WestConnex M4-M5 Link

Rozelle Interchange - Modification No.4:
The Glebe Island Construction Ancillary Facility

Modification report

June 2020

RMS: 21.219
ISBN: 978-1-922338-90-7

(blank page)

Transport for NSW

WestConnex - M4-M5 Link

Rozelle Interchange - The Glebe Island Construction Ancillary Facility

Modification report

June 2020

Prepared for

Transport for NSW

Prepared by

John Holland CPB Contractors Joint Venture

Executive summary

Introduction

The M4-M5 Link project (the approved project) is part of the WestConnex program of works that, together with the proposed Sydney Gateway, will facilitate improved connections between western Sydney, Sydney Airport and Port Botany, and south and south-west Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and through local communities.

The approved project includes the construction and operation of a new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters, an interchange at Lilyfield and Rozelle (the Rozelle Interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link).

Approval for the construction and operation of the project was granted on 17 April 2018 by the NSW Minister for Planning (application number SSI 7485).

The Environmental Impact Statement (EIS) describes construction and operation of the approved project in two stages.

- Stage 1 (also commonly referred to as Stage 3A of the WestConnex program of works), as described in the EIS, included construction of the Mainline Tunnels between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. These works commenced in 2018 with the Mainline Tunnels scheduled to open to traffic in 2022.
- Stage 2 (also commonly referred to as Stage 3B of the WestConnex program of works), as described in the EIS, Construction of the Rozelle Interchange and Iron Cove Link including connection to the stub tunnels at the Inner West subsurface interchange, connection to the surface road network at Lilyfield and Rozelle, and construction of tunnels, ramps and associated infrastructure as part of the Rozelle Interchange to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project.

Proposed modification

The proposed modification relates to Stage 2 of the approved project and involves the following key components:

- Establishment and use of a construction ancillary facility upon a 4,000 square metre concreted area of Port Authority of NSW land on Glebe Island for the purpose of receiving and assembling equipment required for the Rozelle Interchange.

In general, the proposed modification has been identified as a solution to the competing needs between concurrent construction activities to occur at approved project sites and the logistical requirements for assembly of construction materials (in particular steel bridge girders) consequently reducing the risk of delay to the construction program.

The approval of the proposed modification would reduce the likelihood and severity of risk for safety in assembling construction materials at ground level (i.e. avoid working at heights and lifting of construction materials). In addition, the proposed modification would maximise the works efficiency resulting in a reduction of out-of-hours works thereby resulting in an overall reduction of environmental impacts associated with the Stage 2 construction works. Reducing out-of-hours works at the approved project sites is considered to have an overall positive social benefit by minimising negative amenity impacts associated with construction of the approved project.

Community and stakeholder consultation

The consultation activities carried out for the proposed modification include:

- Distributing a Community Guide brochure to registered stakeholders clearly outlining details of the modification, justification, impacts and the benefits of the proposal,
- Sending direct emails to registered stakeholders, including residents, landowners, businesses and community groups where relevant,

- Providing webpage updates about the modification, which will be published on www.westconnex.com.au and will include information on the modification process, and
- Virtual meetings and briefings to allow key stakeholders such as councils, community members and groups, as well as government bodies to have their questions answered about the proposed modification.

Communication and consultation with stakeholders and the community during establishment and use of the proposed modification would focus on providing updates on construction activities and program, responding to enquiries and concerns in a timely manner and minimising potential impacts where possible. Further detail of consultation with stakeholders and the community during construction is provided in section 7.6.2 of the EIS.

Environmental assessment

Potential environmental impacts associated with the proposed modification have been assessed and compared to the environmental impacts assessed in the EIS. Key environmental impacts for the proposed modification are summarised below.

Traffic and transport

- The approved project traffic volumes were assessed to have a negligible impact on the existing road network and there was sufficient capacity to accommodate construction vehicle movements proposed by the modification. No changes to construction traffic volumes from the approved project are proposed,
- Heavy vehicle movements will primarily be associated with the delivery of equipment and steel girder segments to the proposed modification site, and transport from the site to the approved project sites. Some of this equipment is oversized and may require delivery under a Road Occupancy License (ROL). These deliveries would be required to be completed outside of standard construction hours, and
- The proposed modification would not introduce additional vehicle routes other than those approved and currently managed under the approved project.

Noise and vibration

- Noise levels from establishment and use of the proposed modification site are predicted to be below the relevant noise management levels (NMLs) at all sensitive receivers at all times and the risk of sleep disturbance is low as maximum noise levels are below the screening level,
- Given the low volume of redistributed vehicle movements associated with the proposed modification site and separation from residential receivers, noise from construction traffic is also predicted to be minor,
- The proposed modification does not involve vibration intensive works, and no additional construction vibration or ground-borne noise impacts beyond those assessed in the EIS and Submissions and Preferred Infrastructure Report (SPIR) are predicted, and
- The proposed modification would reduce the requirement for out-of-hours works at approved project sites, which are proximate to sensitive residential receivers and reduce the risk for potential delays to the construction program. Reducing out-of-hours works at the approved project sites and minimising delays to the construction program is considered to have an overall positive social benefit by minimising negative amenity impacts associated with construction of the approved project.

Air quality

- The proposed modification would result in low to negligible air quality impacts associated with establishment and use of the proposed modification site.

Soil and water

- The establishment and use of the proposed modification site does not require ground disturbance activities or vegetation removal. Given the proposed modification does not involve ground disturbance activities or material stockpiling, the risk of erosion and sedimentation as a result of runoff or tracking from trucks to surrounding soils, waterways and sensitive receiving environments is considered to be negligible, and
- There is potential for spills and leaks to occur from the use of equipment and machinery at the proposed modification site, which would be mitigated in accordance with the controls for the approved project.

Aboriginal and non-Aboriginal heritage

- There are no Aboriginal heritage items or places recorded within 200 metres of the study area and Glebe Island is a highly disturbed site. There is no ground disturbance activities associated with the proposed modification,

- There are no non-Aboriginal heritage items within the study area. There are several non-Aboriginal heritage items on Glebe Island within the broad vicinity of the proposed modification site, however, there are no works directly adjacent to these heritage items associated with the proposed modification and there are no significant vibratory construction activities required for the establishment and use of the proposed modification site, and

- The proposed modification site may result in a minor, temporary change to the visual setting of non-Aboriginal heritage items on Glebe Island, however, the works would be consistent with the industrial use of the site which forms part of the visual character and significance of these heritage items. There would be no permanent impact to the visual setting of non-Aboriginal heritage items within the vicinity of the proposed modification site as a result of the proposed modification.

Urban design and visual amenity

- There would be short-term minor visual impacts to receivers around the proposed modification site (residences with frontage to Johnstons and Jones Bays and Glebe Island in Pyrmont, Anzac Bridge users and residences located along the White Bay frontage, such as Roberts Street),

- Although the presence of the proposed modification site constitutes a visual change, the use of part of an existing concrete hardstand area for transport and assembly of civil equipment is consistent with existing industrial activities recently occurring at the site, and

- Overall, the visual impact of the proposed modification is low given the proposed modification activities occurring at the site are temporary in nature and consistent with existing transport, storage and assembling activities occurring at Glebe Island.

Socio-economic, land use and property

- The proposed modification is consistent with the handling and assembling activities currently occurring at the Glebe Island site and it will have minimal impact on ongoing port operations. Access to the proposed modification area would be subject to a lease agreement with Port Authority of NSW as well as the approval of this proposed modification.

Planning Approval and environmental management measures

The proposed modification would require the modification of Conditions of Approval A1 and A2 of the project approval. It is considered that no change to environmental management measures would be required to accommodate the proposed modification. All requirements would be adhered to should the proposed modification be approved.

Contents

Appendices

Figures

Tables

Abbreviations and Glossary

Acronym	Definition
AHIMS	Aboriginal Heritage Information Management System
ASS	Acid sulphate soils
CEMP	Construction Environmental Management Plan
CNVMP	Construction Noise and Vibration Management Plan
Critical SSI	Critical State Significant Infrastructure
DPIE	Department of Planning, Industry and Environment, NSW
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPIs	Environmental Planning Instruments
EPL	Environment Protection Licence
ICNG	Interim Construction Noise Guideline (DECCW, 2009)
LGA	Local government area
NML	Noise management level
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
RBL	Rating background noise level
RtS	Response to Submissions
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SPIR	Submissions and Preferred Infrastructure Report
SSI	State Significant Infrastructure
SSIAR	State Significant Infrastructure Assessment Report

1 Introduction

1.1 Purpose of this report

The Glebe Island Construction Ancillary Facility Modification Report (this report) provides the environmental assessment for the proposed modification to the M4-M5 Link project (the approved project) in accordance with Section 5.25 of *the Environmental Planning & Assessment Act 1979* (NSW) (EP&A Act). The proposed modification relates to the Rozelle Interchange stage of the project (Stage 2) and specifically, works at Glebe Island, Rozelle. This report includes:

- An overview of the approved project,
- A description of the proposed modification to the approved project,
- An assessment of the potential environmental impacts of the proposed modification,
- Details of the changes to the conditions of the project approval required by the proposed modification,
- Details of the changes to the approved environmental management measures required by the proposed modification, and
- Justification for the proposed modification.

1.2 Overview of WestConnex

WestConnex is one of the NSW Government's key infrastructure projects. The WestConnex program of works and the proposed Sydney Gateway project will facilitate improved connections between western Sydney, Sydney Airport, Port Botany and south and south-western Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and local communities.

Separate planning applications and assessments have been completed for each of the approved WestConnex projects. Transport for NSW is the proponent for the program of works.

An overview of the WestConnex program of works is provided in the figure below and includes:

- **M4 Widening** – widening of the existing M4 Motorway from Parramatta to Homebush (open to traffic),
- **M4 East** – extension of the M4 Motorway in tunnels between Homebush and Haberfield via Concord (open to traffic),
- **King Georges Road Interchange Upgrade** – upgrade of the King Georges Road interchange between the M5 West and M5 East at Beverly Hills (open to traffic),
- **New M5** – duplication of the M5 East from King Georges Road at Beverly Hills with tunnels from Kingsgrove to a new interchange at St Peters (approved and under construction),
- **M4–M5 Link** – tunnels connecting to the M4 East at Haberfield and the New M5 at St Peters (approved and under construction), and
- **M4-M5 Link** – Rozelle Interchange and Iron Cove Link (approved and under construction).

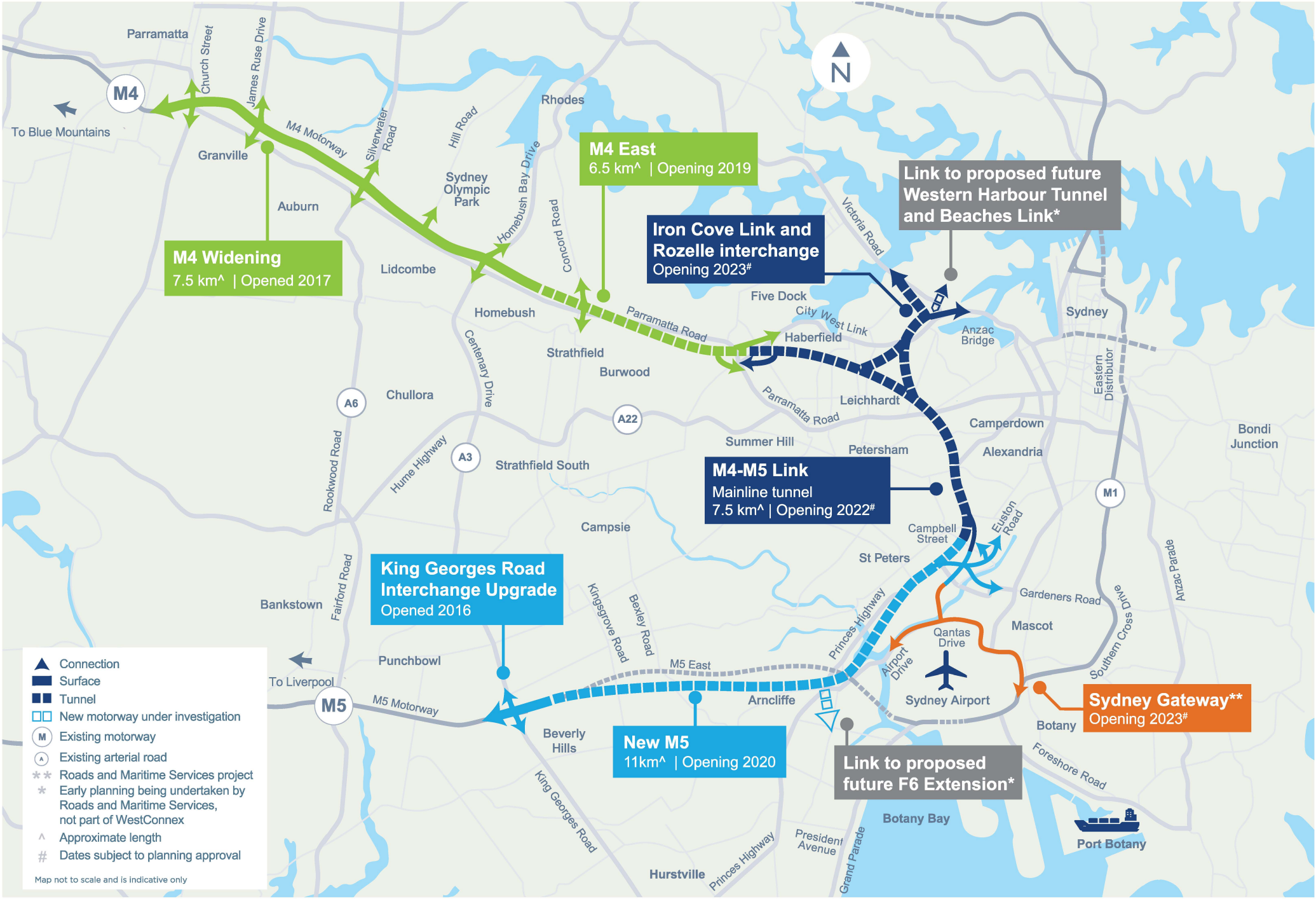


Figure 1-1 Overview of WestConnex and related projects

1.3 M4-M5 Link project

Approval for the construction and operation of the project was granted on 17 April 2018 by the NSW Minister for Planning (application number SSI 7485). The figure below provides an overview of the approved project.

The EIS describes construction and operation of the approved project in two stages.

Stage 1 (also commonly referred to as Stage 3A of the WestConnex program of works), as described in the EIS included:

- Construction of the mainline tunnels between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters, stub tunnels to the Rozelle interchange (at the Inner West subsurface interchange) and ancillary infrastructure at the Darley Road motorway operations complex (MOC1), which was subsequently removed, and the Campbell Road motorway operations complex (MOC5),
- These works commenced in 2018 with the mainline tunnel anticipated to be open to traffic in 2022.

Stage 2 (also commonly referred to as Stage 3B of the WestConnex program of works or the Rozelle Interchange), as described in the EIS, included:

- Construction of the Rozelle Interchange and Iron Cove Link including connection to the stub tunnels at the Inner West subsurface interchange, connection to the surface road network at Lilyfield and Rozelle, and construction of tunnels, ramps and associated infrastructure as part of the Rozelle Interchange to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project. Ancillary infrastructure will be provided at the Rozelle West motorway operations complex (MOC2), the Rozelle East motorway operations complex (MOC3) and the MOC4,
- Stage 2 works commenced in 2019 with these components of the project anticipated to be open to traffic in 2023.

The M4-M5 Link project is part of the WestConnex program of works that, together with the proposed future Sydney Gateway, would facilitate improved connections between western Sydney, Sydney Airport and Port Botany and south and south-west Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and through local communities.

A comprehensive description of the approved project, as well as other aspects of the WestConnex program of works, is provided within the EIS and the Submissions and Preferred Infrastructure Report (SPIR).

