as part of the proposed modification.

Operation

Operational impacts on land use are not anticipated to have a considerable impact as property acquisition is minor and located beside an existing major road corridor. The proposed modification would therefore have a negligible impact on the surrounding land uses.

6.8.3 Safeguards and management measures

The safeguards and management measures identified in **Table 6-17** have been based on those provided in the addendum REF (March 2017). No additional safeguards and management measures are required for land use and property as a result of the proposed modification.

Table 6-17 Mitigation measures for land use, property and socio-economic impacts

ID	Impact	Environmental safeguards	Responsibility	Timing
LU-1	Property acquisition	Roads and Maritime will consult with property owners impacted by the proposal. Property acquisition will be managed in accordance with the provisions of Roads and Maritime's Land Acquisition Policy (Roads and Maritime, 2012b) and the Land Acquisition (Just Terms Compensation) Act 1991.	Roads and Maritime	Detailed design
LU-2	Memorandum of Understanding (MOU)	Roads and Maritime will continue to consult with SACL to agree on an MOU for the proposal.	Roads and Maritime	Detailed design
LU-3	Use of land leased to SACL	The use of leased land and any conditions associated with the use of that land will be agreed between SACL and Roads and Maritime during preparation of the lease agreement. Details on stockpiling will be agreed with SACL during lease negotiations.	Roads and Maritime	Detailed design
LU-4	Impacts on SACL land and assets	Roads and Maritime will continue to investigate opportunities to reduce the impact of the proposal in SACL land and assets.	Roads and Maritime	Detailed design

7 Environmental management

7.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Project Environmental Management Plan (PEMP) and Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the Airport East Precinct project are summarised in **Table 7-1**. Additional safeguards and management measures identified in this addendum REF are included in **bold** and ***italicised font***. The safeguards and management measures will be incorporated into the detailed design phase of the proposed modification, the CEMP and the PEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing
General				
1	General	All environmental safeguards will be incorporated in the following documents: • Project Environmental Management Plan • Detailed design • Contract specifications for the proposal • Contractor's Environmental Management Plan.	Project manager	Pre-construction
2	General	A risk assessment will be carried out in accordance with the Roads and Maritime Audit Pack and Operations and Services Directorate (OSD) risk assessment procedures to determine an audit and inspection program for the project. The recommendations of the risk assessment will be implemented. A review of the risk assessment will be carried out after the initial audit or inspection to evaluate if the level of risk chosen for the project is appropriate. Any work for the proposal and covered by this REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration.	Project manager and regional environmental staff	Pre-construction After first audit
3	General	The environmental contract specification G36 – Environmental Protection (Management System) will be forwarded to the Roads and Maritime Senior Environmental Officer for review at least 10 working days before the tender stage. A contractual hold point will be maintained until the CEMP is reviewed by the Roads and Maritime Senior Environmental Officer.	Project manager	Pre-construction
4	General	The Roads and Maritime Services Project Manager will notify the Roads and Maritime Services Environmental Officer, Sydney	Project manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		Region, at least 5 days before work begins.		
5	General	All businesses and residences likely to be affected by the proposal will be notified at least 5 working days before the proposed activities begin.	Project manager	Pre-construction
6	General	The contractor will provide environmental awareness training to all field personnel and subcontractors.	Contractor	Pre-construction and during construction as required.
Transport				
TR-1	General traffic impacts	A Traffic Management Plan (TMP) will be prepared as part of the Construction Environmental Management Plan (CEMP). The TMP will be prepared in accordance with Roads and Maritime's Traffic Control at Work Sites (RTA, 2010), Australian Standard AS1742 and the worksite manual Roads and Maritime Specification G10. The TMP will outline: • Traffic controls to regulate traffic movements and minimising traffic switching • Coordination of: – General traffic flows at major construction work areas, such as the tie-ins for the Wentworth Avenue extension – Delivery of construction materials and movement of construction plant and equipment to and from the site to limit traffic delays – Other Roads and Maritime roadwork and any work by other agencies that affect traffic flow – Schedules, abnormal loads and other specific aspects of transport with transport operators – Consultation with local councils to identify, evaluate and document alternative routes – Incident response with emergency services. • Maintenance of continuous, safe and efficient movement of	Construction contractor	Detailed design Pre-construction Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		traffic for both the public and construction crew • Haulage routes and access arrangements to minimise impacts on local routes • Construction traffic zones around work areas • Access provisions for local roads and properties • Maintenance of pedestrian access • Provision for appropriate warning and signposting • Requirements and methods to consult with and inform the local community of impacts on the local road network and traffic, as well as impacts on individual property access. A Vehicle Movement Plan will be prepared as part of the overall TMP. The Vehicle Movement Plan will assess construction-related heavy vehicle movements per shift into and out of the construction sites, and provide guidelines for limiting impacts on traffic using the road network.		
TR-2	Impact to traffic from construction site access	All access points to the construction site and site roads will: • Have safe intersection sight distance • Accommodate the turning movements of the largest heavy vehicles • Provide painted median treatments for vehicle delineation • Provide suitable intersection layouts.	Construction contractor	Construction
TR-3	Impact on access to bus stops during construction	Local bus operators will be consulted during detailed design regarding location and provision of access to bus stops during construction.	Roads and Maritime	Detailed design
TR-4	Building rail bridges during scheduled rail possessions	Roads and Maritime will consult with Port Botany and ARTC during detailed design to confirm that the proposal will avoid disturbance and impact on operations during construction where practicable.	Roads and Maritime	Detailed design
TR-5	Impact on access for	Consultation with emergency service authorities will be carried out during development of the detailed design including with NSW Fire	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
	emergency services	Rescue.		
TR-6	Impact on pedestrian and cyclist access during construction	Pedestrian and cyclist access will be maintained throughout construction. Appropriate signage communicating diversion routes to pedestrians and cyclists will be displayed during construction. Advance notification will be provided of any construction works that affect pedestrians and cyclists.	Construction contractor	Construction
TR-7	Impact on property access	Vehicular property access will be maintained including at places of worship and to all commercial premises. Should property access be affected by the proposal, residents will be consulted before any work begins.	Construction contractor	Construction
TR-8	Impact on access to bus stops	The community will be provided with ongoing updates on locations and access to bus stops during the construction period to ensure that disruption is minimised.	Construction contractor/ Roads and Maritime	Construction
TR-9	Alternate linemarking strategies	Roads and Maritime will consider alternate linemarking strategies on the Southern Cross Road off-ramp (westbound).	Roads and Maritime	Detailed design
TR-10	Dedicated left turn lane from Southern Cross Drive onto Botany Road	Roads and Maritime will confirm the viability of upgrading the left turn slip lane on Southern Cross Drive to a dedicated left turn lane at the intersection with Botany Road (southbound).	Roads and Maritime	Detailed design
TR-11	Optimisation of the cycleway	Roads and Maritime will continue to investigate optimising the cycleway within the proposal area, including reducing crossings where feasible.	Roads and Maritime	Detailed design
TR-12	Access to Port Botany Freight Line easement	Roads and Maritime will continue to consult with ARTC regarding the provision of access to the Port Botany Freight Line easement from the General Holmes Drive cul-de-sac.	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
	from the General Holmes Drive cul-de-sac			
TR-13	Austroads Guide to Road Design (2009)	Cyclist facilities for the proposal will be designed with reference to the Austroads Guide to Road Design (2009)	Roads and Maritime	Detailed design
Airport operations				
AO-1	General impacts on airport operations	Roads and Maritime will continue to consult with SACL and Air Services Australia before and during construction of the project regarding any potential impacts on airport operations.	Roads and Maritime	Detailed design
AO-2	Construction impacts on airport operations	The CEMP will include an Airport Operations Management Plan to ensure that airport operations are not affected by construction of the proposal. This plan will include (as a minimum): • Maps indicating areas of permitted disturbance within Sydney Airport land • Communication protocol with Sydney Airport and representatives, outlining frequency and content of updates • Complaints procedure.	Roads and Maritime/ Construction contractor	Pre-construction
AO-3	Integration of the proposal with other projects	Roads and Maritime will consider the integration of the proposal with the T2/T3 Ground Access Solution and Hotel Major Development Plan and the Airport North precinct – WestConnex enabling works projects. Roads and Maritime will continue to consult with SACL to ensure the transition between the Airport North precinct – WestConnex enabling works and the T2/T3 Ground Access Solution and Hotel Major Development Plan is appropriate.	Roads and Maritime	Detailed design
Noise and vibration				
NV-1	Noise and vibration	During the detailed design stage of the proposal, further investigations of potential noise impacts and all feasible and	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
	impacts on sensitive receivers	reasonable mitigation options will be carried out for affected receivers in accordance with the Road Noise Policy (DECCW 2011) and Roads and Maritime's Environmental Noise Management Manual Practice Note 4 (RTA 2001).		
NV-2	Noise and vibration impacts on sensitive receivers during construction	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared as part of the CEMP. The CNVMP will include (as a minimum): • A map indicating the locations of sensitive receivers • A quantitative noise assessment in accordance with the EPA Interim Construction Noise Guidelines (DECCW, 2009) • Management measures to minimise potential noise impacts • A risk assessment to determine construction activities likely to affect sensitive receivers • Mitigation measures to avoid noise and vibration impacts during construction activities • A process for assessing the performance of mitigation measures • A process for documenting and resolving issues and complaints • A construction staging program incorporating noise and vibration monitoring for sensitive receivers • Identification in toolbox talks where noise and vibration management is required.	Construction contractor	Pre-construction
NV-3	General vibration during construction	Building condition surveys will be carried out for buildings identified in the CNVMP. A copy of the report will be sent to the landholder.	Construction contractor	Pre-construction
NV-4	General vibration during construction	A vibration assessment will be prepared and included in the NVMP. The vibration assessment will include (as a minimum): • Identification of potentially affected properties/receivers • A risk assessment to determine the potential for discrete work	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		activities to affect receivers • A map indicating the locations considered likely to be impacted and those requiring building condition surveys • A monitoring program • A process for assessing mitigation measures • A process for resolving issues and conflicts, including additional noise and vibration monitoring where required.		
NV-5	Noise impacts on sensitive receivers from operation of stockpile and compound sites	Construction compound layout will be arranged so that primary noise sources are at a maximum distance from sensitive receivers (primarily residential receivers), with solid structures (sheds and containers) placed between sensitive receivers and noise sources (and as close to the noise sources as is practical).	Construction contractor	Pre-construction Construction
NV-6	Noise impacts from construction machinery	Compressors, generators, pumps and any other fixed plant will not be located near residences where possible	Construction contractor	Construction
NV-7	Noise and vibration induction	An environmental induction program will be developed to include specific noise and vibration awareness training.	Construction contractor	Construction
NV-8	Construction noise impacts on Airport buildings	Detailed design will further investigate construction noise impacts, including impacts on sensitive receivers, Airport buildings, and current hotel sites. Reasonable and feasible mitigation measures will be identified.	Roads and Maritime	Detailed design
NV-9	Noise mitigation	Roads and Maritime will consider noise mitigation at the church on Botany Road and a residence of Hardie Street, during detailed design. In addition, receivers in the proposal area which currently experience exceedances of the NSW Road Noise Policy (RNP) (DECCW, 2011) will be considered for noise mitigation in	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		accordance with the provisions of the Noise Mitigation Guidelines (Roads and Maritime, 2014). Properties which qualify for noise mitigation treatment will be contacted by Roads and Maritime during detailed design.		
NV-10	General vibration during construction	Where construction work near the Breckenham Memorial Church is within the minimum safe working distances (structural damage) for vibration intensive plant, vibration testing of equipment on site would be carried out prior to their commencement of site operation to determine acceptable buffer distances to the building. If this buffer distances cannot be complied with, measures such as using smaller equipment or (if required) time restrictions for the most excessive vibration activities.	Construction contractor	Pre-construction
NV-11	***General noise and vibration impacts***	***Mitigation measure to be implemented as part of the proposed modification will be consistent with the Airport East EPL requirements***	***Construction contractor***	***Pre-construction Construction***
Non-Aboriginal heritage				
NA-1	Landscaping to improve visual amenity of Beckenham Memorial Church	Landscaping surrounding the Beckenham Memorial Church will be investigated during detailed design in consultation with church owners and heritage officers from Botany Bay City Council.	Roads and Maritime	Detailed design
NA-2	Removal of heritage relics	An exception under Section 139 of the Heritage Act will be obtained for impacts to identified relics within the proposal area, if required.	Roads and Maritime	Pre-construction
NA-3	Impact to heritage items	A condition survey will be carried out before the start of work by a qualified contractor and a building condition report prepared for nearby heritage items which may experience indirect impact from construction, including Beckenham Memorial Church.	Roads and Maritime	Pre-construction
NA-4	General impact to	A Non-Aboriginal Heritage Management Plan will be prepared and included in the CEMP. The plan will include but not limited to:	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	heritage	• A map identifying locations of heritage items (including curtilages) which are to be protected and those which are to be destroyed • Identification of potential impacts to heritage items due to construction • Implementation of mitigation measures to protect identified heritage items • A stop works procedure in the event of actual or suspected potential harm to a heritage item • Requirement to comply with Roads and Maritime Standard Management Procedure: Unexpected Archaeological Finds (2012).		
NA-5	Disturbance, removal or demolition of non-Aboriginal heritage items	A photographic archival recording will be made of the following items before any disturbance or demolition, in accordance with OEH guidelines: • House (house and allotment), 1289 Botany Road • House (house and allotment), 1291 Botany Road • Beckenham Memorial Church School Hall (hall and allotment), 1293 Botany Road • Beckenham Memorial Church (church frontage only), 1295 Botany Road • Mascot (Botany Road) Underpass (bridge and its approaches) • Sandstone kerb along Botany Road near Wentworth Avenue • Botany Road tram tracks.	Roads and Maritime	Pre-construction
NA-6	Non-Aboriginal heritage awareness training	Non-Aboriginal heritage awareness training will be provided for all contractors and personnel before the start of construction to make aware of retained heritage items within the vicinity of the works and required management measures and to ensure understanding of the procedure required to be carried out in the event of discovery of non-Aboriginal heritage materials, features or deposits, or the discovery of human remains.	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
NA-7	Protection of non-Aboriginal heritage items from inadvertent damage	The following items will be temporarily fenced and appropriate signage displayed and/or noted on a plan as a heritage item to avoid indirect impacts or encroachment, where necessary: • Mascot (Botany Road) Underbridge • Sandstone kerb and alignment pin at Botany Road, near McBurney Avenue • Botany Water Reserve • Mascot (O'Riordan Street) Underbridge • Electricity Substation 163, at 42 Wentworth Avenue • Commercial Building Group, 1209–1223 Botany Road • Single Storey Terrace Group, 1239–1245 Botany Road • House, 71 Frogmore Street • House, 87 Hardie Street • House, 90 Johnson Street.	Roads and Maritime Construction contractor	Pre-construction Construction
NA-8	Discovery of non-Aboriginal heritage features or deposits	If at any time during construction of the project, non-Aboriginal heritage materials, features and/or deposits are found and are not covered by an issued approval (generally s139 excavation permit, exception or s60 approval or exemption) then the Roads and Maritime Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime, 2015b) will be followed.	Construction contractor	Construction
NA-9	Discovery of tram tracks and additional road fabric	A photographic archival recording will be made of additional road fabric or other unanticipated finds if found during construction. This will be carried out in accordance with Roads and Maritime's Standard Management Procedure: Unexpected Archaeological Finds (2012).	Construction contractor	Construction
NA-10	Rebuilding of Beckenham Memorial Church fence	The front boundary wall of Beckenham Memorial Church will be rebuilt in the same style and with similar materials as the existing wall, in consultation with church owners and heritage officers from Botany Bay City Council.	Construction contractor	Construction
Biodiversity				

No.	Impact	Environmental safeguards	Responsibility	Timing
BI-1	Potential impact to Coastal Freshwater Wetland TEC during construction	• A buffer zone of 5 m will be established around the wetland to avoid physical impact • The area within the wetland buffer area will be rehabilitated as part of the proposal area, including weed control, landscaping and site rehabilitation works with locally indigenous species • Relocate woody debris recovered from the construction footprint to the wetland buffer to provide shelter sites for the Green and Golden Bell Frog.	Construction contractor	Pre-construction, construction
BI-2	Vegetation and habitat removal	Pre-clearance surveys will be carried out by an experienced ecologist to: • Identify and mark fauna habitat features and roosting sites (if any exist) to be protected during construction • Confirm the presence of the Green and Golden Bell Frog and the level of management commitment required during construction • Identify nearby habitats within the proposal area that are suitable for the release of fauna that may be encountered during the pre-clearing process or habitat removal • Select appropriate locations for construction access tracks, ancillary facilities and construction areas in previously cleared and disturbed areas, wherever possible.	Construction contractor	Pre-construction
BI-3	Vegetation and habitat removal	A Biodiversity Management Plan (BMP) will be included in the CEMP. It will include: • Procedures for a site walk with appropriate site personnel including Roads and Maritime representatives to confirm clearing boundaries and sensitive locations before work begins • The exclusion zones to be installed before clearing, to avoid damage to native vegetation and fauna habitats and prevent the distribution of pests, weeds and disease. Temporary fencing, flagging tape or other appropriate method will be installed to indicate the limits of the exclusion fencing. The location of exclusion fencing will be identified on plans in the	Construction contractor	Pre-construction, construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		CEMP and the function and importance of the exclusion zones communicated to construction personnel • Maps showing vegetation clearing boundaries, identifying drainage areas that run towards the Coastal Freshwater Wetland TEC • A procedure to manage stormwater in the proposal to ensure that hydrology of the Coastal Freshwater Wetland TEC is maintained, including periodic drying to prevent colonisation by Gambusia (*Gambusia holbrookii*) • The establishment of a 5 m buffer area/ exclusion zone around the Freshwater Wetland TEC to avoid construction impacts on the TEC, as discussed in BI-1 • A detailed clearing process in accordance with the Roads and Maritime Biodiversity Guidelines (Roads and Maritime, 2011) including requirements of Guide 1, 2 4 and 9 • An unexpected threatened species finds procedure, as outlined in the Biodiversity Guidelines (RTA, 2011a) • Specific details for the re-establishment and rehabilitation of native vegetation on cut faces, batters, the wetland buffer and other areas disturbed during construction • Guidance for the relocation of woody debris from the construction footprint to the wetland buffer to provide shelter for the Green and Golden Bell Frog, if required.		
BI-4	Spread of weeds	A weed management plan will be developed as part of the BMP and incorporated into the CEMP. The plan will detail: • Weed management priorities and objectives • Identification of weeds on the construction site • Sensitive environmental areas within and next to the proposal area, such as the wetland to the south of the Wentworth Avenue underpass • Location of weed infested areas • Mechanical weed control methods such as slashing or mowing, as well as a range of herbicides to avoid the	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		development of herbicide resistance • Procedures to control the use of pesticides, particularly near waterways and immediately before or during wet weather • Measures to prevent the spread of weeds • Procedures for the appropriate disposal of weed-infested materials and soils • Monitoring program to measure the success of weed management • Communication protocol with Botany Bay City Council noxious weed representative.		
BI-5	Introduction or spread of pests and disease	Measures to confirm the presence of pathogens and disease-causing agents will be carried out before construction. Should pathogens or disease-causing agents be found, measures will be implemented to prevent their introduction and/or spread to the proposal area. These measures are provided in the Biodiversity Guidelines and will include, where appropriate: • The provision of vehicle and boot wash-down facilities to ensure vehicles and footwear are free of soil before entering or exiting the site • Procedures to ensure that the risk of spreading pathogens and the mitigation measures required on site are regularly communicated to staff and contractors during inductions and toolbox talks • The programming of construction activities so they move from uninfected areas to any known infected areas • The restriction of vehicles to designated roadsides and parking areas • Specific measures for treating *Phytophthora cinnamomi* and chytrid fungus.	Construction contractor	Pre-construction, construction
BI-6	***Tree valuation***	***Provide the monetary, ecological and aesthetic value of trees which will require removal within the proposed modified area of the Airport East Precinct works on Commonwealth Lands***	***Roads and Maritime***	***Pre-construction***

