Cross River Rail Environmental Impact Statement

Request for Project Change 8

Changes to the Project and changes to the imposed conditions

Volume 1

Date: ***August 2020***

Author: ***Cross River Rail Delivery Authority***

Executive Summary

The Cross River Rail (CRR) Project is a coordinated project for which an Environmental Impact Statement (EIS) is required under the *State Development and Public Works Organisation Act 1971*. The CRR EIS was evaluated by the Coordinator-General, who recommended the project proceed, subject to Imposed Conditions and recommendations. Since the evaluation of the EIS, seven (7) Requests for Project Change (RfPCs) have been evaluated by the Coordinator-General.

The CRR Project, as currently evaluated by the Coordinator-General, is referred to in this Request for Project Change as the "Evaluated Project".

With ongoing detailed design, construction planning and further investigations, a number of changes to the Evaluated Project, and some of the Imposed Conditions (Proposed Changes) have been identified to facilitate project delivery.

The Delivery Authority, as Proponent, now applies to the Coordinator-General to evaluate the environmental effects of the Proposed Changes, the effects of the Proposed Changes on the CRR Project, and other related matters.

Summary of the requested changes

This RfPC requests that the Coordinator-General evaluate the following Proposed Changes:

- Changed heavy vehicle access arrangements to the Southern Portal worksite via Kent Street, Dutton Park, and a private road on land within the Princess Alexandra Hospital site to provide for improved safety and efficiency for heavy vehicle access; and
- Temporary occupation of the road at Annerley Road and Kent Street, Dutton Park, to allow for minor road corridor treatments to facilitate heavy vehicle access to the Southern Portal worksite, and the private road on land within the Princess Alexandra Hospital site.

This request also seeks changes to the Project-Wide Imposed Conditions, as described below:

- Amend Condition 1 to:
  - incorporate Request for Project Change 8 dated August 2020, including updated drawings provided at Volume 2 for the changed temporary worksite access and egress for heavy vehicles;
  - replace the reference to "Schedule 3" in Condition 1(b) with "Schedule 2" as a consequence of renumbering the Schedules in Appendix 1;
  - delete the redundant reference in Condition 1(c) to the temporary coach terminal works conditions at Appendix 3 which has been completed;
- Amend Condition 3 to:
  - replace the reference to "Schedule 2" in Condition 3(a) with "Schedule 1" as a consequence of renumbering the Schedules in Appendix 1;
- Amend Condition 10 to:
  - remove the reference to "extended work hours" in Table 1, and incorporate the requirements for extended work hours wholly within Condition 10(d);
  - remove the existing limitation of 80 hours of continuous work within the rail corridor for the Dutton Park, Southern Portal and Boggo Road worksites so that work hours for track possessions align with the period of the track possessions approved by Queensland Rail (QR);
  - remove the existing limitation of a 10:00pm conclusion of works on a road or busway to align with timeframes set by Brisbane City Council (BCC), the Department of Transport and Main Roads (DTMR) or other permitting agencies;

- retain the existing limitation of a 10:00pm conclusion of works for works involving the transport, assembly or decommissioning of oversized plant, equipment, components, structures or transport of hazardous materials, unless different hours are stated in the road access permit;
- provide a process for Project Works during extended work hours to be undertaken where approved by the entity with jurisdiction for Condition 10 (the Chief Executive, DTMR) and where a specific construction environmental management plan that has been endorsed by the environmental monitor is in place;
- clarify that concrete deliveries required to support continuous activities are not constrained by the Condition 10(a) Table 1 spoil haulage and materials/equipment delivery operating hours, and will instead be managed in accordance with proposed Condition 10(d);
- fix a formatting issue in condition 10(c)(iv) so that the words "may be undertaken outside the hours set out in Table 1 "apply to all of c(i) - (iv).

Reasons for the Changes

The Proposed Changes are required to:

- Provide for safer and more efficient heavy vehicle access to the Southern Portal worksite;
- Allow for temporary occupation of parts of Annerley Road and Kent Street for road adjustments to facilitate heavy vehicle access into the Southern Portal worksite;
- Provide for the most efficient use of track possession periods to complete works within the rail corridor when trains are not operating (approved rail possessions), consistent with track possession periods approved by QR for the Dutton Park, Southern Portal and Boggo Road worksites;
- Provide for efficient use of road/busway possession periods to complete works within a road/busway corridor during low traffic volumes, consistent with road/busway possession periods approved by BCC and/or DTMR;
- Align the imposed conditions with other permits issued by BCC, DTMR or other agencies for the transport on or occupation of roads/busways for the transport, assembly or decommissioning of oversized plant, equipment, components, structures or transport of hazardous materials;
- Ensure that continuous construction activities that are already permitted by Condition 10 (such as tunnel grouting activities, large concrete pours) can be properly supported by continuous concrete deliveries; and
- Make minor administrative and formatting changes to improve legibility of the conditions.

The Proposed Changes to the Evaluated Project are the result of ongoing detailed design and construction planning processes. The Proposed Changes do not result in any significant changes to the current design for the Evaluated Project.

Effects of the requested changes - Project Changes

The anticipated effects of the Proposed Changes to the Evaluated Project are:

- Minor physical modifications to the Annerley Road / Cornwall Street centre median strip and eastern kerb line at the Cornwall Street / Kent Street intersection to accommodate movement of heavy vehicles (i.e. 19m semi-trailers);
- A minor increase in heavy vehicle traffic for:
    - The right turn movement from Annerley Road onto Cornwall Street; and
    - The left turn movement from Cornwall Street onto Kent Street;

- Minor increases in traffic noise at Annerley Road, Cornwall Street and Kent Street (less than 2 dBA).

The assessment concludes that the existing environmental management framework remains appropriate for managing the effects of the requested changes to the Evaluated Project.

Effects of the requested changes - Imposed Condition changes

The proposed changes to Condition 10 will not result in any changes to the nature of the works to be undertaken for the CRR Project, but will result in certain works being undertaken during extended work hours, with an extended duration to those hours. An assessment of the effects of those changes concludes that the environmental effects of the changes can be managed in accordance with the existing environmental management framework, in particular for management of noise and traffic impacts, and that the environmental outcomes and process requirements of the environmental management framework remain appropriate for those works.

The extended work hours will allow efficiencies to be achieved in the delivery of the project, providing for an overall reduction in the number of possessions required to deliver the CRR Project, and an overall reduction in the establishment and handback works required for those possessions. This will reduce disruption compared to the Evaluated Project to users of the rail, road and busway corridors, and is expected to result in less overall disruption to directly affected persons impacted by the works - with less frequent possessions, but of a longer duration.

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1. Introduction

The Cross River Rail Delivery Authority (the Delivery Authority) established by the *Cross River Rail Delivery Authority Act 2016* (Qld) is the proponent for the Cross River Rail (CRR) Project. The CRR Project is a declared coordinated project for which an Environmental Impact Statement (EIS) was required under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). The EIS for the CRR Project (2011 EIS) was evaluated by the Coordinator-General, who recommended that the project proceed, subject to the Imposed Conditions in the evaluation report dated 20 December 2012. Since the 2012 evaluation report, seven Requests for Project Change (RfPC) have been submitted and changes evaluated by the Coordinator-General.

The Evaluated Project is the authorised CRR Project as described in Imposed Condition 1 of the Coordinator-General's Project-wide Imposed Conditions.

In parallel with the commencement of construction of the Project, refinements to detailed design and construction delivery methods have been undertaken for the Project. This RfPC is a result of refinements identified through these processes.

The key Proposed Changes to the Evaluated Project are summarised as:

- Changed heavy vehicle access arrangements to the Southern Portal worksite via Kent Street, Dutton Park, and a private road on land within the Princess Alexandra Hospital site to provide for improved safety and efficiency for heavy vehicle access; and
- Temporary occupation of the road at Annerley Road and Kent Street, Dutton Park, to allow for minor road corridor treatments to facilitate heavy vehicle access to the Southern Portal worksite, and the private road on land within the Princess Alexandra Hospital site.

This request also seeks a change to the Project-Wide Imposed Conditions, as described below:

- Amend Condition 1 to:
  - incorporate Request for Project Change 8 dated August 2020, including updated drawings provided at Volume 2 for the changed temporary worksite access and egress for heavy vehicles;
  - replace the reference to "Schedule 3" in Condition 1(b) with "Schedule 2" as a consequence of renumbering the Schedules in Appendix 1;
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  - remove the existing limitation of a 10:00pm conclusion of works on a road or busway to align with timeframes set by Brisbane City Council (BCC), the Department of Transport and Main Roads (DTMR) or other permitting agencies
  - retain the existing limitation of a 10:00pm conclusion of works for works involving the transport, assembly or decommissioning of oversized plant, equipment, components, structures or transport of hazardous materials, unless different hours are stated in the road access permit;
  - provide a process for Project Works during extended work hours to be undertaken where approved by the entity with jurisdiction for Condition 10 (the Chief Executive,

DTMR) and where a specific construction environmental management plan that has been endorsed by the environmental monitor is in place;

- clarify that concrete deliveries required to support continuous activities are not constrained by the Condition 10(a) Table 1 spoil haulage and materials/equipment delivery operating hours, and will instead be managed in accordance with proposed Condition 10(d);
- fix a formatting issue in condition 10(c)(iv) so that the words "may be undertaken outside the hours set out in Table 1 "apply to all of c(i) - (iv).

The Proposed Changes are further described and the reasons for and effects of the Project Changes are set out in Sections 5 to 7 of this report.

The CRR Project is presently under construction and being delivered in accordance with the Imposed Conditions including the Construction Environmental Management Plan (CEMP) which has been endorsed as being consistent with the Outline Environmental Management Plan (OEMP). The OEMP has been approved by the Coordinator-General and provides the overarching framework for the Project's environmental management requirements. The currently approved OEMP and endorsed CEMP will also be updated, where relevant, to reflect any changes resulting from this RfPC prior to the commencement of Relevant Project Works.

1.1 Purpose

The purpose of this RfPC is to request that the Coordinator-General assess the Proposed Changes to the Evaluated Project and to the Imposed Conditions, in accordance with Part 4, Division 3A of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This report:

- Describes the Proposed Changes and their effects on the Project;
- States reasons for the Proposed Changes;
- Includes relevant information about the Proposed Changes and the changed environmental effects, to allow the Coordinator-General to make the evaluation, including:
  - The assessment of the environmental effects of the changes to the Project; and
  - A review of the relevant elements of the Coordinator-General Imposed Conditions environmental management framework, including updated advice on relevant OEMP and CEMP mitigation measures in response to the environmental effects of the changes; and
- Provides replaced drawings, to ensure the Proposed Changes are accurately captured.

1.1.1 Consultation Requirements

The Coordinator-General will determine whether or not the Delivery Authority will be required to publicly notify the Proposed Changes and its effects on the Evaluated Project. If required, public notices inviting submissions on the request will be published in accordance with the requirements of the SDPWO Act.

The consultation period is determined by the Coordinator-General and stated on the public notification. If the request is publicly notified, any person, company or organisation may make a submission on the request. A 'properly made' submission:

- Is made in writing to the Coordinator-General;
- Is received on or before the deadline for submissions;
- States the name and address of each submitter;
- Is signed by each submitter; and

- States the grounds of the submissions and the facts and circumstances relied on in support of the grounds.

1.1.2 Structure

The Request for Project Change for the CRR Project comprises the following:

- **Volume 1 – Request for Project Change (this report)**

  Volume 1 describes the Proposed Changes, the reasons for the Proposed Changes and the effects of the changes on the Project.

- **Volume 2 – Amended Plans**

  Volume 2 presents the Changed Project drawings including general arrangement drawings, longitudinal and cross sections, property impact plans and station arrangement drawings.

- **Volume 3 – Technical Reports**

  Volume 3 provides technical information supporting the Request for Project Change.

2. Evaluated Project

The CRR Project is a 10.2 km north-south rail line connecting Dutton Park to Bowen Hills with 5.9 km of tunnel under the Brisbane River and Central Business District (CBD). The CRR Project also includes new stations at Boggo Road, Woolloongabba, Albert Street, and Roma Street, with upgrades to the existing Exhibition Railway Station and stations from Fairfield to Salisbury.