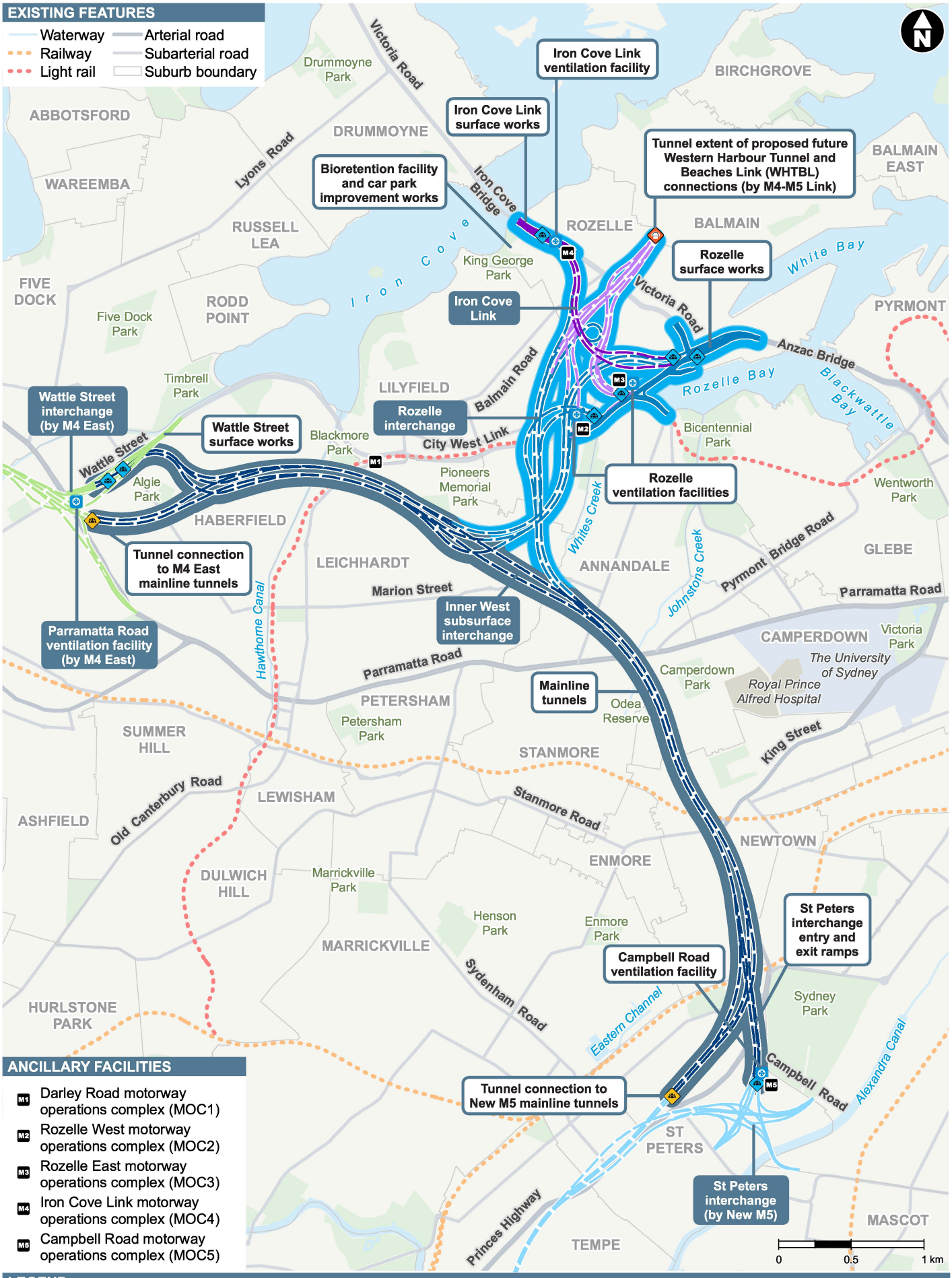


Figure 1-2 Local context of the project

1.4 Modifications to WestConnex M4-M5 Link

Following approval on 17 April 2018, Transport for NSW, formerly Roads and Maritime Services, submitted three modifications to the approved project under Section 5.25 of the EP&A Act. These modifications are:

- Modification 1: The modification related to Stage 1 of the approved project (the mainline tunnel) and was approved by the NSW Minister for Planning on 25 February 2019 (application number SSI 7485 MOD1).
- Modification 2: The proposed modification relates to Stage 2 of the approved project for the construction of The Crescent overpass and active transport links. This modification is currently pending determination (application number SSI 7485 MOD2).
- Modification 3: The proposed modification relates to Stage 2 undergrounding of the Iron Cove tunnel ventilation operational facilities. This modification is currently pending determination (application number SSI 7485 MOD3).

A more comprehensive description of each modification is provided at the following webpage: https://www.planningportal.nsw.gov.au/major-projects/project/3611. This proposed modification (the subject of this report) is being assessed separately from the modifications listed above.

1.5 Report structure

This report is structured as follows:

- **Chapter 1** (Introduction) provides an overview of the modification, its scope and purpose.
- **Chapter 2** (Assessment process) outlines the statutory assessment requirements and explains the steps in the assessment and approval process.
- **Chapter 3** (Proposed modification) provides a detailed description of the modification to the approved project.
- **Chapter 4** (Alternatives considered and identification of the preferred option) of this report provides more detail on the need and justification for the modification and alternatives considered.
- **Chapter 5** (Consultation) outlines the consultation activities undertaken to date and in the future.
- **Chapter 6** (Environmental assessment) identifies the relevant environmental issues, assesses the potential impacts of the modification and presents environmental management measures in response to those impacts.
- **Chapter 7** (Conditions of approval) identifies the conditions of the project approval that are required to be amended as part of this modification.
- **Chapter 8** (Environmental management measures) details changes to the approved environmental management measures as a result of this modification.
- **Chapter 9** (Modification justification and conclusions) presents the justification for the modification.

This report includes the following supporting appendices:

- **Appendix A**: Environmental Aspects Assessed
- **Appendix B**: Noise and Vibration Technical Report

2 Assessment process

2.1 Approval framework

2.1.1 Project approval

The project was declared as SSI and critical SSI and therefore assessed and approved under Part 5 of the EP&A Act. An EIS was prepared and placed on public exhibition from 18 August to 16 October 2017.

Following the public exhibition, over 13,000 submissions were received from the community and from NSW Government agencies and local councils. A SPIR was produced to document the responses to the issues raised and to assess design changes in response to the submissions received. The SPIR was lodged with the DPIE in January 2018.

Planning approval was granted by the NSW Minister for Planning on 17 April 2018 (application number SSI 7485) and was subject to a number of conditions relating to the construction and operation of the project.

Transport for NSW has since submitted three modifications under Section 5.25 of the EP&A Act; MOD1 Modification Report relating to Stage 1 of the approved project, MOD2 Modification Report and MOD 3 Modification Report relating to Stage 2 of the approved project. To date only MOD 1 has been approved by the NSW Minister for Planning on 25 February 2019. The application and determination of MOD 2 and MOD3 are being assessed separately from the modification that is the subject of this report. (Section 1.4)

2.1.2 Modification application

Transport for NSW as the Proponent for the project, is proposing to modify project planning approval SSI 7485 under Section 5.25 of the EP&A Act, which states that *"the proponent may request the Minister to modify the Minister's approval for State Significant Infrastructure. The Minister's approval for a modification is not required if the infrastructure as modified will be consistent with the existing approval under this Division".*

Section 5.25(3) states that *"the request for the Minister's approval is to be lodged with the Planning Secretary. The Planning Secretary may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister". Section 5.25(4) states that "the Minister may modify the approval (with or without conditions) or disapprove of the modification".*

The proposed modification would require the modification of Conditions of Approval A1 and A2. The proposed changes in the context of the Conditions of Approval that are discussed further in Chapter 7.

2.2 Environmental planning instruments

Section 2.2 of the EIS provides an overview of the environmental planning instruments (EPIs) relevant to the project. This section notes that *"in general, Section 115ZF(2) of the EP&A Act (now Section 5.22(2)) excludes the application of environmental planning instruments to SSI projects except as those instruments apply to the declaration of SSI or critical SSI".* Nevertheless, a review of Section 2.2 of the EIS has confirmed that the EPIs relevant to the project remain valid for this modification application and as such it has not been repeated below.

A review of current EPIs identified that two new State Environmental Planning Policies (SEPPs) had been gazetted since lodgement of the EIS for the project. These are the *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* (Vegetation SEPP) and the *State Environmental Planning Policy (Coastal Management) 2018 (Coastal SEPP)*. A review of these SEPPs confirmed that the Vegetation SEPP is not relevant for the modification application as no vegetation is likely to be impacted as a result of this proposed modification. The Coastal SEPP is also not relevant as the proposed modification is located on land where the SEPP does not apply.

2.3 Other NSW legislation

Section 2.3 of the EIS provides an overview of the other NSW legislation relevant to the project. A review of Section 2.3 of the EIS confirmed that the discussion of the other NSW legislation relevant to the project remains valid for this modification application and as such it has not been repeated below. This includes the need for an Environment Protection Licence (EPL) under Chapter 3 of the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act).

2.4 Commonwealth legislation

Section 2.4 of the EIS provides an overview of Commonwealth legislation that is relevant to the project. It considered the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) and the *Airports Act 1996* (Cwth). Consistent with the approved project described in the EIS and SPIR, the nature of the activities associated with the proposed modification means that no matters of national environmental significance are likely to be impacted.

3 Proposed modification

3.1 Overview of the proposed modification

The proposed modification involves:

- Establishment and use of a construction ancillary facility upon a 4,000 square metre concreted area of NSW Port Authority of NSW land on Glebe Island for the purpose of receiving and assembling equipment required for the Rozelle Interchange.

The proposed modification has been identified as a solution to the competing needs between concurrent construction activities to occur at approved project sites and the logistical requirements for assembly of construction materials (in particular steel bridge girders) consequently reducing the risk of delay to the construction program.

In addition to this, by facilitating access to the proposed modification site at Glebe Island, construction materials can be assembled to such a large scale (in particular steel bridge girders) that they could not be transported from a more distant location due to overmass road restrictions. This facilitates a more streamlined night-time construction program, therefore reducing the overall amount of out of hours construction work required to complete a task.

The proposed modification relates to the Stage 2 works. Approved construction activities for Stage 2 are described in Chapter 6 of the EIS. The proposed modification to the approved project involves the establishment and use of a construction ancillary facility. The proposed Glebe Island construction ancillary facility is located outside of the approved project boundary identified in the EIS and Part D of the SPIR and as modified by the application documentation for SSI 7485 MOD1.

The project approval defines construction ancillary facilities as "[a] *temporary facility for construction of the project including an office and amenities compound, construction compound, material crushing and screening plant, materials storage compound, maintenance workshop, testing laboratory, material stockpile area, car parking compound and truck marshalling facility".*

3.2 Details of the proposed modification

3.2.1 The site

Glebe Island is located within the Inner West Local Government Area (LGA) and is surrounded by White Bay to the north, Johnstons Bay to the east and Rozelle Bay to the south. Glebe Island connects to a mainland area of Rozelle to its west and is one of the last remaining industrial port facilities within 2km of Sydney City (Ethos Urban, 2018).

The proposed modification site is a 4,000 square metre concreted area of Port Authority of NSW land. The proposed modification site has been selected based on its close proximity to the approved project as well as the suitability of the existing conditions. In addition, the proposed modification would be consistent with the current land use as a functional port for materials storage and transportation.

The proposed modification site would have two vehicular access points which both provide access to James Craig Road through the Glebe Island internal road network (refer to Section 6.2.1).

The proposed modification would comprise a laydown space, on-site parking for construction personnel, a demountable office/lunchroom, installation of portable ablutions and placement of containers and generator(s) (refer to Figure 3-1 for an Indicative Site Layout).

3.2.2 Site establishment

Site establishment for the proposed modification would involve the following activities:

- Erection of a temporary boundary fence,
- Installation of office/lunchroom and first aid facility,
- Placement of portable ablutions and containers (site sheds/storage), and
- Demarcation of worker parking spaces (approximately 8).

3.2.3 Use of the Glebe Island construction ancillary facility

The use of the proposed modification site would involve the following key components:

- Equipment preparation works and transportation,
- Storage and assembly of materials and equipment, and
- Delivery of equipment to approved project work areas.

The use of the proposed modification site would involve storage of, and pre-assembly of large structural elements required for the approved project such as steel bridge girders along with associated furniture such as throw screens, handrails, decking and other infrastructure such as drainage pipework.

The low number of construction traffic volumes associated with the proposed modification are identified in Section 6.2.1. They are expected to be within the approved project traffic volumes, as without the proposed modification, equipment transport, unpacking and assembly would occur at existing construction ancillary sites associated with the Rozelle Interchange (Stage 2).

Transport of materials and equipment from the proposed modification site to the approved project sites would be undertaken on the approved project transport routes and access points.

Heavy vehicle movements will primarily be associated with the delivery of materials, equipment and steel girder segments to the site, and subsequent export to approved project sites. Some of this equipment is oversized and would require a Road Occupancy Licence (ROL). These deliveries would typically be required to be completed outside of standard construction hours to ensure public safety.

3.2.4 Site demobilisation and reinstatement

Demobilisation would involve removal of all temporary construction materials, plant and equipment installed for the proposed modification. The proposed site would be reinstated and returned to the Port Authority of NSW in accordance with the terms and conditions of the licence agreement.

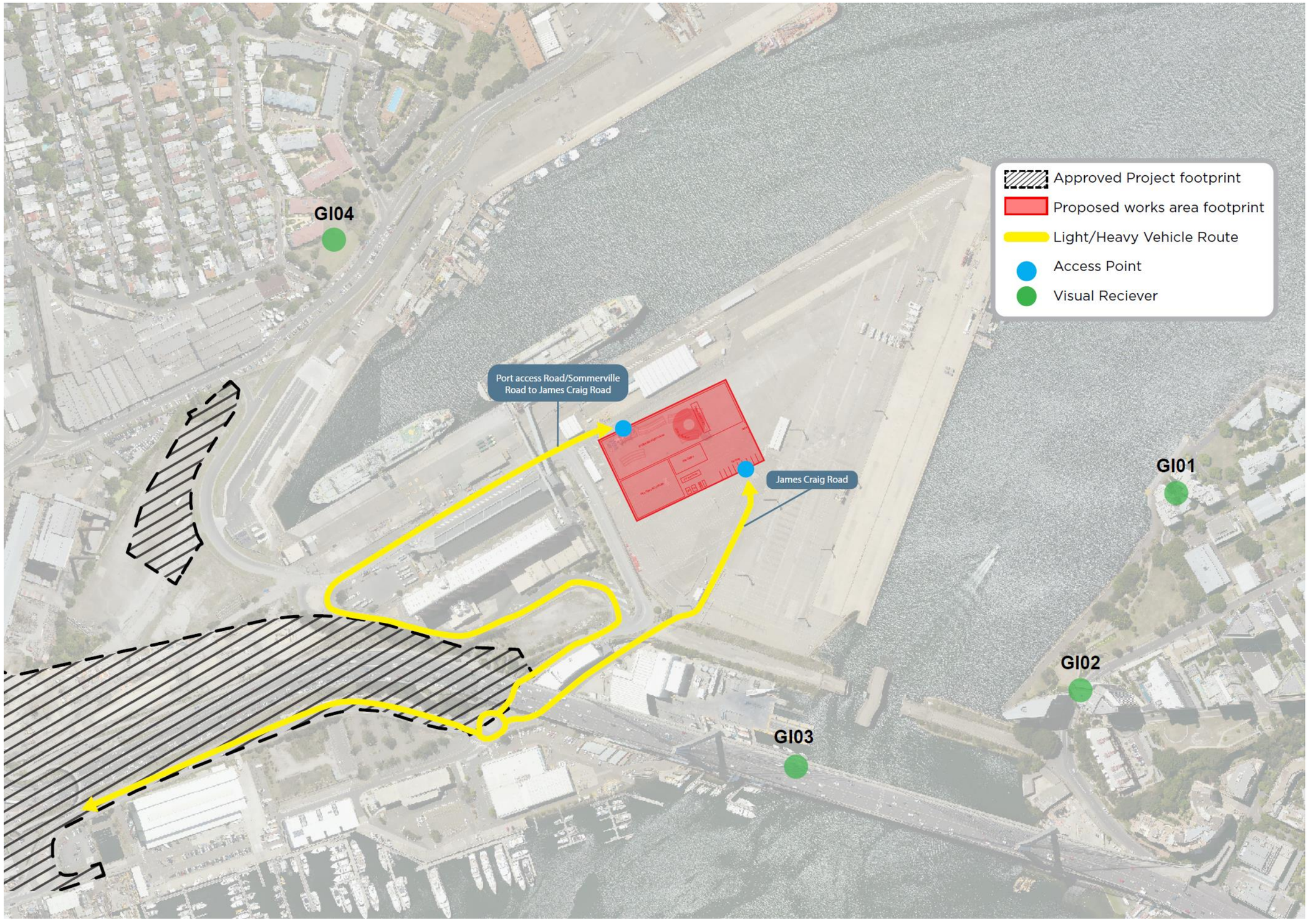


Figure 3-1 Indicative site layout

3.2.5 License agreement with Port Authority of NSW

The use of the proposed modification site would be subject to a license agreement with Port of Authority of NSW. The license agreement would specify time restrictions and would govern when heavy vehicle access will be unavailable to the project. This would typically be during cruise ship times, which are subject to change. As per the SPIR, Transport for NSW will continue to consult with Port Authority of NSW to ensure the coordination of heavy vehicles on roads managed and owned by Port Authority of NSW.

3.3 Changes to construction methodology

3.3.1 Plant and equipment

The additional plant and equipment that would be used at the proposed modification site to support the proposed modification would be:

- Light vehicles,
- Heavy vehicles, including vehicle lifting cranes,
- Generators,
- Hand power tools – drills, saws, rattle guns, welding equipment, etc,
- Mobile cranes,
- Water cart,
- Gurney,
- Tele-handler,
- Elevated work platform,
- Compressors, and
- Light towers.

Reasonable and feasible methods to reduce potential impacts would be further considered during detailed construction planning.

3.4 Construction program

The proposed temporary construction ancillary facility would be established in quarter three (Q3) 2020 for a period of approximately 2-4 weeks. The use of the site as a construction ancillary facility would be from quarter three (Q3) 2020 to the completion of project works.

3.5 Construction workforce

There would be no increase in the construction workforce than that of the approved project as a result of the proposed modification.

3.6 Construction hours

Construction hours for the proposed modification would be in accordance with the planning approval. Site establishment works and equipment preparation, assembly and unpacking works associated with the proposed modification would be undertaken in accordance with the approved project, specifically Condition of Approval E68 or as provided for in other conditions of approval and the project EPL.

Construction works would mainly be undertaken during standard construction hours except for oversize deliveries e.g. girders, as well as the temporary signage removal on Somerville Road.

4 Alternatives considered and identification of the preferred option

4.1 Options considered

As stated in Chapter 5 of the EIS, the EIS assessed an indicative concept design that would continue to be refined, where relevant, to improve road network and safety performance, minimise impacts on receivers and the environment, and in response to feedback from stakeholders. Furthermore, the EIS has been prepared prior to the appointment of a design and construction contractor and as such, the construction strategy presented and assessed in the EIS aimed to provide an assessment of probable construction methodologies. The EIS concludes that this means the detail of the design and construction approach presented in the EIS concept design is indicative only and is subject to further refinement carried out by the Contractor.