No.	Impact	Environmental safeguards	Responsibility	Timing
		at Sydney Airport. ***The report is to:*** • ***Identify tree species, size and number required to be removed for the road extension.*** • ***Provide a monetary valuation for each tree to be removed.*** • ***Provide tree locations and context.***		
Hydrology				
HY-1	Flood impacts on adjacent properties due to altered flood behaviour	Further flood modelling, including a detailed afflux assessment, will be carried out during detailed design to confirm impacts on surrounding land uses.	Roads and Maritime/ Detailed design contractor	Detailed design
HY-2	Licensing for dewatering	The NSW Office of Water will be consulted during detailed design to confirm licensing requirements for the various stages of the proposal.	Roads and Maritime	Detailed design
HY-3	Impact to groundwater levels	Roads and Maritime, in consultation with NSW Office of Water, will carry out a bore census to confirm the status of the groundwater works identified as part of the groundwater assessment.	Roads and Maritime	Detailed design
HY-4	Dewatering	A procedure will be prepared for any dewatering activities to be included as part of the SWMP. The dewatering procedure is to comply with Roads and Maritime Technical Guideline – Environmental Management of Construction Site Dewatering. The procedure will include at a minimum: • A map showing areas of the proposal that will require dewatering • Detailed description and justification of all selected dewatering methods • Description of onsite water reuse requirements	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		• A map showing proposed discharge locations for any offsite discharge • Design requirements for each offsite discharge location to prevent erosion at the discharge location or in the receiving environment • Water quality objectives relevant to the type of dewatering activity • Description of the water quality treatment techniques to be used • Water sampling and testing regime to validate water quality prior to and (if required) during dewatering, including to establish appropriate waste disposal methods • Description of the method for dewatering • Requirements to manage encounters with groundwater or contaminated water.		
HY-5	Flooding of construction site	A contingency plan will be prepared to manage a potential flood event during construction and will outline: • Procedure for communication and notification associated with contingency plan • Procedures to reduce risk including removal of all plant/equipment, stabilising exposed areas and maintaining existing flood flow paths through the site • Evaluation of what flood event will trigger the plan • Evacuation procedures • A map indicating the area that is flood prone and the locations where to evacuate.	Roads and Maritime	Pre-construction
HY-6	Impact to groundwater levels and quality	A Groundwater Monitoring and Management Plan will be prepared to accompany the Soil and Water Management Plan for the proposal. It will include: • Measures to manage groundwater during construction • Location of piezometers • Monitoring and sampling frequency for groundwater levels and	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		groundwater quality • Evaluate any drawdown during construction • Reporting frequency • Timing of activities associated with monitoring. For instance, monitoring of flow, level and quality will continue for 12 months after the project is complete.		
HY-7	Higher than expected inflow volumes	The NSW Office of Water will be advised if the expected inflow volume is observed, or deemed likely to exceed 3 ML/y. Measures to rectify drawdown may include installation of a second, outer containment structure, or reinjection, down-gradient on the other side of containment.	Construction contractor/ Roads and Maritime	Construction
HY-8	Operational impact on capacity of Sydney Airport detention basin	The capacity of the Sydney Airport detention basin will be further investigated in detailed design.	Roads and Maritime	Detailed design
HY-9	Impacts on groundwater	An assessment will be carried out to confirm the potential groundwater impacts due to the proposed option/s chosen to manage groundwater for the new underpass. The following will be considered for the assessment: • The potential impacts due to the proposal on the groundwater level. • The potential impacts due to the proposal on Mill Ponds • Management methods of groundwater during construction • Management methods of groundwater during operation.	Roads and Maritime	Detailed design
HY-10	Groundwater Management and Monitoring Plan	The Groundwater Management and Monitoring Plan will be made available to SACL. Detailed design will investigate groundwater management and groundwater monitoring for the proposal area and any indirectly affected areas. The groundwater monitoring strategy will also provide detail about monitoring before and after	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		construction within the vicinity of the Wentworth Avenue underpass.		
HY-11	Hydrology	Roads and Maritime will carry out further hydrology investigations as part of the detailed design. These investigations will consider in more detail surface water flows within the proposal area, as well as drainage conditions upstream of the Ascot Drain.	Roads and Maritime	Detailed design
Landscape character and visual amenity				
LC-1	General	The detailed design will incorporate the landscape and urban design strategy and objectives described in Section 3 of the Landscape Character and Visual Impact Assessment (Corkery Consulting + Studio Colin Polwarth, 2014). The landscape and urban design strategy for detailed design will be prepared in consultation with SACL. Roads and Maritime will also liaise with Botany Bay City Council and owners of the Beckenham Memorial Church regarding landscaping on their property.	Roads and Maritime	Detailed design
LC-2	Landscape design	During detailed design, the landscape design principles and streetscape (planting) will be reviewed to ensure that they are consistent with the outcomes of the biodiversity assessment. This will be done in consultation with Roads and Maritime environment and urban design staff.	Roads and Maritime	Detailed design
LC-3	Visual impacts of construction activities	To reduce the potential visual impact of construction activities: • Work sites will be left tidy at the end of each work day • Where appropriate, fencing with material attached (e.g. shade cloth) will be provided around the construction compound to screen views from adjoining properties • Lighting for night-time work will comply with relevant Australian Standards, including AS4282-1997 (Control of the obtrusive effects of outdoor lighting).	Construction contractor	Construction
LC-4	Visual impacts	Following construction, temporary compound, stockpile and	Construction contractor	Post-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	of compound, stockpile and storage areas	storage areas will be removed, cleared of all rubbish and materials, and rehabilitated.		
LC-5	Landscape and urban design strategy	A detailed urban design and landscape strategy will be prepared as part of the detailed design of the proposal and will consider: • The impact of removing existing landscaping and its current amenity and value • Airport operational issues in the selection of replacement vegetation, roadside furniture and other urban design elements. The landscape and urban design strategy will be made available to SACL for comment when it is complete. Roads and Maritime will continue to consult with SACL regarding landscaping in the area between General Holmes Drive and the Port Botany Freight Rail Line.	Roads and Maritime	Detailed design
Topography, geology, soils and water quality				
SWQ-1	Pollution as a result of sediment entering waterways during construction and operation	Water management controls and an associated maintenance and inspection program will be investigated during detailed design in accordance with the water quality control strategy for the proposal, with specific focus on the Wentworth Avenue underpass. During detailed design, the following will be confirmed: • Requirement for water quality measures • Location and size of water quality measures • Capacity for spills in the sediment basin design volume.	Design contractor	Detailed design
SWQ-2	Acid sulphate soils	During detailed design, an Acid Sulfate Soil Management Plan will be prepared. The plan will include as a minimum: • A summary of the available ASS information relevant to the proposal area • Confirm the process for identification of ASS/PASS throughout construction • Identify areas where ASS/PASS are expected during project	Design contractor	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		activities • Indicate the management measures to be implemented if ASS/PASS is encountered during dewatering • Indicate the management measures to be implemented if ASS/PASS is excavated during piling activities • Outline the monitoring requirements for ASS/PASS to confirm the surrounding area is being protected • Confirm the treatment and disposal requirements for any ASS/PASS encountered • Detail the reporting requirements.		
SWQ-3	Soil and water quality	A Soil and Water Management Plan (SWMP) will be prepared as part of the CEMP in accordance with the requirements of RMS contract specification G38 prior to the commencement of construction. The SWMP will also address the following: • Roads and Maritime Code of Practice for Water Management, the Roads and Maritime Erosion and Sedimentation Procedure • The NSW Soils and Construction – Managing Urban Stormwater Volume 1 “the Blue Book” (Landcom, 2004) and Volume 2 (DECC, 2008) • Roads and Maritime Technical Guideline: Temporary Stormwater Drainage for Road Construction, 2011 • Roads and Maritime Technical Guideline: Environmental Management of Construction Site Dewatering, 2011.	Roads and Maritime	Pre-construction
SWQ-4	Soil and water quality	The SWMP will detail the following as a minimum: • Identification of catchment and sub-catchment areas, high risk areas and sensitive areas • Sizing of each of the above areas and catchment • The likely volume of run-off from each road sub-catchment • Direction of flow of on-site and off-site water • Separation of on-site and off-site water • The direction of run-off and drainage points during each stage of construction	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		• The locations and sizing of sediment traps such as sump or basin as well as associated drainage • Dewatering plan which includes process for monitoring, flocculating and dewatering water from site (ie sediment basin and sumps) • Identification of areas of PASS that may be encountered during the dewatering work and mitigation measures required if encountered • The staging plans, location, sizing and details of creek alignment and realignment controls for scour protection and bank and bed stabilisation including those used during construction and long term. • A mapped plan identifying the above • Include progressive site specific Erosion and Sedimentation Control Plans (ESCPs). These plans are to be updated at least fortnightly • A process to routinely monitor the BOM weather forecast • Contingency for any acid sulphate soils or salinity found during construction • Preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather. These controls are to be shown on the ESCPs • Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls.		
SWQ-5	Contaminants entering receiving environments during construction	The following measures relating to the storage and management of plant, equipment, chemicals fuels and liquids will be implemented to minimise the risk of contaminants entering receiving environments (including soil, water and air): • Designated exclusion zones will be identified for the storage and use of construction plant and equipment. These zones will delineate traffic areas and restrict entry and exit points to	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		construction sites • All fuels, chemicals and liquids will be stored and disposed of in accordance with Storing and Handling Liquids: Environmental Protection Participants Manual (DECC, 2007) • Refuelling of plant and equipment will occur in bunded areas located a minimum of 40 m from drainage lines or waterways • Plant, equipment and vehicle washdown will occur in a designated bunded area away from waterways and drainage lines • All concrete washouts will occur into a sealed receptacle or bunded concrete washout area with an impermeable liner. The concrete washout area will be sized to be 120% of the estimated volume of the waste that will be received into the washout area at any one time • Any material transported onto pavement surfaces will be swept and removed at the end of each working day.		
SWQ-6	Management of stockpile and compound sites	Management measures for stockpile and compound sites will be incorporated in the SWMP and ESCPs and will include the following measures: • Stockpile and compound sites will be located away from overland flow paths and areas of high topography with minimal upstream catchment • Stockpile and compound sites will be maintained in accordance with Roads and Maritime's Stockpile Site Management Procedures (Roads and Maritime, 2001) • The number and size of stockpile and compound sites will be minimised throughout the proposal • Runoff from stockpile and compound sites will be treated with a stockpile-specific sediment basin, which will be monitored • The base of stockpile and compound sites will be lined if they are to be located over a shallow water table, and will be covered with plastic sheets, where required • Identify areas where ASS or PASS will be encountered during	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		excavation activities • Indicate the stockpile management measures to be implemented if ASS or PASS are excavated during piling activities • Vehicle movements will be restricted to designated pathways, where feasible.		
SWQ-7	Accidental spills during construction, resulting in the release of contaminants into waterways and the soil	A site-specific Emergency Spill Plan will be developed as part of the SWMP. It will include spill management measures in accordance with the Code of Practice for Water Management and Bunding and Liquid Chemical Storage, Handling and Spill Management (DEC, 2005) and Roads and Maritime's Environmental Incident Classification and Reporting Procedures (Roads and Maritime, 2014) Should a spill occur during construction, the Emergency Spill Plan will be implemented. Emergency spill kits will be kept at areas identified as having the highest spill risk at all times.	Construction contractor	Construction
Contamination				
CL-1	Identification and management of contaminated land	A Contamination Management Plan (CMP) will be prepared in accordance with the *Contaminated Land Act 1997* and relevant EPA Guidelines. This plan will form part of the CEMP and will include at a minimum: • Contaminated land legislation and guidelines including any relevant licences and approvals to be obtained • Identification of rehabilitation requirements, classification, transport and disposal requirements of any contaminated land within the construction footprint • Contamination management measures including waste classification and reuse procedures and unexpected finds procedures • Monitoring and sampling procedure for landfill seepage (leachate) • A procedure for dewatering and disposal of potentially	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		contaminated liquid waste • In the event that indications of contamination are encountered (known and unexpected, including odorous or visual indicators), work in the area will immediately cease until a contamination assessment can be prepared to advise on the need for remediation or other action, as deemed appropriate • A process for reviewing and updating the plan.		
CL-2	Remedial Action Plan for contaminated areas	A Remedial Action Plan (RAP) will be prepared and implemented in accordance with relevant regulatory requirements. The RAP will include: • Relevant procedures to manage health and safety of construction staff during remediation • Validation of residual soils in any resulting excavations to demonstrate suitability of remaining materials to remain on site • Further assessment of the wetland area including an assessment of the stockpiled material within the wetland area and waste classification under the Waste Classification Guidelines (DECCW, 2009) for off-site removal. The RAP and Validation Report will be provided to ARTC for review and comment.	Construction contractor	Pre-construction
CL-3	Management of asbestos	An asbestos management plan will be prepared as part of the CEMP and will be in accordance with NSW EPA guidelines (including waste guidelines) and relevant industry codes of practice. The asbestos management plan will include but not be limited to: • Identification of potential asbestos on site • Procedures to manage and handle asbestos and avoid cross contamination • Outline the mitigation measures for encountering asbestos • Procedures for disposal of asbestos in accordance with NSW EPA guidelines (including the waste guidelines) and relevant industry codes of practice.	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
CL-4	Classification and disposal of potential contaminants	All potentially contaminated wastes generated during construction will be classified according to the Waste Classification Guidelines: Parts 1 and 2 (DECC, 2008). Wastes will be disposed to a licensed disposal facility or re-used in construction, as appropriate.	Construction contractor	Construction
CL-5	Management of contamination on ARTC land	Contaminated material located at the stockpile site on the southern side of the proposed Wentworth Avenue underpass (refer to Figure 7-15 in the Project REF) will be legally disposed from ARTC land at an appropriately licensed facility. Fill material permanently located on ARTC land will be certified clean.	Construction contractor	Construction
CL-6	Remediation of SACL land	Details on the remediation of land will be agreed with SACL during lease negotiations.	Roads and Maritime	Detailed design
Air quality				
AQ-1	Air quality impact during construction	An Air Quality Management Plan (AQMP) will be prepared as part of the CEMP. The plan will include but not be limited to: • A map identifying locations of sensitive receivers • Identification of potential risks/impacts due to the work/activities as dust generation activities • Management measures to minimise risk including a progressive stabilisation plan • A process for monitoring dust on site and weather conditions • A process for altering management measures as required. The management measures within the AQMP will include as a minimum: • Vehicles transporting waste or other materials that have a potential to produce odours or dust are to be covered during transportation • Dust will be suppressed on stockpiles and unsealed or exposed areas using methods such as water trucks, temporary stabilisation methods, soil binders or other appropriate practices	Roads and Maritime	Pre-construction Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		• Disturbed areas will be minimised in extent and rehabilitated progressively • Speed limits will be imposed on unsealed surfaces • Stockpiles will be located as far away as feasible from residences and other sensitive receivers • Works (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely • Plant, vehicles and equipment will be maintained in a proper and efficient manner and in accordance with manufacturer's specifications • Wind conditions will be monitored and activities scheduled where possible to avoid winds with a high potential (ie strong winds from the west or southwest) to avoid adverse impacts at nearest sensitive receivers.		
Aboriginal heritage				
AH-1	Unexpected find of Aboriginal heritage artefacts	In the event of an unexpected find of an Aboriginal heritage item (or suspected item): • Work will cease in the affected area • The Roads and Maritime's Environmental Officer, Sydney Region will be contacted for advice on how to proceed • The Unexpected Archaeological Finds Procedure (Roads and Maritime, 2012) will be followed.	Construction contractor	Construction
Land use and property				
LU-1	Property acquisition	Roads and Maritime will consult with property owners impacted by the proposal. Property acquisition will be managed in accordance with the provisions of Roads and Maritime's Land Acquisition Policy (Roads and Maritime, 2012b) and the *Land Acquisition (Just Terms Compensation) Act 1991*.	Roads and Maritime	Detailed design
LU-2	Memorandum of	Roads and Maritime will continue to consult with SACL to agree on an MOU for the proposal.	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
	Understanding (MOU)			
LU-3	Use of land leased to SACL	The use of leased land and any conditions associated with the use of that land will be agreed between SACL and Roads and Maritime during preparation of the lease agreement. Details on stockpiling will be agreed with SACL during lease negotiations.	Roads and Maritime	Detailed design
LU-4	Impacts on SACL land and assets	Roads and Maritime will continue to investigate opportunities to reduce the impact of the proposal in SACL land and assets.	Roads and Maritime	Detailed design
Socio-economic				
SE-1	Community consultation	A Communication Plan will be prepared and included in the CEMP. The Communication Plan will include (as a minimum): • Requirements to provide details and timing of proposed activities to affected residents • Contact name and number for complaints • Procedure to notify adjacent land users for changed conditions during the construction period such as traffic, pedestrian or driveway access. The communications plan will be prepared in accordance with G36 requirements and Roads and Maritime's Community Engagement and Communications Manual (2012).	Construction contractor	Pre-construction Construction
SE-2	Local goods and services	Goods and services will be sourced locally during construction wherever possible to support the local economy.	Construction contractor	Construction
SE-3	Proposal feedback	Roads and Maritime will continue to consider proposal feedback during subsequent stages of proposal development.	Roads and Maritime	Detailed design
SE-4	Airport infrastructure and assets	Any airport infrastructure and assets affected by the proposal will be restored and/or relocated by Roads and Maritime.	Roads and Maritime	Construction
SE-5	Impact of the	Roads and Maritime will investigate locations for the relocated	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
	proposal on SACL signage	advertising structure at Ascot Lodge. A new site for the structure will be selected by Roads and Maritime in consultation with SACL.		
SE-6	Adjustment, relocation and protection of utility services	Further detail regarding adjustment, relocation or protection of utility services will be made available to SACL.	Roads and Maritime	Detailed design
Greenhouse gas and climate change				
GG-1	Impacts on climate change from construction activities	During construction, the following measures will be considered and implemented where possible: • Plant and equipment will be switched off when not in use • Vehicles, plant and construction equipment will be appropriately sized for the task and properly maintained so as to achieve optimum fuel efficiency • Materials will be delivered with full loads and will come from local suppliers, where possible • Energy efficiency and related carbon emissions will be considered when selecting vehicles and equipment • Vegetation clearing will be reduced as much as feasible, and re-established in suitable areas when construction is completed • Waste will be reduced and recycled as a preference before disposing to landfill.	Construction contractor	Construction
GG-2	Climate change risks to construction	Environmental safeguards and management measures in the CEMP will be designed to accommodate and respond to the increased frequency and severity of rainfall events.	Construction contractor	Pre-construction
Waste and resource management				
WR-1	Generation of construction waste	The following resource management hierarchy principles will be followed through the project life cycle: • Unnecessary resource consumption will be avoided as a priority	Construction contractor	Detailed design, pre-construction, construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		• Where avoidance is not possible, waste will be processed for resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) • Where resource recovery is not possible, waste will be disposed as a last resort at an appropriately licensed waste facility – in accordance with the *Waste Avoidance and Resource Recovery Act 2001 and* the EPA waste classification guidelines • Procurement will endeavour to use materials and products with a recycled content, provided that material or product is cost-effective and performance-effective.		
WR-2	Generation of construction waste	A Resource and Waste Management Plan (RWMP) will be prepared and include the following (as a minimum): • The type, classification and volume of all materials to be generated and used on site including identification of recyclable and non-recyclable waste in accordance with EPA Waste Classification Guidelines • Quantity and classification of excavated material generated as a result of the proposal (refer to Roads and Maritime's Waste Management Fact sheets 1-6, 2012) • Interface strategies for cut and fill on site to ensure re-use where possible • Strategies to 'avoid', 'reduce', 'reuse' and 'recycle' materials. • Classification and disposal strategies for each type of material • Destinations for each resource/waste type either for on-site reuse or recycling, offsite reuse or recycling, or disposal at a licensed waste facility • Details of how material will be stored and treated on-site. • Identification of available recycling facilities on and off site • Identification of suitable methods and routes to transport waste. • Procedures and disposal arrangements for unsuitable excavated material or contaminated material	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		• Site clean-up for each construction stage.		
Cumulative environmental impacts				
CE-1	Cumulative traffic and noise impacts from construction of multiple projects	The CEMP will be updated as required to incorporate potential cumulative impacts from surrounding development activities as they become known. This will include close liaison with the authorities carrying out the other projects, and a process to review and update mitigation measures as new work begins or if complaints are received.	Construction contractor	Detailed design Pre-construction Construction
CE-2	Cumulative construction impacts	A working group will be formed to manage cumulative construction impacts associated with the proposal and other Sydney Airport and Roads and Maritime projects. This group will also coordinate between the projects and the proposal.	Roads and Maritime	Detailed design
CE-3	Consultation with SACL regarding cumulative noise impacts	Roads and Maritime will continue to consult with SACL regarding the potential for cumulative noise impacts due to concurrent construction of Roads and Maritime and SACL developments.	Roads and Maritime	Detailed design Pre-construction Construction

7.3 Licensing and approvals

Licences and approvals required for the proposed modification are listed in **Table 7-2**.

Table 7-2 Summary of licensing and approvals required

Requirement	Timing
Consent from SACL and building activity approval from Airport Building Controller (ABC)	Before construction on Airport land
Adjustment of the Sydney Airport Group curtilage would be sought from the Commonwealth Department of Environment in consultation with SACL	Before construction
NSW Traffic Management Centre and Bayside Council approval may be required for the closure of traffic lanes	Before construction, if required

8 Conclusion

This chapter provides the justification for the proposed modification taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposed modification is in the public interest. The proposed modification is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

8.1 Justification

Sydney Airport and Port Botany are two of Australia's most important international gateways. However, the road network around Sydney Airport and Port Botany are becoming increasingly congested due to rising numbers of passenger and freight vehicles. This congestion will worsen if action is not taken to improve the road network.

The project would provide a feasible and cost-effective road network improvement that would address this worsening road congestion. The proposed modification would further assist in addressing road congestion and improving traffic flow by providing additional traffic capacity and supporting neighbouring projects.

The proposed modification would meet the project objectives and the strategic need with no substantial environmental impacts.

8.2 Objects of the EP&A Act

Table 8-1 identifies the objects of the EP&A Act and their relevance to the proposed modification.

Table 8-1 Summary of Objects of the EP&A Act

Object	Comment
5(a)(i) To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.	The proposed modification detailed in this addendum REF would not interfere with the management, development and conservation of natural and artificial resources. The main objective of the project is to improve the road network around Sydney Airport and Port Botany and this will promote the social and economic welfare of local and regional communities using these roads and visitors to Sydney. Where possible, throughout the detailed design of the proposed modification, management and conservation of natural resources would be incorporated into construction specifications and project designs.
5(a)(ii) To encourage the promotion and co-ordination of the orderly economic use and development of land.	The project would assist in the coordination of the orderly economic use and development of land for the region and along this significant transport corridor. The proposed modification would further assist in addressing road congestion and improving

Object	Comment
	traffic flow around Sydney Airport and Port Botany. This would result in greater access and connectivity throughout the wider Sydney Metropolitan region for motorists, public transport travellers, pedestrians and cyclists.
5(a)(iii) To encourage the protection, provision and co-ordination of communication and utility services.	Utilities affected by the proposed modification would be relocated, protected and maintained where required (refer to **Section 3.5**).
5(a)(iv) To encourage the provision of land for public purposes.	The proposed modification is intended to be used for a public purpose.
5(a)(v) To encourage the provision and co-ordination of community services and facilities.	The proposed modification, as part of the project would improve access and connectivity in both the local community and the wider Sydney Metropolitan region.
5(a)(vi) To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.	The proposed modification has been designed to minimise impacts on the environment and is not expected to create impacts to threatened species and populations, and ecological communities and their habitats. Additional measures would be developed to manage and offset impacts after construction.
5(a)(vii) To encourage ecologically sustainable development.	Ecologically sustainable development is considered in **Sections 8.2.1** to **8.2.4** below.
5(a)(viii) To encourage the provision and maintenance of affordable housing.	This clause is not directly relevant to the project.
5(b) To promote the sharing of the responsibility for environmental planning between different levels of government in the State.	This clause is not directly relevant to the project.
5(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.	Consultation was undertaken with Bayside Council (then known as Botany Bay City Council) and Sydney Airport (refer to **Chapter 5**). Ongoing consultation would be undertaken with stakeholders and community members as part of the project.

8.2.1 The precautionary principle

The precautionary principle provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to avoid environmental degradation.

As with the project, the proposed modification would not threaten serious or irreversible environmental damage that would result in impacts of a permanent nature. All measures considered to be necessary to safeguard environmental values have been identified and included

in preparation of this assessment. No serious or irreversible environmental damage is predicted to occur with the implementation of the identified safeguards.

8.2.2 Intergenerational equity

Intergenerational equity provides that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The project would benefit future generations by improving access and connectivity for the wider Sydney Metropolitan region by reducing traffic congestion, reducing travelling times and improving road safety. Should the project not proceed, travelling times and traffic volumes would be expected to increase over time.

The proposed modification would create minor, temporary impacts during construction and require the removal of vegetation that would be offset. These impacts are not considered to be of a nature or extent that would disadvantage future generations.

Implementation of the safeguards outlined in this addendum REF would ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

8.2.3 Conservation of biological diversity and ecological integrity

The conservation of biological diversity and ecological integrity was a fundamental consideration during the development of both the project REF and this addendum REF for the proposed modification.

The proposed modification would require a total of about 1500 square metres of vegetation to be removed. Vegetation removal would be limited to urban native and exotic cover. The proposed modification would not remove any good quality native vegetation, threatened ecological communities or threatened species. Given the limited habitat potential in the proposed modification area, no significant impacts on fauna habitats are anticipated.

Where possible, impacts to biological diversity and ecological integrity have been minimised as outlined in this addendum REF and the project REF.

8.2.4 Improved valuation, pricing and incentive mechanisms

Environmental and social issues were considered in the strategic planning and establishment of the need for the project, and in consideration of various project options. The value placed on environmental resources is evident in the extent of the planning and environmental investigations, and in the design of the proposed mitigation measures and safeguards.

Implementation of these mitigation measures and safeguards would result in an economic cost to Roads and Maritime, which would be included in both the capital and operating cost of the project.

8.3 Objects of the Airport Act

Table 8-2 identifies the objects of the Airports Act and their relevance to the proposed modification.

Table 8-2 Summary of Objects of the Airport Act

Object	Comment
To promote the sound development of civil aviation in Australia.	This clause is not directly relevant to the proposed modification – the proposed modification does not involve development of civil aviation.
To establish a system for the regulation of airports that has due regard to the interests of the airport users and the general community.	This addendum REF has been prepared in accordance with the Sydney Airport Master Plan and Environmental Strategy (refer to **Sections 4.5.1** and **4.5.2**).
To promote the efficient and economic development and operation of airports.	The project would not have a permanent negative impact on the efficient and economic development and operation of Sydney Airport. After construction, the project would facilitate an improved road network with improved travel times and distances also benefitting Sydney Airport-bound traffic.
To facilitate the comparison of airport performance in a transparent manner.	This clause is not directly relevant to the proposed modification – the proposed modification does not involve comparison or facilitate comparison of airport performance.
To ensure majority Australian ownership of airports.	This clause is not directly relevant to proposed modification.
To limit the ownership of certain airports by airlines.	This clause is not directly relevant to the proposed modification.
To ensure diversity of ownership and control of certain major airports.	This clause is not directly relevant to the proposed modification.
To implement international obligations relating to airports.	This clause is not directly relevant to the proposed modification.

8.4 Conclusion

The proposed modification is subject to assessment under Part 5 of the EP&A Act. This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed modification.

This has included consideration (where relevant) of conservation agreements and plans of management under the NPW Act, joint management and biobanking agreements under the TSC Act, wilderness areas, critical habitat, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the concept design development and options assessment. The proposed

modification as described in this addendum REF best meets the project objectives but would still result in some additional impacts on traffic flow, noise and vibration and temporary impacts to visual amenity. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The project would address road congestion and improve traffic flow. The proposed modification would further assist in addressing road congestion and traffic flow by providing additional traffic capacity and supporting neighbouring projects. On balance the proposed modification is considered justified and the following conclusions are made.

As the proposed modification is partially located on Commonwealth land leased to SACL, the proposed modification is subject to the Airports Act. An assessment on whether the proposed modification is a 'major airport development' under section 89(1) of the Airports Act was carried out, and is provided in full in **Appendix A**. The assessment concluded that the proposed modification does not meet the criteria for a major airport development, and therefore a major development plan under Section 89(1) of the *Airports Act 1996* is not required.

The Joyce Drive widening is identified as part of the five year ground transport plan for the Terminal 2/3 precinct in the *Sydney Airport Master Plan 2033*. The Master Plan recognises the heavy traffic volumes currently on Joyce Drive and that widening Joyce Drive would provide consistent traffic access to the airport and support the forecast growth in traffic. The proposed modification is therefore consistent with the Master Plan.

The proposed modification is consistent with the Sydney Airport Environment Strategy 2013-2018 and Airports (Environment Protection) Regulations 1997 as assessed in **Chapter 6** of this addendum REF.

Consent from SACL and a building activity approval from the Airport Building Controller (ABC) in accordance with section 2.02 of the Airports (Building Control) Regulations 1996 would be obtained prior to construction on Airport land.

Significance of impact under NSW legislation

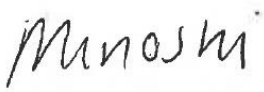
The proposed modification would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Part 5.1 of the EP&A Act. A Species Impact Statement is not required. The proposed modification is subject to assessment under Part 5 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposed modification is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of the Environment and Energy is not required.

9 Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.



Minoshi Weerasinghe
Environmental Planner
Jacobs
Date: 29 May 2017

I have examined this addendum review of environmental factors and accept it on behalf of Roads and Maritime Services.

Liam Sheridan
Project Development Manager
Roads and Maritime Services
Date:

10 References

Aurecon, 2016, *Airport East Precinct project – Addendum review of environmental factors*, prepared for Roads and Maritime, April 2016.

Austroads 2009a, *Austroads Guide to Road Design*.

Austroads 2009b, *Austroads Road Safety Audit Manual*.

Corkery Consulting and Studio Colin Polwarth, 2014, *WestConnex enabling works, Airport east precinct: Urban Design, Landscape Character and Visual Impact Assessment,* prepared for Roads and Maritime, July 2014.

Department of Environment and Climate Change (DECC) 2008a, *Soils and Construction – Managing Urban Stormwater,* Volume 2D, June 2008.

Department of Environment and Climate Change (DECC) 2009, *Interim Construction Noise Guideline*, July 2009.

Department of Premier and Cabinet 2011, *NSW 2021: A Plan to Make NSW Number One*, September 2011, Sydney.

Golden Mackay Logan 2009, *Sydney Airport Heritage Management Plan*, prepared for Sydney Airport Corporation Limited, June 2009.

Jacobs, 2014b, *Traffic and Transport Working Paper,* prepared for Roads and Maritime, October 2014.

Jacobs, 2015a, *WestConnex Enabling Works – Airport East Precinct*, prepared for Roads and Maritime, February 2015.

Jacobs 2015b, *Airport East precinct – WestConnex enabling works Submissions Report*, prepared for Roads and Maritime, August 2015.

Landcom, 2004, *Soils and Construction – Managing Urban Stormwater,* Volume 1.

MI Engineers 2014, *Construction Method Statement,* Prepared for Roads and Maritime Services, June 2014 (Volumes 1 and 2).

Pacific Environment Limited, 2016, *Airport East: General Holmes Drive Project – Detailed Design Operational and Construction Noise and Vibration Assessment*, June 2016.

Parsons Brinckerhoff 2016, *Airport North Precinct Upgrade – operational and construction noise and vibration assessment*, prepared for Roads and Maritime, May 2016.

Roads and Maritime, undated, *Roads and Maritime Road Design Guide*.

Roads and Maritime 2011a, *Roads and Maritime Services procedure for Aboriginal cultural heritage consultation and investigation*, November 2011.

Roads and Maritime 2011b, *Stockpile Management Guidelines*.

Roads and Maritime 2013b, *Environmental Impact Assessment Guidance Note: Guidelines for landscape character and visual impact assessment*.

Roads and Maritime 2016, Construction Noise and Vibration guideline

Roads and Traffic Authority 2010, Traffic Control at Works Sites Manual, June 2010.