Further information on the CRR Project and changes that have occurred since the CRR Project was originally evaluated in 2012 are detailed in:

- The Coordinator-General's evaluation report on the EIS dated 20 December 2012
- The Coordinator-General's change report dated 9 June 2017
- The Coordinator-General's change report dated 31 August 2018
- The Coordinator-General's change report dated 13 March 2019
- The Coordinator-General's change report dated 26 June 2019
- The Coordinator-General's change report dated 8 May 2020
- The Coordinator-General's change report dated 16 July 2020.

2.1.1 Environmental Management Framework

The Evaluated Project is managed by way of the environmental management framework, which is required by the Coordinator-General's Imposed Conditions for the Project.

The environmental management framework for the Project comprises a number of elements being:

- The Coordinator-General's Imposed Conditions as set out in Appendix 1 - Project-wide Imposed Conditions - Cross River Rail Project (Imposed Conditions);
- The OEMP which is approved by the Coordinator-General (and is required by the Imposed Conditions);
- The CEMP (including sub-plans), which are required for all project works, and in some cases are required to be specifically developed for particular project works.

The environmental management framework is supported by:

- A compliance and reporting regime, as set out in Imposed Conditions 5 and 6; and
- Two specific entities required by the Imposed Conditions to increase rigour and transparency for the Cross River Rail Project and provide oversight for the implementation of the Imposed Conditions. Both of these entities are required to be independent, appropriately skilled and experienced, and approved by the Coordinator-General. Those entities are:
    - (i) The Environmental Monitor (Imposed Condition 7); and
    - (ii) The Community Relations Monitor (Imposed Condition 8).

Imposed Condition 2(a) requires an OEMP to be submitted to the Coordinator-General two months prior to the commencement of Project Work and approved by the Coordinator-General.

Imposed Condition 2(b) requires that the OEMP sets the environmental outcomes and performance criteria for the Project, together with possible mitigation measures, monitoring and reporting for each environmental element to achieve the environmental outcomes. The condition also requires a number of sub-plans to be included to form part of the OEMP.

The Coordinator-General has approved the OEMP consistent with Imposed Condition 2. That Approved Outline Environmental Management Plan includes sub- plans that incorporate the environmental outcomes that must be met by the Project in relation to, amongst other elements:

a) Air quality;

b) Community and stakeholder engagement;

c) Construction traffic;

d) Erosion and sediment control;

e) Hazard and risk;

f) Noise and vibration;

g) Water quality management.

Imposed Condition 4(a) requires that a CEMP must be developed by the Proponent and endorsed by the Environmental Monitor prior to the commencement of Relevant Project Work. That CEMP:

> … must meet the requirements of Imposed Condition 4(c), including that it:
>
> i. Must incorporate the environmental outcomes and performance criteria of the Outline Environmental Management Plan;
>
> ii. Must demonstrate that the Imposed Conditions (Construction) will be complied with during Relevant Project Work;
>
> iii. Must incorporate mitigation measures to achieve the environmental outcomes where predictive studies indicate impacts beyond those provided for in the performance criteria;
>
> iv. Must be implemented (Imposed Condition 4(d); and
>
> v. Must be updated and endorsed by the environmental monitor for new or additional Relevant Project Work (Imposed Condition 4(g) and (g)(i).

The Environmental Monitor must endorse the CEMP as consistent with the OEMP and complying with the Imposed Conditions (construction) (Condition 7(c)(viii). That endorsement cannot be given where the requirements are not met.

The endorsed CEMP contains the detailed mitigation measures that are implemented for relevant project works. There are already detailed CEMPs for the project works that are underway, including detailed sub-plans and site management plans. The CEMPs include detail of the construction works to be undertaken and program, mitigation measures, monitoring, auditing and reporting.

The existing CEMPs are available on the Delivery Authority's website at https://crossriverrail.qld.gov.au/planning-environment/environment-approvals/environmental-management/.

An overview of the Coordinator-General Imposed Conditions environmental management framework is provided in Figure 1.

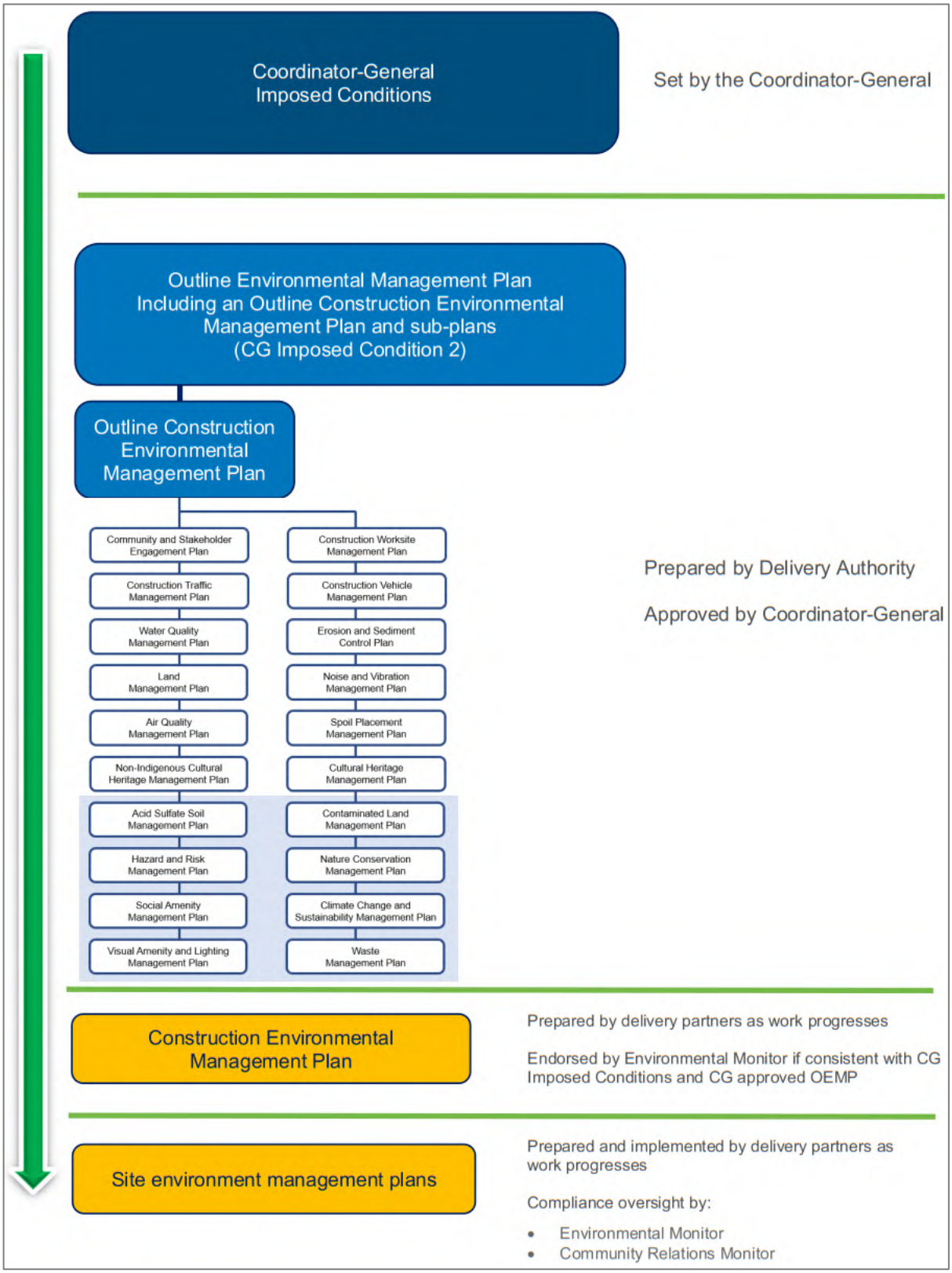

Figure 1: Coordinator-General Imposed Conditions Environmental Management Framework

2.1.2 Amendment to Drawings

The following drawings in Volume 2 are proposed to be amended:

CRRDA Drawing Number	Revision	Title	RfPC8 Changes	Drawing Changes
Property Impact Drawings				
CRR-0003-RP-GA-111	E	Property Impact Plans Sheet 11	Yes	Additional temporary land requirements on Annerley Road, Kent Street and Princess Alexandra Hospital included to improved safety and efficiency for heavy vehicle access to Southern Portal via Kent Street.
General Construction Site Plan Drawings				
CRR-003-CD-GA-135	D	General Construction Site Plan Southern Portal	Yes	Inclusion of new heavy vehicle access point off Kent Street into site. Inclusion of proposed heavy vehicle route through the site including final exit point from site. Inclusion of new perspective views for entry and exit points.

3. Kent Street, Heavy Vehicle Access

3.1 Proposed Change

The proposed change is to change the construction traffic route to allow heavy vehicle access to the Southern Portal worksite along Annerley Road, Cornwall Street and Kent Street. Heavy vehicle access to the Southern Portal worksite is currently O'Keefe Street and Boggo Road Busway. The revised heavy vehicle access route is set out in Figure 2.

Under the proposed change, heavy vehicles would:

- Access the worksite via the Kent Street connection to the Annerley Road / Cornwall Street intersection;
- Exit via Kent Street / Princess Alexandra Hospital approach at the Ipswich Road / O'Keefe Street intersection in a one-way transit; and
- Exit of oversized equipment via Kent St to Cornwall St, where truck size does not allow for exit as per above and will be authorised under the existing Haulage Management Plan which notes such vehicles would operate under the applicable Heavy Vehicle National Law notices and permits.

This would operate in addition to the existing light vehicle access that is approved through the Evaluated Project and would not close access to Kent Street for road users.

The changed access arrangements would be required until works at the Southern Portal worksite are complete which is expected to be 2024, based on the current program.

The new haulage route will progress from the corner of Annerley Road and Kent Street, along Kent Street and into the Southern Portal worksite (Figure 2). The haulage route beyond that point will join an already approved haulage route. Construction vehicles would exit the worksite via the private road within the Princess Alexandra Hospital site.

The approved and proposed haulage routes are also described in Figure 3.

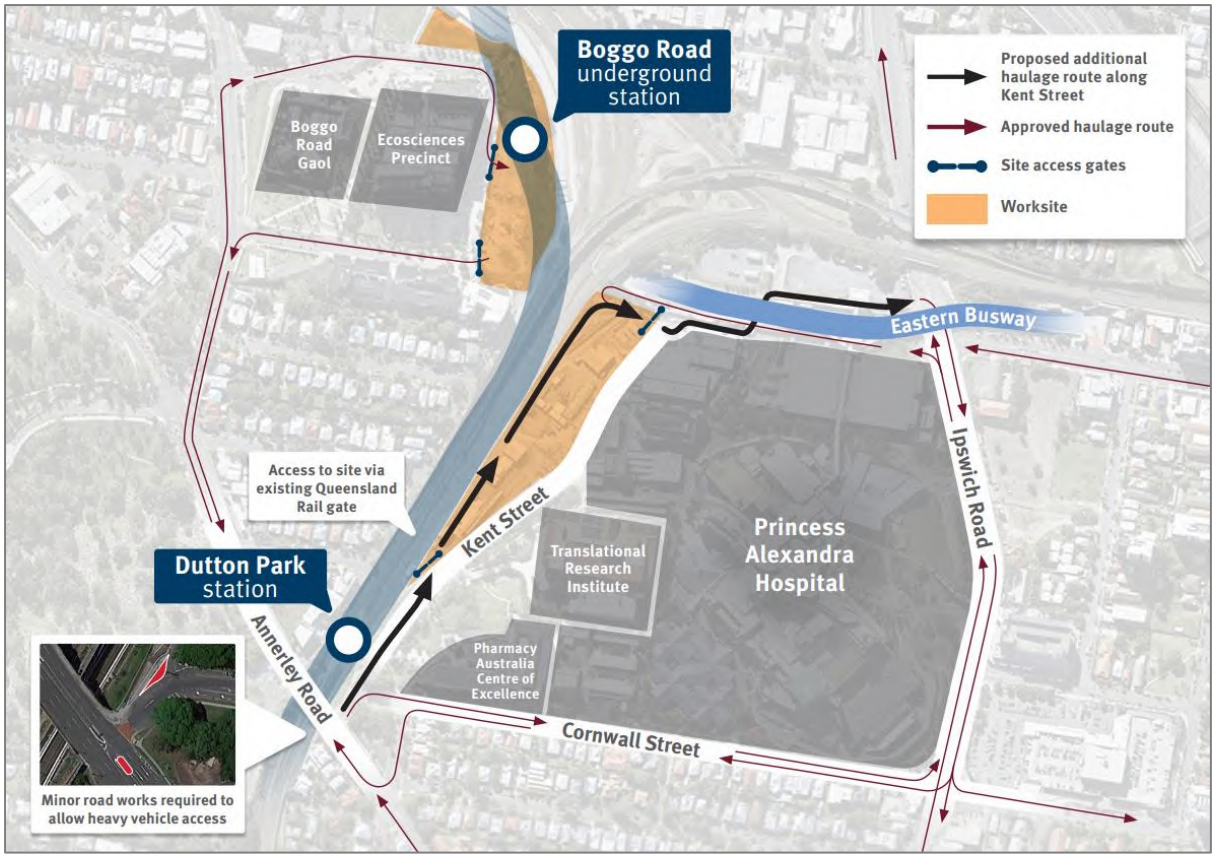

Figure 2: Proposed change in heavy vehicle construction route

3.2 Reason for the Proposed Change

The change will enhance the efficiency and safety of heavy vehicle traffic access and egress from the Southern Portal worksite by allowing for a one-way route for heavy vehicles (except for oversized vehicles).