Construction design and planning has progressed since the project approval, and current construction activities combined with program forecasting indicates there is insufficient available space to assemble the fittings onto the bridge girders at the approved project sites. The unavailability of assembly space within the approved project sites is a result of concurrent construction activities, as well as the large quantity and dimensions of equipment and materials required to deliver the project.

Option 1 – establishment and use the Glebe Island temporary construction ancillary facility

This option represents the proposed modification. A detailed description of the proposed modification is provided in Section 3.2.

To ensure the materials required to construct the project are safely assembled and installed, the proposed modification proposes to establish and use a 4,000 square metre concreted area of Glebe Island (the proposed modification site) to receive and safely and efficiently assemble construction materials. Thereby avoiding the need for works over roads. The logistics of safely processing these materials requires ample working space, which is currently unavailable within the approved project sites.

The location selection of the proposed Glebe Island construction ancillary facility was based on:

- The area's proximity to approved project sites which is necessary to reduce the oversized and overmass delivery requirements to approved project sites,
- The operation of the proposed modification, namely construction material assembly activities, would be consistent with the current use of the land for storage and handling of materials associated with Port Authority of NSW activities,
- Minimal site establishment works are required as the area comprises concrete hardstand suitable for the assembly of materials,
- Already approved transport routes can be utilised for deliveries and transport of equipment to and from existing sites within the approved project, and
- The area is separated from sensitive receivers and noise impacts are predicted to be below the applicable noise management levels (NMLs).

Option 2 – Off-site pre-assembly of civil equipment

This option would involve prefabrication of the civil equipment and transportation to the approved project sites for storage prior to installation. This option would involve accommodating the required storage space within the approved project sites.

Option 3 – Pre-assembly within approved project sites

This option would involve accommodating the required assembly space within the approved project sites.

4.2 Identification of the preferred option

Options were considered to address the issues as identified in Table 4-1. As identified, the preferred option is to undertake the proposed modification being Option 1.

Table 4-1 Identification of Preferred Option

Option	Overview and Justification	Preferred Option
Option 1	This option represents the proposed modification. The approval of the modification would allow the safe and efficient assembly of construction materials to avoid the need for works over roads thus reducing the severity of risk for safety in assembling equipment and maximise the works efficiency that would result in an overall reduction of environmental impacts associated with the Stage 2 construction works. The key benefit of the proposed modification would be: 1. A reduction of planned out-of-hours works at approved project sites, 2. A reduction of noise impacts at sensitive receivers associated with the reduction of out-of-hours works, and 3. An overall improved outcome for affected receivers by way or minimising impacts. The proposed modification will also reduce the requirement for out-of-hours works at approved project sites which are proximate to sensitive residential receivers and reduce potential delays to the construction program. Reducing out-of-hours works at the approved project sites and minimising delays to the construction program is considered to have an overall positive social benefit by minimising negative amenity impacts associated with construction of the approved project. In general, the proposed modification has been identified as a solution to the competing needs between concurrent construction activities occurring at approved project sites, and the logistical requirements for assembly. The use of the proposed modification site will reduce safety risks as well as the likelihood of program delays.	Yes
Option 2	This option is not considered practicable as it would result in: 1. Heavy vehicle movements outside that of the approved project, 2. The requirement for additional out-of-hours works around the local communities in order to accommodate oversized and overmass deliveries to the approved project area, to ensure public safety (when compared with Option 1 and 3). This would likely result in additional nuisance impacts on the community and can be negated, 3. Safety and program risks as there is currently limited space available within the approved project sites, and 4. Increased noise and traffic impacts to the community (when compared with Option 1) associated with additional out-of-hours works.	No
Option 3	This option represents the base case of not proceeding with the proposed modification. There is currently limited space to assemble the construction materials at the approved project sites. Creating the amount of space required within approved project sites would involve rescheduling other indirect planned construction activities and delaying critical planned works, which would extend construction timeframes by approximately 16 weeks and increase the amount of out-of-hours works by approximately an additional 100 nights over a duration of two years. This would likely result in additional nuisance impacts on the community. Therefore, this option is not considered preferable over Option 1.	No

5 Consultation

5.1 Consultation during the preparation of the proposed modification

The government's approach to the COVID-19 crisis requires that all projects re-evaluate and re-imagine community relations practices. The Rozelle Interchange's community relations practices have been updated to take into consideration the government's response. Arguably the most notable change to the project's practices is that paper based notifications have been temporarily set aside for the most part.

In April 2020, community members and stakeholders were asked to provide their email addresses or advise that they still required paper based notifications at this time. Community members and stakeholders who have advised the project that they prefer paper based notifications continue to be engaged through this mechanism.

Targeted, virtual consultation activities have occurred to inform the proposed modification. These activities included:

- Distributing an electronic Community Guide brochure directly to registered stakeholders clearly outlining details of the modification, justification, impacts and the benefits of the proposal,
- Sending a paper based Community Guide to all stakeholders who have noted their preference for this mechanism,
- Sending direct emails to registered stakeholders, including residents, landowners, businesses and community groups where relevant,
- Providing webpage updates about the modification, which were published on www.westconnex.com.au,
- Scheduling virtual meetings, where requested, to allow the community and various stakeholders to have their questions answered about the proposed modification.

5.1.1 Summary of key consultation activities and consultation tools

Table 5-1 provides a summary of the community notifications and community engagement that has occurred, and the relevant feedback received.

Table 5-1 Community notification summary for the proposed modification to date

Activity/Tool	Timing	Feedback
WestConnex Community Reference Group (email briefing)	28 April 2020 5 May 2020	• Potential noise resulting from the proposed ancillary facility.
White Bay Stratas Committee (email briefing)	27 April 2020	• Potential noise resulting from the proposed ancillary facility. • Lack of long-term planning for the port area. • Why a suitable location cannot be found within approved EIS boundary. • Traffic will substantially increase as a result of the proposed modification. • Heavy vehicles may use local roads. • How to make a noise complaint in the future if the modification goes ahead.
Jacksons Landing Coalition (email briefing)	27 April 2020	Nil.
Glebe Island and White Bay Community Liaison Group (email briefing)	27 April 2020	Nil.

Activity/Tool	Timing	Feedback
Local residents – Community briefing and guide to the modification (email)	27 April 2020	• Potential noise resulting from the proposed ancillary facility. • Cumulative noise impacts from Rozelle Interchange project activities as well as from activities relating to the port. • Lack of paper based notifications advising of proposal. • Why a suitable location cannot be found within approved EIS boundary. • Why submissions are directed to the project team and not DPIE.
Local businesses surrounding the port – Community briefing and guide to the modification (email)	28 April 2020	Nil.
Individual meetings (phone calls, virtual)	As requested	• Concern regarding potential noise resulting from the proposed ancillary facility.

5.1.2 Consultation with local, state and commonwealth government agencies, elected representatives and other industry and stakeholder consultation

Table 5-2 provides a summary of the consultation activities undertaken with local, State and Commonwealth Government agencies, elected representatives and other stakeholders during the development of the proposed modification.

Table 5-2 Stakeholder engagement summary for the modification to date

Activity/tool	Timing	Feedback
Inner West Council (virtual briefing)	21 April 2020	• IWC supportive of the proposed modification. • Requested that relevant bicycle group(s) be advised. • Requested that Balmain Rozelle Chamber of Commerce be consulted.
City of Sydney Council (email briefing)	22 April 2020	• Confirmed CoS did not want a virtual briefing. • Confirmed CoS had no comments on the proposed modification.
Balmain Rozelle Chamber of Commerce	27 April 2020	Nil.
NSW Environment Protection Authority (virtual briefing)	21 April 2020	• Mitigation measures in the project's CNVMP should be applied as appropriate, including for any out of hours works. • The project should continue with engaging the community on project works, including the proposed ancillary facility. • The project will apply for a premise boundary adjustment as part of the request for use of the proposed modification site.
MP for Balmain – Jamie Parker (email and phone briefing)	12 May 2020	Nil.
Port Authority of NSW (virtual briefing)	28 April 2020	• Proposed site area has recently been used in similar fashion, and no complaints in relation to visual amenity were received. • Expectation is that noise and vibration assessment will be appended to assess any noise and vibration impacts. • Expectation is that use of proposed ancillary facility will be consistent with the current use of the land (i.e. as an ad-hoc port facility). • Use of land will be subject to a license agreement.

In addition to the meetings noted in Table 5-2, phone and email correspondence has taken place with these stakeholders.

5.2 Consultation and engagement during and following DPIE assessment

During DPIE's assessment of the modification and up to and following determination, Transport for NSW and the Contractor will continue to engage and/or consult with the community and relevant stakeholders in line with the existing and modified (if approved) conditions of the project approval, the approved Communications Strategy and the established communication and complaints processes.

Communication and consultation with stakeholders and the community during site establishment would focus on providing updates on approved activities and program, responding to enquiries and concerns in a timely manner and minimising potential impacts where possible. Further detail of consultation with stakeholders and the community during construction is provided in section 7.6.2 of the EIS.

5.3 Ongoing consultation

Should the proposed modification be approved, ongoing consultation and communication activities would be undertaken with the surrounding residents and key stakeholders as required in accordance with the planning approval.

6 Environmental assessment

6.1 Environmental scoping

A scoping assessment has been completed in Table 6-1 to identify the likely potential environmental impacts associated with the proposed modification which require further assessment, and those which are generally consistent with the EIS and do not require further assessment. The relevant environmental aspect assessed for this modification report were considered when completing this assessment.

Table 6-1 Scoping summary of the environmental assessment of the proposed modification

Environmental aspect	Proposed changes
Construction traffic and transport	The proposed modification would not contribute any additional traffic, transport or access impacts beyond those assessed as part of the approved project. The assessment considers foreseeable access restrictions in relation to port operations. Refer to Section 6.2.1 for more details.
Operational traffic and transport	No additional operational traffic and transport impacts are expected as a result of the proposed modification. The proposed modification does not extend to the operational phase of Stage 2 works.
Construction air quality	The proposed modification would result in low to negligible air quality impacts. No additional environmental management measures as identified in Part E of the SPIR would be required to mitigate the proposed modification. Refer to 6.2.2 for more details.
Operational air quality	No additional operational air quality impacts are expected as a result of the proposed modification. The proposed modification does not extend to the operational phase of Stage 2 works.
Construction noise and vibration	As there are no significant noise and vibration impacts as a result of the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of approval as they relate to noise and vibration impacts are required. Refer to 6.2.3 for more details.
Operation noise and vibration	No additional operational noise and vibration impacts are expected as a result of the proposed modification. The proposed modification does not extend to the operational phase of Stage 2 works.
Human health	No additional human health impacts are expected as a result of the proposed modification.
Socio-economic, land use and property	As there are no significant socio-economic or property impacts associated with the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of approval as they relate to socio-economic or property impacts are required. Refer to 6.2.7 for more detail.

Environmental aspect	Proposed changes
Urban design and visual amenity	Overall, the visual impact of the proposed modification is low given the proposed modification activities occurring at the site are temporary in nature and consistent with existing transport, storage and assembly activities occurring at Glebe Island. Part E of the SPIR includes specific environmental management measures to minimise landscape and visual amenity impacts associated with construction work areas. These measures are sufficient to minimise temporary visual impacts associated with the proposed modification. As there are no significant visual impacts associated with the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of approval as they relate to visual impacts are required. Refer to Section 6.2.6 for more detail.
Soil and water	No significant impacts to soils, surface water or groundwater as a result of the proposed modification have been identified, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of approval as they relate to soils, surface water or groundwater impacts are required. Refer to Section 6.2.4 for more details.
Operational water	No additional operational water impacts are expected as a result of the proposed modification. The proposed modification does not extend to the operational phase of Stage 2 works.
Flooding and drainage	No additional flooding or drainage impacts are expected as a result of the proposed modification.
Biodiversity	The proposed modification site comprises a hardstand concrete area which is void of vegetation and no vegetation removal is proposed as part of the proposed modification. Glebe Island is an active industrial port facility with limited vegetation and is not considered to provide suitable habitat for diverse fauna populations. Indirect impacts to fauna species (e.g. birds) as a result of temporary construction activities are considered to be minor and consistent with existing industrial activities at the site. As such, no additional biodiversity impacts are expected as a result of the proposed modification.
Aboriginal and Non-Aboriginal heritage	The proposed modification site may result in a temporary change to the visual setting of non-Aboriginal heritage items on Glebe Island, however, the works would be consistent with the industrial use of the site which forms part of the visual character and significance of these heritage items. There would be no permanent impact to the visual setting of non-Aboriginal heritage items within the vicinity of the proposed modification site as a result of the proposed modification. As there are no significant impacts to Aboriginal or non-Aboriginal heritage as a result of the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of approval as they relate to Aboriginal or non-Aboriginal heritage impacts are required. Refer to Section 6.2.5 for more details.

Environmental aspect	Proposed changes
Greenhouse gas	No additional greenhouse gas impacts are expected as a result of the proposed modification. The proposed modification largely redistributes the use of equipment and as a whole does not introduce additional equipment that would contribute greenhouse gasses.
Resource use and waste minimisation	Activities associated with the use of the proposed modification site have been assessed as part of the EIS as they would be undertaken at approved project sites if the proposed modification does not proceed. As such, no additional waste or resource consumption impacts are expected as a result of the proposed modification
Climate change risk and adaption	No additional climate change risk impacts are expected as a result of the proposed modification.
Hazard and risk	No additional hazard and risk impacts are expected as a result of the proposed modification.
Cumulative impacts	Potential cumulative traffic and transport and noise and vibration impacts associated with the proposed modification and surrounding existing and proposed projects are discussed in Section 6.2.1 and Section 6.2.3, respectively. No additional cumulative impacts are expected as a result of the proposed modification.

6.2 Assessment of key issues

6.2.1 Traffic and transport

Assessment methodology

The qualitative risk assessment of traffic and transport impacts associated with the proposed modification involved a comparative analysis of the proposed construction traffic volumes and the approved project and project approval.

The proposed modification represents a redistribution of a minor number of daily heavy and light vehicles to the proposed modification site which would have otherwise accessed the approved project sites.

Existing environment

As illustrated in Figure **6**-**1** the berths and associated facilities at Glebe Island are currently accessed from the following access points:

- Port Access/Sommerville Road which connects to James Craig Road to the south and Robert Street to the north, and
- James Craig Road to the south.

Vehicle access to the proposed ancillary facility at Glebe Island is restricted through boom gates and security. The Port Access Road/Sommerville Road is a minor two-lane private road that provides access to the internal road network within Glebe Island. Sommerville Road is however a right of carriageway. There is a ramp that links Sommerville Road to the Anzac Bridge pedestrian and cycling facilities. Robert Street is a restricted road that connects to the White Bay Cruise Terminal and is not open to the public on cruise ship days to accommodate the temporary increase in traffic movements associated with cruise ship passengers. James Craig Road is a local two-lane undivided road that links Glebe Island to major arterial roads including:

- City West Link,
- The Crescent, and
- Victoria Road.

James Craig Road, Port Access/ Sommerville Road and these major arterial roads are also key approved access and transport routes for the Rozelle Interchange (Stage 2).

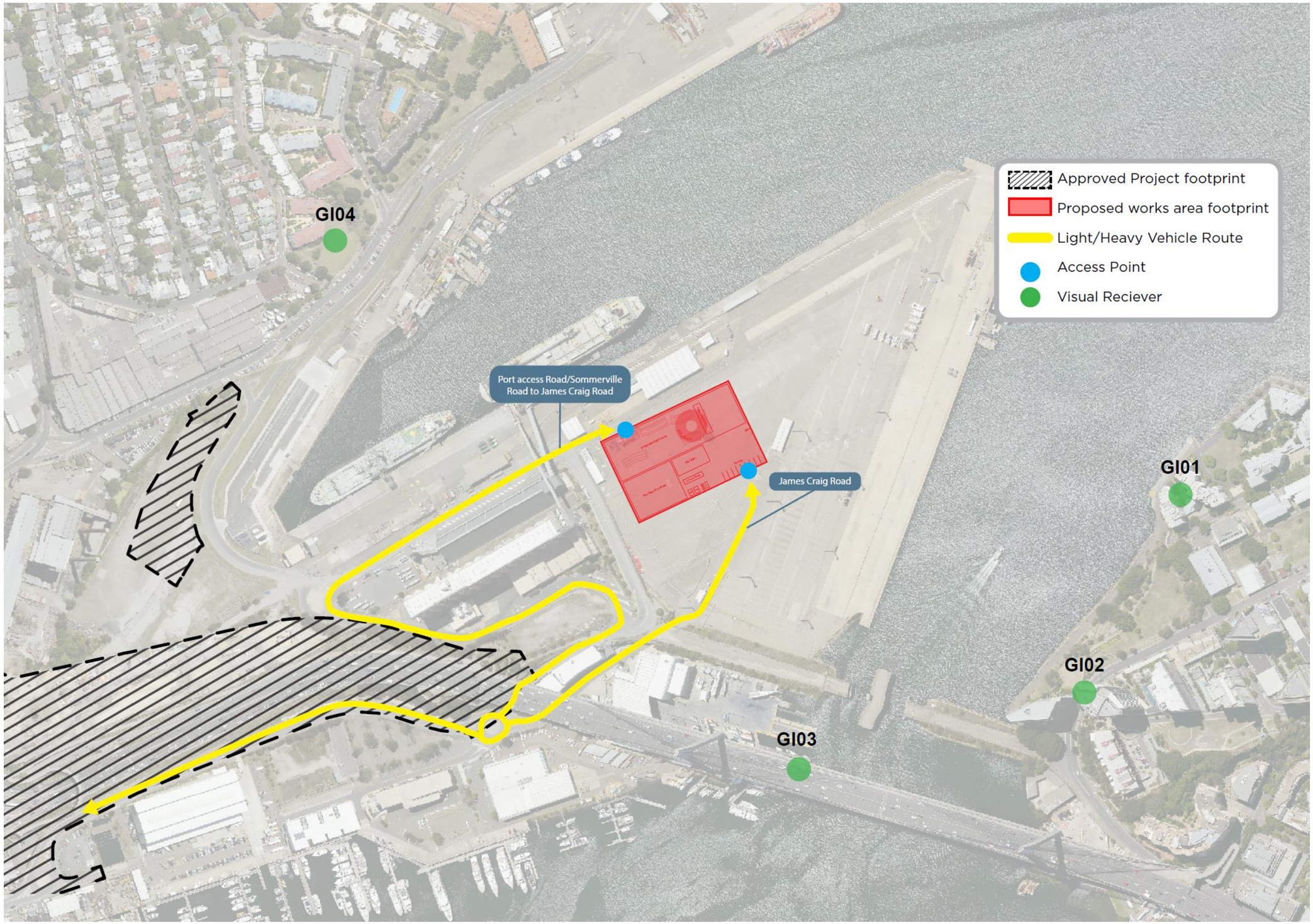


Figure 6-1 **Proposed modification site vehicle access**

Chapter 8 of the EIS included an analysis of existing traffic volumes in the Rozelle Interchange study area, which includes Victoria Road to Drummoyne, City West Link to Lilyfield Road, The Crescent to Johnston Street and Anzac Bridge/Western Distributor to Sydney CBD shown in Figure 6-2.