Roads and Traffic Authority 2001, *Environmental Noise Management Manual*

SMEC 2014, *Biodiversity Assessment, WestConnex Enabling Works – Airport east precinct*, prepared for Roads and Maritime Services, June 2014.

Stedinger Associates, 2014, *WestConnex Enabling Works Airport East Precinct: Statement of Heritage Impact,* prepared for Roads and Maritime, June 2014.

Sydney Airport Corporation Limited (SACL), 2014, *Sydney Airport Environment Strategy 2013 – 2018.*

Sydney Airport Corporation Limited (SACL), 2014, *Sydney Airport Master Plan 2033*.

Wilkinson Murray 2016, *Joyce Drive Widening – assessment of noise impacts on proposed Mantra Hotel*, prepared for Roads and Maritime Services, March 2015.

Terms and acronyms used in this addendum REF

Term / Acronym	Description
AHIMS	Aboriginal Heritage Information Management System.
AQMP	Air Quality Management Plan.
ARI	Average recurrence interval.
ARTC	Australian Rail Track Corporation.
ASS	Acid sulfate soils
CBD	Central business district.
CEMP	Construction environment management plan.
CLM Act	*Contaminated Land Management Act 1997*.
DECC	NSW Department of Environment and Climate Change.
DIRD	Department of Infrastructure and Regional Development.
DPI	Department of Primary Industries.
DUAP	Department of Urban Affairs and Planning.
EIA	Environmental Impact Assessment.
EIS	Environmental Impact Statement.
EPA	NSW Environmental Protection Authority.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development.
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure) 2007. The objective of this SEPP is to facilitate the effective delivery of infrastructure across the State.
LEP	Local Environment Plan.
LGA	Local government area.

Term / Acronym	Description
MDP	Major development plan.
MNES	Matters of national environmental significance.
NAHMP	Non-Aboriginal Heritage Management Plan.
NEPH	Measurement for visibility collected using a nephelometer.
NES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
NPW Act	*National Parks and Wildlife Act 1974.*
NSW	New South Wales.
NVMP	Noise and Vibration Management Plan
OEH	Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water).
OLS	Obstacle limitation service.
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation.
PANS-OPS	Procedures for Air Navigational Services – Aircraft Operations
PEMP	Project environmental management plan.
POEO Act	*Protection of the Environment Operations Act 1997.*
REF	Review of Environmental Factors.
RTA	Roads and Traffic Authority (now Roads and Maritime).
SACL	Sydney Airport Corporation Ltd.
SEPP	State Environmental Planning Policy.
SWMP	Soil and Water Management Plan
SWSOOS	South West Suburbs Ocean Outfall Sewer.
TEC	Threatened ecological community.
TMP	Traffic management plan.
TSC Act	*Threatened Species Conservation Act 1995* (NSW).
WMP	Waste Management Plan

Appendix A

Checklists

Appendix A1: Assessment on whether the proposed modification is a 'major airport development'

Appendix A1: Assessment on whether the proposed modification is a 'major airport development'

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**
Airports Act s.89(1) Meaning of major airport development For the purposes of this Act, a *major airport development* is a development that is carried out at an airport site and that consists of:			
(a)	constructing a new runway	No	The proposed modification does not involve constructing a new runway.
(b)	extending the length of a runway; or	No	The proposed modification would not extend the length of a runway.
(ba)	altering a runway (other than in the course of maintenance works) in any way that significantly changes: flight paths; or the patterns or levels of aircraft noise; or	No	The project would require two one-week restrictions of the east-west runway, about six months apart. This would temporarily affect flight paths and patterns of aircraft noise for the areas. The noise sharing assessment has concluded that the additional noise impacts associated with redistributed flights as a result of the restrictions of the east-west runway is minor (refer to Section 7.2 of the project REF). The assessment found that the noise impacts and the changes to flight paths would not be significant. The proposed modification would not change these requirements by the project.
(c)	constructing a new building wholly or principally for use as a passenger terminal, where the building's gross floor space is greater than 500 square metres; or	No	The proposed modification does not involve construction of any buildings for use as a passenger terminal.
(d)	extending a building that is wholly or principally for use as a passenger terminal, where the extension increases the building's gross floor space by more than 10%; or	No	The proposed modification does not involve extension of any passenger terminals.
(e)	constructing a new building, where: (i) the building is not wholly or principally for use as a passenger terminal; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed; or	No	No new buildings would be constructed as part of the proposed modification.
(f)	constructing a new taxiway, where: (i) the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed; or	No	The proposed modification does not involve constructing a new taxiway.

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**
(g)	extending a taxiway, where: (i) the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed; or	No	The proposed modification does not involve extending a taxiway.
(h)	constructing a new road or new vehicular access facility, where: (i) the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed; or	No	The project involves extending the Wentworth Avenue access road to form a new intersection with General Holmes Drive. The total cost of construction for the project would exceed $20 million. However, the construction of this road would not significantly increase the capacity of the airport to handle movements of passengers, freight or aircraft; rather the project would only increase the capacity of the road network to meet predicted traffic volumes for 2018 (refer to Section 5.2.1 of the project REF). The proposed modification would not change this.
(j)	extending a road or vehicular access facility, where: (i) the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed; or	No	The proposed modification would involve widening Joyce Drive. The total cost of construction for the project is expected to exceed $20 million. However, construction of the project would not significantly increase the capacity of the airport to handle movements of passengers, freight or aircraft. The project has been designed to cater for the increase in general traffic to improve the level of service on these roads.
(k)	constructing a new railway or new rail handling facility, where: (i) the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed	No	The proposed modification does not involve constructing a new railway or new rail handling facility.
(l)	extending a railway or rail handling facility, where: (i) the extension significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and (ii) the cost of construction exceeds $20 million or such higher amount as is prescribed	No	The proposed modification does not involve extending a railway or a rail handling facility.

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**
(m)	a development of a kind that is likely to have significant environmental or ecological impact; or	No	The environmental assessment carried out in this addendum REF has confirmed that the proposed modification would not have a significant environmental or ecological impact during construction or operation (refer to **Section 6**).
(n)	a development which affects an area identified as environmentally significant in the environment strategy; or	No	The proposed modification would not affect any areas identified as environmentally significant. The proposed modification would not discharge into the Sydney Airport Wetlands, which is the main area of natural biodiversity near the Airport.
(na)	a development of a kind that is likely to have a significant impact on the local or regional community; or	No	Socio-economic impacts associated with the project have been assessed in Section 7.13 of the project REF. The proposed modification would not have a significant impact on the local or regional community.
(nb)	a development in relation to which the Minister has given an approval under section 89A	No	The Minister has not given approval to the project under section 89A of the Airports Act.
(o)	a development of a kind specified in the regulations	No	This proposed modification is not a development of a kind specified in the regulations for which a major development plan would need to be prepared.
Airports Act 1996 – Sect 89, item (4)			
(4)	Airports Act 1996 – Sect 9, item (4). The Minister may determine in writing that specified developments that are carried out at an airport site together constitute a major airport development if: Each individual development is : covered by subparagraph (1)(e)(i), (f)(i), (g)(i), (h)(i), (j)(i), (k)(i) or (l)(i); but not covered by subparagraph (1)(e)(ii), (f)(ii), (g)(ii),(h)(ii), (j)(ii), (k)(ii) or (l)(ii); and the developments are: consecutive or concurrent projects; or extensions to existing buildings.	No	The proposed modification does not involve multiple specified developments. Furthermore, the proposed modification does not meet criteria specified in (1)(e)(i), (f)(i), (g)(i), (h)(i), (j)(i), (k)(i) or (l)(i). The purpose of the proposed modification is not to increase the capacity of the airport, rather to meet the projected demand in general traffic for the project area. The cost of construction for the project exceeds $20 million.

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**
	"Significant Impact on Local/ Regional Community" Guide - January 2012	Y/N/NR	In consideration of the significant impact guidelines and significant impact on local/regional community guide, there was found to be no significant impact as a result of the project (refer Chapter 7 of the project REF). The proposed modification would not change this result
Potential impacts include:			
(a)	Noise	No	Noise and vibration generated during construction and operation of the proposed modification would be managed with environmental safeguards and management measures detailed in **Chapter 7**, and therefore would not be significant.
(b)	odour	No	The proposed modification would not generate odour.
(c)	dust or other physical intrusions	No	Dust generated during construction of the proposed modification would be managed with environmental safeguards and management measures, and therefore would not be significant.
(d)	noticeable traffic impacts such as increased traffic congestion at certain times or an increase in heavy vehicle traffic	No	The proposed modification would not have a significant impact to traffic flows during construction with the implementation of appropriate traffic control measures and by maintaining through traffic during peak periods. Cumulative traffic impacts during construction would be managed through consultation and collaboration with other projects in the area. Furthermore, the operation of the project would improve traffic flows, network performance and reduce travel times within the project area.
(e)	impacts on public transport linkages or services	No	The project would maintain public transport infrastructure within the area. The improvement to the network performance, traffic flows and travel times is likely to have a positive flow-on effect to bus services that pass through the project area.

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**
(f)	commercial impacts affecting the viability of business centres in the surrounding areas	No	The project and proposed modification would not reduce the viability of business centres in the surrounding areas.
(g)	lighting impacts on residential areas or other businesses	No	The proposed modification would not affect lighting on any residential areas or other businesses.
(h)	hazardous materials or dangerous goods	No	The proposed modification would not generate any hazardous materials or dangerous goods.
(i)	impacts on implementation of local and regional planning schemes, including land use and transport planning	No	The proposed modification has been reviewed against the Botany Bay Local Environmental Plan 2013 and Sydney Airport Master Plan objectives (refer to **Section 4.3.2** and **4.5.1**). The review has found that the proposed modification is consistent with the objectives of the zones that it is located within.
(j)	impacts on the safety, security or amenity of local communities	No	The project would have a beneficial impact on the safety of the local community, by improving traffic flow.
(k)	impediments to emergency planning and response access or services	No	Improvements to the road network such as reduced travel times and improved traffic flows would have positive flow-on benefits to access for emergency services through the project area.
Airports should ask themselves the following questions:			

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**
(l)	Is the type of development proposed of known concern to the community or government?	No	Several years ago, Sydney Airport undertook a project to construct a runway end safety area (RESA) at the western end of the east-west runway. This resulted in the operation of that runway being affected for around 18 months which, in turn, resulted in a significant change to the distribution of aircraft noise around the airport. At the time, this concerned many in the community. However, as outlined in the reasons for section 89(1)(ba) above, with respect to this project, the additional noise impacts associated with this project are expected to be minor. This is because the period during which runway operations will be affected is significantly less than occurred for the RESA project. The Sydney Airport Community Forum was briefed about the project at its meeting on 21 November 2014. No concerns were raised by the forum.
(m)	Is the proposed development in conflict with planning schemes for the local and regional communities surrounding the airport?	No	Not applicable.
(n)	Have similar types of development raised substantial community concerns in the past?	No	See response to paragraph (l) above.
(o)	Are there any other potential community impacts	No	Other potential community impacts are addressed elsewhere in this table.
Dealing with cumulative impacts Intermittent and cumulative effects need to be considered and if the proposed development is to be undertaken in stages over a period of time, the impacts of the development once completed need to be considered, even if the potential impacts will not be evident in the first instance.			
(p)	Will the development be undertaken in stages over a period of time?	No	

ASSESSMENT ON WHETHER THE PROPOSED MODIFICATION IS A 'MAJOR AIRPORT DEVELOPMENT'			
	Development type	**Y/N/NR**	**Reason**

External consultation

The Guidelines indicate that:

Airport lessee companies should undertake early consultation with their local consultation groups to allow a reasonable time for issues to be worked through and to avoid delays to development schedules. Effective consultation arrangements will be an important part of the process of identifying whether potential impacts are significant enough to warrant a major development plan process.

For Sydney Airport, the following need to be consulted as part of the process of deciding whether or not the proposed development is of a kind that is likely to have a significant impact on the local or regional community:

Sydney Airport Community Forum

Planning Coordination Forum

City of Sydney Council, City of Botany Bay Council, Marrickville Council; and Rockdale City Council

Other people or bodies as appropriate.

To enable the consultation to be meaningful, the following information will need to be provided to the stakeholder:

A full description of the proposed development, where it is proposed to occur on the airport site and the expected timeframe. Maps, diagrams or a photo montage showing the proposal are recommended;

A preliminary list of the anticipated environmental and/or community impacts associated with the development. Refer to paragraphs (a) to (o) above as a guide to what should be included. These should address impacts associated with construction and any impacts expected to occur once the development is operational; and

Where negative impacts are anticipated, a description of what action(s) will be undertaken to ameliorate those impacts (both during construction and once operational).

Stakeholders should be given a period of not less than two weeks in which to provide their comments (and preferably more). This will allow time to brief them directly if needed. The feedback received should be assessed to gauge the likely level of community concern about the proposed development.

Appendix A2: Considerations under the EPBC Act and administrative guidelines

Matters to be considered	Consideration
Environmental context	
a). What are the components or features of the environment in the area where the action will take place?	The proposed modification is located in an area that is heavily urbanised, with residential, commercial, transport infrastructure and light industrial land uses. Four listed heritage items are located next to or within the proposed modification. No natural features are located directly within or adjacent to the proposed modification. Plantings in the proposed modification area are limited to roadside plantings of native and exotic species.
b). Which components or features of the environment are likely to be impacted?	The local road network, the local visual and noise environment and Commonwealth land would be affected by the construction and operation of the proposed modification, as documented and assessed in this addendum REF.
c). Is the environment which is likely to be impacted, or are elements of it, sensitive or vulnerable to impacts?	Construction at night may result in noise impacts on nearby sensitive receivers (refer to **Section 6.3**). Temporary and short-term road closures would result in some land traffic and transport impacts to road users (refer to **Section 6.2**).
Is the environment, or are components of it, rare, endemic, unusual, important or otherwise valuable.	The proposed modification is located in an area that is heavily urbanised, with residential, commercial, transport infrastructure and light industrial land uses. The environment that the proposed modification is located within is not and does not contain components that are rare, endemic, unusual, important or otherwise valuable.
d). What is the history, current use and condition of the environment which is likely to be impacted?	The historical use of the project area has focused on transport (roads). The current use of the project area is consistent with its historical use. The condition of the environment which is likely to be impacted by the action is outlined in **Chapter 6**.
Potential impacts	
a). What are the components of the action?	As described in **Chapter 3**, the key elements of the proposed modification are: • Widening about 190 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot and converting two through lanes to three through lanes eastbound, converting two right turn lanes to through lanes westbound and lengthening two left turn lanes from Joyce Drive into Sir Reginald Ansett Drive to the east. This would involve widening Joyce Drive to the southern side and relocating the central median to allow for additional through lanes and lane reconfiguration • Upgrading and adjusting the Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive intersection to cater for the additional through lanes • Removing the existing pedestrian path on the northern and southern side of Joyce Drive • Relocation of utilities • Demolishing an existing drainage pipe and pits on the southern side of Joyce Drive and replacing with a new drainage pipe and pits • Landscaping and replanting on road verges.
b). What are the predicted adverse impacts associated with the action including indirect consequences	The construction and operation of the proposed modification would result in both positive and negative impacts within Commonwealth land, as outlined in **Chapter 6**. During construction, the unavoidable impacts of the proposed modification would relate to: • Traffic – construction would generate additional traffic on roads within airport/Commonwealth land, which may delay access to Sydney Airport. Construction speed zones may also lengthen travel times • Ecology – clearing of urban native and exotic vegetation on the southern side of Joyce Drive.

Matters to be considered	Consideration
	During construction, the potential impacts of the proposed modification would relate to: • Soil and groundwater contamination – contamination from existing fill and building materials and construction activities and exposure of acid sulfate soils • Surface water and ground water quality – pollution of receiving waters from erosion and sedimentation and pollution of groundwater from construction activities, and potential pollution of groundwater from potential acid sulfate soils • Noise – exceedances of noise management levels at residences and non-residential properties as a result of night-time construction and/or runway closures • Air quality – potential generation of dust during initial site work and excavation • Ecology – clearing of urban exotic and native vegetation • Visual amenity – impacts on views from the local environment. During operation, the benefits of the project and proposed modification would include: • Improved traffic flow and traffic capacity within the project area, which would improve access to Sydney Airport During operation, the potential impacts of the proposed modification would be: • Soil and groundwater contamination from spills or leaks • Pollution of receiving waters by stormwater runoff.
c). How severe are the potential impacts	The potential impacts will be largely confined to the construction period. Construction of the project has commenced and expected to finish in 2018. Whether identified as avoidable or potential, all impacts are assessed to be low to moderate. All potential impacts would be able to be appropriately mitigated (refer to **Chapter 7**).
Impact avoidance and mitigation	
Will any measures to avoid or mitigate impacts ensure with a high degree of certainty that impacts are not significant?	The options development and concept design development processes have sought to avoid adverse impacts through the design process. During detailed design, wherever possible, refinements would be made to the concept design to further reduce potential adverse impacts and to incorporate environmentally beneficial design features. This addendum REF documents environmental management measures to mitigate remaining environmental impacts of the proposed modification. These measures are listed in **Chapter 7**. With the implementation of management measures and avoiding a large number of potential impacts, this addendum REF finds that the environmental impacts of the proposed modification are not likely to be significant.
Are the impacts significant?	
Is the action likely to have a significant impact on the environment?	No. The proposed modification is not likely to have any significant impact on the environment of Commonwealth land. Accordingly, a referral to the Commonwealth Department of the Environment is not required.
Further, the following criteria are intended to provide general guidance on the types of actions likely to have a significant impact on the environment. If you answer “yes” to one or more of the questions below then it would be expected that your action is likely to have a significant impact on the environment.	The criteria listed below have been considered and potential impacts are outlined in **Chapter 6** of this addendum REF. With the implementation of mitigation measures outlined in **Chapter 7** to avoid or minimise impacts, proposed modification is unlikely to have any significant impacts on the environment.

Matters to be considered	Consideration
Impact on landscapes and soils	No. The proposed modification would not have a significant impact on these environmental factors as discussed in **Chapter 6** of this addendum REF.
Impacts on coastal landscapes and processes	
Impacts on ocean forms, ocean processes and ocean life	
Impacts on water resources	
Pollutants, chemicals, and toxic substances	
Impacts on plants	
Impacts on animals	
Impacts on people and communities	
Impacts on heritage	

Appendix B

Concept design

Notes

LEGEND

- PROJECT 6 DESIGN
- AIRPORT EAST DESIGN
- MOTT MACDONALD DESIGN

1:250 0 12.5m 25m

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	13.02.17	DPT	FOR REVIEW & COORDINATION	AL	NW
P3	08.02.17	DPT	ISSUED FOR REVIEW	AL	NW
P2	23.12.16	DPT	ISSUED FOR REVIEW	AL	NW
P1	22.12.16	DPT	ISSUED FOR REVIEW	AL	NW

MOTT MACDONALD

Level 10, 383 Kent Street
Sydney, NSW 2000
Australia
PO Box Q1678, QVB Sydney
NSW 1230, Australia
T +61 (0)2 9098 6800
W www.mottmac.com

Client

Transport Roads & Maritime Services
NSW GOVERNMENT

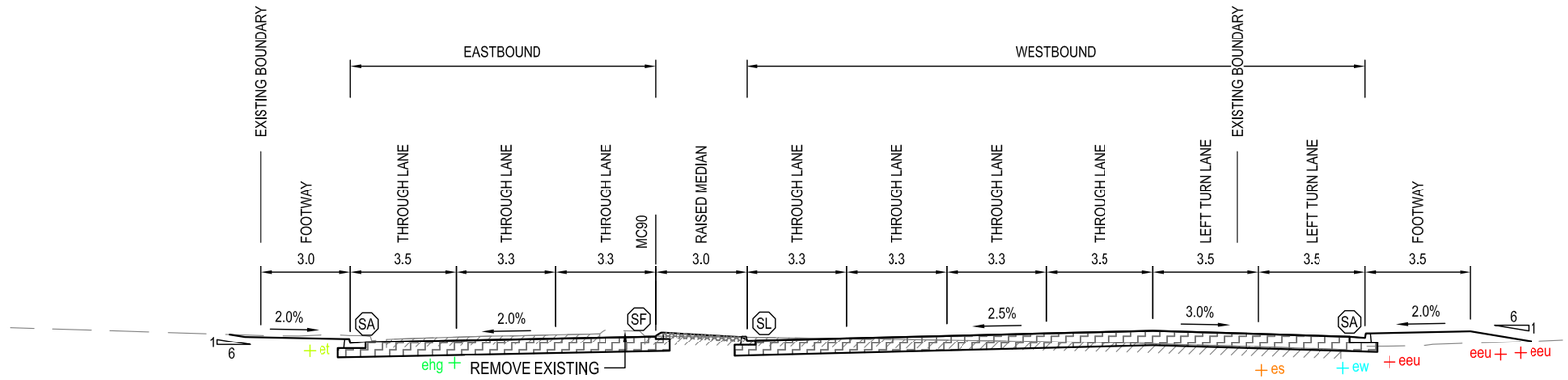
Title

MR658 - O'RIORDAN STREET
AIRPORT NORTH PRECINCT
FROM BOURKE RD TO QANTAS DR
JOYCE DR
TURNING LANE ADJUSTMENTS

Designed	AL		Eng check	AA	
Drawn	DPT		Coordination		
Dwg check	AL		Approved	NW	
Scale at A0	Status		Rev	Security	
1:250	PRE		P4	STD	

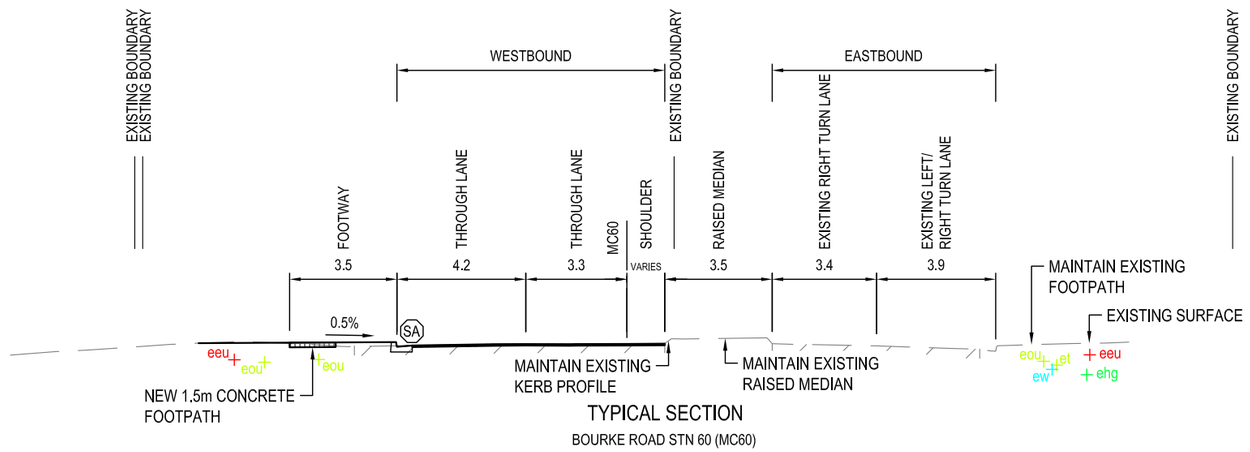
Drawing Number
375212-MMD-DD-C-SK-XX-0110

Preliminary - Not for Construction



TYPICAL SECTION

JOYCE DRIVE STN 410 (MC90)



TYPICAL SECTION

BOURKE ROAD STN 60 (MC60)

NOTES:

1. FOR NOTES AND LEGEND REFER TO SHEET RD-0010

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0010-RD-0060.dwg				DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING DES APT NTH OPT1		PLOT DATE / TIME 19/5/2016 12:04:44 PM		PLOT BY dub76827
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING 0 2.5 5 7.5 SECTION 1:200	DRAWINGS / DESIGN PREPARED BY Mott MacDonald	TITLE	NAME	DATE
370109-MMD-DD-C-M2_TYPICAL CROSS SECTIONS	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS			DRAWN	T. MURRAY	29.04.16
								DRG CHECK	J. REES	29.04.16
								DESIGN	M. DUBBELAAR	29.04.16
								DESIGN CHECK	J. REES	29.04.16
								DESIGN MNGR	R. MACKAY	29.04.16
								PROJECT MNGR	V. SOFREVSKI	29.04.16