3.3 Evaluated Project

3.3.1 Context

The effects of the proposed change relate to Traffic and Transport, and Noise and Vibration.

The changed project would continue to be managed in accordance with the environmental management framework for the Project, which remains relevant and appropriate to manage the environmental effects of the Project including the proposed change.

The relevant requirements under the Imposed Conditions, OEMP, CEMP and related sub-plans for Traffic and Transport and Noise and Vibration are set out below.

3.4 Evaluated Project – Traffic and Transport

3.4.1 Imposed Condition 14 – Traffic and Transport

Appendix 1 of the Coordinator General's Change Report (CGCR) for RfPC 7 sets out Project-wide Imposed Conditions for the Project, in relation to Traffic and Transport.

Imposed Condition 14 sets out the conditions that must be satisfied to avoid or minimise adverse impacts on road safety, traffic flow, public transport, freight rail movements, pedestrian and cyclist safety and property access, among other things.

Relevantly Condition 14 provides that:

(e) *Heavy construction vehicles use only designated routes for spoil haulage and deliveries of major plant, equipment and materials, in accordance with the Construction Environmental Management Plan. The designated haulage routes for each worksite must follow major or arterial roads to the extent practicable and be developed in consultation with the Department of Transport and Main Roads and the Brisbane City Council in preparation of the Construction Environmental Management Plan.*

(f) *The Construction Traffic Management Plan must be supported by a road safety assessment for the spoil haulage route.*

(g) *Construction traffic must operate within the requirements of a construction traffic management sub-plan (Construction Traffic Management Plan) incorporated within the Construction Environmental Management Plan.*

Condition 14 further provides at (h) that Construction Traffic Management Plans must include:

iii. *local traffic management measures developed in consultation with Brisbane City Council for key intersections:*

…

(D) at Dutton Park including Annerley Road, Peter Doherty Street, Joe Baker Street and Boggo Road, as well as Kent Street, Cornwall Street and Ipswich Road;

…

iv. *specific traffic management measures developed in consultation with other key stakeholders, including:*

(A) the department administering the Economic Development Act 2012 with regards traffic management in the Queens Wharf Brisbane priority development area;

(B) Queensland Rail about maintaining access to railway stations; and

(C) the department administering the Transport Infrastructure Act 1994 and the Brisbane City Council about maintaining operations for bus services along streets affected by the Project Works.

Under the Evaluated Project, heavy vehicles may access the Southern Portal worksite from the Boggo Road Busway and exit from Kent Street north next to the Princess Alexandra Laundry building in a circular one-way loop (24hrs 7 days per week) (see approved HV Route in Figure 3, below).[1] Light vehicle access has been approved into the site via Kent Street (for entering and exiting the site). The proposed heavy vehicle access appears in red in Figure 3.

[1] Section 4.2 Southern Portal, Construction Traffic Management Plan, 3 September 2019.

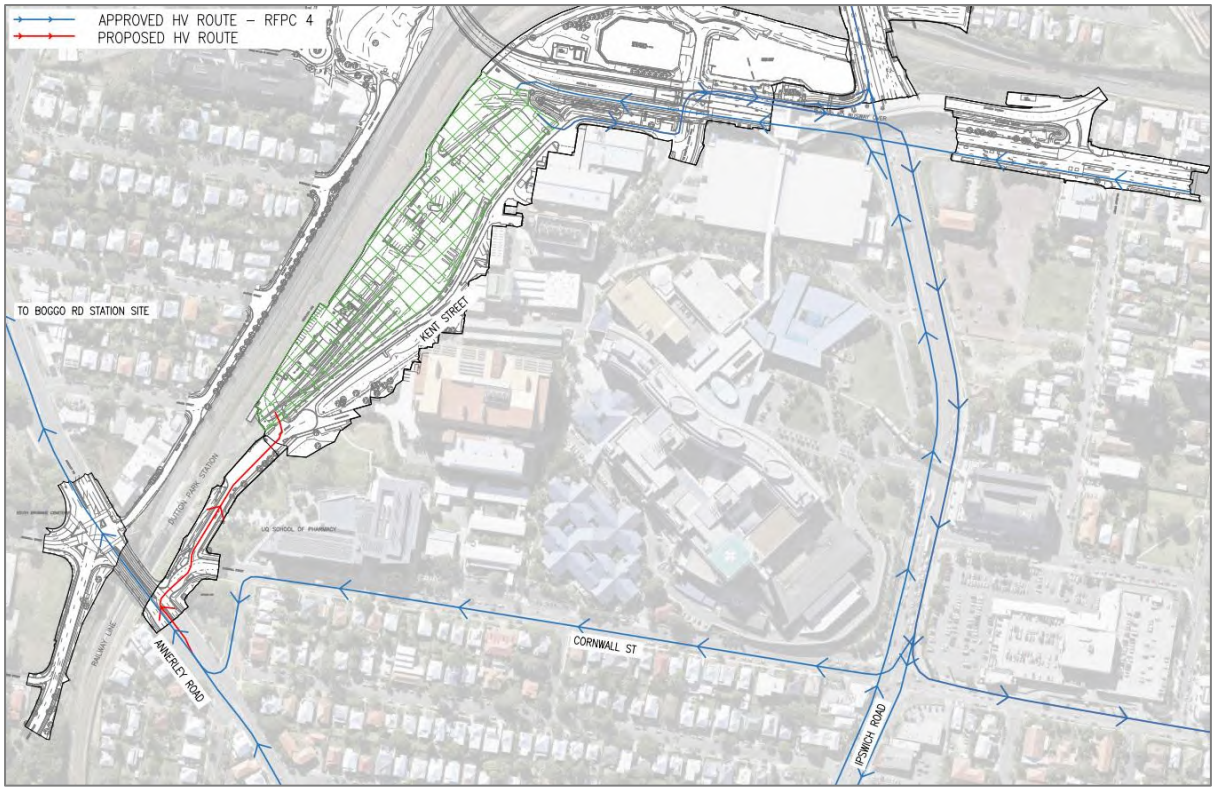

Figure 3: Approved and proposed heavy vehicle route

3.4.2 Outline Environmental Management Plan – Traffic and Transport

Appendix H of the OEMP sets out the requirements of the Construction Traffic Management Plan (CTMP). Section 3.2 of the OEMP-CTMP sets out the Environmental Outcomes required for the Project. This includes:

- Project construction traffic is managed to avoid or minimise and mitigate adverse impacts on road safety and traffic flow, public transport, pedestrian and cyclist safety, property access, freight rail movements and parking, existing road pavements and railway tracks.

Section 3.3 of the OEMP-CTMP sets out Performance Criteria which includes (among other things) the following performance criteria which must be achieved throughout construction of the Project:

- Safe and efficient access is maintained for pedestrians, bicycles and for passengers to and from public transport facilities, including rail and busway stations and bus stops.
- Practicable access is maintained to adjacent properties throughout the construction phase.
- Haulage vehicles (i.e. spoil, construction equipment and materials haulage) only travel on designated haulage routes identified in the CTMP, unless agreed beforehand with the relevant road authority and the Environmental Monitor.
- Information about the timing and scale of changes to traffic and transport conditions on passenger rail operations, the busway and road networks in the vicinity of Project Works is provided in advance to the local community, commuters and on request to other people interested in the Project Works.

- Pedestrian and cycle access to community facilities is not disrupted by Project Works, unless approved by the relevant road authority in consultation with the manager of the community facilities.

3.4.3 Construction Traffic Management Plan

The Construction Traffic Management Plan (CTMP) responds to the requirements set out above. The CTMP also sets out a range of strategies for minimising disruptions, ensuring safe traffic management and maintaining equivalent functionality and capacity to existing public/private access egress at all times (unless otherwise approved in writing by the relevant owner/occupier).

To minimise disruption the CTMP sets out several strategies to be implemented in CTMP sub-plans to minimise construction traffic impacts which (among other things) include:

Road Network

- Maintaining the traffic-carrying capacity and connectivity of affected roads and current levels of service, safety and travel time, as far as is practicable;
- Minimising the impact of construction traffic on local roads (e.g. Boggo Road, Joe Baker Street and Peter Doherty Street);
- Early consultation with DTMR, BCC and Emergency Services about and incorporating feedback into the CTMP Sub-plans as applicable;
- Avoiding disruptions to the operation of the road network due to Project Works during peak periods, where possible, and managing such disruptions during off-peak periods;
- Working collaboratively with BCC to assess where the implementation of local traffic management measures will reduce traffic impacts associated with construction vehicles at key intersections at Dutton Park including Annerley Road, Peter Doherty Street, Joe Baker Street and Boggo Road, as well as Kent Street, Cornwall Street and Ipswich Road; and
- Avoiding major haulage tasks during scheduled major events at the Gabba Stadium, Lang Park, Riverfire and New Year's Eve.

Maintaining Access for businesses, residents and community facilities

- Staging the Project Works to maintain access for delivery vehicles to businesses at Boggo Road Urban Village and the Ecosciences Precinct;
- Maintaining access for both the general public and emergency services vehicles to hospitals and medical centres at Princess Alexandra Hospital, Mater Hospital and the Royal Brisbane and Women's Hospital (RBWH) at all times;
- Staging the Project Works to maintaining pedestrian access at all times through the Albert Street road closure including to commercial properties during trading hours;
- Staging the Project Works to maintain equivalent level of access to public transport providers facilities;
- Using real time monitoring and direct communication with Spoil Haulage vehicles to manage headways / arrivals at construction site access gates to ensure vehicles do not queue on adjacent roads; and
- Where a reduction in level of access to any of the above is predicted in the CTMP Sub-plan CBGUJV Stakeholder and Community Relations team will undertake consultation

The CTMP also describes strategies to be implemented in CTMP Sub-plans to maintain the safe and efficient traffic flow on the transport network include:

Road, Pedestrian and Cyclist Infrastructure

- Locating construction site accesses on higher order roads where practicable, to minimise the potential impact on local roads;
- Designing construction site access points and site layouts to provide unimpeded turn movements from the public road network (and where not possible, identify appropriate operational controls) and with adequate storage capacity to ensure construction vehicles do not queue or stand on adjacent roads;
- Staging of the Project Works to maintain acceptable footpath and cycle paths in areas adjacent to Project worksites and where changes are required to facilitate Project Works consult with BCC, QR, DTMR, Translink as applicable;
- Designated haulage routes will utilise the arterial and major road network to the greatest extent possible with local or minor roads only used where it is unavoidable to access a Project worksite;
- Real time management of spoil haulage vehicles to monitor vehicle speed and position to and between worksites and spoil disposal sites; and
- Spoil haulage and materials and equipment delivery will be undertaken within the hours of work set out in the Conditions of Approval to avoid disruption to traffic flows during peak periods.