This analysis found that all roads within the Rozelle Interchange study area accommodate existing high traffic volumes, however the level of service (LoS) at key intersections is generally good with a decline in service during the PM weekday peak hour period. The key intersections and their existing LoS rating are detailed in Table 6-2.

Table 6-2 Existing LoS at key intersections

Intersection	AM peak hour LoS	PM peak hour LoS
The Crescent/James Craig Road	A	B
City West Link/The Crescent	B	D
The Crescent/Johnston Street/Chapman Road	C	F

Impact assessment

The approved project construction traffic volumes included the use of a total of 14 construction ancillary facilities for M4-M5 Link Project from 2018 to 2023. Construction ancillary facilities associated with Rozelle Interchange (Stage 2) include:

- Rozelle civil and tunnel site (C5),
- The Crescent civil site (C6),
- Victoria Road civil site (C7), and
- Iron Cove Link civil site (C8).

The approved project traffic volumes were determined to have a negligible impact on the existing road network and there was sufficient capacity to accommodate construction vehicle movements. No changes to construction traffic volumes from the approved project are proposed.

The low number of construction traffic volumes associated with the proposed modification identified in Table 6-3 are predicted to be within the approved project traffic volumes, as without the proposed modification, material transport, unpacking and assembly would occur at existing construction ancillary sites associated with Rozelle Interchange (Stage 2). A minor number of construction vehicles and workers would therefore be redistributed from these sites to the proposed modification site. As construction traffic volumes would remain within the approved project volumes, no re-assessment of the 2021 construction traffic scenario is required.

Table 6-3 Maximum traffic volumes for the proposed modification

Vehicle type	Day (7am to 10pm)	Night (10pm to 7am)
Heavy vehicle	34	7
Light vehicle	25	15

Heavy vehicle movements will primarily be associated with the delivery of construction material and steel girder segments to the proposed site, and subsequent export to the approved project sites. Some of this equipment is oversized and may require delivery under a Road Occupancy License. These deliveries are typically required to be completed outside of standard construction hours for public safety reasons.

The proposed modification site will have two vehicular access points which both provide access to James Craig Road through the Glebe Island internal road network, as shown in Table 6-4 and Figure 6-2. Access to the Port Access Road and Sommerville Road which are managed and owned in part by Port Authority of NSW would be subject to an license agreement as per Section 3.2.5. Such an agreement would manage the interface between cruise ships and heavy vehicles associated with the proposed modification.

Table 6-4 Proposed modification site vehicle access

Vehicle type	Access	Road type
Heavy and light vehicles	James Craig Road	Local road
	Port Access Road	Private road
	Sommerville Road	Private road / right of carriageway

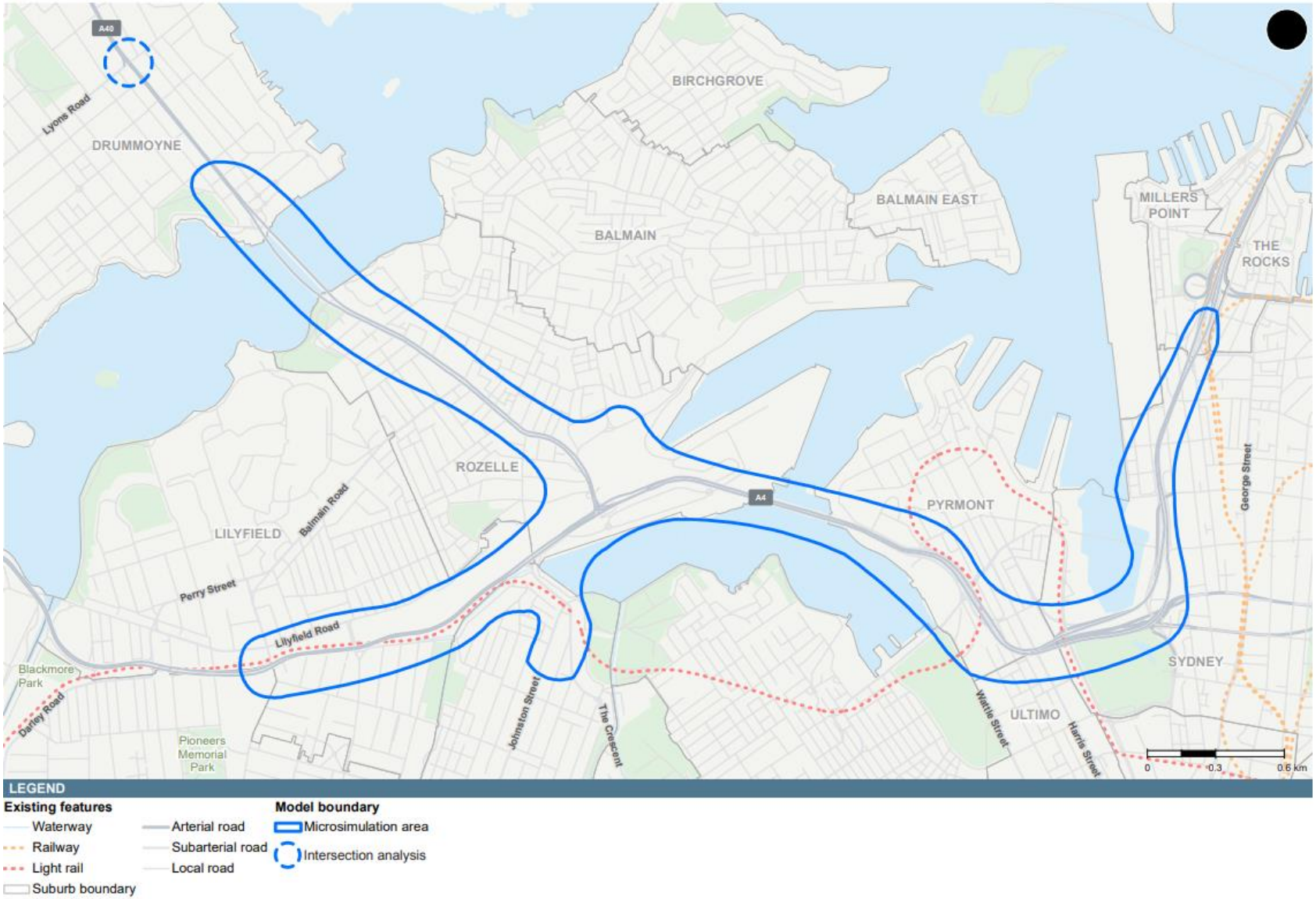


Figure 6-2 Rozelle Interchange study area (source: EIS)

James Craig Road and the Port Access Road/Sommerville Road are approved transport routes for the Project under the SPIR and the Rozelle Interchange Traffic, Transport and Access Management sub-Plan (TTAMP) (April 2020). Transport of materials and equipment from the proposed modification site to the approved project sites would also be undertaken on the approved transport routes and access points for these sites and would be subject to an license agreement with Port Authority of NSW (refer Section 3.2.5).

The proposed modification would therefore not introduce additional vehicle routes other than those that form part of the approved project.

No additional changes to pedestrian and cycling routes are proposed to that identified as part of the approved project. Safe pedestrian and cyclist access would be maintained during construction in accordance with Condition of Approval E57.

The proposed modification would therefore not contribute any additional traffic, transport or access impacts beyond those already assessed as part of the approved project.

Cumulative impact assessment

The SPIR included an assessment of potential cumulative impacts on roadway LoS and intersection performance around Rozelle from construction traffic generated by the approved project and the following projects:

- The proposed future Western Harbour Tunnel,
- Two separate short to medium-term proposals at Glebe Island including:
    - Multi-User Facility
    - Hanson Concrete Batching Plant

These projects are adjacent to the proposed modification site. Since the preparation of the SPIR, the Multi-User Facility at Glebe Island has been approved. The proposed Western Harbour Tunnel, Hanson Concrete Batching Plant and Construction logistics site have not yet been approved at the time of this report. The construction phase has not commenced of any the above projects, at the time of this report, and no additional significant development proposals have been identified.

The SPIR identified that, if construction of all projects was to occur, there would be potential for cumulative impacts as a result of additional queuing at the James Craig Road intersection, however the overall LoS would remain at satisfactory levels with the exception of this intersection, which would experience a deterioration.

The proposed modification does not introduce any additional traffic or additional transport routes to the approved project. As such, it is considered that any cumulative impacts associated with the proposed modification have been sufficiently assessed under the EIS and SPIR.

As identified in the SPIR and noted in Section 3.2.5, Transport for NSW would continue to consult with the Port Authority of NSW to ensure the coordination of heavy vehicle movements on roads managed and owned by Port Authority of NSW.

Management measures and conditions of approval

As the proposed modification is consistent with the traffic, transport and access impacts assessed in the EIS and SPIR, no changes to the conditions of the project approval or environmental management measures are required.

6.2.2 Air quality

Assessment methodology

The air quality impact assessment undertaken for the EIS assessed potential construction air quality impacts associated with the approved project using the methodology described in the UK Institute of Air Quality Management (IAQM) document: *Guidance on the assessment of dust from demolition and construction*. The air quality impact assessment considered the main air quality risks during construction of the project would be associated with dust soiling and the effects of airborne particles on human health and amenity.

The proposed modification does not extend to the operation of the approved project, so an operational air quality assessment is not required.

The IAQM methodology uses a four-step process to assess construction dust impacts:

- **Step 1:** Screening assessment based on distance to human and ecological receptors
- **Step 2:** Assess risk of dust impacts from activities based on the scale and nature of the works and sensitivity of the area
- **Step 3:** Determine site-specific mitigation
- **Step 4:** Reassess residual dust impacts after mitigation has been applied.

This section provides an assessment of potential construction air quality impacts associated with the proposed modification in accordance with the IAQM methodology.

Existing environment

For the purposes of this assessment, the existing air quality environment surrounding the proposed modification site is assumed to be consistent with the local and regional meteorological conditions described in Chapter 9 of the EIS.

Impact assessment

Step 1- Screening assessment

The IAQM recommends a construction dust assessment is generally required where:

- There are human receptors within 350 metres of the boundary of the site and/or within 50 metres of the route(s) used by construction vehicles on the public highway, up to 500 metres from the site entrances(s)
- There are ecological receptors within 50 metres of the boundary of the site and/or within 50 metres of the route(s) used by construction vehicles on the public highway, up to 500 metres from the site entrance.

For the screening assessment, the assessment area was assumed to be limited to the proposed modification site. There are human receptors (including residential and commercial properties) within a 350-metre radius of the footprint of the proposed modification site, although the number of receptors is low shown in Figure 6-3.There are no ecological receptors within the proposed modification site boundary or buffer zone. As there are human receptors within 350 metres of the proposed modification site, a construction dust assessment is required.

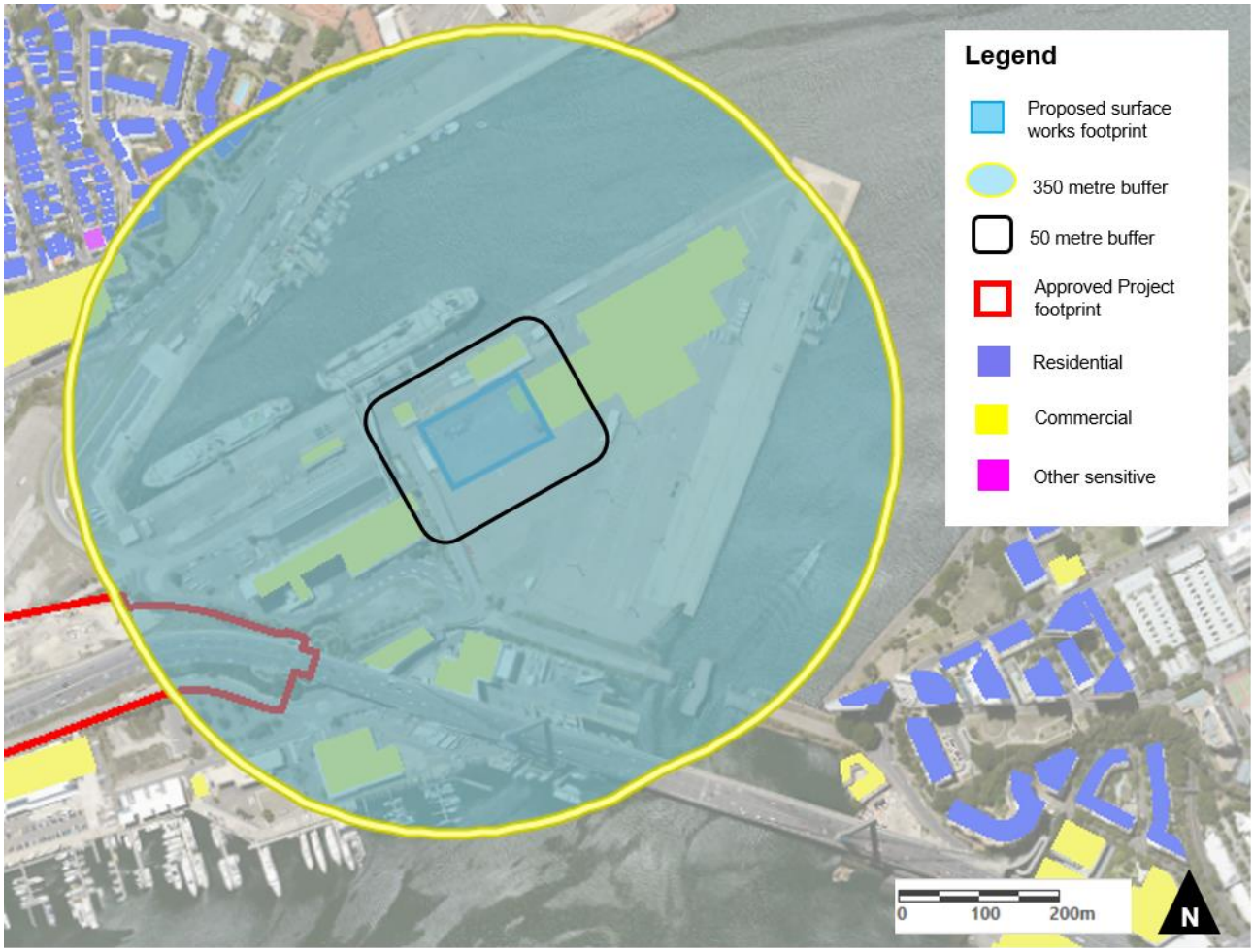


Figure 6-3 Proposed modification site dust screening assessment

Step 2- Dust risk assessment

Step 2 requires an assessment of the risk of dust from the proposed modification causing annoyance and/or health effects. This is determined by assessing:

- **Step 2A:** The scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large
- **Step 2B**: The sensitivity of the area to dust impacts which is defined as low, medium or high sensitivity.

Step 2A Dust emission magnitude

The IAQM determines that construction activities likely to cause dust can be separated into the following four categories:

- **Demolition** is any activity that involves the removal of existing structures
- **Earthworks** covers the processes of soil stripping, ground levelling, excavation and landscaping. Earthworks primarily involve excavating material, haulage, tipping and stockpiling.
- **Construction** is any activity that involves the provision of new structures, or modification or refurbishment of existing structures. 'Structures' include buildings, ventilation outlets and roads.
- **Track-out** involves the transport of dust and dirt from the construction/demolition site onto the public road network on construction vehicles. These materials may then be deposited and re-suspended by vehicles.

Section 7.2 of the IAQM outlines example activities involved in each of these categories of work which are considered to have 'large', 'medium' or 'small' potential dust emission magnitude.

An assessment of the potential dust emission magnitude associated with the proposed modification site is provided in Table 6-5.