		CO-ORDINATE SYSTEM MGA ZONE 56	HEIGHT DATUM AHD	MM DRAWING NUMBER 370109-MMD-DD-C-DR-0010-RD-0060	

CLIENT: NSW Government — Transport Roads & Maritime Services

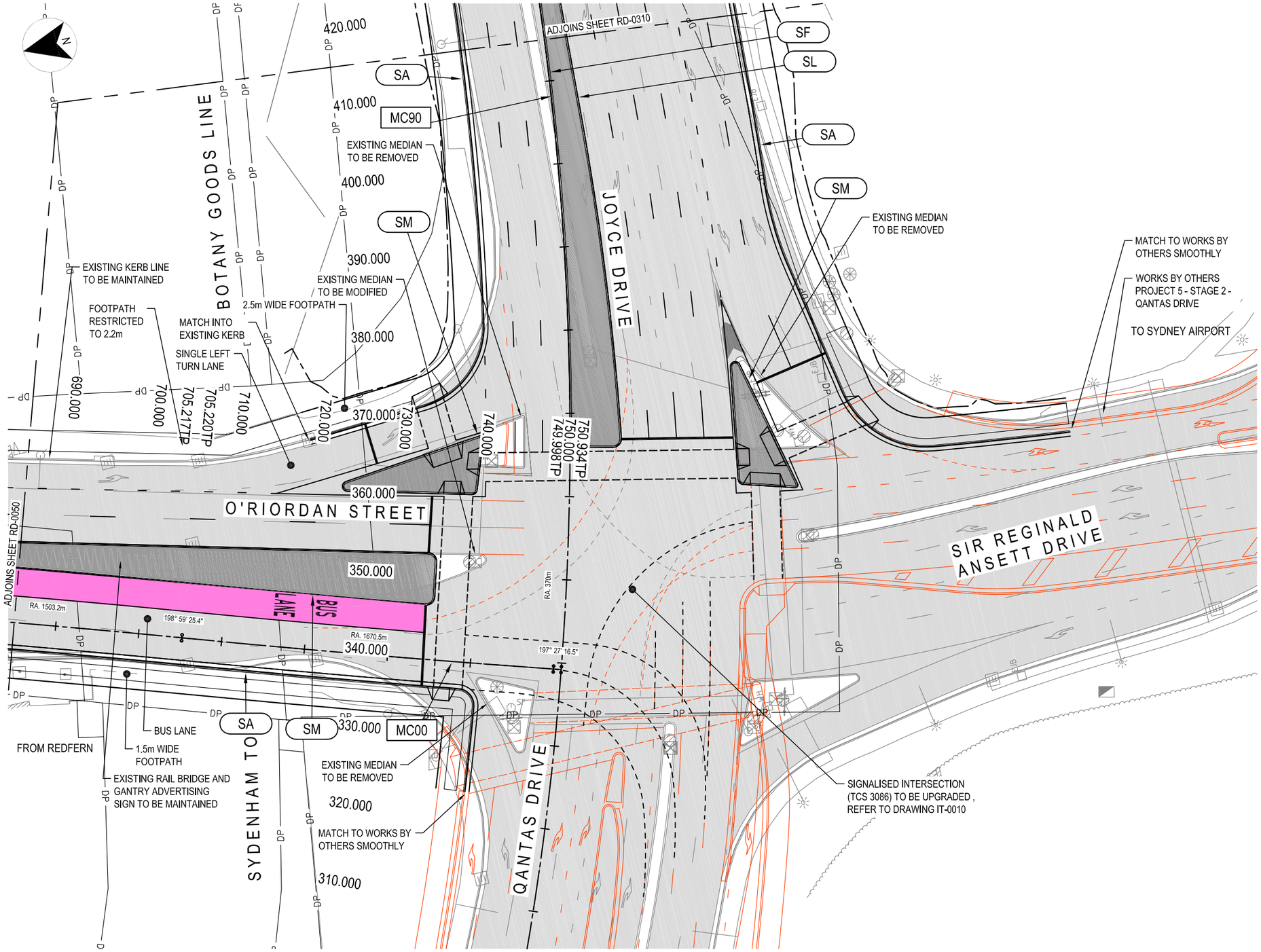
PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
TYPICAL CROSS SECTIONS

A3

SHEET 6 OF 6

RMS REGISTRATION No.			PART
DS2016 / 001133			01
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
PRELIMINARY DETAILED DESIGN		RD-0006	0



ROADWORKS LEGEND

- EXISTING CADASTRAL BOUNDARY
- NEW ROAD BOUNDARY
- CONSTRUCTION BOUNDARY
- EXISTING TREE TO BE REMOVED
- EXISTING WATER COURSE
- EXISTING EDGE OF GARDEN
- EXISTING FENCE
- EXISTING MANPROOF FENCE
- EXISTING GATE
- EXISTING PAVEMENT
- EXISTING STRUCTURE TO BE DEMOLISHED
- XX — DENOTES KERB TYPE. REFER TO RMS STANDARD DRAWING NO MD.R15.A01.A.2
- MCXX — DENOTES ALIGNMENT CONTROL
- SYDNEY AIRPORT PROJECT 5 - STAGE 2 - QANTAS DRIVE
- AIRPORT EAST PRECINCT - RMS REGISTRATION NO. DS2015/002753

NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT RMS STANDARDS UNLESS OTHERWISE STATED. AUSTRALIAN STANDARDS ARE TO BE USED IN OTHER INSTANCES.
2. PROVISION FOR TRAFFIC DURING CONSTRUCTION TO BE IN ACCORDANCE WITH RMS SPECIFICATION G10.
3. PROVIDE LIPLESS KERB RAMPS AT PEDESTRIAN CROSSING POINTS IN ACCORDANCE WITH MD.173.B01
4. MAKE SMOOTH CONNECTION WITH EXISTING AT LIMIT OF WORKS
5. SEE SEPARATE PROPERTY DRAWINGS FOR ADJUSTMENTS IDENTIFIED BY PROPERTIES MARKED.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0050-RD-0060.dwg
DESIGN LOT CODE	
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	DES APT NTH OPT1
PLOT DATE / TIME	19/5/2016 12:05:59 PM
PLOT BY	dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES 370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_DESIGN LINEMARKING 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN 370109-SAC-DD-C-M2_ASBUILT SURVEY 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 1 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 2	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM	HEIGHT DATUM
MGA ZONE 56	AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0050-RD-0060

	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

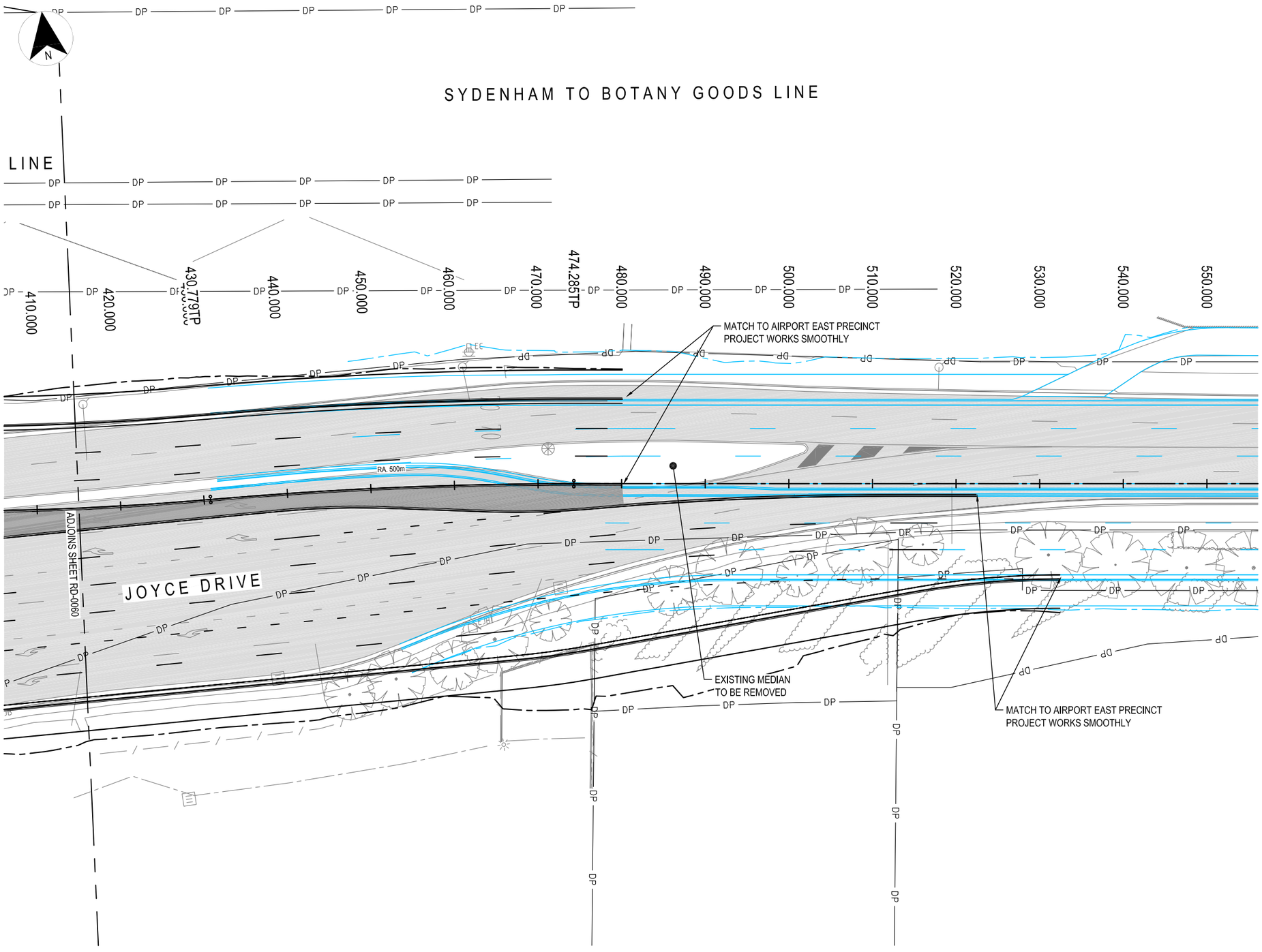
PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES FROM BOURKE ROAD TO QANTAS DRIVE ROADWORKS
O'RIORDAN STREET - STN 685.000 TO STN 750.934

A3 — SHEET 6 OF 10

RMS REGISTRATION No.: DS2016 / 001133 — PART 01

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
PRELIMINARY DETAILED DESIGN		RD-0060	0



ROADWORKS LEGEND

- EXISTING CADASTRAL BOUNDARY
- NEW ROAD BOUNDARY
- CONSTRUCTION BOUNDARY
- EXISTING TREE TO BE REMOVED
- EXISTING WATER COURSE
- EXISTING EDGE OF GARDEN
- EXISTING FENCE
- EXISTING MANPROOF FENCE
- EXISTING GATE
- EXISTING PAVEMENT
- EXISTING STRUCTURE TO BE DEMOLISHED
- XX — DENOTES KERB TYPE. REFER TO RMS STANDARD DRAWING NO MD.R15.A01.A.2
- MCXX — DENOTES ALIGNMENT CONTROL
- SYDNEY AIRPORT PROJECT 5 - STAGE 2 - QANTAS DRIVE
- AIRPORT EAST PRECINCT - RMS REGISTRATION NO. DS2015/002753

NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT RMS STANDARDS UNLESS OTHERWISE STATED. AUSTRALIAN STANDARDS ARE TO BE USED IN OTHER INSTANCES.
2. PROVISION FOR TRAFFIC DURING CONSTRUCTION TO BE IN ACCORDANCE WITH RMS SPECIFICATION G10.
3. PROVIDE LIPLESS KERB RAMPS AT PEDESTRIAN CROSSING POINTS IN ACCORDANCE WITH MD.173.B01
4. MAKE SMOOTH CONNECTION WITH EXISTING AT LIMIT OF WORKS
5. SEE SEPARATE PROPERTY DRAWINGS FOR ADJUSTMENTS IDENTIFIED BY PROPERTIES MARKED.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0050-RD-0310.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:06:47 PM

PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES 370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_DESIGN LINEMARKING 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN 370109-SAC-DD-C-M2_ASBUILT SURVEY 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 1 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 2	0	19.05.16	PRELIMINARY DETAILED DESIGN		V.JS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0050-RD-0310

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES FROM BOURKE ROAD TO QANTAS DRIVE ROADWORKS
JOYCE DRIVE - STN 415.000 TO STN 550.000

A3

SHEET 10 OF 10

RMS REGISTRATION No.: DS2016 / 001133

PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN

EDMS No.:

SHEET No.: RD-0310

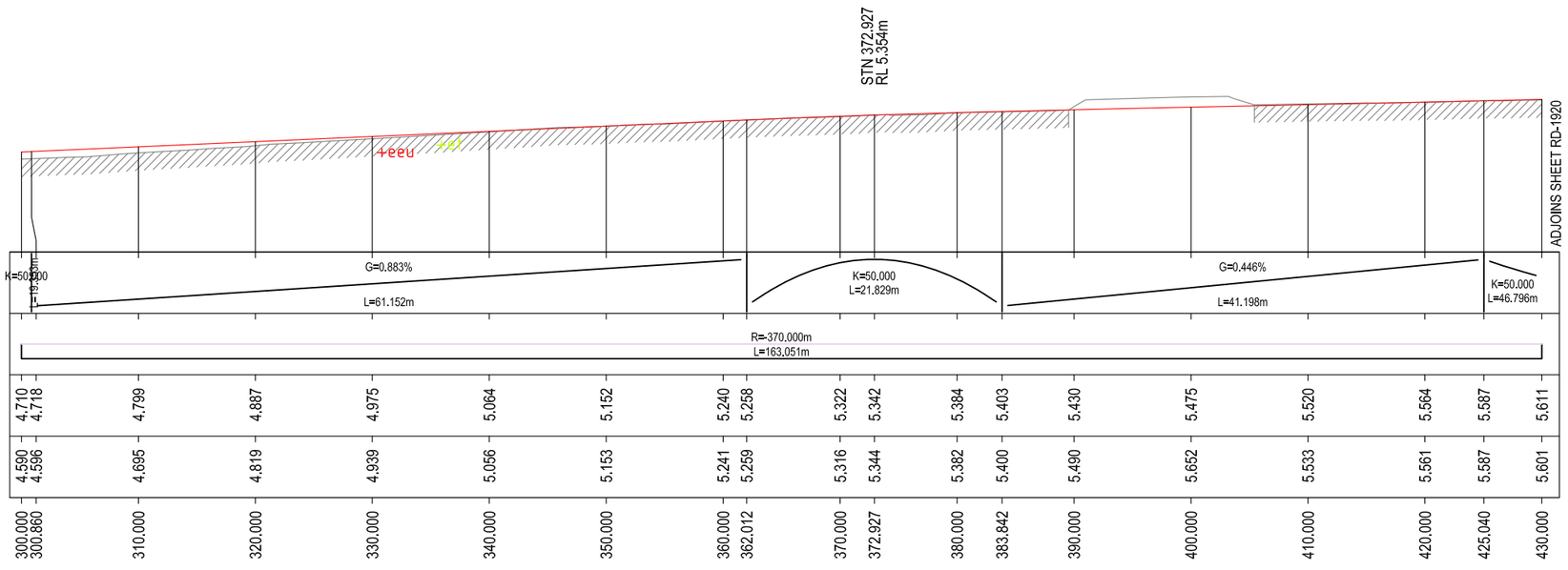
ISSUE: 0

NOTES:

1. UTILITIES HAVE BEEN SHOWN FOR INFORMATION PURPOSES ONLY. UTILITIES HAVE BEEN MODELLED BASED ON DBYD AND SURVEY LOCATOR INFORMATION. FOR DETAILS OF PROTECTION AND UTILITY TREATMENT REFER TO UTILITIES DESIGN PACKAGES.
2. FOR UTILITY LEGEND REFER TO SHEET UT-1010
3. FOR GENERAL NOTES REFER TO SHEET GE-0110 AND GE-0120

LEGEND

- EXISTING SURFACE
- DESIGN SURFACE
- EXISTING ROAD PAVEMENT



LONGITUDINAL SECTION ALONG JOYCE DRIVE - CONTROL LINE MC90

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0060-RD-9010.dwg				DESIGN LOT CODE		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1	PLOT DATE / TIME: 19/5/2016 12:08:09 PM — PLOT BY: dub76827
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY
370109-MMD-DD-C-M2_LS MC90 H1_500 V1_100-0001	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS	0 1 2 3 4 VERTICAL 1:100; 0 5 10 15 20 HORIZONTAL 1:500	Mott MacDonald
						CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD	MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0060-RD-9010

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
LONGITUDINAL SECTION
CONTROL LINE MC90 - JOYCE DRIVE

A3

SHEET 1 OF 2

RMS REGISTRATION No.: DS2016 / 001133 — PART 01

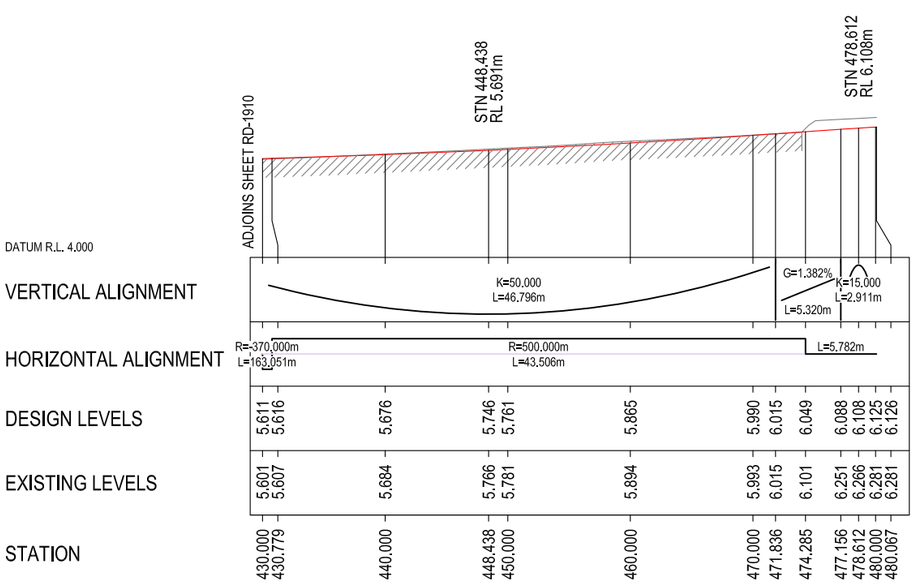
ISSUE STATUS: PRELIMINARY DETAILED DESIGN — EDMS No. — SHEET No.: RD-1910 — ISSUE 0

NOTES:

1. UTILITIES HAVE BEEN SHOWN FOR INFORMATION PURPOSES ONLY. UTILITIES HAVE BEEN MODELLED BASED ON DBYD AND SURVEY LOCATOR INFORMATION. FOR DETAILS OF PROTECTION AND UTILITY TREATMENT REFER TO UTILITIES DESIGN PACKAGES.
2. FOR UTILITY LEGEND REFER TO SHEET UT-1010
3. FOR GENERAL NOTES REFER TO SHEET GE-0110 AND GE-0120

LEGEND

- EXISTING SURFACE
- DESIGN SURFACE
- EXISTING ROAD PAVEMENT



LONGITUDINAL SECTION ALONG JOYCE DRIVE - CONTROL LINE MC90

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY	CLIENT
C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0060-RD-9020.dwg		DES APT NTH OPT1	19/5/2016 12:08:14 PM	dub76827	Transport Roads & Maritime Services

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_LS MC90 H1_500 V1_100-0002	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING
0 1 2 3 4
VERTICAL 1:100
0 5 10 15 20
HORIZONTAL 1:500

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0060-RD-9020

	TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

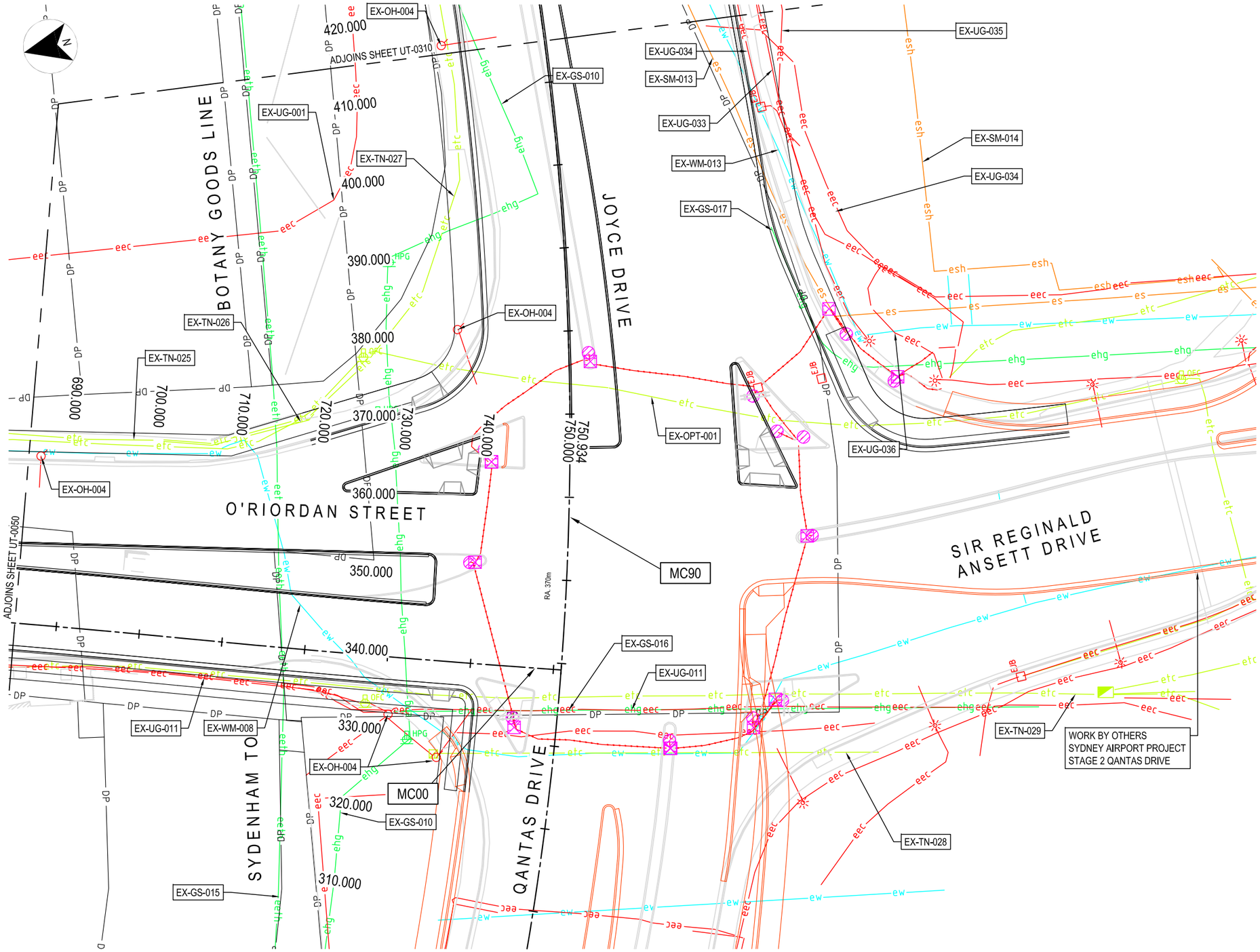
PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
LONGITUDINAL SECTION
CONTROL LINE MC90 - JOYCE DRIVE

A3

SHEET 2 OF 2

RMS REGISTRATION No.			PART
DS2016 / 001133			01
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
PRELIMINARY DETAILED DESIGN		RD-1920	0



NEW UTILITIES LEGEND

- G — GAS MAIN
- HG — HIGH PRESSURE GAS MAIN
- E — ELECTRICAL
- T — TELSTRA, OPTUS, PRIMUS
- W — WATER MAIN
- CONCRETE SLAB PROTECTION
- EX-SM-001 — ADJUSTMENT ID PUBLIC UTILITY

NOTES

1. ATTENTION IS DIRECTED TO THE POSSIBLE EXISTENCE OF UNDERGROUND UTILITIES NOT SHOWN ON THE DRAWINGS, OR AT LOCATIONS OR ELEVATIONS DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS. THE EXACT LOCATION OF EACH UNDERGROUND UTILITY SHALL BE VERIFIED ON SITE PRIOR TO DOING ANY WORK THAT MAY DAMAGE SUCH UTILITY.
2. FOR DETAILS OF PUBLIC UTILITY ADJUSTMENTS INCLUDING MITIGATION STRATEGY, REFER TO SHEET UT-2010 TO UT-2050
3. FOR EXISTING SERVICES LEGEND REFER TO SHEET UT-1010
4. FOR STORMWATER WORKS REFER TO SHEET SM-0010 TO SM-0310
5. FOR ELECTRICAL WORKS ASSOCIATED WITH EXISTING TRAFFIC SIGNALS REFER TO SHEET IT-0010 TO IT-0040

UTILITY DISCLAIMER

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

DIAL BEFORE YOU DIG www.1100.com.au

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0100-UT-0060.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:13:24 PM

PLOT BY: dub76827

EXTERNAL REFERENCE FILES
370109-MMD-DD-C-M2_DESIGN BOUNDARIES
370109-MMD-DD-C-M2_DESIGN ROAD
370109-MMD-DD-C-M2_DESIGN UTILITIES
370109-MMD-DD-C-M2_EXISTING BOUNDARIES
370109-MMD-DD-C-M2_EXISTING STORMWATER 1_500
370109-MMD-DD-C-M2_EXISTING SURVEY
370109-MMD-DD-C-M2_EXISTING UTILITIES
370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN
370109-SAC-DD-C-M2_ASBUILT SURVEY

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0100-UT-0060

	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
PUBLIC UTILITY PLAN
O'RIORDAN STREET - STN 685.000 TO STN 750.934

A3

SHEET 6 OF 10

RMS REGISTRATION No.: DS2016 / 001133

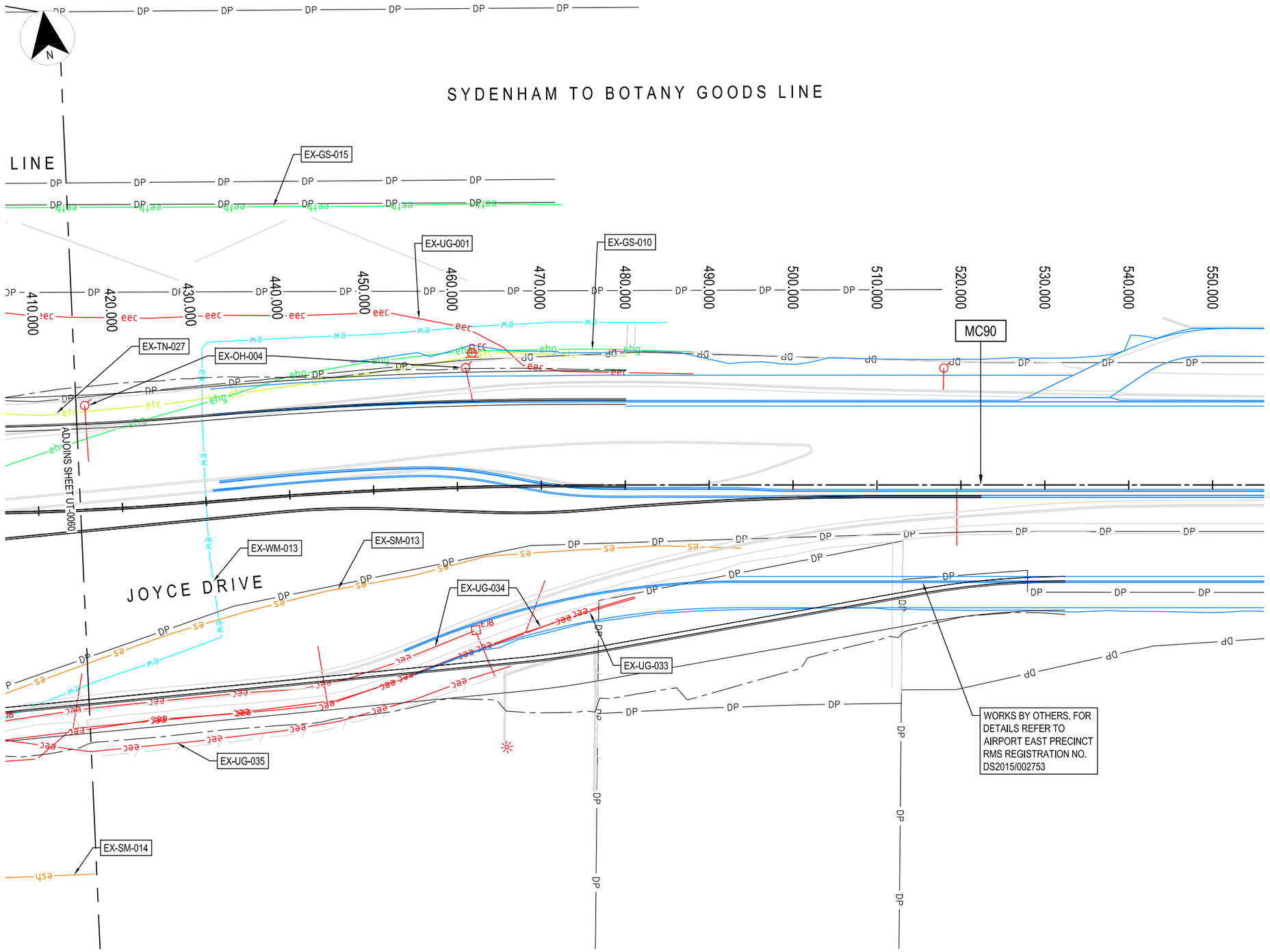
PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN

EDMS No.:

SHEET No.: UT-0060

ISSUE: 0



NEW UTILITIES LEGEND

- G — GAS MAIN
- HG — HIGH PRESSURE GAS MAIN
- E — ELECTRICAL
- T — TELSTRA, OPTUS, PRIMUS
- W — WATER MAIN
- CONCRETE SLAB PROTECTION
- EX-SM-001 — ADJUSTMENT ID PUBLIC UTILITY

NOTES

1. ATTENTION IS DIRECTED TO THE POSSIBLE EXISTENCE OF UNDERGROUND UTILITIES NOT SHOWN ON THE DRAWINGS, OR AT LOCATIONS OR ELEVATIONS DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS. THE EXACT LOCATION OF EACH UNDERGROUND UTILITY SHALL BE VERIFIED ON SITE PRIOR TO DOING ANY WORK THAT MAY DAMAGE SUCH UTILITY.
2. FOR DETAILS OF PUBLIC UTILITY ADJUSTMENTS INCLUDING MITIGATION STRATEGY, REFER TO SHEET UT-2010 TO UT-2050
3. FOR EXISTING SERVICES LEGEND REFER TO SHEET UT-1010
4. FOR STORMWATER WORKS REFER TO SHEET SM-0010 TO SM-0310
5. FOR ELECTRICAL WORKS ASSOCIATED WITH EXISTING TRAFFIC SIGNALS REFER TO SHEET IT-0010 TO IT-0040

UTILITY DISCLAIMER

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

DIAL BEFORE YOU DIG www.1100.com.au

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0100-UT-0310.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:14:02 PM — PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES 370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_DESIGN UTILITIES 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING STORMWATER 1_500 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-MMD-DD-C-M2_EXISTING UTILITIES 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN 370109-SAC-DD-C-M2_ASBUILT SURVEY	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0100-UT-0310

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW Government — Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
PUBLIC UTILITY PLAN
JOYCE DRIVE - STN 415.000 TO STN 550.000 — SHEET 10 OF 10

A3

RMS REGISTRATION No.: DS2016 / 001133 — PART 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN — EDMS No. — SHEET No.: UT-0310 — ISSUE 0

EXISTING UTILITIES

ELECTRICITY

- ELECTRICITY CONDUIT — eec
- ELECTRICITY TRAFFIC CONDUIT — TS
- GARDEN LIGHT — EGL
- POLE - POWER — EP
- POLE - POWER AND LIGHT
- LIGHT WITH OUTREACH
- POLE - LIGHT
- ELECTRICAL - MAIN SUMP / CABINET
- ELEC. CABLE MANHOLE — EMH
- ELEC. CABLE MARKER — EC
- ELEC. CABLE JUNCTION BOX — EJB
- TRAFFIC SIGNAL JUNCTION BOX
- TRAFFIC CONTROL SIGNAL
- TRAFFIC LIGHT WITH OUTREACH
- TRAFFIC SIGNAL CONTROLLER — TSC

GAS

- ETHANE PIPELINE — eeth
- GAS MAIN — eg
- HIGH PRESSURE GAS PIPELINE — ehg
- GAS VALVE BOX
- HIGH PRESSURE GAS PIPELINE MARKER — HPG
- GAS METER
- GAS PIPELINE MARKER — GP
- GAS TEST POINT

TELECOMS

- OPTICAL FIBRE CONDUIT — eoc
- TELEPHONE CONDUIT — etc
- TELEPHONE SINGLE CONCRETE PIT
- TELEPHONE TWIN CONCRETE PIT
- STANDARD 1.1m x 1.1m MAIN PIT — TSP
- OPTICAL FIBRE JUNCTION BOX — OJB
- TELEPHONE SUMP PIT / BOX — TB
- TELEPHONE TRIPLE CONCRETE PIT
- OPTICAL FIBRE CABLE MARKER — OFC
- TELEPHONE DISTRIBUTION PILLAR

SEWER

- SEWER - HOUSE CONNECTION — esh
- SEWER MAIN — es
- SEWER MANHOLE COVER
- SEWER VENT PIPE — SVP
- SEWER LAMPHOLE — SLH

WATER

- WATER MAIN — ew
- WATER HYDRANT — WH
- STOP VALVE
- WATER TAP
- WATER METER

DRAINAGE

- DRAINAGE JUNCTION MANHOLE
- DISTRIBUTION FUSE POINT
- DRAINAGE INLET TO SUMP — IL10.00
- SUBSOIL DRAINAGE INVERT — SD10.00
- DRAINAGE TOP OF CONCRETE JUNCTION BOX — JB

MISCELLANEOUS

- UNIDENTIFIED SERVICE — ?

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0100-UT-1010.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:14:07 PM — PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING:

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0100-UT-1010

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

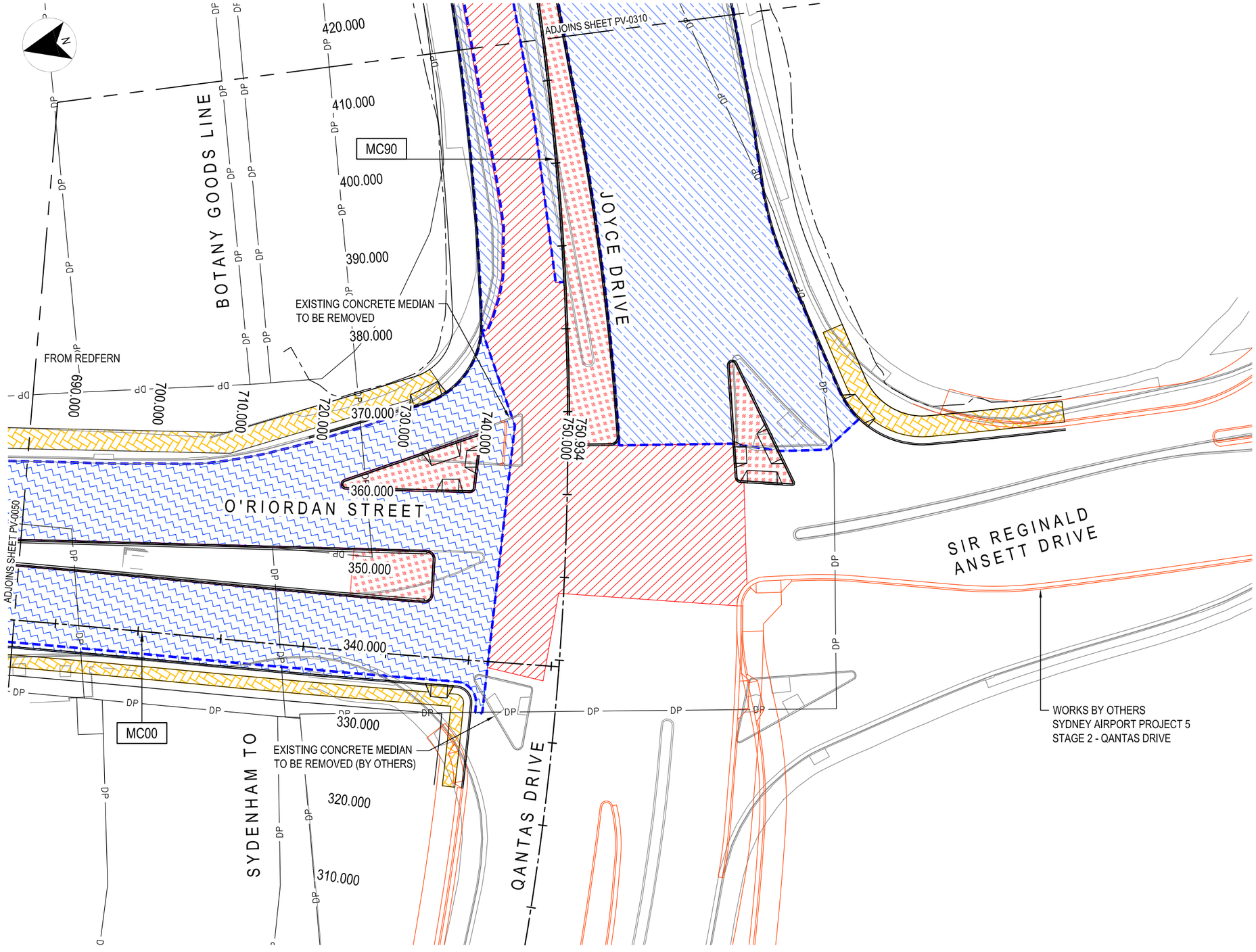
MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
PUBLIC UTILITIES LEGEND

A3

SHEET 1 OF 1

RMS REGISTRATION No.: DS2016 / 001133 — PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN — EDMS No. — SHEET No.: UT-1010 — ISSUE: 0



PAVEMENT LEGEND

- PAVEMENT TYPE 1 : MILL AND RESHEET WITH PATCHING
- PAVEMENT TYPE 2: MILL AND RESHEET
- PAVEMENT TYPE F12: FULL DEPTH ASPHALT
- PAVEMENT TYPE F13: FULL DEPTH ASPHALT
- PAVEMENT TYPE R8: RAISED CONCRETE MEDIAN
- PAVEMENT TYPE R7: SHARED PATH PAVEMENT
- TRENCH DRAIN

NOTES:

1. REFER TO SHEET PV-1010 FOR NOTES AND PAVEMENT DETAILS

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0180-PV-0060.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:18:56 PM

PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES 370109-MMD-DD-C-M2_DESIGN PAVEMENT 370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN 370109-SAC-DD-C-M2_ASBUILT SURVEY 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 1 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 2	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0180-PV-0060

	NAME	DATE
TITLE		
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW Government — Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
PAVEMENT PLAN
O'RIORDAN STREET - STN 685.000 TO STN 750.934

A3

SHEET 6 OF 10

RMS REGISTRATION No.: DS2016 / 001133

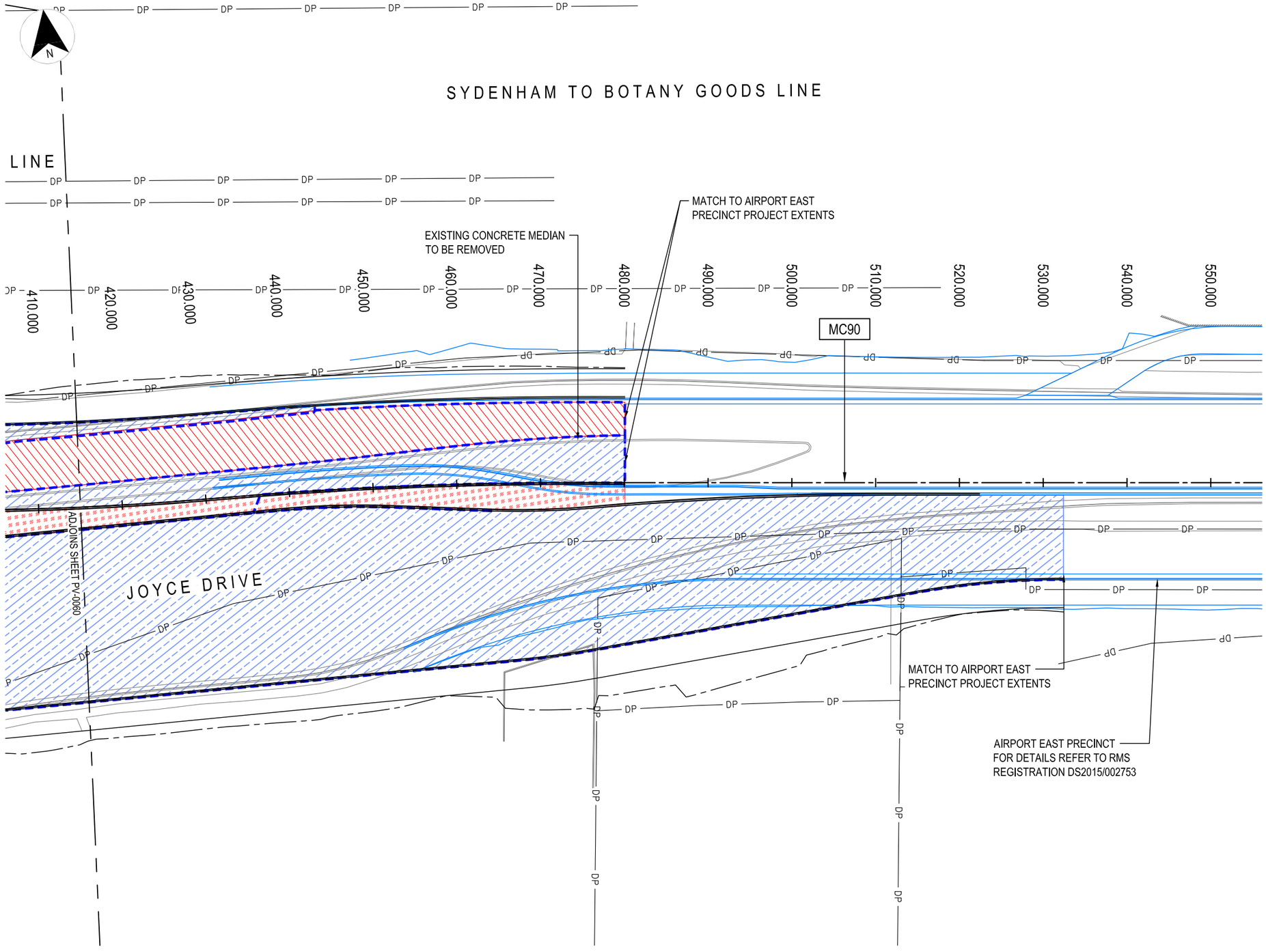
PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN

EDMS No.:

SHEET No.: PV-0060

ISSUE: 0



PAVEMENT LEGEND

- PAVEMENT TYPE 1 : MILL AND RESHEET WITH PATCHING
- PAVEMENT TYPE 2: MILL AND RESHEET
- PAVEMENT TYPE F12: FULL DEPTH ASPHALT
- PAVEMENT TYPE F13: FULL DEPTH ASPHALT
- PAVEMENT TYPE R8: RAISED CONCRETE MEDIAN
- PAVEMENT TYPE R7: SHARED PATH PAVEMENT
- TRENCH DRAIN

NOTES:

1. REFER TO SHEET PV-1010 FOR NOTES AND PAVEMENT DETAILS

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0180-PV-0310.dwg
DESIGN LOT CODE	
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	DES APT NTH OPT1
PLOT DATE / TIME	19/5/2016 12:19:26 PM
PLOT BY	dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES 370109-MMD-DD-C-M2_DESIGN PAVEMENT 370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN 370109-SAC-DD-C-M2_ASBUILT SURVEY 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 1 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 2	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0180-PV-0310

	TITLE	NAME	DATE
DRAWN		T. MURRAY	29.04.16
DRG CHECK		J. REES	29.04.16
DESIGN		M. DUBBELAAR	29.04.16
DESIGN CHECK		J. REES	29.04.16
DESIGN MNGR		R. MACKAY	29.04.16
PROJECT MNGR		V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
PAVEMENT PLAN
JOYCE DRIVE - STN 415.000 TO STN 550.000 — SHEET 10 OF 10

A3

RMS REGISTRATION No.: DS2016 / 001133 — PART 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN — EDMS No. — SHEET No.: PV-0310 — ISSUE 0

PAVEMENT NOTES

GENERAL

1. NOT ALL TACKCOATS AND CURING COMPOUNDS ARE SHOWN ON THESE DRAWINGS

ASPHALT

2. AS PER R116, EACH ASPHALT COURSE DEPTH MUST ALLOW FOR INDIVIDUAL ASPHALT LAYER THICKNESS

GRANULAR

3. AS PER R71, EACH COURSE THICKNESS IS TO COMPRISE OF COMPACTED LAYERS THAT ARE NOT MORE THAN 150mm OR LESS THAN 100mm THICK (A SPECIFIED COURSE THICKNESS OF 150 - 200mm DOES NOT COMPLY)

PRIMERSEAL, SPRAYED SEAL AND LOW CUTTER SEAL

4. USE THE AVERAGE LEAST DIMENSION (ALD) OF SEALING AGGREGATE TO DETERMINE THE CONTRIBUTION OF A SPRAYED SEAL THICKNESS TO THE TOTAL PAVEMENT THICKNESS
5. A LOW CUTTER SEAL IS TO BE PROVIDED AT ALL LOCATIONS WHERE A SPRAYED SEAL IS TO BE PLACED DIRECTLY UNDER AN ASPHALT LAYER
6. THE APPLICATION OF A LOW CUTTER SEAL IS AS FOLLOWS:
   - AGGREGATE SPREAD RATE FOR 10mm AGGREGATE AS PER RMS FORM DESIGN. AGGREGATE SPREAD RATE FOR 7mm AGGREGATE IS TO BE BETWEEN 200 - 230m $^2/m^3$
   - A MAXIMUM OF 2% CUTTER OIL MAY BE USED
   - USE 1% ADHESION AGENT
   - DOUBLE THE AMOUNT OF ROLLING FOR A SPRAYED SEAL
   - TO BE PLACED IN ACCORDANCE WITH R106. CONTRACTOR TO CONSULT WITH THE PRINCIPAL REGARDING A SUITABLE % OF CUTTER
7. A 7mm PRIMER SEAL IS TO BE PROVIDED OVER THE DGB20 LAYER, EXCEPT AT THE FOLLOWING LOCATIONS:
   a) DIRECTLY UNDER AN ASPHALT LAYER, WHERE A LOW CUTTER SEAL IS TO BE PROVIDED
   b) DIRECTLY UNDER A GRANULAR LAYER (AS APPROVED BY THE PRINCIPAL)

REFERENCES:

RMS 3051: GRANULAR BASE AND SUBBASE MATERIALS FOR SURFACED ROAD PAVEMENTS
RMS R44: EARTHWORKS
RMS R53: CONCRETE (FOR GENERAL USE), MORTAR AND GROUT
RMS R71: CONSTRUCTION OF UNBOUND AND MODIFIED PAVEMENT COURSE
RMS R73: CONSTRUCTION OF PLANT MIXED HEAVILY BOUND PAVEMENT COURSE
RMS R106: SPRAYED BITUMINOUS SURFACING (WITH CUTBACK BITUMEN)
RMS R116: HEAVY DUTY DENSE GRADED ASPHALT
RMS R173: GENERAL CONCRETE PAVING

GENERAL NOTES

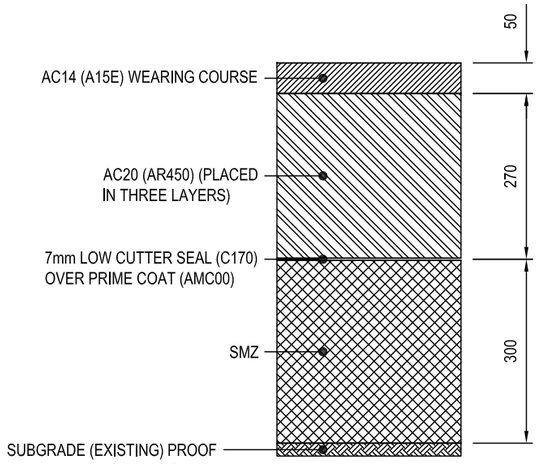
1. ANY SURVEY PMS OR SSMS THAT ARE DESTROYED ARE TO BE REPLACED WITH ANOTHER PM OR SSM TO EQUIVALENT LANDS DEPTARTMENT STANDARDS. PLEASE REFER TO RMS TECHNICAL DIRECTION OSD02. PENALTIES MAY APPLY FOR NON-COMPLIANCE
2. PURSUANT TO THE SURVEYING AND SPATIAL INFORMATION ACT, ANY CADASTRAL REFERENCE MARKS THAT ARE ON KERBS, FOOTPATHS OR SIMILAR THAT MAY BE AFFECTED BY CONSTRUCTION OR MAINTENANCE, NEED TO BE IDENTIFIED AND SURVEYED BY A REGISTERED LAND SURVEYOR BEFORE THEY ARE DESTROYED OR DISTURBED. PERSONAL FINES APPLY FOR BREACHES OF THE ACT

ABBREVIATIONS

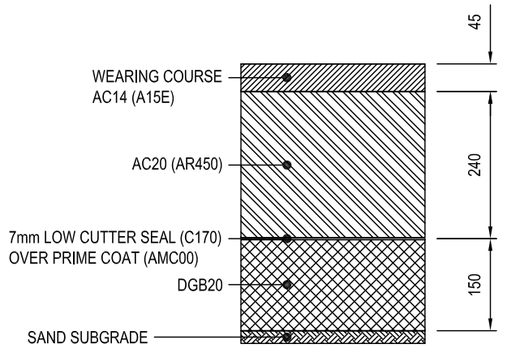
ABBREVIATION	DESCRIPTION
AC14	DENSE GRADED ASPHALT (NOMINAL SIZE 14mm)
AC20	DENSE GRADED ASPHALT (NOMINAL SIZE 20mm)
F	FLEXIBLE PAVEMENT
HBM	HEAVILY BOUND MATERIAL
R	RIGID PAVEMENT
SG	SUBGRADE
SMZ	SELECTED MATERIAL ZONE
UZF	UPPER ZONE OF FORMATION

PAVEMENT TYPES AND DESCRIPTIONS

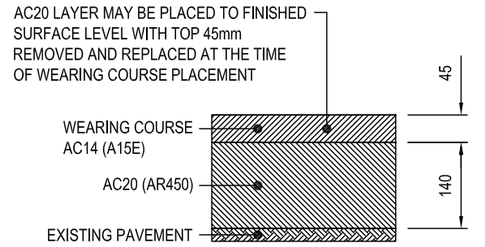
TYPE	DESCRIPTION
PT1	MILL AND RESHEET WITH PATCHING
PT2	MILL AND RESHEET
F12	FULL DEPTH ASPHALT (JOYCE DRIVE)
F13	FULL DEPTH ASPHALT (O'RIORDAN ST)
F14	FULL DEPTH ASPHALT - (O'RIORDAN ST / ROBEY ST)
R7	SHARED PATH PAVEMENT
R8	RAISED CONCRETE MEDIAN



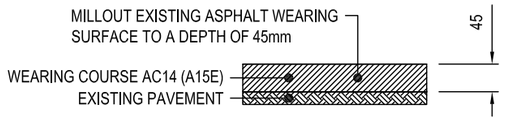
PAVEMENT TYPE F12
FULL DEPTH ASPHALT
(JOYCE DRIVE)



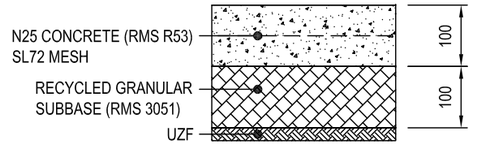
PAVEMENT TYPE F13
FULL DEPTH ASPHALT
(O'RIORDAN STREET / ROBEY STREET)



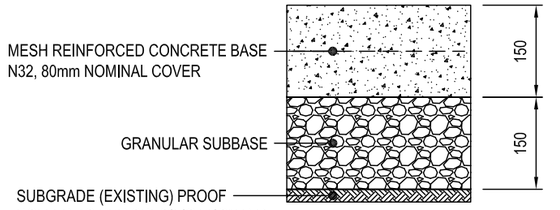
PAVEMENT TYPE PT1
MILL AND RESHEET WITH PATCHING



PAVEMENT TYPE PT2
MILL AND RESHEET



PAVEMENT TYPE R8
RAISED CONCRETE MEDIAN



PAVEMENT TYPE R7
SHARED PATH PAVEMENT

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0190-PV-0010.dwg				DESIGN LOT CODE	
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1			
SCALES ON A3 SIZE DRAWING: NOT TO SCALE	DRAWINGS / DESIGN PREPARED BY: Mott MacDonald		
CO-ORDINATE SYSTEM: MGA ZONE 56	HEIGHT DATUM: AHD	MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0190-PV-0010	

PLOT DATE / TIME: 19/5/2016 2:51:04 PM	PLOT BY: dub76827	
TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: Transport Roads & Maritime Services (NSW GOVERNMENT)