3.4.4 Construction Vehicle Management Plan

The Construction Vehicle Management Plan (CVMP) also contemplates a range of traffic and other impacts from the use of heavy vehicles, including increased congestion and delays for existing road users due to increased construction traffic on local roads, impact to traffic and access requirements for other Brisbane projects, and social amenity impacts (especially noise for nearby residents).

The mitigations discussed in the CVMP refer back to the CTMP sub-plans relating to Haulage Management, Precinct Subplans detailing access and egress routes to avoid local roads, and real time monitoring of spoil haulage vehicles ensures compliance with routes, construction hours, load limits and speed limits

The project plant inspection procedures are also designed to ensure all vehicles are in good working order while travelling on public roads, and the precinct CTMP Sub-plans detail access procedures to ensure queueing near site accesses, sensitive community facilities and residential neighbourhoods is avoided.

3.5 Impact of the proposed change – Traffic and Transport

A Traffic Impact Assessment has been prepared in accordance with DTMR's Guide to Traffic Impact Assessment to assess the potential traffic and transport impacts arising from the Proposed Changes to the Southern Portal worksite, as compared to the Evaluated Project. Traffic Impact Assessment report is provided in Volume 3 Technical Reports (Attachment B Technical Report – Traffic and Transport).

3.5.1 Current Traffic Volumes

Traffic volumes were modelled based on intersection counts conducted over a 24-hour period on Thursday 18 June 2020. A 24-hour summary is shown in Table 1. At the time the report was prepared, Average Annual Daily Traffic (AADT) data for these roads was unavailable.

On each of the roads considered, heavy vehicle traffic accounted for between 3.3 percent and 5.4 percent of total traffic observed during the survey period [refer to Volume 3 - Section 3 of the Construction Traffic Noise Assessment Report (Attachment C)].

Table 1: Existing traffic volumes Thursday 18 June 2020

Worksite	Road Segment	24-hour day period	
		Existing Total	Existing Heavy vehicles
Southern Portal	Annerley Road	24,990	834 (3.3%)
	Noble Street	12,272	668 (5.4%)
	Railway Terrace	232	11 (4.7%)
	Cornwall Street	8,972	322 (3.6%)
	Kent Street	1,409	50 (3.5%)

The Evaluated Project already provides for a maximum of 8 light vehicles per hour to access via Kent Street.

Peak hour construction will require up to 10 heavy vehicles per hour (in addition to the 8 light vehicles) at any time of the day. It is generally expected that heavy vehicle volumes will average 4 per hour.

The maximum daily traffic forecast for heavy and light vehicles associated with the Southern Portal worksite will be approximately:

- 8 light vehicles per hour (already approved for access via Kent St); and
- 10 heavy vehicles per hour (additional vehicles proposed via Kent Street).

3.5.2 Traffic under Proposed Change

The effects of the Proposed Changes are largely consistent with the Evaluated Project. Impacts by the Proposed Changes include traffic around the Southern Portal and Dutton Park worksites, with consequential impacts on residents, businesses, road users and active transport users in adjacent areas.

Traffic Volumes

The expected construction 24-hour traffic volumes have been calculated and are shown in Table 2.

24-hour traffic volumes will increase during Project Works from between 3.7 percent and 10 percent, with the greatest increases to occur on Kent Street [refer to Volume 3 - Section 4.1 of the Construction Traffic Noise Assessment Report (Attachment C)].

Table 2: Traffic volumes summary

Worksite	Road Segment	24-hour day period					
		Existing Total	Existing Heavy vehicles	Additional Vehicles due to Construction	Additional Heavy vehicles due to Construction	TOTAL	Heavy vehicles
Southern Portal	Annerley Road	24,990	834 (3.3%)	110	102	25,095	936 (3.7%)
	Cornwall Street	8,972	322 (3.6%)	110	102	9,077	424 (4.7%)

Worksite	Road Segment	24-hour day period					
		Existing Total	Existing Heavy vehicles	Additional Vehicles due to Construction	Additional Heavy vehicles due to Construction	TOTAL	Heavy vehicles
	Kent Street	1,409	50 (3.5%)	110	102	1,514	152 (10%)

Peak Construction Period

It is anticipated the peak construction traffic volume for the Southern Portal worksite will occur in May 2022, when average construction traffic volumes are expected to be around four vehicles per hour. Predominantly these movements will process one-way. However, oversized plant and equipment (such as piling rigs, cranes and trucks carrying oversized pre-fabricated materials) will need to move in and out via Kent Street and Cornwall Street. This is due to the swept path analysis demonstrating that oversized trucks are unable to make the left-right turn out of the northern exit of the Southern Portal worksite. Oversized trucks exiting the site via the southern gate would only occur by exception.

As mentioned above, a peak of 10 vehicles per hour (predominantly one way) may be required in the busiest construction periods.

Modifications and Impacts

Appendix D of the Traffic Impact Assessment Report – Southern Portal (included in Volume 3 Attachment B) details the physical changes required to roads to accommodate the heavy vehicle access to the Southern Portal worksite. These changes are summarised below.

Annerley Road / Cornwall Street

Minor modifications to the Annerley Road / Cornwall Street centre median strip and eastern kerb line at the Cornwall Street / Kent Street intersection are required to accommodate the movements of the design vehicle (i.e. 19-metre-long semi-trailers).

Ipswich Road / O'Keefe Street

Construction traffic on the Ipswich Road / O'Keefe Street intersection will be reduced compared to the Evaluated Project, because under previously approved arrangements construction vehicles would use that intersection to both enter and exit the worksite.

Annerley Road / Cornwall Street / Noble Street / Railway Terrace

No increase in traffic volumes at the Annerley Road / Cornwall Street / Noble Street / Railway Terrace intersection during the AM, PM or weekend peaks is predicted.

3.5.3 Traffic Impacts

Construction traffic is anticipated to increase by more than 5 percent of projected 2022 background traffic levels for:

- The right turn movement from Annerley Road onto Cornwall Street; and
- The left turn movement from Cornwall Street onto Kent Street.

Refer to Volume 3 - Section 3.3.2 of the Traffic Impact Assessment Report (Attachment B) for more details.

The specific impacts on these two intersections are set out below. It is noted that impacts on these intersections will flow on to some nearby roads. The flow on impacts are discussed further below (see section 5.5.5 'Overall traffic impacts').

Right turn movement from Annerley Road onto Cornwall Street

Weekday and weekend traffic modelling show the Annerley Road / Cornwall Street intersection will remain within acceptable operating limits for priority-controlled intersections (i.e. Degree of Saturation (DOS) < 0.8, delay less than 42 seconds) under both the background and design scenarios for 2022.

While modelling shows a reduction in Level of Service (LOS) for the right turn movement from Annerley Road onto Cornwall Street during the afternoon peak, 95 percent of the time queue lengths are anticipated to remain within the existing capacity of the right turn storage facility.

Left turn movement from Cornwall Street onto Kent Street

Weekday and weekend traffic modelling for the Cornwall Street / Kent Street Intersection shows that the intersection remains within acceptable operating limits for a priority-controlled intersection (i.e. DOS < 0.8, delay less than 42 seconds) under both the background and design scenarios for 2022.

The modelling shows changes in the DOS and queue lengths due to the additional construction traffic would be negligible.

Overall traffic impacts

The modelling shows the addition of construction traffic has the potential to increase total intersection delays by more than five percent, totalled across all intersections (i.e. Annerley Road / Cornwall Street and Cornwall Street / Kent Street) and peak assessment periods.

The key contributor to the increased delay will be the addition of construction traffic to the right turn movement from Annerley Road to Cornwall Street. Traffic volumes on this movement are anticipated to increase by 15-23 percent at peak times, resulting in proportional delay increases for the movement (refer to Volume 3 - Section 3.3.5 of the Traffic Impact Assessment Report (Attachment B).

Despite this, the traffic modelling assessments also show that:

- These delays will remain below the acceptable threshold for an un-signalised intersection; and
- Queueing will be contained within the existing right turn storage facility.

Public transport and pedestrian impacts

Construction traffic is not expected to adversely impact the operation of public transport services close to the Southern Portal worksite or the operation of pedestrian crossing facilities at the Annerley Road / Cornwall Street intersection and Cornwall Street / Kent Street intersection.

3.6 Mitigations – Traffic and Transport

The proposed changes to the construction traffic route to allow for heavy vehicle movement along Annerley Road, Cornwall Street and Kent Street will be managed in accordance with the current Environmental Management Framework.

This will include development of a site-specific CTMP sub-plan for the Southern Portal worksite (CTMP-SP) to detail spoil haulage routes to and from the Southern Portal worksite. This Plan will be prepared in consultation with the relevant Road Authority prior to works commencing.

CTMP-Sub-plan will document the provisions to be made for pedestrians and cyclists to mitigate potential risks between construction vehicles and other road users.

The site specific CTMP Sub-plan will include the permitted haulage routes between the adjacent arterial road networks and the Sub-plan precinct (via Kent Street). Spoil haulage routes, to and from the sub-plan precinct will be documented within the CTMP Sub-plan Haulage Management Plan.

The CTMP Sub-plan will document the provisions to be made for pedestrians and cyclists to mitigate potential risks between construction vehicles and other road users in Kent Street and will be developed in consultation with the relevant Road Authority.

This would align with requirements already imposed under the OEMP which are to:

- Ensure the Project's impacts on the community and stakeholders with respect to traffic and transport are minimised; and
- Monitor the effects of management and mitigation measures.

Under current conditions the CTMP (and sub-plans) must be periodically reviewed to address changes in the Project's construction programme and methodology, including modification to delivery schedules, delivery routes and spoil haulage route changes.

Relevantly, this includes:

- Proposed access to worksites, with local or minor roads only used where unavoidable to access a Project worksite;
- Processes for advance notice to Directly Affected Persons (DAPs) and local communities within the vicinity of the spoil haulage routes and worksite accesses;
- Local traffic management measures developed in consultation with BCC for key intersections at Dutton Park including Annerley Road, Peter Doherty Street, Joe Baker Street and Boggo Road, as well as Kent Street, Cornwall Street and Ipswich Road;
- Relevant specific traffic management measures developed in consultation with other key stakeholders, including QR, DTMR and BCC.

There is also a requirement for Works to be designed, planned and implemented to maintain acceptable footpath and cycle paths in areas adjacent to Project worksites in terms of capacity, legibility and pavement condition. The proponent must consult with BCC, QR, DTMR (Metro/Translink) about changes in pedestrian and cycle paths required to facilitate Project Works.

3.7 Evaluated Project – Noise and Vibration

3.7.1 Imposed Condition 11 – Noise and Vibration

Appendix 1 of the Coordinator General's Change Report (CGCR) for RfPC 7 sets out Project-wide Imposed Conditions for the Project, in relation to Noise and Vibration.

Imposed Condition 11 Construction Noise and Vibration provides that:

(a) *Project Works must aim to achieve the project noise goals for human health and wellbeing presented in Table 2 at a Sensitive Place.*

Table 2 (Imposed Conditions) – Noise goals (internal) for Project Works

	Monday to Saturday 6.30am-6.30pm	***Monday to Friday 6.30am-10pm (Gabba, CBD only)***	***Monday to Saturday 6.30pm-6.30am Sundays, Public Holidays***	***For blasting Monday to Saturday 7.30am-4.30pm only***
Continuous ($LA_{eq\ adj}$)(1hr)	*AS 2107 maximum design level*	*40dBA $LA_{eq\ adj}$ (1hr)*	*35dBA $LA_{eq\ adj}$ (1hr)*	
Intermittent ($LA_{10\ adj}$)(15min)	*AS 2107 maximum design level + 10dBA*	*50dBA ($LA_{10\ adj}$)*	*42dBA $LA_{10\ adj}$*	*130dB Linear Peak*

Notes:

1. All goals are internal noise levels for human health and well-being outcomes.
2. Where internal noise levels are unable to be measured or monitored, the typical noise reductions presented in the relevant State guideline, such as the Guideline Planning for Noise Control, Ecoaccess, DEHP, January 2017 (currently under review).
3. Adjustments (adj) will be applied as outlined in the Department of Environment and Science Noise Measurement Manual Version 4 August 2013.