Table 6-5 AQM dust emission magnitude assessment

Activity	Description of activities (proposed modification)	Potential dust emission magnitude
Demolition	• Demolition works are minor and limited to removal of road signs and access gates which have low potential for dust release (e.g. metal and steel). • Total demolition volume less than <20,000m^3	Small
Earthworks	• No ground disturbance activities proposed	Small
Construction	• The total building volume would be less than <25,000m^3 as there are no permanent built works proposed by the proposed modification. • The construction material to be unpacked and assembled at the proposed modification site has low potential for dust release (e.g. metal and steel).	Small
Track out	• The total number of outward heavy vehicle movements per day is expected to be between approximately 10-41. • The proposed modification site is located on an existing concrete hardstand area and there are limited unpaved or unsealed surfaces. • Access to and from the proposed modification site is via paved roads (James Craig Road and Port Access Road)	Medium

Step 2B Sensitivity analysis

The IAQM methodology requires an analysis of the sensitivity of an area to dust soiling and health impacts caused by potential dust emissions by considering type and proximity of local receptors and local background PM_{10} concentration.

According to the IAQM guidance, the overall sensitivity of the proposed modification site to dust is low provided in Table 6-6.

Table 6-6 Dust sensitivity analysis

Potential impact	Sensitivity of the area	Justification
Dust soiling	Low	• No highly sensitive receptors (residential) within 50 metres of the proposed modification site boundary. • Less than 100 highly sensitive receptors (residential) within 350 m of the proposed modification site boundary.
Human health (PM_{10})	Low	• No highly sensitive receptors (residential) within 50 metres of the proposed modification site boundary. • Less than 100 highly sensitive receptors (residential) within 350 m of the proposed

Potential impact	Sensitivity of the area	Justification
		modification site boundary. • The latest annual average PM_{10} concentration in the area was recorded at 22.7 µg/m^3, which is below the EPA criterion of 25 µg/m^3 and within the 'low' range of the IAQM.

Step 2C Risk of dust impact

Step 2C of the IAQM requires the dust emission potential determined in Step 2A to be combined with the sensitivity of the area determined in Step 2B to give the risk of impacts with no mitigation applied. As shown in Table 6-7 even with no mitigation the risk of dust impacts associated with the proposed modification is negligible to low.

Table 6-7 Risk of dust impacts without mitigation

Potential impact	Risk of dust impacts on sensitive receptors- without mitigation			
	Demolition	**Earthworks**	**Construction**	**Track out**
Dust soiling	Negligible	Negligible	Negligible	Low
Human health (PM_{10})	Negligible	Negligible	Negligible	Low

Step 3 Determine site specific mitigation

The IAQM recommends site specific mitigation measures be applied to reduce potential dust emissions and a residual risk assessment (Step 4) be undertaken to determine the risk of dust impacts following the implementation of the recommended mitigation measures.

A screening assessment of the environmental management measures contained in Part E of the SPIR, and the conditions of approval relevant to air quality impacts of the approved project has identified these measures are sufficient to mitigate the negligible to low risk of dust impacts associated with the proposed modification. No additional environmental management measures are required.

Step 4 of the IAQM has not been undertaken as the risk of dust impacts without mitigation has already been assessed as negligible to low.

Summary

This assessment has identified there is low to negligible air quality impacts associated with establishment and use of the proposed modification site at Glebe Island. The environmental management measures identified in Part E of the SPIR and the conditions of approval which manage air quality impacts of the Approved project will apply to the proposed modification to ensure the impacts of dust emissions during construction of the project are reduced as far as possible.

Management measures and conditions of approval

Based on the low risk of potential air quality impacts associated with dust emissions as a result of the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of the project approval as they relate to air quality impacts are required.

6.2.3 Noise and vibration

Assessment methodology

A detailed construction noise and vibration assessment has been prepared by Renzo Tonin and Associates to address the proposed modification and is included in Appendix A. The methodology of the assessment is

consistent with methodology applied to assess construction noise and vibration impacts in the EIS and includes:

- Identification of nearest noise sensitive receivers and applicable construction NMLs,
- Assessment of noise and vibration from construction scenarios, including construction activities, equipment and machinery, traffic volumes and hours of work (within or outside standard construction hours),
- Sleep disturbance screening assessment, and
- Identification of whether any additional environmental management measures are required to minimise potential impacts.

Ground-borne noise and vibration has not been assessed as construction activities associated with the proposed modification are not vibration intensive.

Existing environment

The EIS identified noise catchment areas (NCAs) around the approved project footprint to assess construction noise impacts. Following project approval, a Land Use Survey was carried out to inform the Rozelle Interchange (Stage 2) Construction Noise and Vibration Management Plan (CNVMP) by identifying existing land uses and development adjacent to the approved project as required by the Conditions of Approval.

The nearest noise sensitive receivers and NCAs to the proposed modification site identified from the EIS and Land Use Survey are shown in Figure 6-4. There are no residential land uses within the noise catchment area of the proposed modification site (NCA 26). However, there are two heritage items and 18 commercial buildings in NCA 26. There are residential premises in the adjoining noise catchment areas NCA 25, 27, 28 and 29.

Plot Date: 26/06/19 - 13:01
GIS File: R:\Assocsyd\Projects\TJ901-TJ950\TJ914-pk WCX 3B\03 Construction\5 Calcs\00 GLOBAL\01 GIS\WCX3B - MT(r1).qgs

NCA31
NCA30
NCA29
NCA24
NCA25
NCA26
NCA28
NCA27
NCA21

R.01
R.02
R.03
R.04
R.06
R.08
R.15
R.16

Victoria Rd W1 (VRW1)
Victoria Rd W2 (VRW2)
Victoria Rd E1
Rozelle Rail Yard (RRY)
The Crescent
RTA TJ914-03 L04
AECOM REF Glev Island Multi-user facility, 2018

0 100 200 300 400 500 600 700 800 m

LEGEND

- NCA
- Worksite
- Monitoring location
- Heritage structures (EIS)

Land Use

- Childcare
- Commercial
- Educational
- Hotel/Motel/Hostel
- Industrial
- Medical
- Place of Worship
- Recording studio
- Recreational - Active
- Recreational - Passive
- Residential
- Theatre/Auditorium
- Mixed use

REV	BY	DATE	DESCRIPTION	APPD.
r1	MT	26.06.19	Update figures	MT
r0	MT	26.02.19	Prepare figures	MT

A3 Original | Co-ordinate System: UTM Zone 56S

SCALES
0 100 200 300 400 m
1:7500

NOTE: Do not scale from this drawing.

CLIENT
JOHN HOLLAND
CPB CONTRACTORS

ACOUSTIC CONSULTANT
RENZO TONIN & ASSOCIATES
inspired to achieve
SYDNEY OFFICE
1/418A Elizabeth St., SURRY HILLS, NSW 2000
Ph (02) 8218 0500 Fax (02) 8218 0501

M4-M5 LINK ROZELLE INTERCHANGE

Land use, Heritage structures, NCAs and Monitoring locations

Status:
Sheet 03 of 06
Drawing No. 1
Rev. No. 0

The nearest residential noise sensitive receivers to the proposed modification site are located in NCA 25, NCA 29, NCA27 and NCA 28. Table 6-8 identifies the adopted construction NMLs for the nearest noise sensitive receivers. The NMLs for residential receivers are based on long-term noise logging conducted by SLR Consulting on behalf of Transport for NSW (nee. NSW Roads and Maritime Services) to quantify ambient noise levels for the EIS, supplemented by data from the Renzo Tonin and Associates noise monitoring database as outlined in the CNVMP.

Table 6-8 Noise Management Levels (NMLs)

NCA	Rating Background Noise Levels (RBL)			Noise Management Levels (NML)		
	Day	Evening	Night	Day	Evening	Night
NCA25	51	51	45	61	56	50
NCA27	49	49	42	59	54	47
NCA28	50	49	47	60	54	52
NCA29	61	60	44	71	65	49
NCA55	52	49	44	62	54	49

Impact assessment

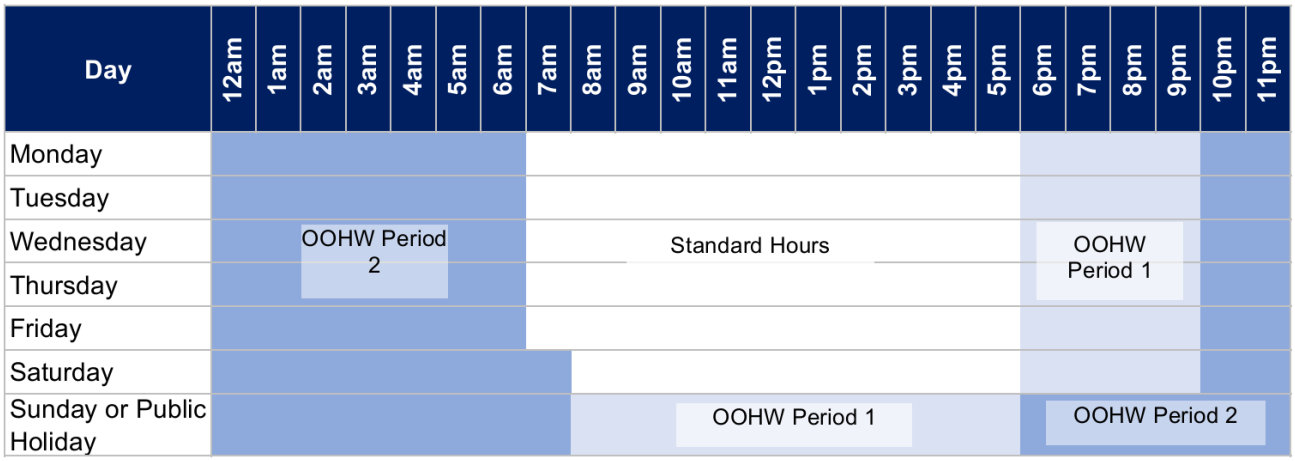
Construction noise

Residential receivers are considered 'noise affected' where construction noise levels are greater than the NMLs. The noise affected level represents the point above which there may be some community reaction to noise.

During standard construction hours, a highly affected noise objective of LAeq(15min) 75dB(A) applies at all residential receivers. The NMLs for commercial, industrial and 'other' sensitive receivers are derived from the *Interim Construction Noise Guideline* (ICNG). In addition to the objectives identified in Table 6-8. where construction activities are described in the ICNG as being particularly annoying, a +5dB(A) correction would be added to the activity noise.

Construction hours for the approved project, including standard construction hours and out-of-hours works periods are shown in Figure 6-5.

Figure 6-5 Proposed construction hours



The construction noise modelling considered the typical equipment and machinery and light and heavy vehicle movements for the following activities associated with the proposed modification site:

- Site establishment,
- Equipment preparation works and transportation,
- Equipment/girder delivery and preparation,

- Girder export and installations, and
- Site demobilisation.

The construction scenarios are further described in Appendix A.

A summary of worst-case predicted noise levels during standard construction hours in each NCA for the various work activities is presented i**n the figure below**.

Table 6-9 Predicted worst case noise levels at residential receivers during standard construction hours

NCA	NML	Predicted LAeq,15min (dBA) during standard construction hours[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	61	46	43	45	39	46
NCA27	59	36	34	35	<30	36
NCA28	60	49	46	48	41	49
NCA29	71	51	48	50	44	51
NCA55	62	48	46	47	41	48

Notes: 1) Assessment periods are defined in Appendix A

Noise levels associated with the proposed modification site are predicted to comply with the applicable NMLs during standard construction hours provided in Table 6-8. The noise predictions represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area, based on the construction scenarios outlined in Appendix A.

Some activities associated with the proposed modification are required to be undertaken outside of standard construction hours for safety reasons, including some activities associated with equipment preparation and transportation, removal of an existing static road sign on Sommerville Road under Anzac Bridge and transport of steel girders from the proposed modification site to approved project sites for installation.

A summary of worst-case predicted noise levels outside standard construction hours in each NCA for the various work activities is presented in Table 6-10 and Table 6-11.

Table 6-10 Predicted worst case noise levels at residential receivers during OOHW Period 1

NCA	NML	Predicted LAeq,15min (dBA) during OOHW Period 1[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	56	44	40	N/A[2]	39	N/A[2]
NCA27	54	34	<30	N/A[2]	<30	N/A[2]
NCA28	55	46	44	N/A[2]	41	N/A[2]
NCA29	65	49	45	N/A[2]	44	N/A[2]
NCA55	54	46	43	N/A[2]	41	N/A[2]

Notes: 1) Assessment periods are defined in Appendix A

2) No OOH works for this activity

Table 6-11 Predicted worst case noise levels at residential receivers during OOHW Period 2

NCA	NML	Predicted LAeq,15min (dBA) during OOHW Period 2[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	50	44	40	N/A[2]	39	N/A[2]
NCA27	47	34	<30	N/A[2]	<30	N/A[2]
NCA28	52	46	44	N/A[2]	41	N/A[2]
NCA29	49	49	45	N/A[2]	44	N/A[2]
NCA55	49	46	43	N/A[2]	41	N/A[2]

Notes: 1) Assessment periods are defined in Appendix A

2) No OOH works for this activity

As shown in Table 6-10 and Table 6-11, noise levels associated with the proposed modification site are predicted to comply with the applicable NMLs during all OOHW periods. The noise predictions represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area, based on the construction scenarios outlined in Section 3.4 of Appendix A.

Sleep disturbance

The risk of sleep disturbance associated with proposed modification site is considered low, as maximum noise levels from construction activities at night are expected to be below the screening level for sleep disturbance and the 'awakening reaction' level of 55 dB(A) $L_{A1(1min)}$ (internal).

In accordance with Section 5.2.3 of the CNVMP, receivers are considered to experience sleep disturbance where noise levels exceed an initial screening level of $L_{A1(1min)} \leq L_{A90(15min)} + 15$ dB(A). A summary of worst-case predicted maximum noise levels during OOHW Period 2 in each NCA for the various work activities is presented in Table 6-12.

Table 6-12 Predicted worst maximum noise levels during OOHW Period 2

NCA	Sleep disturbance		Predicted $L_{A1(1min)}$ (dBA) during OOHW Period 2				
	Screening level (RBL+15)	'Awakening reaction' level[1]	Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	60	65	48	47	N/A[2]	47	N/A[2]
NCA27	57	65	38	36	N/A[2]	37	N/A[2]
NCA28	62	65	50	51	N/A[2]	49	N/A[2]
NCA29	59	65	53	52	N/A[2]	52	N/A[2]
NCA55	59	65	50	50	N/A[2]	49	N/A[2]

Notes:
1) External equivalent 'awakening reaction' level assuming an open window (i.e. internal 55dB(A) + 10dB(A) building façade loss)
2) No OOH works for this activity

As can be noted from the Table above, the risk of sleep disturbance associated with proposed modification site is considered low, as maximum noise levels from construction activities at night are expected to be below the screening level for sleep disturbance and the 'awakening reaction' level of 55 dB(A) $L_{A1(1min)}$ (internal).

Construction traffic

Traffic volumes need to increase by around 60 percent in order to create a discernible difference in traffic noise levels (i.e. more than 2 dB(A)). As discussed in Section 6.2.1, the vehicle movements associated with the proposed modification would constitute a minor redistribution from approved project sites, however these movements would not increase existing traffic volumes on any roads by 60 percent.

In addition, the number of maximum noise events (particularly at night-time) on the Port Access/Sommerville Road and James Craig Road would be low compared with to the relatively high existing traffic volumes on City West Link and Victoria Road. There are no residential receivers along Port Access/Sommerville Road or James Craig Road and the closest residential receivers are approximately 300-350m away in NCA29. As City West Link is approximately 400m away from the same residential receivers, traffic noise increase at these receivers is unlikely to result in a discernible increase in traffic noise.

Noise impacts from construction traffic associated with the proposed modification are therefore considered to be minor.

Summary

Noise levels from establishment and use of the proposed modification site are expected to be below the relevant NMLs at all sensitive receivers at all times and the risk of sleep disturbance is low as maximum noise levels are below the screening level. Given the low volume of redistributed vehicle movements associated with the proposed modification site and separation from residential receivers, noise from construction traffic is also expected to be minor. The proposed works are not vibration intensive, and no additional construction vibration or ground-borne noise impacts beyond those assessed in the EIS and SPIR are expected.

Cumulative impact assessment

Concurrent noise impacts can occur where more than one works activity occurs at the same time and in the same location such that an individual receiver is potentially impacted by noise from more than one element of works.

The noise levels from approved project works along the City West Link and Victoria Road are expected to be up to 10-25dB(A) above night-time NMLs (depending on the work activities and locations) at the closest noise sensitive receivers in NCA29. As the noise levels from the operation of the City West Link and Victoria Road area are expected to be below NMLs in NCA29, cumulative noise levels will not be affected by the night-time use of the proposed modification site. Even during standard hours, the closest residential receivers in NCA29 are expected to experience noise levels up to 60-63 dB(A) from works at the Victoria Road East compound, City West Link and Victoria Road, whilst they would only experience noise levels up to 45-49dB(A) from the operation of the proposed modification site.

Noting the difference in predicted levels of more than 10dB, no cumulative impacts are therefore expected.

Management measures and conditions of approval

As there are no significant noise and vibration impacts as a result of the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of the project approval as they relate to noise and vibration impacts are required.

6.2.4 Soil and water

Assessment methodology

A qualitative assessment of potential soil, surface water and groundwater impacts associated with the proposed modification has been undertaken by undertaking a desktop assessment of the existing features of the site and the nature of proposed modification.

Existing environment

Glebe Island is currently used as an industrial port facility. The majority of the Glebe Island site consists of concrete handstand and internal access roads. The proposed modification site consists completely of concrete hardstand, with no vegetated or landscaped areas.

Soils

The proposed modification site is included in the 'White Bay Catchment' of the study area. Based on the Soil Landscapes of the Sydney 1:100,000 Sheet 9130 (Department of Conservation and Land Management 1989), the proposed modification site is underlain by the 'disturbed terrain' soil landscape. This soil landscape is characterised by terrain extensively disturbed by human activity, including complete disturbance, removal or burial of soil and variable relief and slopes.