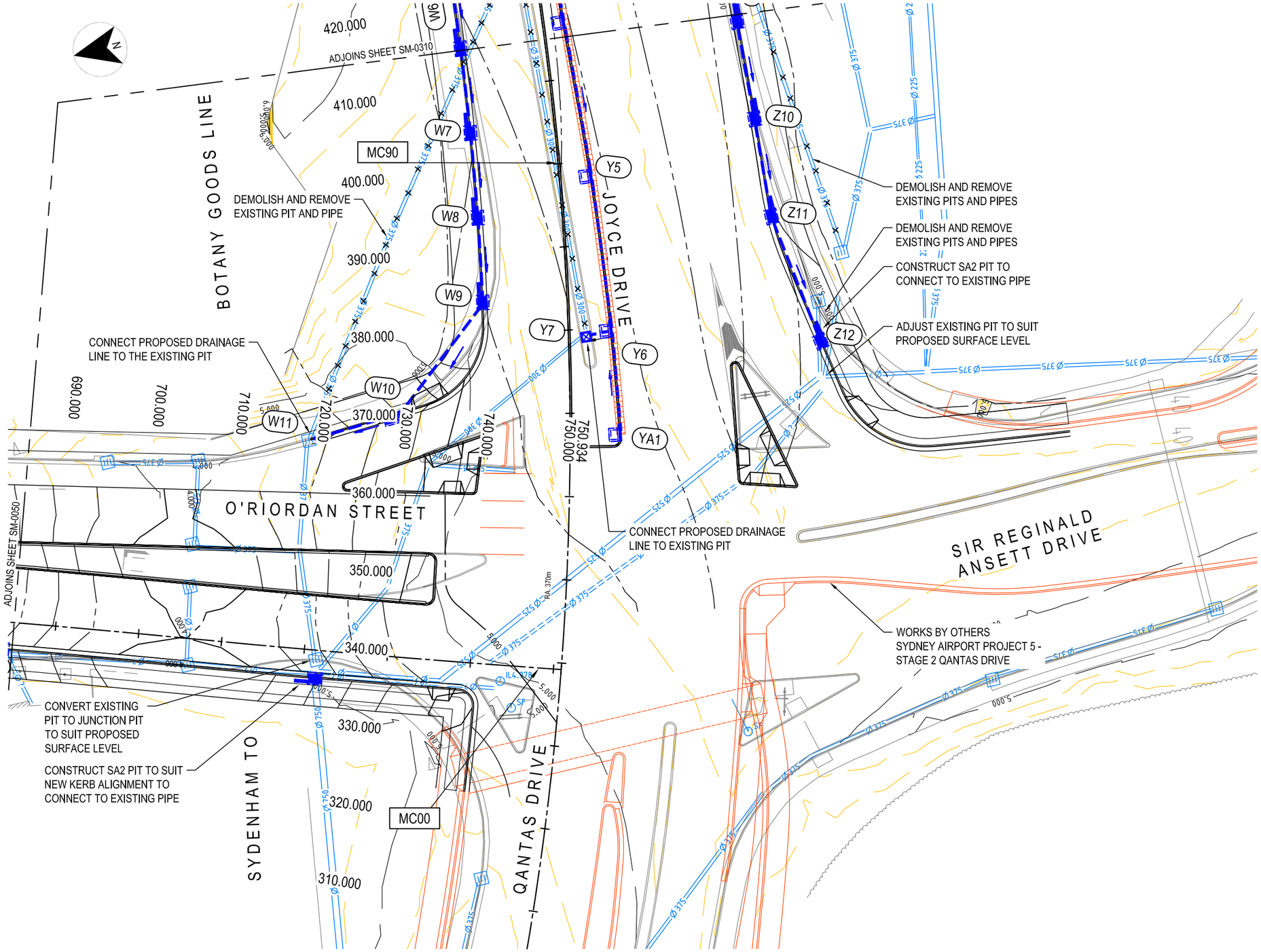
PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY
PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
PAVEMENT NOTES AND DETAILS

A3

SHEET 1 OF 1

RMS REGISTRATION No.		PART
DS2016 / 001133		01
ISSUE STATUS	EDMS No.	SHEET No. / ISSUE
PRELIMINARY DETAILED DESIGN		PV-1010 / 0



DRAINAGE LEGEND

- EXISTING WATER COURSE
- EXISTING DRAINAGE LINE AND PIT
- EXISTING SUBSOIL FLUSH POINT
- EXISTING HEADWALL
- XXX — DESIGN PIT LABEL (LINE & NUMBER)
- DESIGN DRAINAGE LINE, SIZE & DIRECTION, PIT AND HEADWALL
- DEMOLISH AND REMOVE DRAINAGE PIPES, PITS AND HEADWALL.
- PIT TYPE SA1 - MD.R11.B01
- PIT TYPE SA2 - MD.R11.B01
- PIT TYPE SAS - MD.R11.B01
- PIT TYPE SF - MD.R11.B09
- JUNCTION PIT - MD.R11.B36
- 'ACO' CLASS D 'TRAFFIK DRAIN-TD-300' OR APPROVED EQUIVALENT

NOTES

1. EXISTING PIPES, WHICH FORM NO PART OF THE DRAINAGE SYSTEM, ARE TO BE REMOVED OR SEALED AS INDICATED ON THE DRAWING.
2. ALL PIPES TO BE SPIGOT AND SOCKET WITH RUBBER RING JOINTS UNLESS OTHERWISE INDICATED.
3. PIPE INSTALLATION IS DESIGNED IN ACCORDANCE WITH CONCRETE PIPE ASSOCIATION OF AUSTRALIA PUBLICATION "CONCRETE PIPE SELECTION AND INSTALLATION".
4. MGA CO-ORDINATE GULLY PIT REFERENCES ARE LOCATED AT THE CENTRE OF GRATING ON THE LIP LINE OR AT THE KERB WHERE THERE IS NO LIP LINE. THE REFERENCE POINT FOR SURFACE INLET PITS AND HEADWALLS ARE INDICATED ON THE MODEL DRAWINGS.
5. AT GULLY PITS, A 100mm DIAMETER SUBSURFACE DRAINAGE PIPE SHALL BE IN ACCORDANCE WITH MD.R33.A08.
6. ATTENTION IS DIRECTED TO THE POSSIBLE EXISTENCE OF UNDERGROUND UTILITIES NOT SHOWN ON THE DRAWINGS, OR LOCATIONS OR ELEVATIONS DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS. THE EXACT LOCATION OF EACH UNDERGROUND UTILITY SHALL BE VERIFIED ON SITE PRIOR TO DOING ANY WORK THAT MAY DAMAGE SUCH UTILITY.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0120-SM-0060.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:16:18 PM — PLOT BY: dub76827

EXTERNAL REFERENCE FILES
370109-MMD-DD-C-M2_DESIGN ROAD
370109-MMD-DD-C-M2_DESIGN CONTOURS 1_500
370109-MMD-DD-C-M2_DESIGN STORMWATER
370109-MMD-DD-C-M2_EXISTING BOUNDARIES
370109-MMD-DD-C-M2_EXISTING SURVEY
370109-MMD-DD-C-M2_EXISTING CONTOURS 1_500
370109-MMD-DD-C-M2_EXISTING STORMWATER 1_500
370109-MMD-DD-C-M2_EXISTING UTILITIES
370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0120-SM-0060

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW Government — Transport Roads & Maritime Services

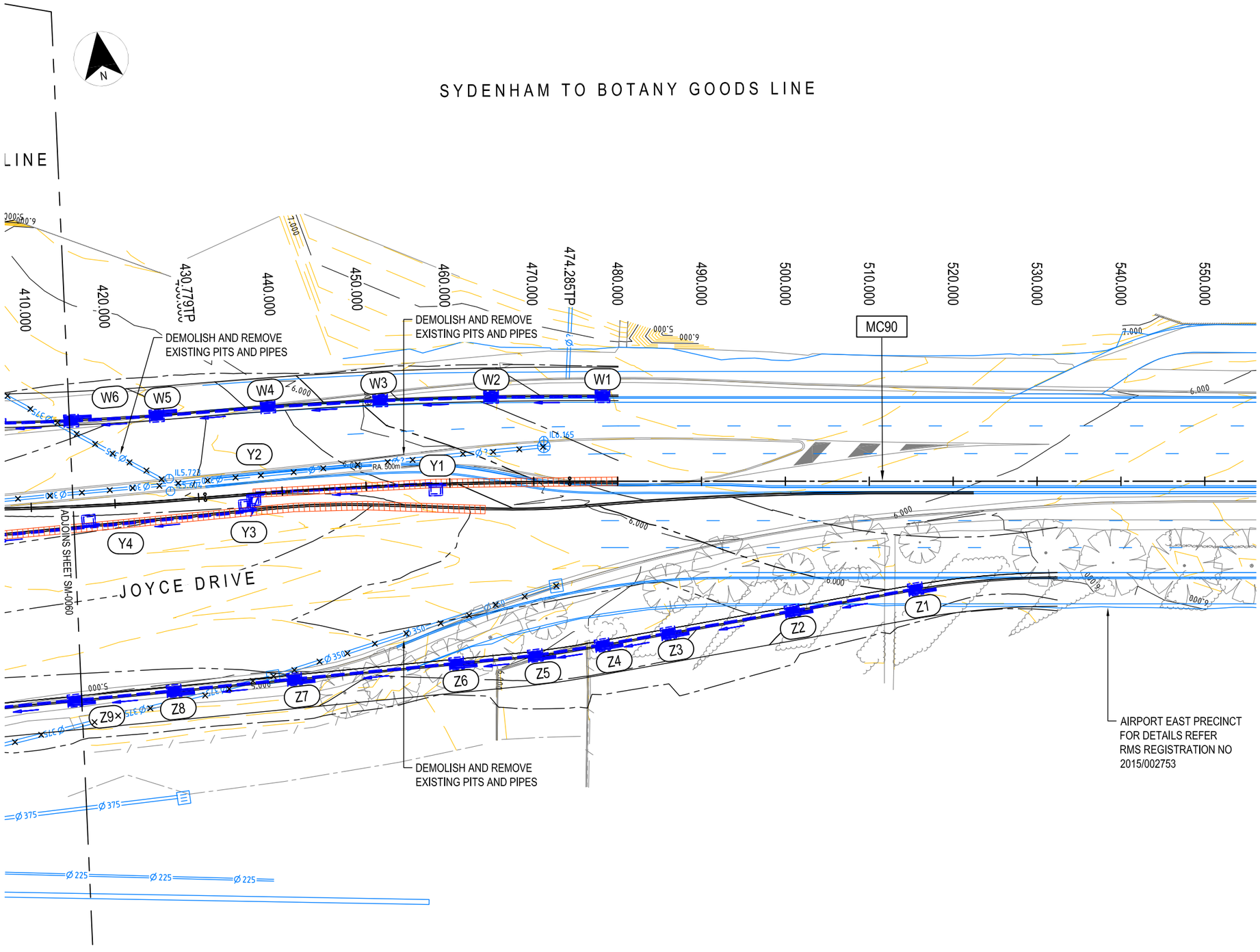
PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES FROM BOURKE ROAD TO QANTAS DRIVE
DRAINAGE PLAN
O'RIORDAN STREET - STN 685.000 TO STN 750.934

A3 — SHEET 6 OF 10

RMS REGISTRATION No.: DS2016 / 001133 — PART 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN — EDMS No. — SHEET No.: SM-0060 — ISSUE: 0



DRAINAGE LEGEND

- EXISTING WATER COURSE
- EXISTING DRAINAGE LINE AND PIT
- EXISTING SUBSOIL FLUSH POINT
- EXISTING HEADWALL
- XXX — DESIGN PIT LABEL (LINE & NUMBER)
- DESIGN DRAINAGE LINE, SIZE & DIRECTION, PIT AND HEADWALL
- DEMOLISH AND REMOVE DRAINAGE PIPES, PITS AND HEADWALL.
- PIT TYPE SA1 - MD.R11.B01
- PIT TYPE SA2 - MD.R11.B01
- PIT TYPE SAS - MD.R11.B01
- PIT TYPE SF - MD.R11.B09
- JUNCTION PIT - MD.R11.B36
- 'ACO' CLASS D 'TRAFFIK DRAIN-TD-300' OR APPROVED EQUIVALENT

NOTES

1. EXISTING PIPES, WHICH FORM NO PART OF THE DRAINAGE SYSTEM, ARE TO BE REMOVED OR SEALED AS INDICATED ON THE DRAWING.
2. ALL PIPES TO BE SPIGOT AND SOCKET WITH RUBBER RING JOINTS UNLESS OTHERWISE INDICATED.
3. PIPE INSTALLATION IS DESIGNED IN ACCORDANCE WITH CONCRETE PIPE ASSOCIATION OF AUSTRALIA PUBLICATION "CONCRETE PIPE SELECTION AND INSTALLATION".
4. MGA CO-ORDINATE GULLY PIT REFERENCES ARE LOCATED AT THE CENTRE OF GRATING ON THE LIP LINE OR AT THE KERB WHERE THERE IS NO LIP LINE. THE REFERENCE POINT FOR SURFACE INLET PITS AND HEADWALLS ARE INDICATED ON THE MODEL DRAWINGS.
5. AT GULLY PITS, A 100mm DIAMETER SUBSURFACE DRAINAGE PIPE SHALL BE IN ACCORDANCE WITH MD.R33.A08.
6. ATTENTION IS DIRECTED TO THE POSSIBLE EXISTENCE OF UNDERGROUND UTILITIES NOT SHOWN ON THE DRAWINGS, OR LOCATIONS OR ELEVATIONS DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS. THE EXACT LOCATION OF EACH UNDERGROUND UTILITY SHALL BE VERIFIED ON SITE PRIOR TO DOING ANY WORK THAT MAY DAMAGE SUCH UTILITY.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0120-SM-0310.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:17:10 PM

PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_DESIGN CONTOURS 1_500 370109-MMD-DD-C-M2_DESIGN STORMWATER 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-MMD-DD-C-M2_EXISTING CONTOURS 1_500 370109-MMD-DD-C-M2_EXISTING STORMWATER 1_500 370109-MMD-DD-C-M2_EXISTING UTILITIES 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0120-SM-0310

	NAME	DATE
TITLE		
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
DRAINAGE PLAN
JOYCE DRIVE - STN 415.000 TO STN 550.000

A3

SHEET 10 OF 10

RMS REGISTRATION No.: DS2016 / 001133

PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN

EDMS No.:

SHEET No.: SM-0310

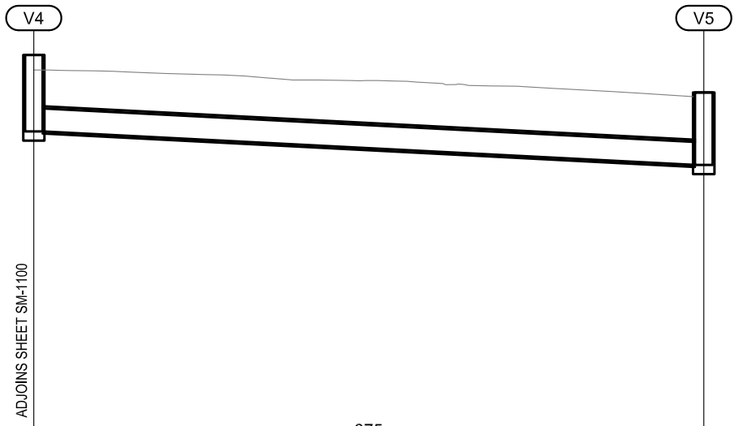
ISSUE: 0

NOTES:

1. UTILITIES HAVE BEEN SHOWN FOR INFORMATION PURPOSES ONLY. UTILITIES HAVE BEEN MODELLED BASED ON DBYD AND SURVEY LOCATOR INFORMATION. FOR DETAILS OF PROTECTION AND UTILITY TREATMENT REFER TO UTILITIES DESIGN PACKAGES.
2. FOR UTILITY LEGEND REFER TO SHEET UT-1010
3. FOR GENERAL NOTES REFER TO SHEET GE-0110 AND GE-0120

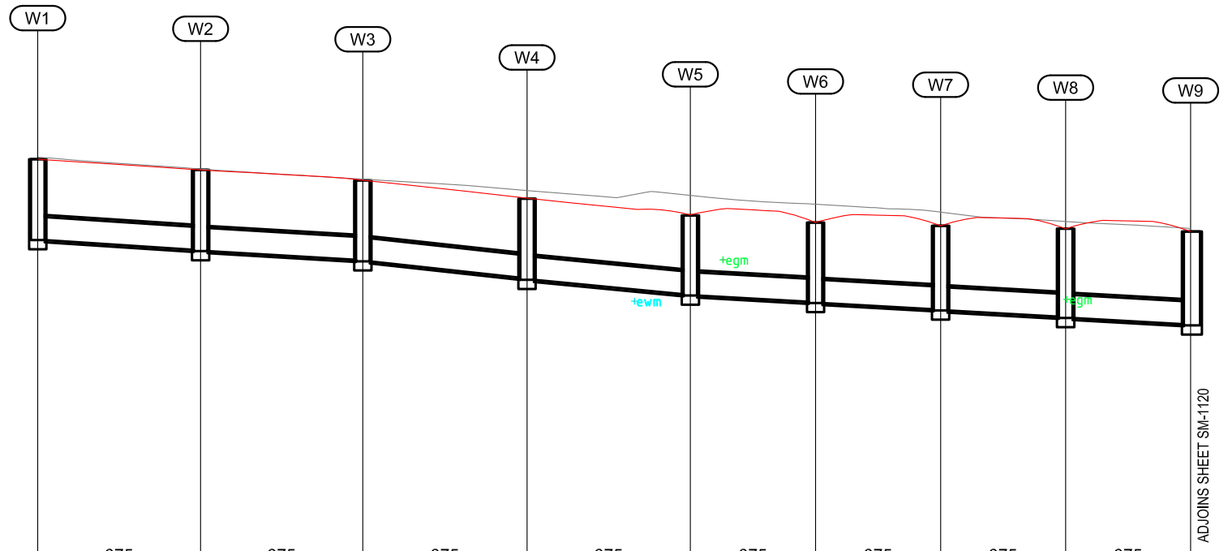
LEGEND

- EXISTING SURFACE
- DESIGN SURFACE
- EXISTING ROAD PAVEMENT



PIPE DIAMETER (mm)	375	
PIPE CLASS	4	
PIPE INSTALLATION TYPE	HS3	
PIPE TRENCH WIDTH (m)	1.10	
PIPE FLOW (m3/s)	0.000	
PIPE CAPACITY	0.190	
PIPE GRADE (%)	1.0	
DATUM R.L.	-2.000	
DEPTH TO INVERT	1.147	1.167 1.181 1.181
HYDRAULIC GRADE LINE	0.000	0.000 0.000 0.000
PIPE INVERT LEVELS	6.786	6.766 6.219 6.219
DESIGN SURFACE LEVELS		8.012 7.400
EXISTING SURFACE LEVELS		7.768 7.400
PIPE CHAINAGE	71.720	126.362

LINE V



PIPE DIAMETER (mm)	375	375	375	375	375	375	375	375
PIPE CLASS	4	4	4	4	4	4	4	4
PIPE INSTALLATION TYPE	HS3	HS3	HS3	HS3	HS3	HS3	HS3	HS3
PIPE TRENCH WIDTH (m)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
PIPE FLOW (m3/s)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PIPE CAPACITY	0.210	0.200	0.270	0.250	0.190	0.190	0.190	0.190
PIPE GRADE (%)	1.2	1.1	2.0	1.8	1.0	1.0	1.0	1.0
DATUM R.L.	-4.000							
DEPTH TO INVERT	1.319	1.305	1.325	1.299	1.323	1.300	1.333	1.294 1.314 1.292 1.312 1.361 1.381 1.435 1.455 1.510
HYDRAULIC GRADE LINE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
PIPE INVERT LEVELS	5.032	4.873	4.853	4.710	4.686	4.418	4.384	4.148 4.128 4.026 4.006 3.904 3.884 3.782 3.762 3.660
DESIGN SURFACE LEVELS	6.350		6.177		6.006		5.708	5.435 5.317 5.264 5.218 5.171
EXISTING SURFACE LEVELS	6.383		6.189		6.025		5.838	5.759 5.615 5.488 5.335 5.221
PIPE CHAINAGE	0.000	13.283	26.513	39.905	53.224	63.434	73.634	83.829 94.024

LINE W

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0130-SM-0110.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:18:00 PM

PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_SWLS H1_500 V1_100-0011	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: VERTICAL 1:100; HORIZONTAL 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0130-SM-0110

	NAME	DATE
TITLE		
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
DRAINAGE LONGITUDINAL SECTIONS

A3

SHEET 11 OF 13

RMS REGISTRATION No.: DS2016 / 001133

PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN

EDMS No.:

SHEET No.: SM-1110

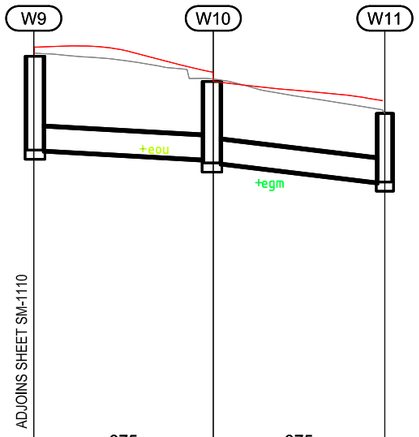
ISSUE: 0

NOTES:

1. UTILITIES HAVE BEEN SHOWN FOR INFORMATION PURPOSES ONLY. UTILITIES HAVE BEEN MODELLED BASED ON DBYD AND SURVEY LOCATOR INFORMATION. FOR DETAILS OF PROTECTION AND UTILITY TREATMENT REFER TO UTILITIES DESIGN PACKAGES.
2. FOR UTILITY LEGEND REFER TO SHEET UT-1010
3. FOR GENERAL NOTES REFER TO SHEET GE-0110 AND GE-0120

LEGEND

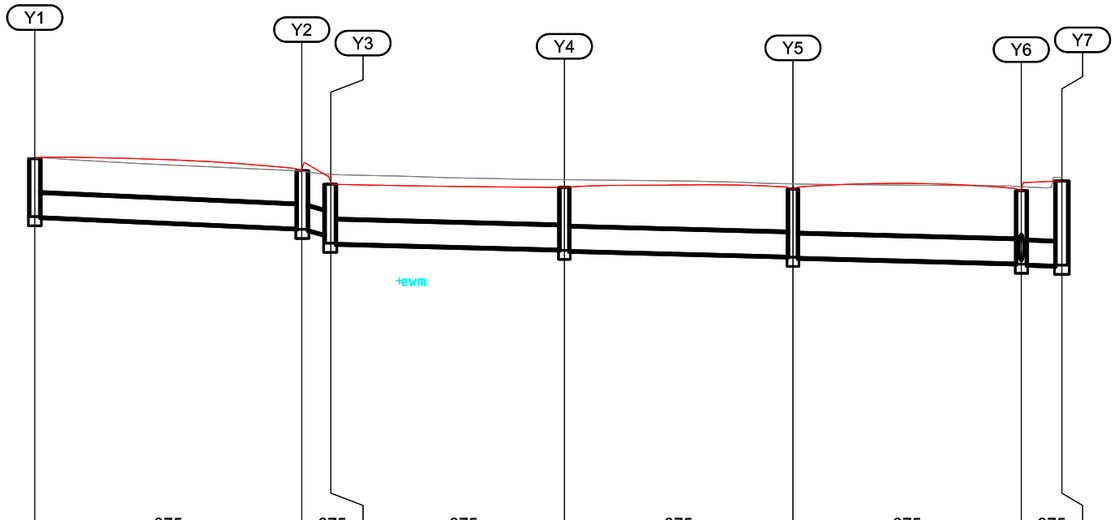
- EXISTING SURFACE
- DESIGN SURFACE
- EXISTING ROAD PAVEMENT



ADJOINS SHEET SM-1110

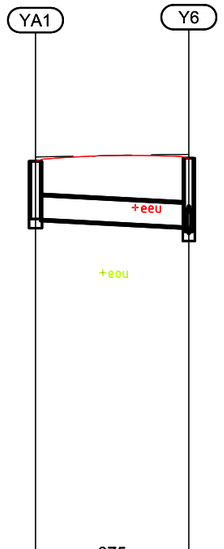
PIPE DIAMETER (mm)	375	375	
PIPE CLASS	4	4	
PIPE INSTALLATION TYPE	HS3	HS3	
PIPE TRENCH WIDTH (m)	1.10	1.10	
PIPE FLOW (m3/s)	0.000	0.000	
PIPE CAPACITY	0.190	0.280	
PIPE GRADE (%)	1.0	2.2	
DATUM R.L.	-5.000		
DEPTH TO INVERT	1.510 / 1.530	1.267 / 1.330	1.119 / 1.119
HYDRAULIC GRADE LINE	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000
PIPE INVERT LEVELS	3.660 / 3.640	3.494 / 3.431	3.120 / 3.120
DESIGN SURFACE LEVELS	5.171	4.761	4.239
EXISTING SURFACE LEVELS	5.221	4.800	4.239
PIPE CHAINAGE	94.024	108.664	122.659

LINE W



PIPE DIAMETER (mm)	375	375	375	375	375	375	
PIPE CLASS	4	4	4	4	4	4	
PIPE INSTALLATION TYPE	HS3	HS3	HS3	HS3	HS3	HS3	
PIPE TRENCH WIDTH (m)	1.10	1.10	1.10	1.10	1.10	1.10	
PIPE FLOW (m3/s)	0.000	0.000	0.000	0.000	0.000	0.000	
PIPE CAPACITY	0.180	0.360	0.130	0.130	0.130	0.130	
PIPE GRADE (%)	0.9	3.6	0.5	0.5	0.5	0.5	
DATUM R.L.	-4.000						
DEPTH TO INVERT	0.942 / 0.937	0.957 / 0.823	0.963 / 1.005	1.025 / 1.094	1.114 / 1.180	1.200 / 1.374	1.374
HYDRAULIC GRADE LINE	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000
PIPE INVERT LEVELS	4.910 / 4.722	4.702 / 4.615	4.475 / 4.380	4.360 / 4.267	4.247 / 4.154	4.134 / 4.117	4.117
DESIGN SURFACE LEVELS	5.854	5.658	5.438	5.385	5.361	5.333	5.491
EXISTING SURFACE LEVELS	5.878	5.651	5.597	5.510	5.442	5.396	5.553
PIPE CHAINAGE	0.000	21.767	24.141	43.188	61.830	80.448	83.756