(b) *During construction monitor and report on noise and vibration in accordance with the Noise and Vibration Management Plan, a sub-plan of the Construction Environmental Management Plan.*

(c) *Project Works predicted to or monitored as generating noise levels more than 20dBA ($LA\ 10_{adj\ (15\ min)}$) above the relevant goal in Table 2. are authorised to occur in a locality only:*

(i) when advance notification and consultation has been undertaken with Directly Affected Persons or potentially Directly Affected Persons about the particular predicted impacts and the approach to mitigation of such impacts;

(ii) (ii) where mitigation measures addressing the particular predicted or measured impacts have been developed on a 'case by case' basis in consultation with Directly Affected Persons;

(iii) where the mitigation measures are incorporated in a mitigation register and implemented prior to undertaking the Project Works;

(iv) between the hours 7:00am to 6:00pm Monday to Friday, with a respite period between 12:00noon and 2:00pm each day with the respite only applying where generating noise levels more than 20dBA $LA_{10\ adj\ (15\ min)}$ at a Sensitive Place that is occupied;

(d) *The works authorised by Condition 10(d) are not subject to the requirements of Condition 11(c)(iv)*

Noise Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbol LA represents A-weighted sound pressure level.[2]

Noise level descriptors are as follows:

- LAmax – The maximum A-weighted noise level associated with a sampling period
- LA1 – The A-weighted noise level exceeded for 1% of a given measurement period. This parameter is often used to represent the typical maximum noise level in a given period
- LA10 – The A-weighted noise level exceeded 10% of a given measurement period and is utilised normally to characterise average maximum noise levels
- LAeq – The A-weighted average noise level, is defined as the steady noise level that contains the same amount of acoustical energy as a given time-varying noise over the same measurement period
- LA90 – The A-weighted noise level exceeded 90% of a given measurement period and is representative of the average minimum background noise level (in the absence of the source under consideration), or simply the "background" level.

Table 3 provides examples of the typical noise levels of everyday sounds:

Table 3: Common sounds and typical noise levels

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130 120 110	• Threshold of Pain • Heavy rock concert • Grinding on steel	• Intolerable • Extremely noisy
100 90	• Loud car horn at 3m • Construction site with pneumatic hammering	• Very noisy
80 70	• Kerb side of busy street • Loud radio or television	• Loud
60 50	• Department store • General Office	• Moderate to Quiet
40 30	• Inside private office • Inside bedroom	• Quiet to Very quiet
30	• Unoccupied recording studio	• Almost silent

Source: Table 16-1, Cross River Rail Environmental Impact Statement

[2] A-weighted sound pressure level is a measure of sound intensity for environmental and industrial noise. The A-weighting filter de-emphasizes the very low and very high frequency components of sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.

3.7.2 Noise and Vibration Management Plan

The existing Noise and Vibration Management Plan (NVMP) addresses impacts and associated mitigation measures for noise and vibration impacts arising from the remaining phases of construction which broadly include but are not limited to:

- Tunnel boring;
- Surface construction; and
- Spoil haulage.

In relation to the Southern Portal worksite, the NVMP notes a number of activities as having potentially the greatest noise impact on the surrounding receivers, including the impacts of heavy vehicle movements.

For the purposes of describing the effects of the proposed change to the heavy vehicle route, multiple scenarios have been developed based on all plant items (including haul trucks where applicable) operating simultaneously. Scenarios relating to night-time truck movements (e.g. spoil, delivery etc) in the worksite near the entrance were considered.

3.8 Effect of the Change – Noise and Vibration

3.8.1 Predicted construction traffic noise

A Construction Traffic Noise Assessment was prepared for the Cross River Rail Project-Southern Portal. This report adopted the same calculation methodology as the EIS and is available in Volume 3 Technical Reports (Attachment C).

3.8.2 Noise – Construction Road Traffic Noise (EIS)

In relation to the impact thresholds for traffic noise, Section 2.2.6 Construction Road Traffic Noise of the EIS states:

> *Where the construction phase of CRR is adding heavy vehicles to the existing road network, it is appropriate to consider the incremental change in noise levels due to the changes in traffic volume.*
>
> *A change of up to 3 dBA in the level of a dynamic noise, such as passing vehicles is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness.*
>
> *It is acknowledged that people are likely to notice increased traffic based on visual clues and perception of vehicle pass-by frequency before they will objectively notice an increase in the average noise level.*

For assessment purposes it is common to set the threshold of significance in relation to changes in the noise emission level from roads at 2 dBA. For the impact assessment of construction traffic noise, the recommended noise goal is set out in Table 4, which is based on Table 7 of the EIS.

Table 4: EIS construction road traffic noise goal

Type of Roads	Goal
• *Existing Roads*	*2dBA change in existing* • *$LA_{10\ (1hour)}$ [1]* • *$LA_{10(12hour)}$[2]* • *$LA_{10(18hour)}$ [3]*

Note:

1 $LA_{10(1hour)}$ for the peak number of heavy vehicle movements during any hour between 12midnight and 6am as stated in Section 9.4.2 of the EIS.

2 $LA_{10(12hour)}$ is the average LA_{10} traffic noise level between the hours of 6:30am and 6:30pm as stated in Section 9.4.2 of the EIS.

3 $LA_{10(18hour}$ is the average LA_{10} traffic noise level between the hours of 6am and 12midnight.

In this context, the predicted increase in traffic noise on all assessed roads is detailed in Table 5 [also refer to Volume 3 - Section 5.1 of the Construction Traffic Noise Assessment Report (Attachment C)].

Table 5: Predicted increase in traffic noise

Worksite	Road Segment	Predicted increase noise level, dBA	
		LA10(12hour)	LA10(1hour)
Southern Portal	Annerley Road	+0.3	+0.2
	Cornwall Street	+0.3	+0.6
	Kent Street	+0.5	+0.7

Table 5 shows the predicted increase road traffic noise levels will be less than the 2dBA threshold for existing roads for the overall $LA_{10(12hour)}$ and $LA_{10(1hour)}$ noise parameters.

3.9 Mitigation Measures – Noise

3.9.1 Noise

Due to the very minor impacts of the increased predicted traffic volume on noise, no specific measures are required when construction vehicles are on public roads.

In the event that construction traffic impacts local traffic such that noise exceeds the 2dBA threshold, the mitigation measures discussed in Section 3.2 of the NVMP will be applied to manage those impacts, including:

- Initiate on-going and early consultations with potentially Directly Affected Persons to notify them of the proposed works and to determine suitable mitigation measures;
- Maintain plant and machinery in good working order, in accordance with the management system; and
- Other best practice measures, such as limiting of compression braking will also contribute to ensuring the noise impacts of Heavy Vehicle traffic on surrounding streets are minimised.

3.10 Conclusions

3.10.1 Traffic and Transport

The proposed change relates to changes in the construction traffic route to allow heavy vehicles along Annerley Road, Cornwall Street and Kent Street to enter the Southern Portal worksite, rather than using the existing approved route using O'Keefe Street and Boggo Road Busway.

The effect of this change is appropriately managed in accordance with an update to the existing CTMP (and the use of CTMP Sub-Plan mechanisms). These mitigations are discussed in full in Section 3.6 (Mitigations – Traffic and Transport) above.

Accordingly,

- No changes are required to Imposed Condition 14 (traffic and transport);
- No changes are required to the OEMP; and
- An update to the CEMP-CTMP Sub Plan for the Southern Portal will be required to address the identified changes to the heavy vehicle access arrangements and address relevant road treatments and management of any safety risk related to the interaction between construction vehicles and other road users, including vehicles, cyclists and pedestrians. Consistent with the current CTMP arrangements, updates will be prepared in consultation with relevant authorities, and must be endorsed by the environmental monitor.

3.10.2 Noise

Construction traffic noise is predicted to satisfy the noise goal Table 4 and comply with the existing Imposed Condition. The anticipated impacts of traffic noise remain well below the noise goals for existing roads.

Due to the limited impacts of the increased traffic on noise, no specific measures are required when construction vehicles are on public roads. Notwithstanding the above, the traffic noise issues identified can be further mitigated consistent with the measures set out in Section 3.9.1.

4. Land use and tenure

4.1 Proposed Change

The proposed change is for:

- Temporary occupation of a part of Annerley Road and Kent Street; and
- Temporary occupation of a private road owned by Metro South Hospital and Health Service on Lots 702SP198203 and 2SP198202 on the eastern side of the rail line.

The changes will not impact the utilities located within the declared road area of Kent Street.

The additional temporary land requirements are shown in blue hatch area in Figure 4. The shaded section of road adjoining the rail corridor shows the location of minor works required to support heavy vehicle movements through the intersection.

Figure 4: Proposed temporary land requirements

The final proposed land requirements are shown in blue outline in Figure 5.

Figure 5: Proposed final land requirements

4.2 Reason for the Proposed Change

The proposed change will provide the Southern Corridor worksite with improved safety and efficiency for heavy vehicle access, compared to the current approved design, by allowing for a dedicated, one-way heavy vehicle access to the worksite.

4.3 Evaluated Project

4.3.1 Imposed Condition 14 - Traffic and transport

Imposed Condition 14 is discussed in Section 3.4 in relation to the Kent Street heavy vehicle access request, along with the relevant OEMP requirements, and existing management options under the CTMP.

4.3.2 Imposed Condition 11- Noise and Vibration

Imposed Condition 11 is discussed in Section 3.7 in relation to the Kent Street heavy vehicle access request, along with the relevant OEMP requirements, and existing management options under the NVMP.

4.3.3 Land use requirements

At the time of the 2011 EIS assessment, a total of 412 sites would have been impacted by a whole or partial compulsory acquisition. Of these, 108 sites were required for surface works and 304 were required for volumetric acquisitions for underground tunnels and stations.

The Evaluated Project currently impacts a total of 201 sites.

4.4 Effect of the change

The effect of the change will be to allow heavy vehicle access to the Southern Portal worksite via Kent Street. This will require temporary occupation and use of Kent Street at Dutton Park, and temporary access and use of the private road on land within the Princess Alexandra Hospital site, as well as minor modifications to the existing intersection of Kent Street and Annerley Road to facilitate right hand movements for heavy vehicles.

An update to the Project's property impact plans is provided in Volume 2, Property Impact Plans, Sheet 11, CRRDA Drg.No. CRR-0003-RP-GA-111, Revision E.

Kent St, between Cornwall St and its termination with the Princess Alexandra Hospital private road is Brisbane City Council local road. The private road on Lots 702SP198203 and 2SP198202 is owned by Metro South Hospital and Health Service. The total additional area of temporary occupation impact is approximately 1.81 ha.

4.4.1 Summary of land requirement impacts

The change to the number of properties required as a result of the change request is set out in Table 6 and will increase by one from 201 to 202.

Table 6: Number of sites required by land use type

Property site type	Evaluated Project	RfPC8 Changes	Evaluated project and RfPC8 Changes
Surface – residential	2	0	2
Surface – commercial/industrial	30	0	30
Surface – other (park etc.)	17	+1	18
Total surface property sites	**49**		**50**
Volumetric – residential	104	0	104
Volumetric – commercial/industrial	33	0	33
Volumetric – other (park etc.)	15	0	15
Total volumetric property sites	**152**		**152**
Property sites - Total	**201**		**202**

Notes:

1. Property numbers exclude existing roads, busways and railway properties

4.5 Mitigations

The Delivery Authority and its contractor have consulted with the directly affected stakeholders the Princess Alexandra Hospital, BCC, DTMR and the various active transport groups in relation to the temporary road and land access requirements.