Acid sulfate soils (ASS) are naturally occurring soils that contain iron sulfides, which, when exposed to air, can oxidise to form sulfuric acid. The proposed modification site is located in Class 1 area, where acid sulfate soils are likely to be found on and below the natural ground surface. Douglas Partners (2017) undertook soil sampling at Glebe Island to inform the environmental assessment for the Glebe Island Multi-User Facility (GIMUF) led by the NSW Port Authority. The GIMUF would be located approximately 80 metres west of the proposed modification site. The Review of Environmental Factors (2018) for the GIMUF identified that soil samples taken from the site were laboratory tested for preliminary signs of actual acid sulfate soils (AASS) and potential acid sulfate soils (PASS). Samples taken at depth provided positive indicators of PASS, however the shallow filling above the water table (maximum depth of approximately 2.6 metres below the surface water level) did not include PASS.

Douglas Partners (2017) also undertook at a preliminary waste classification of soils at the GIMUF site which included an analysis of soil samples for contaminants of concern. The classification did not identify any contamination at the site. The proposed modification site is directly adjacent to the GIMUF site and is also a concrete hardstand area used for storage and handling of goods.

Surface water and groundwater

Glebe Island is within Sydney Harbour and Parramatta River catchment. Glebe Island is surrounded by White Bay to the north and Johnstons Bay and Jones Bay to the north-east. Blackwattle Bay and Rozelle Bay are south of Glebe Island, on the other side of the Anzac Bridge. There are also several creeks, infilled creeks and canals in the broader area including Easton Park drain, Whites Creek and Johnstons creek.

The EIS identified that existing surface water quality in the study area is influenced by several factors, including:

- Current and former polluting land uses within the catchments,
- Stormwater and sewerage overflows and leachate from contaminated/reclaimed land,
- Urbanisation of the catchments and subsequent reduction in permeable area, increasing run-off and pollutant loads entering waterways, and
- Illegal dumping.

Water sampling undertaken to inform the EIS identified that existing water quality in Rozelle Bay and White Bay was influenced by elevated concentrations of metals, and incidences of pH and/or turbidity which exceeds relevant guidelines. Mapped key fish habitat at Rozelle Bay and White bay were also identified as sensitive receiving environments. Sensitive receiving environments are areas which have a high conservation or community value or that support ecosystems or human uses of water and that is sensitive to pollution or degradation of water quality.

The proposed modification site is located in an urbanised area which is drained by the stormwater network. The majority of creeks, canals and drains in the surrounding environment, including Easton Park drain, Whites Creek and Johnstons Creek are concrete lined. In concrete lined creeks, seepage to groundwater is limited to water flowing through fractures within the concrete lining or along naturalised areas. Sydney Water is in the process of naturalising some creeks and canals, including parts of Johnstons Creek and Whites Creek. The GIMUF REF (2018) identified that groundwater at Glebe Island was observed during drilling of test boreholes at depths between 1.7 metres and 2.9 metres, although this may fluctuate with weather and tidal influences.

Impact assessment

The EIS identified the main risks to soils and surface water quality associated with the approved project construction activities are erosion and sedimentation from ground disturbance activities, vegetation removal and stockpiles, tunnel wastewater, mobilisation of sediments and pollutants during works (including potential contaminants and waste produced onsite), tracking of soil by trucks and leaks or spills or hydrocarbons from machinery and equipment. These risks are higher during periods of strong winds and rain where exposed soils, waste and other pollutants runoff from construction sites to stormwater systems, and surrounding waterways and soils.

The establishment and temporary use of the proposed modification site does not require ground disturbance activities or vegetation removal. Given the proposed modification does not involve ground disturbance activities or material stockpiling, the risk of erosion and sedimentation as a result of runoff or tracking from trucks associated with the proposed modification to surrounding soils, waterways and sensitive receiving environments is negligible.

There would be no impacts associated with groundwater as there is no ground disturbing activities. The proposed modification would not result in additional impacts associated with groundwater recharge, groundwater drawdown or groundwater quality beyond those managed under the approved project.

The risk of encountering ASS is not present as the proposed modification does not involve ground disturbing activities. Although the risk of encountering ASS is considered negligible, the environmental management measures contained in Part E of the SPIR are sufficient to manage the residual risk of encountering unexpected ASS during the establishment of the proposed modification site.

The risk of encountering unidentified contamination at the proposed modification site is also considered negligible given recently soil sampling of an area proximate to the site did not identify any contaminants of concern, the area comprises concrete hardstand and no ground disturbance activities are proposed. Unexpected contaminated material is capable of being managed in accordance with the unexpected contaminated lands discovery procedure included in the Construction Environmental Management Plan (CEMP), as required by the environmental management measures included in Part E of the SPIR.

There is potential for spills and leaks to occur from the use of equipment and machinery at the proposed modification site, however this risk can be minimised through the implementation of the environmental management measures included in Part E of the SPIR, which include procedures to ensure safe storage and transport of soils, fuels and other hazardous materials used during construction.

Potential surface water quality impacts associated with the amenities block are considered negligible, as these facilities would be connected to existing sewerage and grey water systems at the site or be serviced by a mobile tanker.

Management measures and conditions of approval

As there are no significant impacts to soils, surface water or groundwater as a result of the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of the project approval as they relate to soils, surface water or groundwater impacts are required.

6.2.5 Aboriginal and Non-Aboriginal heritage

Assessment methodology

The EIS identified Aboriginal and non-Aboriginal heritage values within the approved project footprint, assessed the potential impact of the project on these values and recommended environmental management measures to minimise these potential impacts. As the proposed modification site is outside of the approved project boundary, an assessment of the potential impact of the proposed modification on Aboriginal and non-Aboriginal heritage is included in this section. The methodology for the assessment is consistent with the methodology applied in the EIS, which includes:

- A review of applicable legislation, guidelines, archaeological and historical reports and publicly available databases (including the Aboriginal Heritage Information Management System (AHIMS)) to identify heritage items within and adjacent to the proposed modification site,
- Assessment of potential heritage impacts from the proposed modification, and
- Recommendation of appropriate environmental management measures to avoid, mitigate and/or manage potential impacts on relevant Aboriginal and non-Aboriginal heritage values.

The study area for the assessment comprises the proposed modification site footprint and a 200-metre buffer to ensure road adjustment works associated with site establishment activities and indirect impacts (e.g. visual impacts) are appropriately assessed.

Existing environment

No registered Aboriginal archaeological sites or Aboriginal places were identified within 200 metres of the study area. Glebe Island is a disturbed site that has been subject to significant reclamation and ground disturbance works during construction of the facility during the early 1900s.

A search of National, State, regional and local heritage registers identified there are no non-Aboriginal heritage items within the study area. There are five heritage items adjacent to the proposed modification site, as identified in Figure 6-6 and Table 6-13.

As shown in the figure below, the nearest heritage conservation area (HCA) to the site is the Hughes HCA (C30) which has local significance under the *Sydney Local Environmental Plan 2012* located 300 metres north west of the site. The figure below also identifies the Glebe Island Dyke Exposure (Item no. 45600056) heritage item listed under the Port Authority of NSW section 170 heritage register to the south of the proposed modification site within the approved project footprint. This heritage item will not be impacted by the proposed modification.

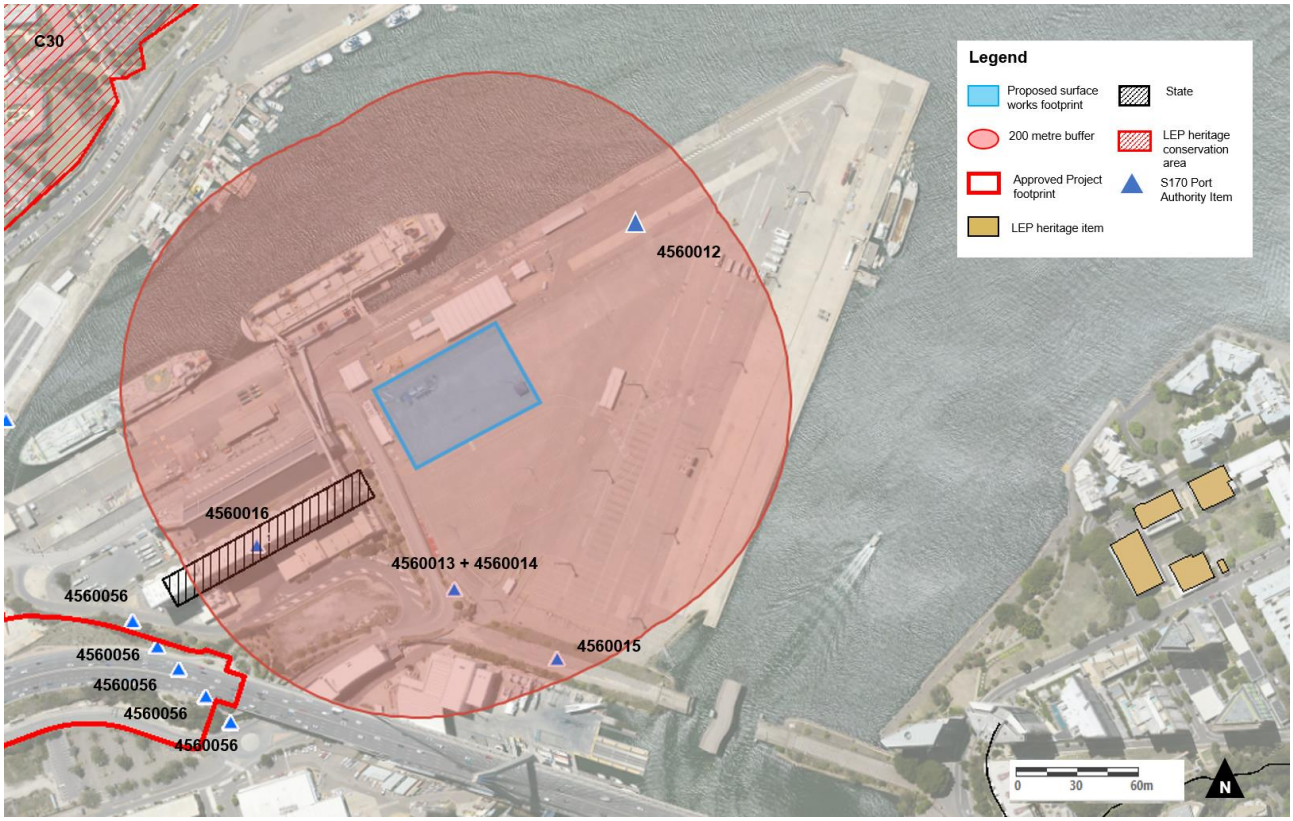


Figure 6-6 Non-Aboriginal heritage items within the vicinity of the proposed modification site

Table 6-13 Non-Aboriginal heritage items within the vicinity of the proposed modification site

Heritage item	Reference number	Source	Significance	Distance from proposed modification site
Glebe Island World War II Monument	4560012	Port Authority of NSW section 170 heritage register *Sydney Regional Environmental Plan No 26- City West*	Local	150 metres
Glebe Island Plaque- Opening of Container Terminal	4560013	Port Authority of NSW section 170 heritage register	Local	100 metres
Glebe Island Sandstone Quarry Sample	4560014	Port Authority of NSW section 170 heritage register	Local	100 metres
Glebe Island Bridge Approach	4560015	Register of the National Estate Port Authority of NSW section 170 heritage register *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*	Local	130 metres
Glebe Island Silos	4560016	Port Authority of NSW section 170 heritage register *Sydney Regional Environmental Plan No 26- City West*	State, regional	20 metres

Impact assessment

There are no Aboriginal heritage items or places recorded within 200 metres of the study area and Glebe Island is a highly disturbed site. There is no ground disturbance activities associated with the proposed modification. As such, there is no opportunity of an unexpected Aboriginal archaeological finds being uncovered during the works.

There are no non-Aboriginal heritage items within the study area. There are several non-Aboriginal heritage items on Glebe Island within the broad vicinity of the proposed modification site, however, there are no works directly adjacent to these heritage items associated with the proposed modification and there are no significant vibratory construction activities required for the establishment and use of the proposed modification site. As such it is unlikely these items would be directly impacted by the proposed modification. The environmental management measures identified in Part E of the SPIR include measures to ensure safe working distances are applied when using vibration-intensive equipment adjacent to heritage items. These measures are sufficient to minimise potential vibration impacts on heritage items within the vicinity of the proposed modification site.

The proposed modification site may result in a temporary change to the visual setting of non-Aboriginal heritage items on Glebe Island, however, the works would be consistent with the industrial use of the site which forms part of the visual character and significance of these heritage items. There would be no permanent impact to the visual setting of non-Aboriginal heritage items within the vicinity of the proposed modification site as a result of the proposed modification.

Management measures and conditions of approval

As there are no significant impacts to Aboriginal or non-Aboriginal heritage as a result of the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of the project approval as they relate to Aboriginal or non-Aboriginal heritage impacts are required.

6.2.6 Urban design and visual amenity

Assessment methodology

Chapter 13 of the EIS includes a landscape character and visual impact assessment of construction activities associated with the Approved project undertaken in accordance with *Environmental Impact Assessment Practice Note- Guidelines for Landscape Character and Visual Impact Assessment* (NSW Roads and Maritime Services 2013). The EIS notes that receivers with views to construction activities could include:

- Residents who adjoin and/or have views of the project,
- Workers in commercial properties that adjoin and/or have views of the project,
- Road users and pedestrians, and
- Users of recreation areas/reserves with views of the project.

The key surrounding receivers of the proposed modification site are identified in Figure 6-7 as:

- **GI01** - Residences with frontages to Johnstons Bay and Glebe Island in Pyrmont,
- **G102** - Residences with frontages to Johnstons Bay and Glebe Island in Pyrmont,
- **GI03** - Anzac Bridge pedestrians and road users, and
- **GI04** - White Bay frontage.

Figure 6-7 Visual receivers within the vicinity of the proposed modification site

Existing environment

Glebe Island is currently used as an industrial port facility. Key visual elements of the site include the Glebe Island Silos located approximately 20 metres west of the proposed modification site, storage buildings, sheds, amenities buildings, berths, substations, and high light mast towers. Aside from these structures, the majority of the Glebe Island site consists of concrete handstand and internal access roads. There are no vegetated or landscaped areas within the proposed modification site. There is some minor landscaping around the north-eastern side of the Glebe Island silos site.

Impact assessment

Visual receivers GI01 and GI02 who face towards the proposed ancillary facility have clear views across the water to the proposed site. The proposed modification would cause temporary visual impacts to these receivers due to the presence of temporary fencing around the site, plant and equipment (e.g. a mobile crane), lighting and construction vehicles and personnel. Pedestrians and road users (including vehicles and cyclists) at GI03 also have direct views to the proposed modification site passing over Anzac Bridge. Views from GI04 to the proposed modification site are restricted due to the mature vegetation located in Birrung Park, intervening infrastructure from the Ausbarge Wharf at White Bay and existing structures to the north of the proposed modification site on Glebe Island. It is unlikely visual receivers at GI04 would experience a significant visual change associated with the proposed modification.

There would be temporary visual impacts to the visual receivers at GI01, GI02 and GI03 during the use of the proposed modification site from Q3 2020 to the completion of project works due to the presence of construction activities. Lighting associated with the delivery and exportation of materials outside of standard construction hours may be visible to visual receivers at G101, G102 and G103. Glebe Island is currently used as an industrial port, and transport, storage and handling of equipment and materials, as well as associated activities occurs on a daily basis. Although the presence of the proposed modification site constitutes a visual change, the use of part of an existing concrete hardstand area for transport and assembly of civil equipment is consistent with existing industrial activities presently occurring at the site.

Overall, the visual impact of the proposed modification is low given the proposed modification activities occurring at the site are temporary in nature and consistent with existing transport, storage and assembly activities occurring at Glebe Island. Part E of the SPIR includes specific environmental management measures to minimise landscape and visual amenity impacts associated with construction work areas. These measures are sufficient to minimise temporary visual impacts associated with the proposed modification.

Management measures and conditions of approval

As there are no significant visual impacts associated with the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of the project approval as they relate to visual impacts are required.

6.2.7 Socio-economic, land use and property

Existing environment

The proposed modification site is located at Glebe Island, which is an industrial port facility owned and operated by the Port Authority of NSW. Glebe Island is in the suburb of Rozelle, within the Inner West Council Local Government Area (LGA). Glebe Island currently has four operational shipping berths which are used for importation and transportation of bulk construction materials, sugar and salt.

Land uses surrounding Glebe Island include:

- **North** - White Bay port area and associated shipping activities, including the Ausbarge wharf and White Bay Cruise Passenger Terminal,
- **East** - High density residential and recreational land uses at Pyrmont,
- **South** - Commercial activities associated with Glebe Island, Sydney Superyacht Marina and Anzac Bridge, and
- **West** - Commercial activities associated with Glebe Island, White Bay Power Station and low density residential land uses and other commercial land uses west of Victoria Road.

Impact assessment

The proposed modification site would occupy a 4,000m^2 portion of the Glebe Island site in agreement with the Port Authority of NSW, as such no property acquisition would be required to facilitate the proposed modification. The land in question is not accessible to the community so would therefore have minimal impact on recreational users. As the proposed modification is consistent with the handling and processing activities currently occurring at the Glebe Island site it will have minimal impact on ongoing port operations and local businesses. As discussed in Section 6.2.6, visual amenity impacts to surrounding receivers are also considered to be minor and temporary given the consistency of the proposed modification with the existing character and land use activities at Glebe Island.