LINE Y



PIPE DIAMETER (mm)	375	
PIPE CLASS	4	
PIPE INSTALLATION TYPE	HS3	
PIPE TRENCH WIDTH (m)	1.10	
PIPE FLOW (m3/s)	0.000	
PIPE CAPACITY	0.190	
PIPE GRADE (%)	1.0	
DATUM R.L.	-5.000	
DEPTH TO INVERT	0.941 / 1.115	1.200
HYDRAULIC GRADE LINE	0.000 / 0.000	0.000
PIPE INVERT LEVELS	4.343 / 4.218	4.134
DESIGN SURFACE LEVELS	5.284	5.333
EXISTING SURFACE LEVELS	5.352	5.396
PIPE CHAINAGE	0.000	12.504

LINE YA

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0130-SM-0120.dwg				DESIGN LOT CODE		
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	
370109-MMD-DD-C-M2_SWLS H1_500 V1_100-0012	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS	

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

SCALES ON A3 SIZE DRAWING: 0 1 2 3 4 — VERTICAL 1:100; 0 5 10 15 20 — HORIZONTAL 1:500

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0130-SM-0120

PLOT DATE / TIME: 19/5/2016 12:18:05 PM — PLOT BY: dub76827

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
DRAINAGE LONGITUDINAL SECTIONS

A3

SHEET 12 OF 13

RMS REGISTRATION No.: DS2016 / 001133 — PART: 01

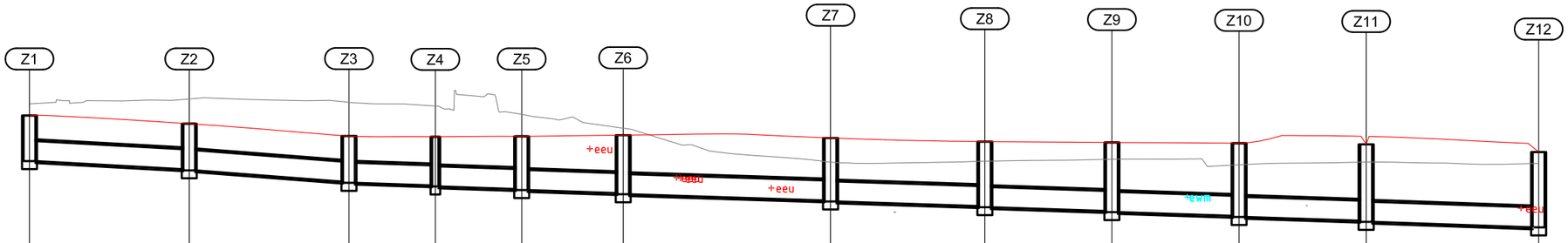
ISSUE STATUS: PRELIMINARY DETAILED DESIGN — EDMS No. — SHEET No.: SM-1120 — ISSUE: 0

NOTES:

1. UTILITIES HAVE BEEN SHOWN FOR INFORMATION PURPOSES ONLY. UTILITIES HAVE BEEN MODELLED BASED ON DBYD AND SURVEY LOCATOR INFORMATION. FOR DETAILS OF PROTECTION AND UTILITY TREATMENT REFER TO UTILITIES DESIGN PACKAGES.
2. FOR UTILITY LEGEND REFER TO SHEET UT-1010
3. FOR GENERAL NOTES REFER TO SHEET GE-0110 AND GE-0120

LEGEND

- EXISTING SURFACE
- DESIGN SURFACE
- EXISTING ROAD PAVEMENT



	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	Z11	Z12
PIPE DIAMETER (mm)	375	375	375	375	375	375	375	375	375	375	375	375
PIPE CLASS	4	4	4	4	4	4	4	4	4	4	4	4
PIPE INSTALLATION TYPE	HS3	HS3	HS3	HS3	HS3	HS3	HS3	HS3	HS3	HS3	HS3	HS3
PIPE TRENCH WIDTH (m)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
PIPE FLOW (m3/s)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PIPE CAPACITY	0.190	0.230	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
PIPE GRADE (%)	1.0	1.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	
DATUM R.L. -4.000												
DEPTH TO INVERT	0.855	0.852 / 0.872	0.856 / 0.876	0.911 / 0.931	0.986 / 1.006	1.086 / 1.106	1.170 / 1.190	1.208 / 1.228	1.283 / 1.303	1.359 / 1.379	1.429 / 1.449	1.413 / 1.413
HYDRAULIC GRADE LINE	0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000
PIPE INVERT LEVELS	5.131	4.979 / 4.959	4.745 / 4.725	4.677 / 4.657	4.608 / 4.588	4.532 / 4.512	4.395 / 4.375	4.289 / 4.269	4.197 / 4.177	4.106 / 4.086	4.015 / 3.995	3.890 / 3.890
DESIGN SURFACE LEVELS	5.985	5.831	5.601	5.587	5.594	5.617	5.562	5.496	5.480	5.466	5.444	5.302
EXISTING SURFACE LEVELS	6.202	6.294	6.232	6.163	6.008	5.747	5.112	5.130	5.166	5.061	5.115	5.089
PIPE CHAINAGE	-53.857	-38.924	-23.996	-15.924	-7.852	1.632	21.015	35.433	47.312	59.195	71.078	87.195

LINE Z

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0130-SM-0130.dwg

DESIGN LOT CODE:

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 12:18:10 PM

PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_SWLS H1_500 V1_100-0013	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: VERTICAL 1:100; HORIZONTAL 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0130-SM-0130

	NAME	DATE
TITLE		
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES
FROM BOURKE ROAD TO QANTAS DRIVE
DRAINAGE LONGITUDINAL SECTIONS

A3

SHEET 13 OF 13

RMS REGISTRATION No.: DS2016 / 001133

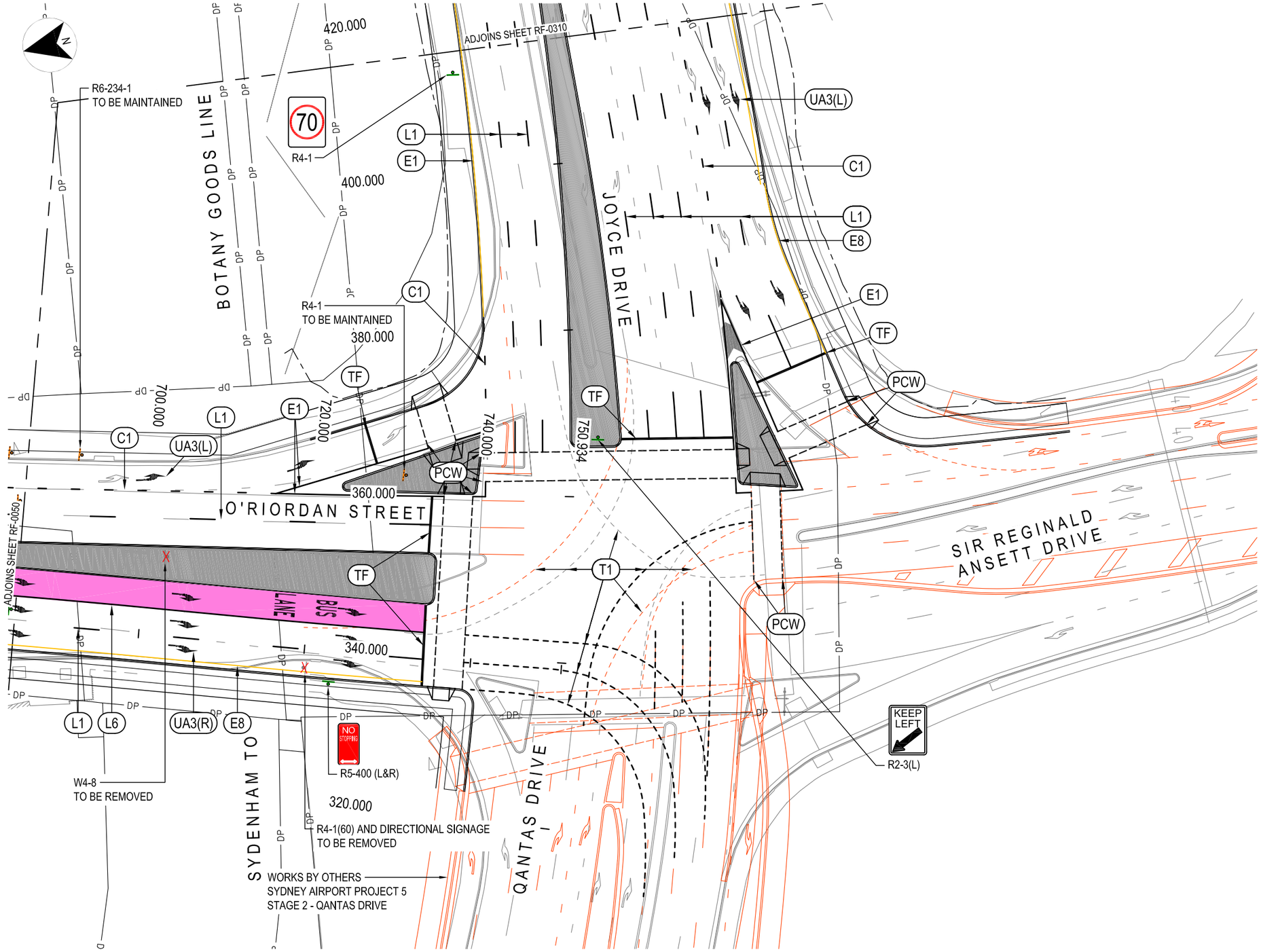
PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN

EDMS No.:

SHEET No.: SM-1130

ISSUE: 0



SIGNPOSTING AND PAVEMENT MARKING LEGEND

- SEPARATION LANE LINE (3x9) - L1
- CONTINUITY LINE (600x300) - C1
- LANE EDGE LINE (80mm) - E1
- BUS LANE EDGE LINE (150mm) - L6
- STOP LINE (300mm) - TF
- PEDESTRIAN CROSSING LINES - PCW
- NO PARKING YELLOW EDGE LINE - E8
- TURN LINE - T1
- UA5R — PAVEMENT ARROW (UA5 - L or R)
- PAVEMENT ARROW (UA3 - L or R)
- C1 — PAVEMENT MARKING INDICATOR
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE MAINTAINED
- REMOVE EXISTING SIGN

NOTES

1. PAVEMENT MARKING AND SIGNPOSTING TO BE IN ACCORDANCE WITH THE CURRENT RMS GUIDES AND STANDARDS.
2. FOR SAFETY BARRIER SCHEDULE REFER TO SHEET RD-0050.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0200-RF-0060.dwg				DESIGN LOT CODE	
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: DES APT NTH OPT1				PLOT DATE / TIME: 19/5/2016 12:20:30 PM	PLOT BY: dub76827
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES 370109-MMD-DD-C-M2_DESIGN ROAD 370109-MMD-DD-C-M2_DESIGN LINEMARKING 370109-MMD-DD-C-M2_EXISTING BOUNDARIES 370109-MMD-DD-C-M2_EXISTING SURVEY 370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN 370109-SAC-DD-C-M2_ASBUILT SURVEY 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 1 370109-SAC-DD-C-M2_ROAD DESIGN STAGE 2	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — PLAN 1:500

DRAWINGS / DESIGN PREPARED BY: Mott MacDonald

CO-ORDINATE SYSTEM: MGA ZONE 56 | HEIGHT DATUM: AHD

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0200-RF-0060

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services

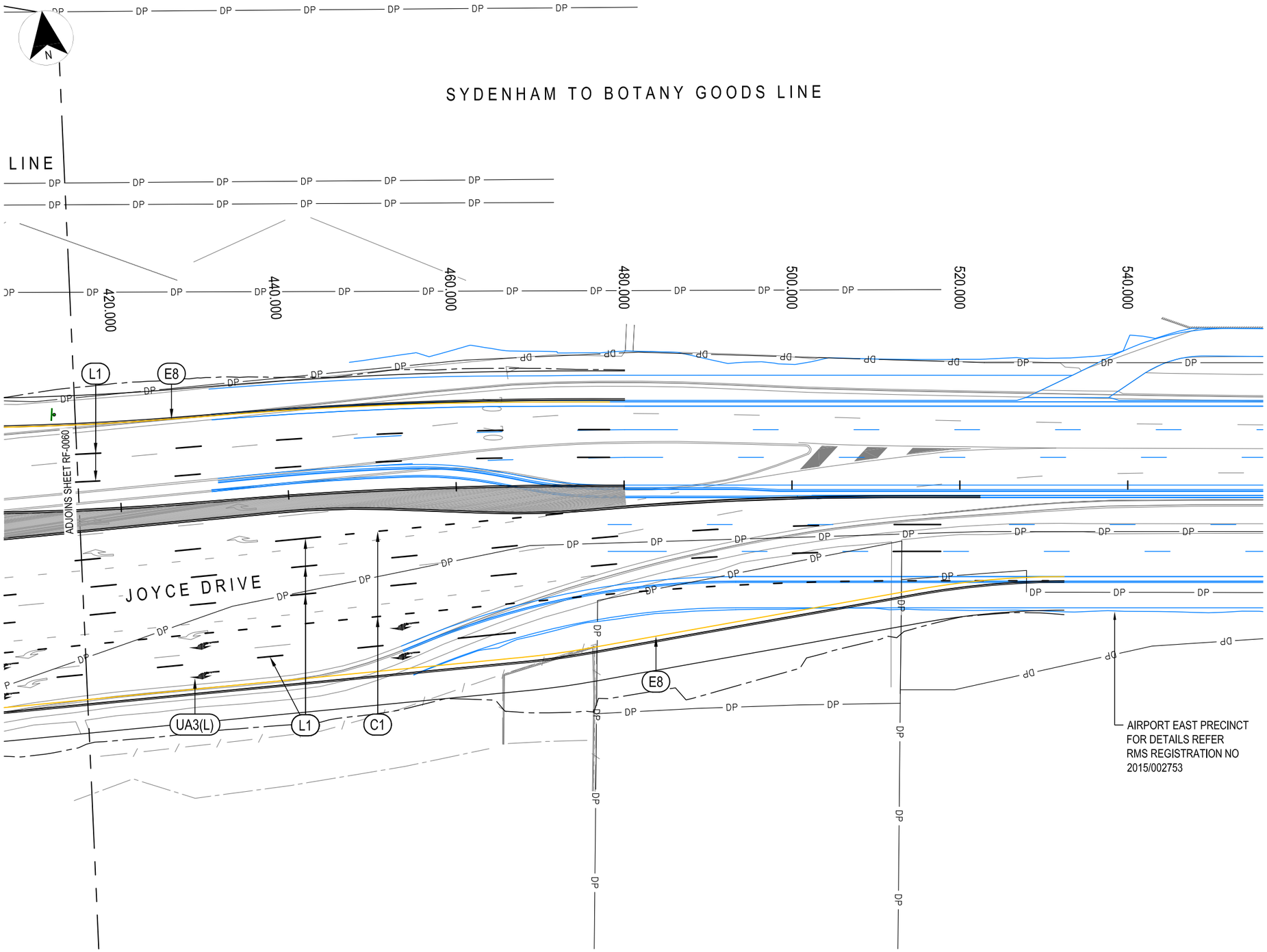
PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

A3

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES FROM BOURKE ROAD TO QANTAS DRIVE SIGNPOSTING AND PAVEMENT MARKING PLAN
O'RIORDAN STREET - STN 685.000 TO STN 750.934 SHEET 6 OF 10

RMS REGISTRATION No.: DS2016 / 001133 | PART: 01

ISSUE STATUS: PRELIMINARY DETAILED DESIGN | EDMS No. | SHEET No.: RF-0060 | ISSUE: 0



SIGNPOSTING AND PAVEMENT MARKING LEGEND

- SEPARATION LANE LINE (3x9) - L1
- CONTINUITY LINE (600x300) - C1
- LANE EDGE LINE (80mm) - E1
- BUS LANE EDGE LINE (150mm) - L6
- STOP LINE (300mm) - TF
- PEDESTRIAN CROSSING LINES - PCW
- NO PARKING YELLOW EDGE LINE - E8
- TURN LINE - T1
- UA5R — PAVEMENT ARROW (UA5 - L or R)
- PAVEMENT ARROW (UA3 - L or R)
- C1 — PAVEMENT MARKING INDICATOR
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE MAINTAINED
- REMOVE EXISTING SIGN

NOTES

1. PAVEMENT MARKING AND SIGNPOSTING TO BE IN ACCORDANCE WITH THE CURRENT RMS GUIDES AND STANDARDS.
2. FOR SAFETY BARRIER SCHEDULE REFER TO SHEET RD-0050.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME
C:\pw working folder\pw01\dub76827\dms02417\370109-MMD-DD-C-DR-0200-RF-0310.dwg

DESIGN LOT CODE

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
DES APT NTH OPT1

PLOT DATE / TIME: 19/5/2016 2:17:45 PM
PLOT BY: dub76827

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
370109-MMD-DD-C-M2_DESIGN BOUNDARIES	0	19.05.16	PRELIMINARY DETAILED DESIGN		VJS
370109-MMD-DD-C-M2_DESIGN ROAD					
370109-MMD-DD-C-M2_DESIGN LINEMARKING					
370109-MMD-DD-C-M2_EXISTING BOUNDARIES					
370109-MMD-DD-C-M2_EXISTING SURVEY					
370109-AUC-DD-C-M2_AIRPORT EAST ROAD DESIGN					
370109-SAC-DD-C-M2_ASBUILT SURVEY					
370109-SAC-DD-C-M2_ROAD DESIGN STAGE 1					
370109-SAC-DD-C-M2_ROAD DESIGN STAGE 2					

SCALES ON A3 SIZE DRAWING
0 5 10 15 20
PLAN 1:500

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
Mott MacDonald

MM DRAWING NUMBER: 370109-MMD-DD-C-DR-0200-RF-0310

TITLE	NAME	DATE
DRAWN	T. MURRAY	29.04.16
DRG CHECK	J. REES	29.04.16
DESIGN	M. DUBBELAAR	29.04.16
DESIGN CHECK	J. REES	29.04.16
DESIGN MNGR	R. MACKAY	29.04.16
PROJECT MNGR	V. SOFREVSKI	29.04.16

CLIENT
NSW GOVERNMENT Transport Roads & Maritime Services

PREPARED FOR
PROJECT DELIVERY
GREATER SYDNEY

A3

MASCOT - CITY OF BOTANY BAY
MR658 - O'RIORDAN STREET
WIDENING TO SIX LANES FROM BOURKE ROAD TO QANTAS DRIVE
SIGNPOSTING AND PAVEMENT MARKING PLAN
JOYCE DRIVE - STN 415.000 TO STN 550.000 SHEET 10 OF 10

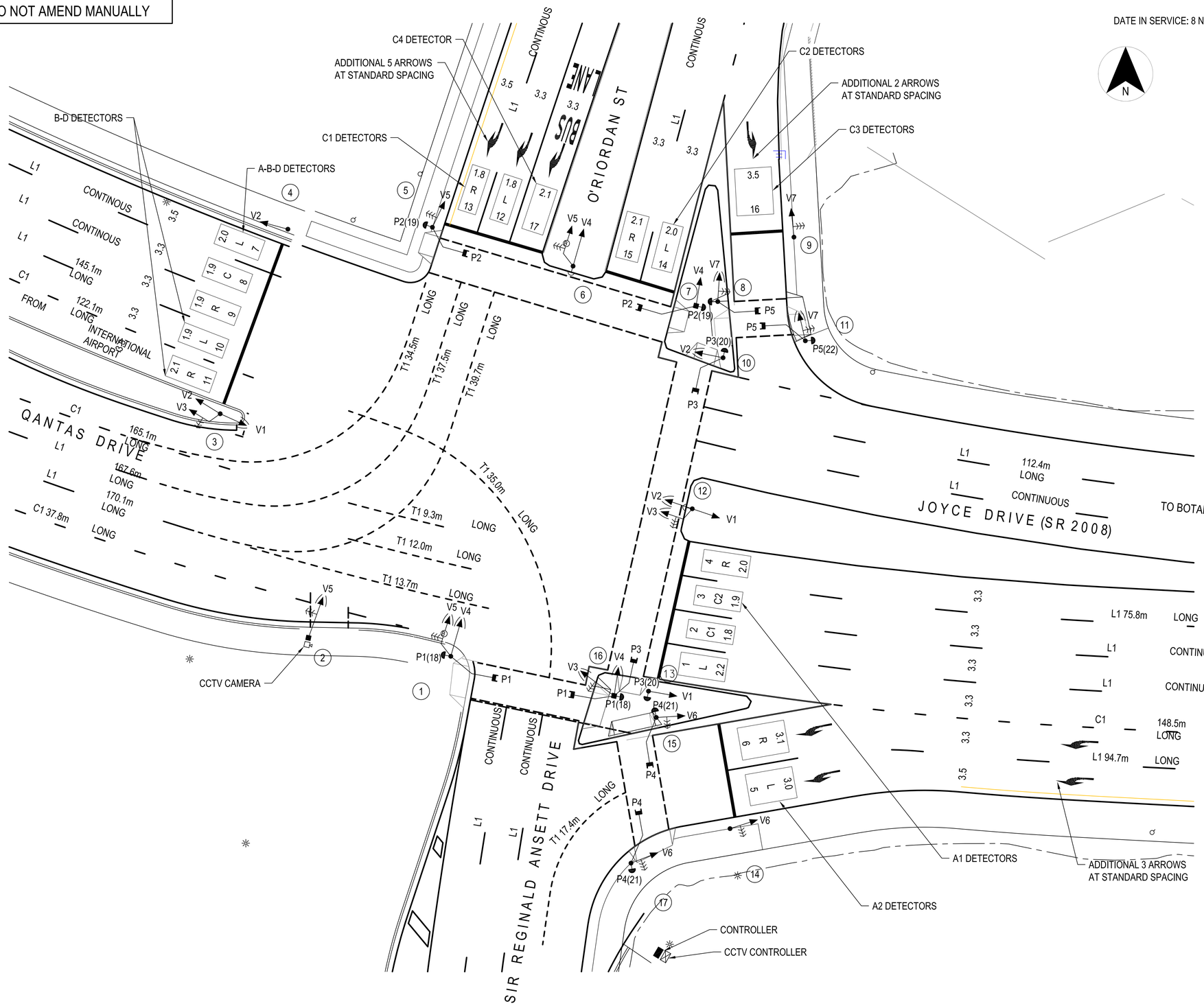
RMS REGISTRATION No.: DS2016 / 001133
PART: 01
ISSUE STATUS: PRELIMINARY DETAILED DESIGN
EDMS No.:
SHEET No.: RF-0310
ISSUE: 0

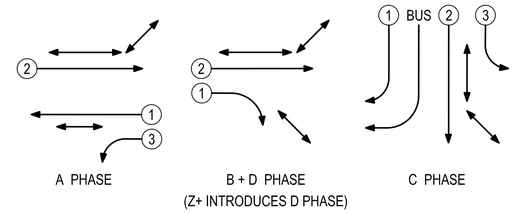
TCS 3086

DRAWN BY CADD
DO NOT AMEND MANUALLY

DATE IN SERVICE: 8 November 1994

Transport Roads & Maritime Services
NSW GOVERNMENT





MOVEMENT DIAGRAMS

POSTS

POST	TYPE	LENGTH	REMARKS
1	2	4.1	NEW
2	6	-	NEW
3	2	4.1	NEW
4	2	4.1	NEW
5	2	4.1	NEW
6	2	4.1	NEW
7	6	-	NEW
8	2	4.1	NEW
9	2	4.1	NEW
10	2	4.1	NEW
11	2	4.1	NEW
12	2	4.1	NEW
13	2	4.1	NEW
14	2	4.1	NEW
15	6	-	NEW
16	1	4.1	NEW

NOTES

1. THIS SITE IS SCATS LINKED.
2. SPECIAL STOP SIGN (R1-4) PLACED ON POST 5 AND 7.
3. ALL PUSH BUTTONS ARE AUDIO TACTILE.
4. KERB RAMPS ARE PROVIDED AT PEDESTRIAN CROSSING IN ACCORDANCE WITH RMS MODEL DRAWING MD.R173.B01.A.1.
5. RELOCATE EXISTING CCTV CAMERA MOUNTED TO POST 2.
6. PROVISION TO BE MADE FOR CABLE AND DUCTING FOR FUTURE PEDESTRIAN CROSSING ACROSS THE WESTERN APPROACH OF QANTAS DRIVE.
7. FOR DETAILS OF CIVIL WORKS REFER TO PLAN RD-0060
8. 'BUS ONLY' LANE IS COLOURED RED. REFER TO RMS SPECIFICATION R110 AND TD 99/9.