Permit options to access the road area are available through the BCC, and discussions with Princess Alexandra Hospital to confirm access impacts on its land have already been initiated and will continue for as long as temporary access is required. Permit options may include:

- Temporary Road Closure Certificate – Southern Area Works (Annerley Road / Cornwall Street / Kent Street). Content and approval process will include the submission of the application to BCC Congestion Reduction Unit 20BD in advance of the works, application includes completed application form and Traffic Guidance Schemes (TGS).
- If any DTMR asset / infrastructure is impacted, the following process will be followed:
    - Submit a Road Corridor Permit to DTMR Metropolitan Region a minimum of 10BD prior to commencing works.
    - Submit CTMP to DTMR Metropolitan Region.
    - Submit Traffic Control Permit application to DTMR Metropolitan Region if traffic control is required to be conducted on State controlled road.

Access to the private road on State Land managed by the Princess Alexandra Hospital will likely be by way of a construction licence agreement, which will also include relevant conditions to manage and restore any damage to private road pavements.

4.6 Change to conditions

A change to Imposed Condition 1 (a) will be required to recognise the change in land requirements. The proposed change is as follows:

Requested changes to condition
Condition 1. General Conditions (a) The project must be carried out generally in accordance with: i. the Cross River Rail Request for Project Change dated August 2020; ii. the drawings provided at Volume 2, Cross River Rail Request for Project Change dated August 2020; iii. the Cross River Rail Request for Project change dated May 2020; iv. amendments to the Project identified in the Cross River Rail Request for Project Change dated June 2018; v. amendments to the Project identified in the Cross River Rail Request for Project Change dated November 2019; vi. the Cross River Rail Request for Project Change dated April 2019.

4.7 Conclusion

The requested change to land will support minor road corridor treatments for the movement of heavy vehicles into the Southern Portal worksite, with improved safety and efficiency outcomes. The change in land requirements affects road tenure under the control of BCC and a private road on land owned by Metro South Hospital and Health Services.

Management of pavement and reinstatement of land at the end of the haulage task will be managed under specific construction access licence arrangements.

The Project's land impact drawings at Volume 2 of this Request for Project Change have been updated to identify these temporary land impacts.

A change to Coordinator-General Imposed Condition 1(a) is requested, which will reflect the incorporation of this land area into the Project temporary construction footprint.

5. Hours of work - proposed changes to Condition 10

5.1 Proposed Change to Condition 10

This RfPC proposes to change Condition 10 to:

- remove the reference to "extended work hours" in Table 1, and incorporate the requirements for extended work hours wholly within Condition 10(d);
- remove the existing limitation of 80 hours of continuous work within the rail corridor for the Dutton Park, Southern Portal and Boggo Road worksites so that work hours for track possessions align with the period of the track possessions approved by QR;
- remove the existing limitation of a 10:00pm conclusion of works on a road or busway to align with timeframes set by BCC, DTMR or other permitting agencies
- retain the existing limitation of a 10:00pm conclusion of works for works involving the transport, assembly or decommissioning of oversized plant, equipment, components, structures or transport of hazardous materials, unless different hours are stated in the road access permit;
- provide a process for Project Works during extended work hours to be undertaken where approved by the entity with jurisdiction for Condition 10 (the Chief Executive, DTMR) and where a specific construction environmental management plan that has been endorsed by the environmental monitor is in place;
- clarify that concrete deliveries required to support continuous activities are not constrained by the Condition 10(a) Table 1 spoil haulage and materials/equipment delivery operating hours, and will instead be managed in accordance with proposed Condition 10(d);
- fix a formatting issue in condition 10(c)(iv) so that the words "may be undertaken outside the hours set out in Table 1 "apply to all of c(i) - (iv).

The proposed changes to Condition 10 are provided as follows:

Condition 10: Hours of work

(a) Surface works for the Project are authorised to be undertaken within the hours set out in Table 1A.

Table 1A. Construction hours

Worksite	Surface works – standard hours	~~Extended work hours~~	Managed Work	Spoil haulage and materials/ equipment delivery **(excluding concrete deliveries)**
Fairfield, Yeronga, Yeerongpilly, Rocklea and Salisbury stations	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Saturday: 6:30am-6:30pm

Worksite	Surface works – standard hours	~~Extended work hours~~	Managed Work	Spoil haulage and materials/ equipment delivery (excluding concrete deliveries)
Moorooka	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Saturday: 6:30am-6:30pm
Clapham Yard	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession – 80 hrs continuous work~~	24 hours, 7 days	Monday to Friday: 6:30am-7:30am 9:00am-2:30pm 4:30pm-6:30pm Saturday: 6:30am-6:30pm
Southern Portal	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession – 80 hrs continuous work~~	24 hours, 7 days	24 hours, 7 days
Boggo Road Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession – 80 hrs continuous work~~	24 hours, 7 days	Monday to Friday: 6:30am-7:30am 9:00am-2:30pm 4:30pm-6:30pm Saturday: 6:30am-6:30pm Additional hours during gazetted school holidays: Monday to Friday: 7:30am-9:00am 2:30pm-4:30pm
Dutton Park Railway station	Monday to Saturday: 6:30am-6:30pm	~~For approved rail possession – 80 hrs continuous work~~	n/a	24 hours, 7 days, except for: Monday to Friday: 7:00am-9:00am 4:30pm-6:30pm

Worksite	Surface works – standard hours	~~Extended work hours~~	Managed Work	Spoil haulage and materials/ equipment delivery (excluding concrete deliveries)
Woolloongabba Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~	24 hours, 7 days	24 hours, 7 days, except for: Monday to Friday: 7:00am-9:00am 4:30pm-6:30pm
Albert Street Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~	24 hours, 7 days	Monday to Friday: 6:30am-10:00pm Saturday: 6:30am-6:30pm
Roma Street Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~	24 hours, 7 days	Monday to Friday: 6:30am-7:30am 9:00am-4:30pm 6:30pm-10:00pm Saturday: 6:30am-6:30pm
Northern portal	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Friday: 6:30am-10:00pm Saturday: 6:30am-6:30pm
Exhibition Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Saturday: 6:30am-6:30pm
Mayne Railway Yard	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm-10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	24 hours, 7 days

(b) Project Works that are underground, or in a ventilated acoustic enclosure, may be undertaken at any time provided the environmental outcomes are achieved.

(c) Works carried out because of an emergency that:

(i) is endangering the life or health of a person; or

(ii) is endangering the structural safety of a building; or

(iii) is endangering the operation or safety of community infrastructure that is not a building; or

(iv) is required to prevent environmental harm,

~~(iv)~~ may be undertaken outside the hours set out in Table 1.

(d) Despite Condition 10(a), the following work (including associated spoil haulage and materials/equipment delivery, and concrete delivery) may be undertaken during the extended work hours in Table 1B, ~~Extended Work Hours as set out in Table 1 (despite any separate restrictions on equipment delivery hours listed in Table 1)~~ subject to compliance with a specific Construction Environmental Management Plan sub-plan in accordance with Condition 4:

Table 1B. Extended work hours

Description of works	Extended work hours
Project Works within rail corridor land	For the duration of an approved rail possession at all worksites except Clapham Yard. For Clapham Yard - for the duration of an approved rail possession - 80 hours continuous work
Project Works within busway land	During the hours authorised by DTMR for access to the busway for Project Works
Project Works within a road	During the hours authorised by Brisbane City Council or DTMR (as relevant) for access to the road for Project Works
Project Works involving the transport, assembly or decommissioning of oversized plant, equipment, components or structures, or transport of hazardous materials	For transport and/or for the period of road occupation, during the hours stated in the road access permit Otherwise, 6:30pm - 10:00pm, Monday to Friday

~~(d)~~

~~(i) Project Works within rail corridor land;~~

~~(ii) Project Works within a road reserve or busway that cannot be undertaken reasonably nor practicably during standard hours due to potential disruptions to peak traffic flows or bus operations;~~

~~(iii) Project Works involving the transport, assembly or decommissioning of oversized plant, equipment, components or structures;~~

~~(iv) delivery of "in time" materials such as concrete, hazardous materials, large components and machinery;~~

~~(v) Project Works that require continuous construction support, such as continuous concrete pours, pipe-jacking or other forms of ground support necessary to avoid a failure or construction incident.~~

(e) The works detailed in 10(d) may also be undertaken outside the hours set out in Table 1A, only where written confirmation has been obtained from the entity with jurisdiction for Condition 10 prior to commencement of the specific works and subject to compliance with an updated and endorsed site-specific Construction Environmental Management Plan sub-plan in accordance with Condition 4.

(f) Blasting must not occur on public holidays, and is only authorised to occur during the hours of 7:30am to 4:30pm Monday to Saturday, and not on Sundays or public holidays.

(g) Prior to blasting events, at least 48 hours' notice must be provided to persons who may be adversely affected.

5.2 Reasons for the proposed change to Condition 10

The reasons for the proposed changes to Condition 10 are as follows:

- to remove the limitation of 80 hours of continuous work for the Southern Portal, Boggo Road and Dutton Park Railway Station worksites, and instead allow for works for rail possessions for those worksites to align with the duration of possessions as approved by QR. Note that the 80 hour continuous work limit continues to apply to Clapham Yard. This change would allow possession periods to be used more efficiently, reducing the establishment and restoration timeframes compared to multiple shorter possessions, and allow an overall reduction in the number of rail possessions. The change has been requested as QR has approved longer rail possessions (up to 7 days), allowing the CRR Project to be delivered more efficiently;
- consolidate all of the requirements for extended work hours into Condition 10(d);
- ensure that it is clear that the hours for spoil haulage and materials/equipment delivery in Table 1 of Condition 10 do not operate to restrict concrete deliveries that are necessary for the works contemplated in proposed Condition 10(d). As currently drafted, there is uncertainty as to whether Condition 10 also accommodates the ancillary works, in particular concrete deliveries, that are required to undertake the out of hours works;
- remove the limitations on extended hours for works that are authorised to occur only within particular times by regulatory authorities, including for road possessions, busway possessions and works that require road access permits, so that the hours approved by other regulatory authorities are not frustrated by the imposed conditions. Approved hours for road and busway possessions, or road access permits, are typically hours that minimise disruption for users of the infrastructure, which are inconsistent with the restrictions imposed by Condition 10. Similarly to the rail possessions, this change would also allow for longer duration possessions, reducing the overall number of possessions (and consequential disruptions to road and busway users) for construction;
- retain the existing limitation on other project works involving the transport, assembly or decommissioning of oversized plant, equipment, components or structures where a road access permit is not required for those works;
- make allowance for other project works that are required to be undertaken outside of the hours in Table 1 of Condition 10, provided only that such works are approved by the entity with jurisdiction for Condition 10 (the chief executive, DTMR) and the works are subject to a specific CEMP that is endorsed by the Environmental Monitor. The reason for this change is to allow the chief executive, DTMR, to approve additional works to be undertaken where such

works are necessary for the efficient delivery of the CRR Project, and where the proponent has ensured that all required environmental management requirements are in place.

5.3 Evaluated Project - hours of work

5.3.1 Imposed Condition 10 – hours of work

Imposed Condition 10 provides for the authorised hours of work for the CRR Project. Relevant to this RfPC, Imposed Condition 10:

- restricts continuous works for rail possessions to 80 hours for the Southern Portal worksite, Boggo Road worksite and Dutton Park worksite;
- includes authorised hours for spoil haulage and materials/equipment delivery, with certain lock out periods. Those hours do not exclude concrete deliveries which are required to support extended hours works, and do not align with the extended work hours;
- permits the works described in Condition 10(d) during the extended work hours that are set out in Table 1, subject to compliance with a specific CEMP sub-plan that has been endorsed by the environmental monitor. Those works are:
  - (i) Project Works within rail corridor land;
  - (ii) Project Works within a road reserve or busway that cannot be undertaken reasonably nor practicably during standard hours due to potential disruptions to peak traffic flows or bus operations;
  - (iii) Project Works involving the transport, assembly or decommissioning of oversized plant, equipment, components or structures;
  - (iv) Delivery of "in time" materials such as concrete, hazardous materials, large components and machinery;
  - (v) Project Works that require continuous construction support, such as continuous concrete pours, pipe-jacking or other forms of ground support necessary to avoid a failure or construction incident.

Condition 10 (e) also provides that the works detailed in 10(d) may also be undertaken outside the hours set out in Table 1, only where written confirmation has been obtained from the entity with jurisdiction for Condition 10 prior to commencement of the specific works and subject to compliance with an updated and endorsed site-specific Construction Environmental Management Plan sub-plan in accordance with Condition 4.