Management measures and conditions of approval

As there are no significant socio-economic or property impacts associated with the proposed modification, no further environmental management measures are considered necessary beyond those summarised in Part E of the SPIR. No amendments to the conditions of approval as they relate to socio-economic or property impacts are required.

7 Conditions of approval

This chapter outlines the Conditions of Approval relevant to the project, as described in Chapter 1 (Introduction), that would need to be amended as a result of the proposed modification.

A review of the conditions of approval for the project was undertaken to identify the conditions that would require either amendment or deletion as part of the proposed modification.

7.1 Conditions to be amended

Table 7-1 presents the proposed changes to the conditions of the project approval. Proposed amendments are shown in bold text.

The proposed changes would ensure that the conditions of the project approval are consistent with the proposed modification.

Table 7-1 Conditions of the project approval to be amended

No.	Description of CSSI or condition of approval	Action and reason
A1	The CSSI must be carried out in accordance with the terms of this approval and generally in accordance with the description of the CSSI in the WestConnex M4-M5 Link Environmental Impact Statement- Volumes IA-C and 2A-J (dated August 2017) (the EIS); the WestConnex M4-M5 Link Submissions and Preferred Infrastructure Report (dated January 2018) (the SPIR); ~~and~~ the WestConnex M4-M5 Link Mainline Tunnel Modification Report (dated September 2018) (Modification 1 Report) as amended by the WestConnex M4-M5 Link Mainline Tunnel Modification Response to Submissions (dated November 2018) (Modification 1 RtS) **and the WestConnex M4-M5 Link Glebe Island Temporary Construction Ancillary Facility Modification Report (dated XX) (Modification 4 Report).**	Add this proposed modification to Condition A1.
A2	The CSSI must be carried out in accordance with all procedures, commitments, preventative actions, performance criteria and mitigation measures set out in the EIS, SPIR, Modification 1 Report, Modification 1 RtS **and Modification 4 Report** unless otherwise specified in, or required under, this approval.	Add this proposed modification to Condition A2.

8 Environmental management measures

Chapter 29 of the EIS for the project summarised the identified environmental management measures that would be adopted to avoid or reduce potential environmental impacts. These measures were revised in Part E of the SPIR after consideration of the issues raised during the EIS public Exhibition period.

Chapter 6 (Environmental assessment) indicated that potential impacts for the environmental issues would be effectively managed through the implementation of the approved environmental management measures for the project as summarised in the SPIR. Section 6.1 provides a summary of the environmental assessment, the potential for impacts and proposed management measures. The proposed modification would not require any changes or additions to the environmental management measures.

9 Justification and conclusions

9.1 Need for the proposed modification

Approval for the construction and operation of the project was granted on 17 April 2018 by the former NSW Minister for Planning (application number SSI 7485). The approved project allows construction and operation of the M4-M5 Link in two stages. The proposed modification relates to Stage 2 of the project, the Rozelle Interchange and Iron Cove Link.

The EIS assessed an indicative concept design that would continue to be refined where relevant to improve road network and safety performance, minimise impacts on receivers and the environment, and in response to feedback from stakeholders.

In general, the proposed modification has been identified as a solution to the competing needs between concurrent construction activities to occur at approved project sites and the logistical requirements for assembly of construction materials (in particular steel bridge girders).

The approval of the modification would reduce the likelihood and severity of risk for safety in assembling construction materials at ground level (ie. avoid working at heights and lifting of construction materials) and maximise the works efficiency that would result in a reduction of out-of-hours works thereby resulting in an overall reduction of environmental impacts associated with the Stage 2 construction works. Reducing out-of-hours works at the approved project sites and minimising delays to the construction program is considered to have an overall positive social benefit by minimising negative amenity impacts associated with construction of the approved project.

9.2 Environmental assessment

Chapter 6 (Environmental assessment) assessed the potential environmental impacts associated with the proposed modification and provides a comparison of the potential environmental impacts for the proposed modification and the approved project.

Refer to Section 6.1 for a summary of the potential for environmental impacts in relation to each aspect.

9.3 Planning Approval and environmental management measures

No changes to the planning approval or the environmental management measures have been proposed to accommodate the proposed modification, other than including this modification report in Condition A1 and A2.

9.4 Community and stakeholder consultation

Consultation has been carried out with the community, local councils, government agencies and other stakeholders during the preparation of the modification as outlined in Chapter 4 (Consultation).

10 References

AECOM Australia Pty Ltd, WestConnex M4-M5 Link: Environmental Impact Statement, prepared for NSW Roads and Maritime Services, August 2017
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7485

AECOM Australia Pty Ltd, WestConnex M4-M5 Link: Submissions and preferred infrastructure report, prepared for NSW Roads and Maritime Services, January 2018
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7485

Ethos Urban, Environmental Impact Statement SSD Application 8854, Glebe Island Concrete Batching Plant, March 2018

State Significant Infrastructure Assessment Report (SSIAR) was lodged in January 2016, with SSIAR addendums following in September 2016 and March 2017

Roads and Maritime Services, Secretary's Environmental Assessment Requirements (SEARs) for Modification, May 2019

WestConnex M4-M5 Link

Rozelle Interchange - Modification No.4:

The Glebe Island Construction Ancillary Facility

Modification report

Appendix A

Environmental Aspects Assessed

Environmental Aspects Assessed

Environmental aspects to be assessed in this modification were agreed to by the Department of Planning, Industry and Environment (DPIE) in April 2020. DPIE also advised that:

- With regard to traffic and access, the assessment should detail and consider foreseeable access restrictions in relation the operation of the port, and
- Consultation should be undertaken with stakeholders, including community action groups (such as the Jacksons Landing Coalition and Glebe Island and White Bay Community Liaison Group) as part of the assessment process.

The table below sets out the relevant environmental aspects assessed for the proposed modification (the subject of this report) and identifies where they have been addressed in this EIS.

Environmental issue	Relevant aspect assessed	Where addressed
Construction traffic and access	(a) Assessment should detail and consider foreseeable access restrictions in relation the operation of the port. (b) A description of the car parking arrangements for the construction workforce confirming that construction vehicles would be parked in previously approved locations or within the proposed ancillary facility. (c) A qualitative assessment of heavy and light vehicle numbers. (d) A qualitative assessment of other potential traffic and transport impacts including access, pedestrians and cyclists, and public transport services and infrastructure.	Section 6.2.1
Visual amenity	A qualitative assessment of visual impacts associated with the ancillary facility when viewed from nearby sensitive receptors and public vantage points.	Section 6.2.6
Water (hydrology, groundwater) and flooding	(a) A qualitative assessment noting the impacts of the construction and operation of the proposed facility on surface water. (b) Assess and minimise the effects of stormwater and wastewater management during construction and operation of the proposed facility.	
Socio economic	A qualitative assessment of the potential impacts of the proposed modification on private property.	Section 6.2.7
Heritage	Assess the potential impact of the proposed modification on State Heritage Listed and locally listed heritage items.	6.2.5
Noise and vibration	(a) An assessment of construction noise and vibration impacts including sleep disturbance associated with the proposed modification. This assessment will be	Section 6.2.3, Section 6.2.5 Appendix A

Environmental issue	Relevant aspect assessed	Where addressed
	undertaken in accordance with relevant NSW noise and vibration guidelines and potential noise and vibration mitigation measures will be identified. (b) The assessment of construction noise and vibration impacts will address: ○ The nature of construction activities (including transport, tonal or impulsive noise-generating works as relevant), ○ The likely intensity and duration of potential noise and vibration impacts (both air and ground-borne), ○ The potential for works outside standard construction hours, including estimated duration and timing, predicted levels, exceedances and number of potentially affected receivers and justification for the activity in terms of the Interim Construction Noise Guideline (DECCW, 2009), ○ Figures illustrating the existing, previously assessed and predicted noise levels related to the modification, and ○ A cumulative noise and vibration assessment of other M4-M5 Link works where potential impacts are likely to differ from those that were previously assessed under the EIS for SSI 7485.	

WestConnex M4-M5 Link

Rozelle Interchange - Modification No.4:

The Glebe Island Construction Ancillary Facility

Modification report

Appendix B

Noise and vibration technical report

Transport for NSW

WestConnex - M4-M5 Link

Glebe Island Surface Works Assembly Area Modification

Modification report

Appendix A Noise and Vibration

May 2020

Prepared for

Transport for NSW

Prepared by

Renzo Tonin & Associates

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
15.04.2020	Issued	-	0	M. Tabacchi	M. Tabacchi	T. Gowen
22.04.2020	Minor update	-	1	M. Tabacchi	M. Tabacchi	T. Gowen
27.05.2020	Update following DPIE comments	-	2	M. Tabacchi	M. Tabacchi	T. Gowen

Contents

Figures

Tables

Glossary of terms and abbreviations

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Airborne noise	Noise which is fundamentally transmitted by way of the air and can be attenuated by the use of barriers and walls placed physically between the noise source and receiver.
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
A-weighting	A filter applied to the sound recording made by a microphone to approximate the response of the human ear.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the LA90 noise level if measured as an overall level or an L90 noise level when measured in octave or third-octave bands.
Barrier (Noise)	A natural or constructed physical barrier which impedes the propagation of sound and includes fences, walls, earth mounds or berms and buildings.
Decibel [dB]	The units of sound measurement. The following are examples of the decibel readings of everyday sounds: 0dB The faintest sound we can hear, defined as 20 micro Pascal 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 110dB Operating a chainsaw or jackhammer 120dB Deafening

dB(A)	A-weighted decibel. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz) but is less effective outside these frequencies. The dB(C) level is not widely used but has some applications.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Ground-borne noise	Vibration propagated through the ground and then radiated as noise by vibrating building elements such as wall and floor surfaces. This noise is more noticeable in rooms that are well insulated from other airborne noise. An example would be vibration transmitted from an underground rail line radiating as sound in a bedroom of a building located above.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
INP	NSW Industrial Noise Policy, EPA 1999
ICL	Iron Cove Link civil site
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
Intrusive noise	Refers to noise that intrudes above the background level by more than 5 dB(A).
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L10(1hr)	The L10 level measured over a 1 hour period.
L10(18hr)	The arithmetic average of the L10(1hr) levels for the 18 hour period between 6am and 12 midnight on a normal working day.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).

LAeq or Leq	The “equivalent noise level” is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the LAeq.
LAeq(1hr)	The LAeq noise level for a one-hour period. In the context of the NSW EPA’s Road Noise Policy it represents the highest tenth percentile hourly A-weighted Leq during the period 7am to 10pm, or 10pm to 7am (whichever is relevant).
LAeq(8hr)	The LAeq noise level for the period 10pm to 6am.
LAeq(9hr)	The LAeq noise level for the period 10pm to 7am.
LAeq(15hr)	The LAeq noise level for the period 7am to 10pm.
LAeq (24hr)	The LAeq noise level during a 24 hour period, usually from midnight to midnight.
Lmax	The maximum sound pressure level measured over a given period. When A-weighted, this is usually written as the LAmax.
Lmin	The minimum sound pressure level measured over a given period. When A-weighted, this is usually written as the LAmin.
Microphone	An electro-acoustic transducer which receives an acoustic signal and delivers a corresponding electric signal.
NCA	Noise Catchment Area. An area of study within which the noise environment is substantially constant.
Noise	Unwanted sound
RRY	Rozelle Railyards civil and Tunnel Site
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 mico Pascal.
Spoil	Soil or materials arising from excavation activities.

1 Introduction

Renzo Tonin & Associates was engaged by John Holland CPB Contractors Joint Venture (the Contractor) to prepare a noise and vibration assessment of the establishment and operation of a surface work assembly area at Glebe Island.

1.1 Summary description of proposed modification

This technical report provides an assessment of noise and vibration impacts from activities associated with the establishment and operation of the Glebe Island Surface Works Assembly area. The purpose of this area would be to receive, process and assemble equipment required for the use on the WestConnex M4-M5 Link Project - Stage 2 Rozelle Interchange during standard and outside of standard construction hours.

The Glebe Island Surface Works Assembly Area is proposed as a solution to the competing needs between concurrent construction activities at Approved Project work sites and the logistical requirements for processing. The use of the proposed surface works area would reduce the risk for safety and the likelihood for program delays at the Approved Project construction activities.

This report includes the assessment the following construction activities at the Glebe Island Surface Works Assembly Area:

- Site establishment – standard construction hours expect for the removal of an RMS sign on Somerville road under Anzac bridge;
- Equipment preparation works and transportation – standard construction hours and Out-Of-Hours (OOHW Period 1 and Period 2);
- Equipment/ Girder Preparation – standard construction hours;
- Girder Delivery & Export – standard construction hours and Out-Of-Hours (OOHW Period 1 and Period 2);
- Site Demobilisation – standard construction hours.

Key details regarding the proposed plant and equipment and hours of operation are summarised in Table 3.2.

The Glebe Island Surface Works Area is proposed to be located on the existing concreted section of Glebe Island (Figure 1.1). The proposed surface works area is planned to be established and used between quarter three 2020 through quarter two 2023 following the majority completion of civil works.

Figure 1.1 - Location and access routes for the proposed Glebe Island Surface Works Assembly Area

1.2 Quality assurance

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on *Australian Standard / NZS ISO 9001*.

2 Compliance with Environmental Aspects Assessed

Environmental Aspects Assessed (Noise & Vibration)	Construction
The construction noise and vibration assessments must be quantitative assessments. The assessments must identify any sensitive receivers not previously affected by the modified activities and those where the level of impact is predicted to increase.	Yes, quantitative assessment in Section 4
The assessment of sleep disturbance must assess the predicted number of awakening events.	Maximum noise levels are expected to be below 'awakening reaction' level (Section 4.1.3)
the nature of construction activities (including transport, tonal or impulsive noise-generating works as relevant);	Section 3.4
the likely intensity and duration of potential noise and vibration impacts (both air and ground-borne);	Section 3.4
confirmation of works occurring within and outside standard construction hours, including estimated duration and timing, predicted levels, exceedances and number of potentially affected receivers and justification for the activity in terms of the Interim Construction Noise Guideline (DECCW, 2009);	Section 3.3, Section 3.4 and Section 4
Assess potential construction and operation noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must include consideration of impacts to the structural integrity and heritage significance of items (including Aboriginal places and items of environmental heritage).	Yes, construction noise and vibration assessed to relevant NSW noise and vibration guidelines. Assessment methodology outlined in Section 3.4

3 Methodology

3.1 Construction noise objectives

3.1.1 Noise management levels

Construction noise management levels have been determined using the NSW Interim Construction Noise Guideline (ICNG).

Table 3.1. identifies the adopted construction noise management levels (NMLs) for the nearest noise sensitive receivers to the worksite. The NMLs for residential receivers are based on long-term noise logging conducted by SLR Consulting on behalf of NSW Roads and Maritime Services to quantify ambient noise levels for the Environmental Impact Statement (EIS), supplemented by data from the Renzo Tonin and Associates noise monitoring database as outlined in the Construction Noise and Vibration Management Plan (CNVMP).

Table 3.1 - Noise Management Levels (NMLs)

NCA	Rating Background Noise Levels (RBL)			Noise Management Levels (NML)		
	Day	Evening	Night	Day	Evening	Night
NCA25	51	51	45	61	56	50
NCA27	49	49	42	59	54	47
NCA28	50	49	47	60	54	52
NCA29	61	60	44	71	65	49
NCA43	52	49	44	62	54	49

Residential receivers are considered ‘noise affected’ where construction noise levels are greater than the noise management levels identified in Table 3.1. The noise affected level represents the point above which there may be some community reaction to noise. Where predicted and/or measured construction noise levels exceed NMLs, all feasible and reasonable work practices would be applied to meet the NMLs.

During standard construction hours, a highly affected noise objective of $L_{Aeq(15min)}$ 75dB(A) applies at all residential receivers.

The NMLs for commercial, industrial and ‘other’ sensitive receivers are derived from the ICNG, as reported in Section 5.2.2 of the CNVMP.

In addition to the objectives identified in Table 3.1, where construction activities are described in the ICNG as being particularly annoying, a +5dB(A) correction would be added to the activity noise.

3.1.2 Sleep disturbance

Consistent with Section 5.2.3 of the CNVMP, to assess the likelihood of sleep disturbance, an initial screening level of $L_{A1(1min)} \leq L_{A90(15min)} + 15$ dB(A) is used. In situations where this results in an external screening level of less than 55 dB(A), a minimum screening level of 55 dB(A) is set. Note that this is equivalent to a maximum internal noise level of 45 dB(A) with windows open.