A ORIGINAL ISSUE

PUBLIC UTILITY LEGEND	
HYDRANT	
STOP VALVE	
GAS VALVE	
SEWER MANHOLE	
TELECOM PIT	
ELECT LIGHT POLE	
POWER POLE	
STAY POLE	
TELEPHONE BOX	
TELECOM PILLAR	

REFERENCE PLANS	
SYMBOLS/ABBS.	VD003-6
STD POSIT	VD001-5
PRES. DETECT	VC005-17
VEH. GROUP OP	TS-TN-019
DET. LOGIC OP	TS-TN-020
PED. MOVEMNT OP	TS-TN-021
SURVEYOR :	
DATE :	

U.B.D. Ref.
I.S.G. CO-ORDS E: N:
DESIGNED
CHECKED
SITE CHECKED
RECOMMENDED

DESIGN APPROVAL
APPROVED
NAME
POSITION
DATE
DESIGN PREPARED BY
Mott MacDonald

RMS ACCEPTANCE
RECOMMENDED
NAME
POSITION
DATE
ACCEPTED
NAME
POSITION
DATE

ROADS AND MARITIME SERVICES

MUNICIPALITY OF BOTANY
TRAFFIC SIGNALS AT
O'RIORDAN STREET, JOYCE DRIVE, QANTAS DRIVE
AND SIR REGINALD ANSETT DRIVE
MASCOT

DESIGN LAYOUT TCS No. 3086

EXISTING ☒ PROPOSED ☐
CADD FILE: VV3086_1I.dgn
SCALE 0 2.5 0 7.5 PLAN 1:200
ISSUE I
FILE 051.TS.117
SUPERSEDES SHEET/ISSUE 1/H
REG No. DSS2014 / 003475
TCS No. 3086
SHEET IT-0010

$DATE$ $TIME$ $FILE$

Appendix C

Consideration of clause 228(2) factors and matters of national environmental significance

Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* guideline (DUAP 1995/1996) and the *Roads and Related Facilities EIS Guideline* (DUAP 1996) as detailed in the REF, the following factors, listed in clause 228(2) of the *Environmental Planning and Assessment Regulation 2000*, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
a. Any environmental impact on a community? The proposed modification may result in temporary visual, traffic and access and noise impacts during construction, but is not expected to create noticeable overall impacts to nearby residents or users of the road network when compared to the impacts identified in the project REF. Potential impacts would be minimised with the implementation of the safeguards detailed in Table 7-1 of this addendum REF.	Short-term, minor, negative
b. Any transformation of a locality? During construction, the proposed modification would result in temporary impacts on the existing locality, which would be predominantly through negative visual amenity impacts associated with construction machinery, temporary fencing, signage, light spill, vegetation clearing and the generation of wastes.	Short-term, minor, negative
c. Any environmental impact on the ecosystems of the locality? The proposed modification would require an additional 1500 square metres of vegetation to be removed. Vegetation clearing for the proposed modification would not have any significant impact on the ecosystems of the locality, as the proposed modification would not impact habitat or viability of any species, including any threatened flora or fauna species. Biodiversity impacts and management measures to be implemented are described further in Section 6.7 of this addendum REF, Section 7.5.4 of the project REF and Table 7-1 of this addendum REF.	Long-term, minor, negative
d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? During construction, the proposed modification would result in potential moderate to high visual impacts. The majority of visual impacts during construction would be caused by construction machinery, temporary fencing, signage, light spill and the generation of wastes. The construction footprint associated with the proposed modification would require an additional 1500 square metres of vegetation to be removed. Construction of the proposed modification would also affect the amenity of adjacent land uses due to noise and vibration and the generation of dust. Notwithstanding the above visual impacts of the proposed modification, some enhancements would improve the visual amenity for the area in the long term, such as landscaping undertaken in roadside areas following completion of construction.	Short-term, minor, negative

Factor	Impact
e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The proposed modification would not impact on any known heritage items, cultural heritage values, places or buildings with an aesthetic, anthropological, archaeological, scientific or socially significant value.	Nil
f. Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act* 1974)? The proposed modification would not remove any good quality native vegetation, threatened ecological communities or threatened species. The removal of urban and exotic vegetation would not result in a significant impact on the habitat of protected fauna. Measures proposed to minimise the proposed modification's biodiversity impact are outlined in Table 7-1 of this addendum REF.	Nil
g. Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposed modification would not result in impacts to any threatened or endangered species of animal, plant or other form of life, whether living on land, in water or in the air. The removal of urban and exotic vegetation for the proposed modification would not result in a significant impact on the habitat or foraging area for protected fauna. Potential impacts would be minimised with the implementation of the safeguards detailed in Table 7-1 of this addendum REF.	Nil
h. Any long-term effects on the environment? The proposed modification is not expected to result in any long-term effects on the environment beyond those identified in the project REF.	Nil
i. Any degradation of the quality of the environment? The proposed modification is not expected to increase the risk of degradation of the quality of the environment beyond that identified in the project REF. The project has the potential to degrade the quality of the environment through accidental spills and erosion and sedimentation during construction. A Soil and Water Management Plan (SWMP) would be prepared and implemented prior to construction to mitigate these impacts (refer to Section 7.8.4 of the project REF and Table 7-1 of this addendum REF).	Short-term, minor, negative

Factor	Impact
j. Any risk to the safety of the environment? The proposed modification is not expected to increase the risk of safety to the environment beyond that identified in the project REF. Construction of the proposed modification has the potential to temporarily decrease safety for other road users and pedestrians due to carrying out construction work adjacent to operating traffic lanes, the movement of construction vehicles to and from the site and construction works restricting access to pedestrian footpaths. This would be managed through the implementation of a Traffic Control Plan (TCP) prepared for the project REF (discussed further in Section 7.1.4 of the project REF).	Short-term, minor, negative
k. Any reduction in the range of beneficial uses of the environment? The proposed modification would require further acquisition of one property owned by Sydney Airport. Land would be permanently acquired and, therefore, unable to be returned to its former land use. Roads and Maritime will consult with landholders impacted by the project. Property acquisition will be managed in accordance with the provisions of Roads and Maritime's Land Acquisition Policy (Roads and Maritime, 2012b) and the Land Acquisition (Just Terms Compensation) Act 1991.	Long-term, moderate, negative
l. Any pollution of the environment? The proposed modification is not expected to increase the risk of accidental spills during construction beyond that identified in the project REF. There is the potential for accidental spills of chemicals during construction which could affect the surrounding land, surface water and groundwater. There is the potential for air quality and noise amenity to be reduced during construction activities. The proposed modification is unlikely to cause any significant pollution of the environment if the safeguards detailed in the project REF are implemented and maintained.	Short-term, minor, negative
m. Any environmental problems associated with the disposal of waste? No environmental problems are anticipated for the disposal of waste as a result of the proposed modification. Potential impacts would be minimised with the implementation of the safeguards detailed in the determined REF.	Short-term, minor, negative
n. Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The proposed modification would require resources such as concrete and asphalt, which are common construction materials. The proposed modification would not create any significant demand on these resources. All other required resources for the proposed modification are considered to be readily available and have not been identified as being short supply.	Nil

Factor	Impact
o. Any cumulative environmental effect with other existing or likely future activities? The proposed modification is not expected to increase the timeframe of the project or result in a substantial intensification of activities that could enhance cumulative effects with other projects being undertaken at the same time in the surrounding area. Cumulative impacts associated with the project are discussed in Section 7.16 of the project REF.	Nil
p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposed modification would not result in any impact on coastal processes and coastal hazards including those under projected climate change conditions.	Nil

Matters of National Environmental Significance

Under the environmental assessment provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of the Environment and Energy.

A referral is not required for proposed actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property? The proposed modification would not impact on a World Heritage property.	Nil
Any impact on a National Heritage place? The Sydney Kingsford Smith Airport Group is an indicative place on the Commonwealth Heritage List, and is located to the south of the proposal area. The road widening will encroach inside the heritage curtilage of the Sydney Kingsford Smith Airport Group by 25 metres to the south of Joyce Drive at its furthest point. The exact distance that the proposed modification would encroach into heritage-listed curtilage would be determined during detailed design. The existing heritage curtilage of the Sydney Airport precinct will require adjustment. No known heritage items will be disturbed by the proposed widening of Joyce Drive.	Long-term, minor, negative
Any impact on a wetland of international importance? The proposed modification would not directly impact on a wetland of international importance.	Nil
Any impact on a listed threatened species or communities? The proposed modification would not impact on listed threatened species or communities	Nil
Any impacts on listed migratory species? The proposed modification would not impact on listed migratory species	Nil
Any impact on a Commonwealth marine area? The proposed modification would not impact on a Commonwealth marine area.	Nil
Does the proposal involve a nuclear action (including uranium mining)? The proposed modification does not involve a nuclear action.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Long-term, minor,

Factor	Impact
A further 1450 m^2 of Commonwealth land would be acquired for the proposed modification and converted to road reserve. This process would be carried out in consultation with Sydney Airport.	negative

Appendix D

Statutory consultation checklists

Infrastructure SEPP

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Stormwater	Are the works likely to have a *substantial* impact on the stormwater management services which are provided by council?	No	Bayside Council	ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will *strain* the existing road system in a local government area?	Yes	Bayside Council	ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a *substantial* impact on the capacity of any part of the system?	No	Bayside Council	ISEPP cl.13(1)(c)
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a *substantial* volume of water?	No	Bayside Council	ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a *minor* or *inconsequential* disruption to pedestrian or vehicular flow?	Yes	Bayside Council	ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than *minor* or *inconsequential* excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	Bayside Council	ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the item/area are more than *minor* or *inconsequential*?	Yes	Bayside Council	ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a *minor* extent?	No	Bayside Council	ISEPP cl.15

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*?	No	Office of Environment and Heritage	ISEPP cl.16(2)(a)
Marine parks	Are the works adjacent to a declared marine park under the *Marine Parks Act 1997*?	No	Department of Planning and Environment	ISEPP cl.16(2)(b)
Aquatic reserves	Are the works adjacent to a declared aquatic reserve under the *Fisheries Management Act 1994*?	No	Office of Environment and Heritage	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*?		Department of Planning and Environment	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)

Appendix E

Aboriginal clearance letter

Transport
Roads & Maritime
Services

15/08/2016

Karina Rubenis
Environmental Officer
Greater Sydney Project Office

Dear Karina

Re: Preliminary assessment results for the Joyce Dr Widening Project Proposal based on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (the procedure).

The project, as described in the Stage 1 assessment checklist, was assessed as being unlikely to have an impact on Aboriginal cultural heritage. The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate any known Aboriginal objects or places in the immediate study area.
- The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure.
- The work to be undertaken is within a disturbed area.
- There are no site or ancillary compound areas to be established.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact me to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Roads and Maritime Services' *Unexpected Archaeological Finds Procedure.*

For further assistance in this matter do not hesitate to contact me.

Yours sincerely

Jeff Nelson
Aboriginal Cultural Heritage Officer (ACHO) – Sydney Region

Appendix F

Mantra Hotel Noise and Vibration assessment

ACOUSTICS AND AIR

JOYCE DRIVE WIDENING ASSESSMENT OF NOISE IMPACTS ON PROPOSED MANTRA HOTEL

REPORT NO. 14174-OR
VERSION B

JANARY 2017

PREPARED FOR

ROADS AND MARITIME SERVICES
27 ARGYLE STREET
PARRAMATTA NSW 2150

WILKINSON MURRAY

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	12 December 2016	Sean Flaherty	Neil Gross
A	Final	15 December 2016	Sean Flaherty	Neil Gross
B	Final	23 January 2017	Sean Flaherty	Neil Gross

Note

All materials specified by Wilkinson Murray Pty Limited have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose. The information contained in this document produced by Wilkinson Murray is solely for the use of the client identified on the front page of this report. Our client becomes the owner of this document upon full payment of our **Tax Invoice** for its provision. This document must not be used for any purposes other than those of the document's owner. Wilkinson Murray undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

Quality Assurance

We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.

AAAC

This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.

Celebrating 50 Years in 2012

Wilkinson Murray is an independent firm established in 1962, originally as Carr & Wilkinson. In 1976 Barry Murray joined founding partner Roger Wilkinson and the firm adopted the name which remains today. From a successful operation in Australia, Wilkinson Murray expanded its reach into Asia by opening a Hong Kong office early in 2006. 2010 saw the introduction of our Queensland office and 2011 the introduction of our Orange office to service a growing client base in these regions. From these offices, Wilkinson Murray services the entire Asia-Pacific region.

TABLE OF CONTENTS

GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

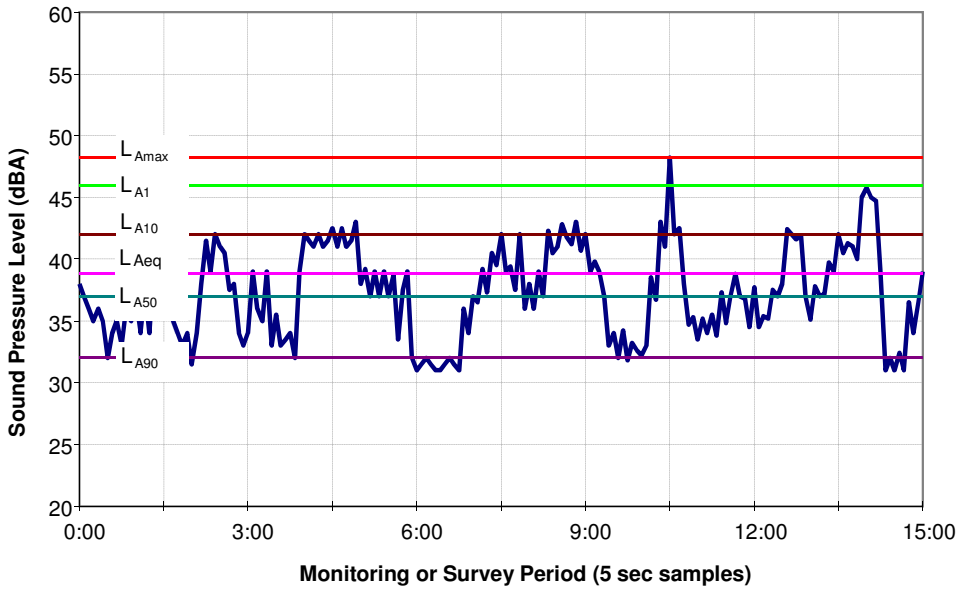
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Roads and Maritime Services NSW (Roads and Maritime) proposes to widen approximately 100 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot. This widening is required to connect to the proposed Airport East Precinct Project, Airport North Precinct Project and road upgrades associated with the Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development project. The proposal, together with the adjacent road upgrades, would improve traffic flow and access to Sydney Airport, Port Botany and the existing and proposed motorway network.

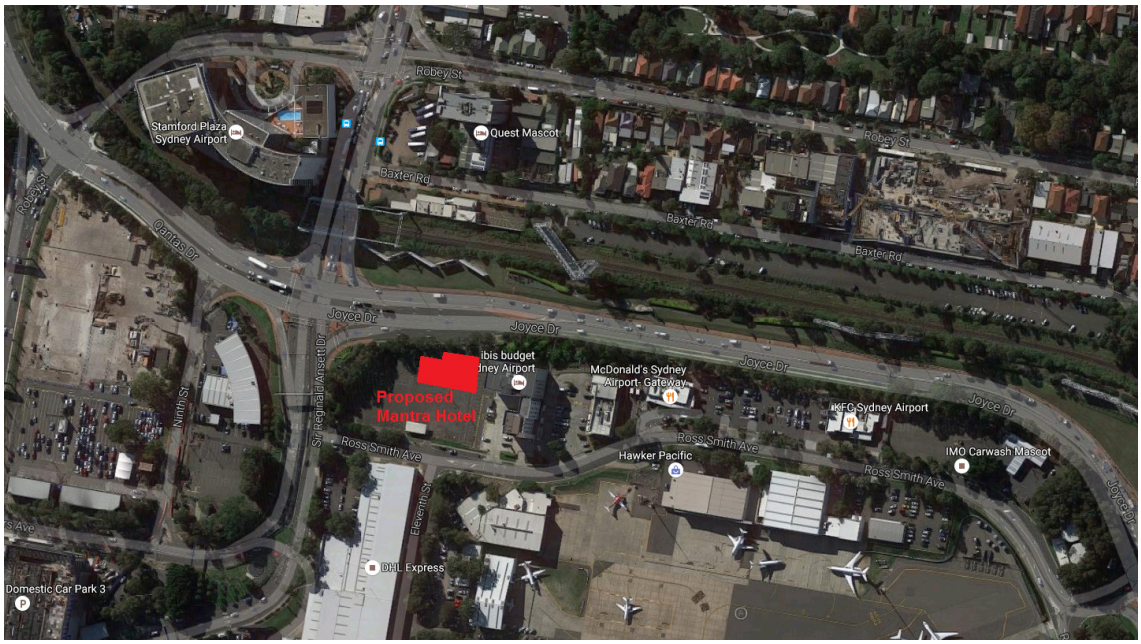
Wilkinson Murray has undertaken construction and operational noise assessments for the Airport East Precinct Project, the findings of which have been documented in three reports:

- *WestConnex Enabling Works (Airport East) Construction Noise Impact Statement* (dated 28/11/2014);
- *WestConnex Enabling Works (Airport East) Operational Noise Impact Statement* (dated 06/01/2015);
- *WestConnex Enabling Works (Airport East) Construction and Operational Noise Impact Statement for the Ibis Hotel* (dated 31/03/2015).

Since the publication of these reports, a further sensitive receiver has been identified - the proposed Mantra Hotel, located on Joyce Drive (See Figure 1-1). At the request of Roads and Maritime the existing construction and operational noise models prepared for the existing assessments have been updated in order to predict construction and operational noise levels external to the hotel.

This report presents the results of this further modelling.

Figure 1-1 Aerial View showing Proposed Mantra Hotel Location



2 INTERNAL NOISE CRITERIA RELEVANT TO HOTELS

The assessments previously undertaken have applied noise criteria based on the provisions of the *NSW Road Noise Policy* (*RNP*, 2011) and the *NSW Interim Construction Noise Guideline* (*ICNG*, 2009). These criteria apply principally to residential uses and not strictly to short term accommodation uses, such as the proposed Mantra Hotel. For the purpose of this assessment, Wilkinson Murray considers the recommendations of the Australian/New Zealand Standard *AS/NZS 2107:2000 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*.

AS/NZS 2107:2000

Australian/New Zealand Standard *AS/NZS 2107:2000* recommends that the following internal noise limits are not exceeded due to extraneous noise sources in hotels situated near major roads:

- Sleeping Areas - L_{Aeq} 35 dB(A) satisfactory and L_{Aeq} 40 dB(A) maximum

Wilkinson Murray considers the maximum internal design standard of L_{Aeq} 40 dB(A) to be an appropriate noise goal for this Project.

3 ACOUSTIC DESIGN OF MANTRA HOTEL

In order to determine internal noise levels within the sleeping areas it is necessary to consider the design of hotel's external facades. Given the location near an airport, the façade design is expected to have a higher acoustic performance due to protection from aircraft noise than that generally required to control road traffic noise. From discussions with architects Martin & Ollmann, who prepared the detailed design for the hotel, it is understood that the hotel design incorporates external facades constructed from 200 mm precast concrete panels and fixed substantial double glazed windows comprising 6mm heat strengthened glass/12 mm air gap/10 mm heat strengthened glass.

The specified glazing standard would be expected to achieve a sound insulation rating of approximately Rw+C = 36 (for typical urban traffic) or Rw+C_{tr} = 34 (for low frequency sources).

4 OPERATIONAL NOISE ASSESSMENT

Based on the modelling procedures described in the identified operational noise impact statement, daytime and night time traffic noise levels for the design year 2018 have been predicted at the external facades of the proposed Mantra Hotel. As a new (yet to be developed receiver), Year 2013 predictions are not considered relevant and therefore have not been considered.

For the purpose of this assessment it has been conservatively assumed that 50% of the westbound traffic on Joyce Drive would occupy the lanes closest to the hotel and turn left on to Sir Reginald Ansett Drive.

The predicted 2018 external levels are set out in Table 4-1. Based on the identified external façade elements, the anticipated internal noise levels are also included in the table and compared with the adopted internal noise criteria.

Table 4-1 Year 2018 "Build" Predicted $L_{Aeq,Period}$ Traffic Noise Levels

Receiver	$L_{Aeq,Period}$ (dBA) Year 2018 'Build'		Internal Noise Level L_{Aeq} (dBA)		Internal Noise Criteria $L_{Aeq,}$(dBA)		Compliance	
	Day	Night	Day	Night	Day	Night	Day	Night
Proposed Mantra Hotel	73	67	< 40	< 35	40	40	Yes	Yes

As shown in Table 4-1, the adopted internal criteria from *AS/NZS 2107:2000* would be expected to be readily achieved with the operation of the Project. Additionally, the design of the hotel's external facades would be expected to be sufficient to protect against any potential sleep disturbance effects from road traffic noise.

Further, it is noted that results indicate no change to the predictions previously undertaken for the Ibis Hotel.

5 CONSTRUCTION NOISE ASSESSMENT

Based on the modelling procedures described in the identified construction noise impact statement, construction noise levels have been predicted at the external facades of the proposed Mantra Hotel. Worst-case construction noise levels, based on all the identified sources operating simultaneously and continuously, are presented in Table 5-1.

Table 5-1 Worst Case Predicted $L_{Aeq,15min}$ Construction Noise Levels

Construction Activity	Predicted $L_{Aeq,15min}$ (dBA)	Internal Noise Level L_{Aeq} (dBA)	Internal Noise Criteria $L_{Aeq,}$(dBA)	Compliance	Exceedance
General Holmes Widening	59	< 25	40	Yes	Nil
Joyce Drive Widening	86	52	40	No	12
New Rail Bridges	53	< 25	40	Yes	Nil
Botany Road Intersection Upgrade	56	< 25	40	Yes	Nil
Finalisation Works	57	< 25	40	Yes	Nil

As shown in Table 5-1, the adopted internal noise criteria would be expected to be met during most of the identified construction activities.

The highest construction noise levels would be expected to arise during the Joyce Drive widening works, which are predicted to result in a potential exceedance of up to 12 dB. Therefore, the Joyce Drive widening works should be managed through the mitigation measures detailed in the Project's noise management plan, as detailed in the identified Construction Impact Statement.

6 CONSTRUCTION VIBRATION ASSESSMENT

Construction Vibration Criteria

When assessing vibration there are two components that require consideration:

- human exposure to vibration; and
- the potential for building damage from vibration.

Construction work is generally considered an intermittent source of vibration.

Assessing Vibration: A Technical Guideline provides guidance for assessing human exposure to vibration. The publication is based on British Standard BS 6472:1992. Intermittent vibration is assessed by the Vibration Dose Value (VDV) which is based on the *weighted* root mean quartic (rmq) acceleration in each component.

Table 6-1 sets out VDV values as specified by *Assessing Vibration: A Technical Guideline.*

Table 6-1 Human Comfort Vibration Goals – VDV ($m/s^{1.75}$)

Place	Day (7.00am-10.00pm)		Night (10.00pm-7.00am)	
	Preferred	Maximum	Preferred	Maximum
Residences	0.20	0.4	0.13	0.26

There are currently no Australian Standards or guidelines to provide guidance on assessing the potential for building damage from vibration. It is common practice to derive goal levels from international standards.

British Standard BS 7385:1993 and German Standard DIN 4150:1999 both provide goal levels, below which vibration is considered insufficient to cause building damage. Of these, DIN 4150 is the more stringent. DIN 4150 bases the goal levels on the highest vibration level in each component (Peak Component Particle Velocity – PCPV). Table 6-2 summarises the goal levels specified in DIN 4150.

Table 6-2 Guideline Values for Vibration Velocity to be used when Evaluating the Effects of Short-Term Vibration on Structures (DIN 4150-3:1999)

Type of Structure	Guideline Values for Velocity – PCPV (mm/s)		
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz
Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50
Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20
Structures that, because of their particular sensitivity to vibration, cannot be classified under either of the other classifications and of great intrinsic value	3	3 to 8	8 to 10

With regard to these levels DIN 4150 states, *"experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur. If damage nevertheless occurs, it is to be assumed that other causes are responsible. Exceeding [these] values does not necessarily lead to damage; should they be significantly exceeded, however, further investigations are necessary."*

For general construction vibration, the dominant frequency of vibration is typically greater than 50 Hz. However, because the dominant frequency of vibration cannot be determined with certainty at this stage, this assessment has adopted conservative goals of 5 mm/s for residential buildings.

Construction Vibration Assessment

No material risk of structural damage due to construction vibration effects is anticipated.

Potential human comfort vibration impacts would be expected to be controlled by virtue of the progressing works, that is, the vibratory rollers and hammers would not remain in static locations for prolonged periods of time, but would typically move around the works areas, thereby limiting the vibration dose received by individual receivers.

Calculations indicate that the VDV criteria may be achieved for receivers that are located within 30 m of the works by limiting the time that vibratory rollers/hydraulic hammers are used within this setback distance.

Compliance with the maximum night time VDV criterion (0.26 ms-1.75) can be demonstrated considering the cumulative vibration dose generated by a vibratory roller operating at progressive setback distances of 15 m, 20 m, 25 m and 30 m. Provided the roller would operate for no more than one hour at each of these setback distances, during a working day (i.e. for no more than one hour at 15 m setback, followed by no more than one hour at 20 m setback, no more than one hour at 25 m setback and no more than one hour at 30 m setback) compliance with the maximum night time VDV criterion may be achieved.

On this basis, it is considered that any vibration effects would be appropriately managed during the Joyce Drive widening works, to achieve the maximum human comfort criteria at the Mantra Hotel.

7 CONCLUSION

Roads and Maritime Services NSW (Roads and Maritime) proposes to widen approximately 100 metres of Joyce Drive to the east of the intersection of Joyce Drive, O'Riordan Street, Sir Reginald Ansett Drive and Qantas Drive, Mascot. This widening is required to connect to the proposed Airport East Precinct Project, Airport North Precinct Project and road upgrades associated with the Sydney Airport T2/T3 Ground Access Solutions and Hotel Major Development project. The proposal, together with the adjacent road upgrades, would improve traffic flow and access to Sydney Airport, Port Botany and the existing and proposed motorway network.

Wilkinson Murray has undertaken construction and operational noise assessments for the Airport East Precinct Project, the findings of which have been documented in three reports:

- *WestConnex Enabling Works (Airport East) Construction Noise Impact Statement* (dated 28/11/2014);
- *WestConnex Enabling Works (Airport East) Operational Noise Impact Statement* (dated 06/01/2015);
- *WestConnex Enabling Works (Airport East) Construction and Operational Noise Impact Statement for the Ibis Hotel* (dated 31/03/2015).

Since the publication of these reports, a further sensitive receiver has been identified - the proposed Mantra Hotel, located on Joyce Drive (See Figure 1-1). At the request of Roads and Maritime the existing construction and operational noise models prepared for the existing assessments have been updated in order to predict construction and operational noise levels external to the hotel.

Predicted operational and construction noise levels external to the proposed hotel have been predicted and are presented in this report. Based on review of the proposed hotel's external building façade specifications, internal levels have also been estimated and included.

Results indicate that the operation of the project would not be expected to result in any exceedance of the maximum or satisfactory internal noise level recommended by Australian/New Zealand Standard *AS/NZS 2107:2000.*

During most of the identified construction activities no construction noise impacts are predicted. During the Joyce Drive widening works, however, an exceedance of the maximum internal noise level recommended by *AS/NZS 2107* by up to approximately 12 dB has potential to arise. These works should therefore be managed through the mitigation measures detailed in the Project's noise management plan, as detailed in identified Construction Impact Statement.

No material vibration impacts are expected.