5.3.2 Outline Environmental Management Plan - CEMP

The OEMP Construction Environmental Management Plan (OEMP-CEMP) requires compliance with Imposed Condition 10: Hours of Work, and reflects the requirements of Imposed Condition 10. In detailing works during extended hours, the OEMP includes the following requirements:

- The works are in accordance with those works deemed able to be undertaken during extended work hours in accordance with the Imposed Conditions;
- The extended hours relate to a discrete package of work, or specified work activity (e.g. material delivery, concrete pours, tying reinforcing steel, site set-up, piling) for which there is a defined programme and completion date;
- A site-specific EMP sub-plan has been prepared addressing extended hours work, predicted impacts and mitigations, and a site management contact number for complaints. The sub-plan must be developed by the Contractor and provide measures to achieve the environmental

outcomes. It must be endorsed by the Environmental Monitor and submitted to the Coordinator-General, by the Delivery Authority before works commence; and

- Near neighbours and stakeholders are consulted about the proposed works, potential impacts, proposed mitigations and management, monitoring programme and complaints procedure before the EMP sub-plan being submitted to the Coordinator-General.

5.3.3 Imposed Condition 11 – Noise and Vibration

Imposed Condition 11 Construction Noise and Vibration provides that:

(a) *Project Works must aim to achieve the project noise goals for human health and wellbeing presented in Table 2 at a Sensitive Place.*

Table 2 – Noise goals (internal) for Project Works[3]

	Monday - Saturday 6.30am-6.30pm	***Monday -Friday 6.30am-10pm (Gabba, CBD only)***	***Monday - Saturday 6.30pm-6.30am Sundays, Public Holidays***	***For Blasting Monday - Saturday 7.30am-4.30pm only***
Continuous ($LA_{eq\ adj}$)(1hr)	*AS2107 maximum design level*	*40dBA $LA_{eq\ adj\ (1hr)}$*	*35dBA $LA_{eq\ adj\ (1hr)}$42 dBA*	
Intermittent ($LA_{eq\ adj}$)(15min)	*AS 2107 maximum design level + 10dBA*	*50dBA ($LA_{10\ adj}$)*	*42dBA $LA_{10\ adj}$*	*130dB Linear Peak*

Notes:

1. *All goals are internal noise levels for human health and well-being outcomes.*
2. *Where internal noise levels are unable to be measured or monitored, the typical noise reductions presented in the relevant State guideline, such as the Guideline Planning for Noise Control, Ecoaccess, DEHP, January 2017 (currently under review).*
3. *Adjustments (adj) will be applied as outlined in the Department of Environment and Science Noise Measurement Manual Version 4 August 2013.*

(b) *During construction monitor and report on noise and vibration in accordance with the Noise and Vibration Management Plan, a sub-plan of the Construction Environmental Management Plan.*

(c) *Project Works predicted to or monitored as generating noise levels more than 20dBA (LA 10 adj (15 min)) above the relevant goal in Table 2. are authorised to occur in a locality only:*

(i) when advance notification and consultation has been undertaken with Directly Affected Persons or potentially Directly Affected Persons about the particular predicted impacts and the approach to mitigation of such impacts;

(ii) (ii) where mitigation measures addressing the particular predicted or measured impacts have been developed on a 'case by case' basis in consultation with Directly Affected Persons;

[3] Table 2 from Imposed Condition 11 – Coordinator-General's change report 16 July 2020

(iii) *where the mitigation measures are incorporated in a mitigation register and implemented prior to undertaking the Project Works;*

(iv) *between the hours 7:00am to 6:00pm Monday to Friday, with a respite period between 12:00noon and 2:00pm each day with the respite only applying where generating noise levels more than 20dBA LA10 adj (15 min) at a Sensitive Place that is occupied;*

(d) *The works authorised by Condition 10(d) are not subject to the requirements of Condition 11(c)(iv)*

(e) *Project Works must aim to achieve the construction vibration goals in Table 3.*

Construction vibration goals are set out in Table 3 of the Imposed Conditions and are discussed in Condition 11(e) to 11(g). They are not considered in this change request.

5.3.4 Construction Environment Management Plan

The Construction Environmental Management Plan (CEMP) refers generally to noise and noise treatments and notes that the requirements of Condition 11: Noise and Vibration are addressed in the Noise and Vibration Management Plan (NVMP).

Noise and Vibration Management Plan

The NVMP acknowledges that construction of the Project has the potential to result in impacts related to noise and vibration. The NVMP addresses impacts and associated mitigation measures arising from the remaining phases of construction.

The NVMP discusses the Southern Portal, Dutton Park and Boggo Road worksites and refers to activities assessed as having the greatest potential noise impact on the surrounding receivers. Under the NVMP where modelling shows noise levels above the construction noise goals, mitigation measures must be implemented which may include:

- On-going and early consultation with potentially Directly Affected Persons to notify them of the proposed works and to determine suitable mitigation measures;
- Operators of construction equipment to be made aware of the potential noise/ vibration problems and of techniques to minimise emission through continuous operator education;
- Enclose equipment generating higher noise levels, subject to confirmation of noise levels;
- Noise attenuation screens;
- Maintain plant and machinery, in good working order per CPB CMS management system;
- Scheduling noisy work coinciding with high levels of ambient noise (e.g. during peak hour traffic), so construction noise is partially masked;
- Substituting noisy demolition with quieter ones (e.g. using saw cutting instead of breaking);
- Lowest noise/vibration emitting plant and equipment that can economically undertake the work should be selected, wherever possible;
- Machines/ tools found to produce excessive noise/vibration compared to industry best practice should be removed from site or stood down until repairs or modification can be made - if repairs or modification are not possible then a suitable replacement should be found;
- Consultation with potentially affected entities to notify them of proposed works and determine suitable mitigations;
- Use of pre-fabricated materials for construction where possible;

- Switch plant and equipment off when not in use;
- Where appropriate fit effective residential class silencers to engine exhausts;
- Noise walls and hoardings are to be installed as required at relevant worksites. The proposed locations and designs for the noise walls are detailed in figures 6 through 10;
- Construction works are to be undertaken during the nominated hours in Table 1 of Condition 10 of the Imposed Conditions;
- Where Out of Hours works are unavoidable, they are to be undertaken in accordance with:
    - Project Out of Hours Work Protocol
    - After consultation with the DA and any Directly Affected Persons
    - This NVMP and any specific agreed mitigation measures.

Specific mitigation measures discussed in the NVMP for the Southern Portal, Dutton Park and Boggo Road Station Works include:

- Notify in advance with Directly Affected Persons and near neighbours about the station and portal works and the surface works in the designated rail corridor between Dutton Park Station and Park Road Station;
- Notification must identify the activities likely to approach or be above the noise and vibration goals for the Project;
- Notify with the PA Hospital, TRI Building, ESA Village (Leukaemia Foundation) and the Ecosciences facility to minimise the effects of construction on people and sensitive equipment (e.g. Transmission Electron Microscopes or TEM). Confirm the technical specifications of the Ecosciences TEM vibration isolation system prior to commencement of vibration intensive Project Works;
- Prior to the commencement of Project Works undertake predictive modelling to identify work likely to produce noise levels above the noise goals, and those properties likely to be impacted by such noise levels above the noise goals in the Imposed Conditions. If predictive modelling indicates that noise levels are above the construction noise goals during the Project Works, then mitigations may include:
    - Notification to Directly Affected Persons, local communities, particularly those south of Peter Doherty Street, west of Railway Terrace and the Quarry Street area north of the rail corridor about measures to mitigate night-time works in the rail corridor;
    - Erect noise barriers around the station shaft and portal works, while having regard for the operational requirements of the rail corridor. Such noise barriers must also be capable of modification for dust control as necessary;
    - All handling of construction spoil, including loading construction spoil vehicles, must occur within acoustic enclosures;
    - Erect a noise barrier along the north-west side of the on-site spoil route adjacent to the rail track if night-time spoil removal is required;
    - Implement all other practical and reasonable mitigation measures to reduce noise impacts from the Project Works; and
    - Undertake monitoring of construction noise at residential and commercial premises predicted to be affected by the works (e.g. immediately to the west of Railway Terrace and Joe Baker Street, and premises to the north of Park Road Station).

Where monitoring detects noise levels above the noise goal in the Imposed Conditions for human health and wellbeing, develop and implement mitigation measures in consultation with the Directly Affected Persons as soon as practicable after monitoring.

- Noise mitigation measures for the Boggo Road Station Worksite already includes a 5m high noise barrier along part of the northern site boundary (named NW02) and 4m to 5.5m high noise barrier along a section of the southern site boundary (named NW01).

5.4 Effect of the proposed changes to Condition 10 - extended rail possessions at Southern Portal, Dutton Park and Boggo Road

5.4.1 Noise and Vibration – Construction Noise (EIS)

The change is expected to involve the increased duration of noise and vibration resulting from operation of plant and equipment in the rail corridor 24 hours a day during the rail possession period, which is proposed to be extended to the duration of the possessions, and not limited to 80 hours continuous work.

A noise and vibration impact assessment has been undertaken to assess the potential noise and vibration impacts for a continuous five day period from Friday 25 December 2020 to Wednesday 30 December 2020, as an example of the continuous works. This possession has been approved by QR. The assessment is provided at Volume 3 of this RfPC (Attachment D Construction Noise and Vibration Mitigation Design Report).

5.4.2 Proposed Rail Possession Works

The works proposed to occur during the Christmas / New Year 2020-21 track possession are outlined in Table 7.

Table 7: Proposed track possession works Christmas/New Year 2020-21

Category	Activities
Combined Service Route and Signalling Works	• Install Buranda Combined Service Route (CSR) • Install Fairfield CSR route • Install Location Case (LOC) L1-1 foundation, local conduit route & cabinet • Construct Signal Equipment Room (SER) / Power Equipment Room (PER) / Communications Equipment Room (CER) building foundations • Equipment Room (CER) building foundations • Non-Destructive Digging (NDD) for Dutton Park CSR route • Dutton Park maintenance siding – decommissioning works. • Terminate new local cable routs, joint and cut across main run cable and commission B14 LOC
Track	• Fairfield On Track Vehicle (OTV) Pad [Ensign Ave] • Cleveland Fork-line reconfiguration [Access via Park Road Triangle] > Support to Middle Road temporary works piled retaining wall

Category	Activities
Park Road Triangle + Rail works to support Middle Road TW works	• Middle Road beam bearing piles and side retention piled wall • OHLE support to Middle Road TW piled retention wall. • Track support for Middle Road TW
Over-Head Line Equipment (OHLE) Works	• NDD for Fairfield OHLE Foundations • OHLE support to Middle Road Temporary Works • Install temp OHLE mast(s) and alter wire runs to facilitate Fork-line – Installation of mast foundation, future wire removal/slews for Middle Road temporary piling works
Earthworks / Geotech Investigation / Ground Investigation	• Earthworks re-profiling & waste disposal within Park Road Triangle • Geotechnical investigation of the cut and cover section
Note: All works to occur 24hours a day during planned rail possessions under QR's Scheduled Corridor Access System (SCAS).	

5.4.3 Stakeholder Impacts

Sensitive Receivers

There are several locations in Buranda, Park Road and Dutton Park adjacent to the rail possession corridor with the potential to experience increased noise and vibration impacts. The Figures 6-8 below show the location of the site and surrounding noise impacts, broken up into fixed plant, moving plant, and fixed and moving plant combined. Refer to Volume 3 – Appendix E of Attachment D Construction Noise and Vibration Mitigation Design Report for more details.