Where noise events are found to exceed the initial screening level, further analysis would be made to identify:

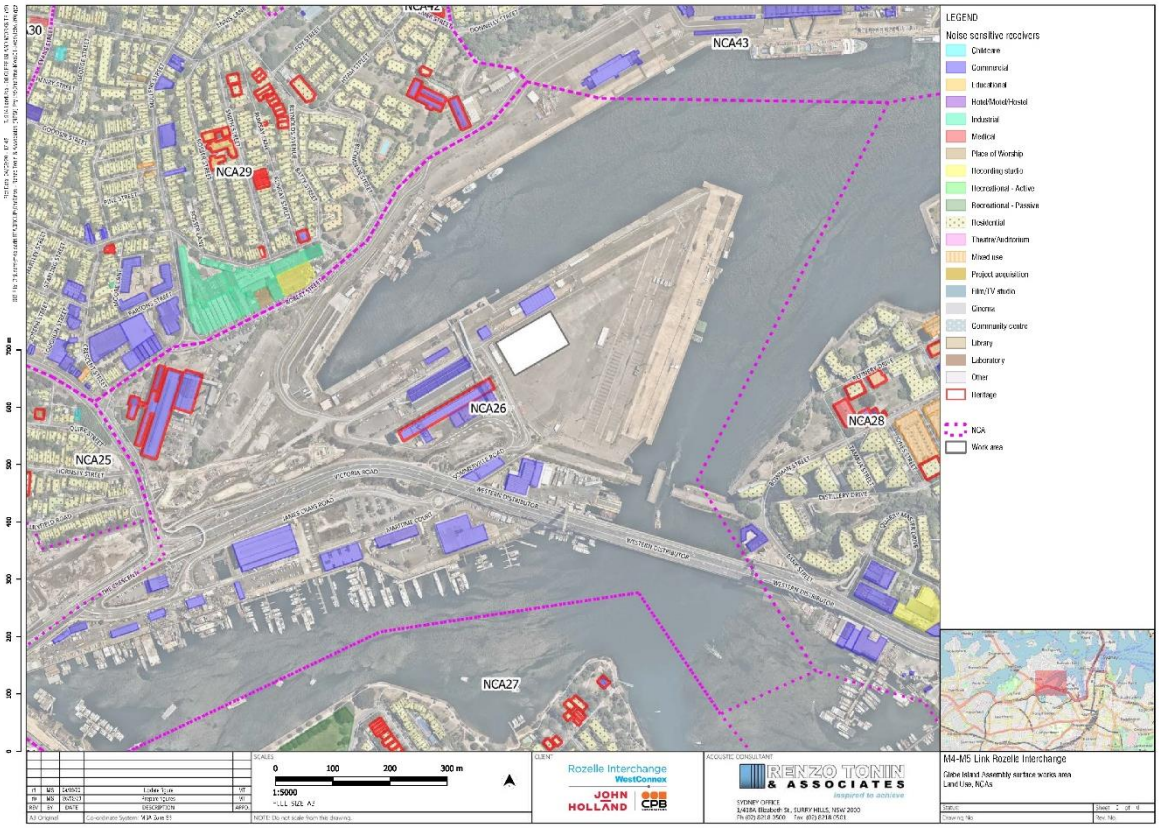
- the likely number of events that might occur during the night assessment period, and
- Whether events exceed an 'awakening reaction' level of 55 dB(A) $L_{A1(1min)}$ (internal) that equates to NML of 65 dB(A) externally (assuming open windows).

3.2 Nearest sensitive receivers

To assess and manage construction noise and vibration impact, a Land Use Survey was completed to satisfy Project Planning Approval (PPA) Condition E66 and incorporated into the CNVMP. The Land Use Survey identified existing land use and development within and around the Project, including a mix of residential, commercial, industrial and 'other' noise sensitive receivers. Further to the Land Use Survey, residential areas surrounding the Rozelle Interchange works (including the Glebe Island surface work area) have been divided into Noise Catchment Areas (NCAs) based on those established in the EIS for the WestConnex M4-M5 Link project.

All relevant nearest noise sensitive receivers near the Glebe Island surface work area are identified in Figure 3.1 below.

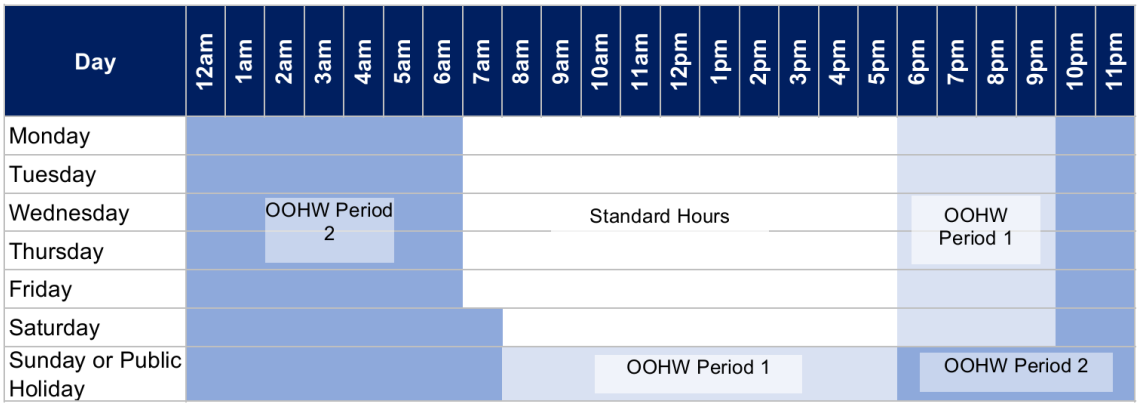
Figure 3.1 - Land use map including Glebe Island surface work area



3.3 Construction hours

Construction works would mainly be undertaken during 'Standard Construction Hours' except for Girder Export & Installation and RMS sign removal on Somerville road under Anzac Bridge (see Table 3.2). Construction hours including Standard Construction Hours are shown in Figure 3.2 below.

Figure 3.2 - Construction hours



Works hours for the M4-M5 Link project are outlined in PPA Conditions E68 and E69. Condition E68 allows works to be undertaken during standard construction hours as outlined in the ICNG, while condition E69 allows works to be undertaken between 1:00 pm and 6:00 pm on Saturdays. Daytime works for this proposed modification would be undertaken during these hours.

3.4 Assessment methodology

Assessment of noise impacts from activities associated with the construction works were determined by modelling the noise sources, receiver locations, topographical features, and possible noise mitigation measures using a Cadna-A computer noise model developed for this project. The model calculates the contribution of each noise source at identified sensitive receiver locations and allows for the prediction of the total noise from the construction works.

The noise prediction models consider:

- Location of noise sources varying from 0.5 m to 4 m above the ground depending on the equipment or plant in use.
- Receiver points at 1.5 m above each floor level along all building facades.
- Height of sources and receivers referenced to one metre digital ground contours for the site area and surrounding area.
- Sound Power Levels (L_w) of plant and equipment likely to be used during the various construction activities are included in Table 3.2. This table also identifies construction hours plant and equipment would be operating. L_{Aeq} sound power levels are identified for assessment against the construction NMLs. L_{A1} (or L_{Amax}) sound power levels are identified for sleep disturbance assessment.
- Ground factors between sources and receivers varying from 1 for absorptive surfaces (e.g. park land) to 0 for reflective surfaces (e.g. water, concrete, paving)
- Attenuation from barriers (natural and purpose built).

Key details regarding the proposed plant and equipment and hours of operation are summarised in Table 3.2.

Table 3.2 – Construction activities including plant/equipment list and hours of operation

Activity/ Work Area	Plant/ Equipment	Day (Standard construction hours)[1]	Evening (OOHW Period 1)[1]	Night (OOHW Period 2)[1]	Duration	Sound Power Level (Lw re: 1pW), dB(A)			Comments
						L_{Aeq}	Penalty dB	L_{A1}	
Site establishment	Light Vehicles	30 in total			2-4 weeks	89	-	100	
	Heavy Vehicles	5 in total				106	-	111	
	Hiab Trucks	5				103	-	111	
	Generator	1				94	-	96	
	Hand Power Tools - Drills	3				105	-	110	
	Hand Power Tools - Saws	3				107	-	112	
	Franna crane	1	1	1		99	-	106	Out-Of-hour use only for removal of an RMS sign on Somerville road under Anzac bridge (1-2 night-shifts)
	Rattle Guns	3	1	1		107	-	112	
Equipment preparation works and transportation	Light Vehicles	30 in total	4 in total	7 in total	156 weeks	89	-	100	
	Heavy Vehicles (Semi's)	20 in total	4 in total	7 in total		106	-	111	
	Water Cart	1				104	-	107	
	Gurney	1				104	-	107	
	Hiab Trucks	1				103	-	111	
	Franna crane	2				99	-	106	
	Flatbed truck	1	1	1		103	-	111	
	Tele-handler	5	1	1		95	-	98	
Equipment/ Girder Preparation	EWPs	3			156 weeks	95	-	98	
	Compressor	1				92	-	94	
	Hand Power Tools - Drills	3				105	-	110	
	Hand Power Tools - Saws	3				107	-	112	
Girder Delivery & Export	Light Vehicles	30 in total	4 in total	7 in total		89	-	100	

Activity/ Work Area	Plant/ Equipment	Day (Standard construction hours)[1]	Evening (OOHW Period 1)[1]	Night (OOHW Period 2)[1]	Duration	Sound Power Level (Lw re: 1pW), dB(A)			Comments
						L_{Aeq}	Penalty dB	L_{A1}	
	Heavy Vehicles (Semi's)	20 in total	5 in total	15 in total	156 weeks	106	-	111	
	Tele-handler	3	1	1		95	-	98	
	Hiab Trucks	3	1	1		103	-	111	
	Light Towers	-	3	3		93	-	95	
	Mobile Crane	1	1	1		100	-	107	
Site Demobilisation	Light Vehicles	30 in total			2-4 weeks	89	-	100	
	Heavy Vehicles	5 in total				106	-	111	
	Hiab Trucks	5				103	-	111	
	Franna crane	1				99	-	106	
	Generator (5kva)	1				94	-	96	
	Rattle Guns	3				107	-	112	
	Hand Power Tools - Drills	3				105	-	110	
	Hand Power Tools - Saws	3				107	-	112	

Notes: 1) Assessment periods are defined in Figure 3.2

4 Construction noise and vibration assessment

4.1 Construction noise

Noise levels were determined by modelling the noise sources, receiver locations and operating activities, based on the information presented in Section 3.4.

The noise predictions presented in this report represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area. At each receiver, noise levels will vary during the construction period based on the position of equipment within the work area, the distance to the receiver, the construction activities being undertaken and the noise levels of particular plant items and equipment. Actual noise levels will often be less than the predicted levels presented in this report.

4.1.1 Works during standard construction hours

A summary of worst-case predicted noise levels during standard construction hours in each NCA for the various work activities is presented in the table below, indicating a realistic worst-case scenario when construction occurs at the closest location within a specific work area, based on the construction plant and equipment details presented in Section 3.4.

Table 4.1 – Predicted worst case noise levels at residential receivers during standard construction hours

NCA	NML	Predicted $L_{Aeq,15min}$ (dBA) during standard construction hours[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	61	46	43	45	39	46
NCA27	59	36	34	35	<30	36
NCA28	60	49	46	48	41	49
NCA29	71	51	48	50	44	51
NCA55	62	48	46	47	41	48

Notes: 1) Assessment periods are defined in Figure 3.2

The predictions show that noise levels are expected to be below relevant NMLs at the closest noise sensitive receivers in all NCAs during standard construction hours.

4.1.2 Works outside standard construction hours

Some activities associated with the proposed modification are required to be undertaken outside of standard construction hours for safety reasons, including some activities associated with equipment preparation and transportation, removal of an existing static road sign on Sommerville Road under Anzac Bridge and transport of steel girders from the proposed modification site to approved project sites for installation.

A summary of worst-case predicted noise levels outside standard construction hours in each NCA for the various work activities is presented in Table 4.2 and Table 4.3.

Table 4.2 – Predicted worst case noise levels at residential receivers during OOHW Period 1

NCA	NML	Predicted $L_{Aeq,15min}$ (dBA) during OOHW Period 1[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	56	44	40	N/A[2]	39	N/A[2]

NCA	NML	Predicted $L_{Aeq,15min}$ (dBA) during OOHW Period 1[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA27	54	34	<30	N/A[2]	<30	N/A[2]
NCA28	55	46	44	N/A[2]	41	N/A[2]
NCA29	65	49	45	N/A[2]	44	N/A[2]
NCA55	54	46	43	N/A[2]	41	N/A[2]

Notes:
1. Assessment periods are defined in Figure 3.2
2. No OOH works for this activity

Table 4.3 - Predicted worst case noise levels at residential receivers during OOHW Period 2

NCA	NML	Predicted $L_{Aeq,15min}$ (dBA) during OOHW Period 2[1]				
		Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	50	44	40	N/A[2]	39	N/A[2]
NCA27	47	34	<30	N/A[2]	<30	N/A[2]
NCA28	52	46	44	N/A[2]	41	N/A[2]
NCA29	49	49	45	N/A[2]	44	N/A[2]
NCA55	49	46	43	N/A[2]	41	N/A[2]

Notes:
1. Assessment periods are defined in Figure 3.2
2. No OOH works for this activity

As shown in Table 4.2 and Table 4.3, noise levels associated with the proposed modification site are predicted to comply with the applicable NMLs during all OOHW periods. The noise predictions represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area, based on the construction scenarios outlined in Section 3.4.

4.1.3 Sleep disturbance

In accordance with Section 5.2.3 of the CNVMP, receivers are considered to experience sleep disturbance where noise levels exceed an initial screening level of $L_{A1(1min)} \leq L_{A90(15min)} + 15$ dB(A). A summary of worst-case predicted maximum noise levels during OOHW Period 2 in each NCA for the various work activities is presented in Table 4.4.

Table 4.4 - Predicted worst maximum noise levels during OOHW Period 2

NCA	Sleep disturbance		Predicted $L_{A1(1min)}$ (dBA) during OOHW Period 2				
	Screening level (RBL+15)	'Awakening reaction' level[1]	Site establishment	Equipment preparation works & transportation	Equipment/ Girder Delivery & Preparation	Girder Export & Installation	Site Demobilisation
NCA25	60	65	48	47	N/A[2]	47	N/A[2]
NCA27	57	65	38	36	N/A[2]	37	N/A[2]
NCA28	62	65	50	51	N/A[2]	49	N/A[2]
NCA29	59	65	53	52	N/A[2]	52	N/A[2]
NCA55	59	65	50	50	N/A[2]	49	N/A[2]

Notes:
1. External equivalent 'awakening reaction' level assuming an open window (i.e. internal 55dB(A) + 10dB(A) building façade loss)
2. No OOH works for this activity

As can be noted from the Table above, the risk of sleep disturbance associated with proposed modification site is considered low, as maximum noise levels from construction activities at night are expected to be below the screening level for sleep disturbance and the 'awakening reaction' level of 55 dB(A) $L_{A1(1min)}$ (internal).

4.2 Cumulative noise impacts

A construction tool (Gatewave, www.gatewave.com.au) has been developed specifically for the Project to assist the construction and environment teams in mitigating and managing cumulative construction noise impacts from all Rozelle Interchange worksites as well as the Glebe Island assembly work area.

4.3 Construction traffic

Heavy vehicles and light vehicles would access the proposed surface works area via CityWest link, Victoria Road, Sommerville Road and James Craig Road.

Existing traffic volumes have been obtained from the traffic validation table in ANNEXURE E-1 of the M4-M5 Link EIS, APPENDIX J. The traffic volumes are detailed Table 4.5 below.

Table 4.5 - Existing traffic volumes

Road	Traffic data			
	Day (7am to 10pm)		Night (10pm to 7am)	
	Light	Heavy	Light	Heavy
City West link (between The Crescent and Victoria Rd)	56746	3016	11478	598
Victoria Road (between Robert St to CityWest link)	70600	3513	11975	538

Notes: No data available for Sommerville Road and James Craig Road in EIS ANNEXURE E-1. All traffic movements to the Glebe Island Assembly surface works area would occur through either the City West Link or Victoria Rd.

The maximum numbers of proposed light and heavy vehicles during the operation of the Glebe Island surface work area are summarised in Table 4.6 (see APPENDIX C Table C1 for more information).

Table 4.6 - Total construction related traffic for Glebe Island surface work area

	Day (7am to 10pm)	Night (10pm to 7am)
Maximum light vehicles	34	7
Maximum heavy vehicles	25	15

Traffic volumes need to increase by around 60 percent in order to create a discernible difference in traffic noise levels (i.e. more than 2 dB(A)). As can be noted from Tables above, heavy and light vehicles travelling along City West Link and Victoria Road would not significantly increase as a result of the Glebe Island surface work area, thus there is unlikely to be a noticeable change in existing traffic noise levels.

Furthermore, the number of maximum noise events (particularly at night-time) on Sommerville Road and James Craig Road would be low compared with to the relatively high existing traffic volumes on City West Link and Victoria Road. There are no residential receivers along Sommerville and James Craig Road. The closest residential receivers are approximately 300-350m away. Considering that City West Link is about 400m away from the same residential receivers, traffic noise increase at these receivers is expected to be minor.

In addition, the proposed maximum numbers of light and heavy vehicles are less than what considered for the operation of the White Bay civil site C11 (Table 3-14 of APPENDIX B – Technical working paper: Noise and vibration).

Therefore, construction traffic associated with the proposed activities is considered to be minor.

4.4 Ground-borne noise and vibration

As the proposed works are not vibration intensive, construction vibration or ground-borne noise impacts are considered to be negligible and are not further addressed in this report.

5 Conclusion

Renzo Tonin & Associates was engaged by the Contractor to prepare a noise and vibration assessment of the establishment and operation of Glebe Island Surface Works Assembly Area.

The findings of this noise and vibration assessment are summarised below:

- **Construction noise:**

  Noise levels are expected to below relevant NMLs at the closest noise sensitive receivers in all NCAs at all time. Airborne noise impact from the Glebe Island Surface Works Assembly Area is therefore assessed as low.

  Potential cumulative impacts would be managed by using the Project's construction noise and vibration management tool (Gatewave).

  The risk of sleep disturbance is low, as maximum noise levels from the operation of the Glebe Island assembly area at night are expected to be below the screening level for sleep disturbance and the 'awakening reaction' level of 55 dB(A) $L_{A1(1min)}$ (internal).

- **Construction traffic:**

  Construction traffic associated with the proposed activities is considered to be minor.

- **Construction vibration and ground-borne noise:**

  The proposed works are not vibration intensive, therefore no construction vibration or ground-borne noise impacts are expected.