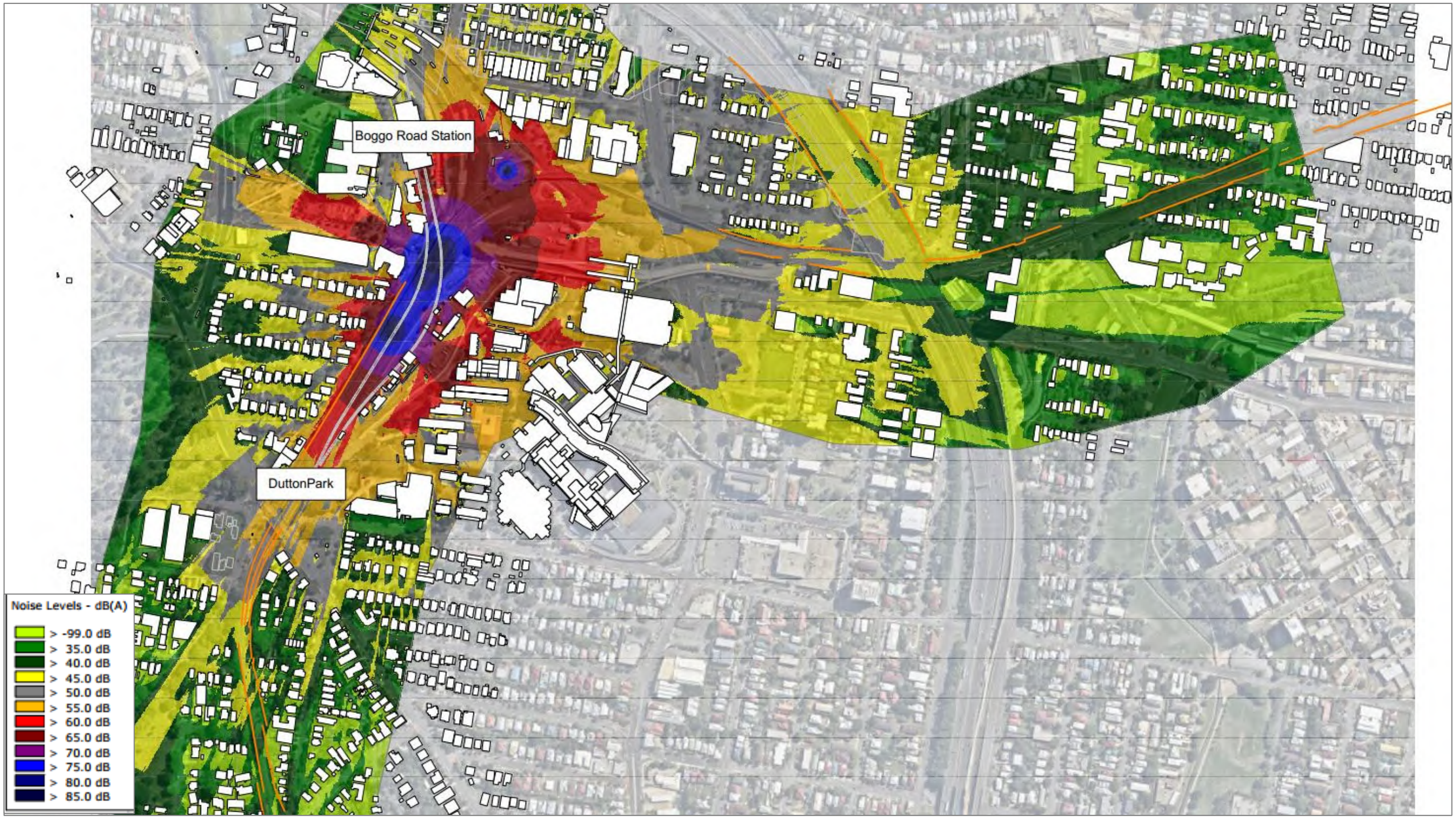

Figure 6: Noise contour impact locations - fixed plant

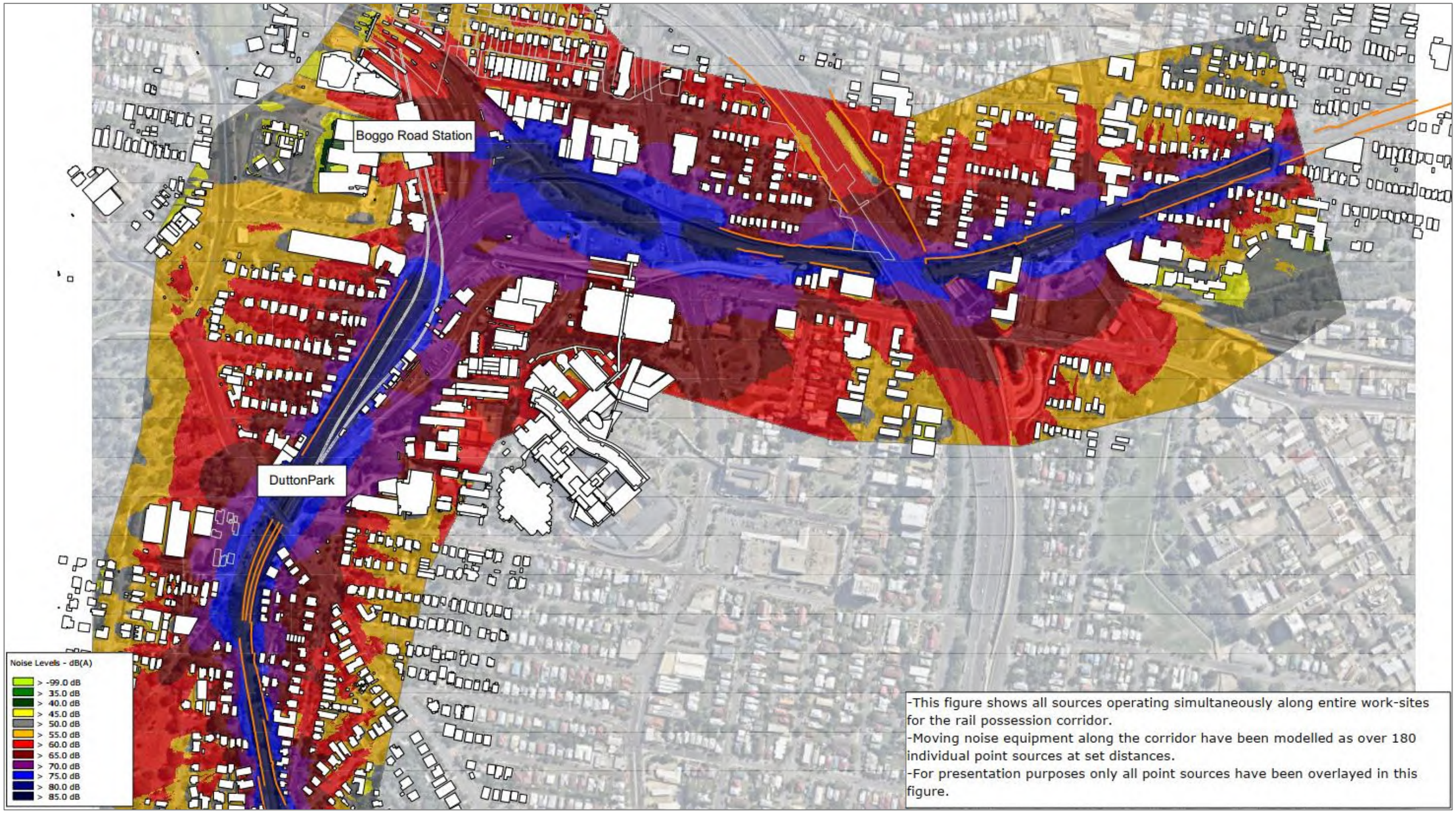

Figure 7: Noise contour impact locations - moving plant

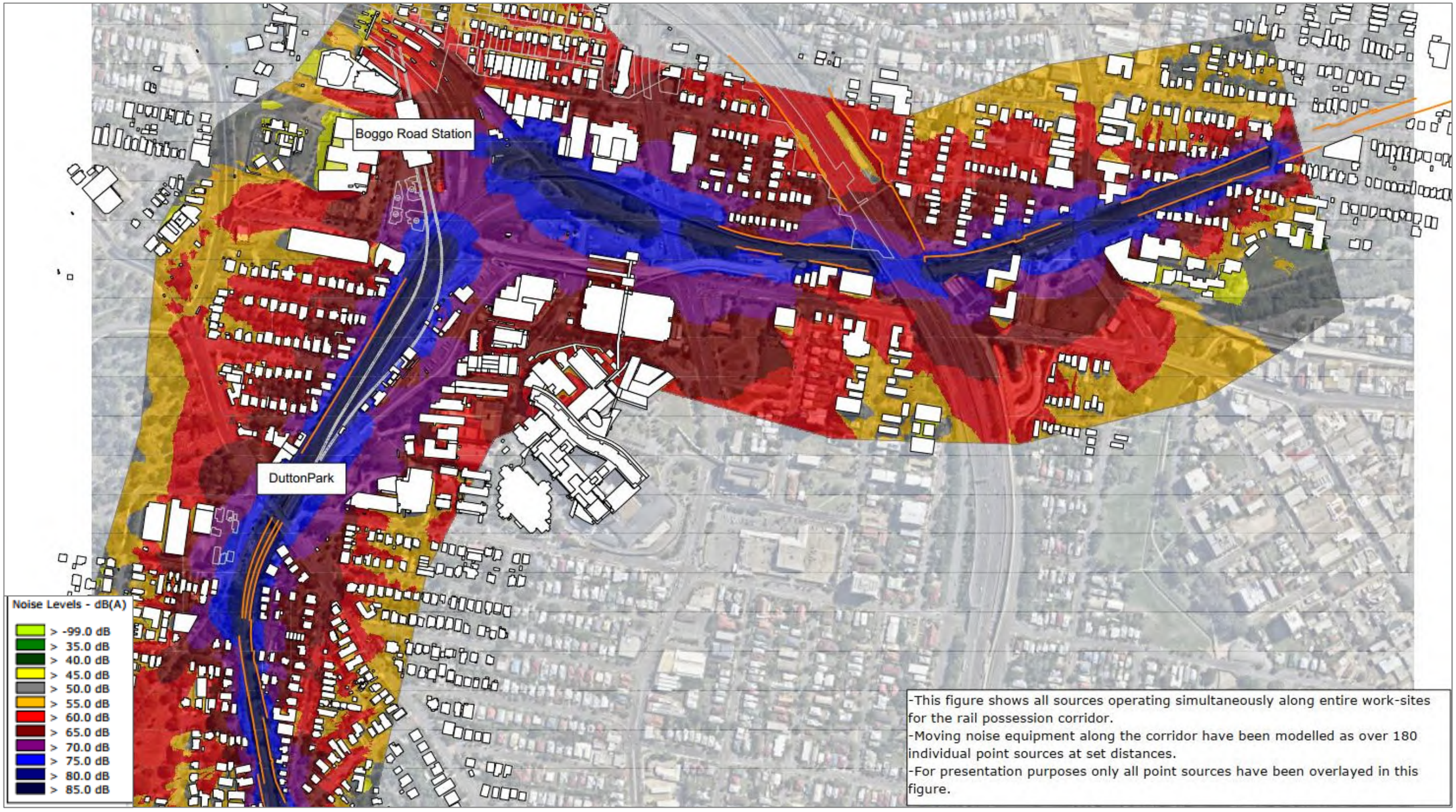

Figure 8: Noise contour impact locations - fixed and moving plant

Areas with the potential to experience increased noise and vibration impacts are contained within an area approximately 100 metres from the worksite.

They have been broken down into the following receiver categories:

- Residential;
- Commercial;
- Educational;
- Medical (i.e. hospitals);
- Public Building (e.g. judicial buildings, municipal buildings, etc);
- Place of Worship; and
- Heritage Building.

Residential receivers are generally considered to be most sensitive to construction activities, and noise and vibration impacts are assessed at residential receivers for all hours of work.

Other receivers may be less sensitive to construction activities, with impacts generally limited to hours of occupancy (e.g. commercial buildings are generally only impacted during standard work hours, or buildings that are specifically designed to reduce the impact of increased noise levels adjacent to a rail corridor).

Key impacted stakeholders, beyond sensitive receivers, include rail commuters, freight users and the AirTrain.

Longer track possessions may in some circumstances result in changes for public transport users. The project will understand the breadth of changes for customers by conducting Customer Journey Mapping and research activities.

Based on the findings of the Customer Journey Mapping and other research activities, the project will develop strategies and work with TransLink to ensure appropriate alternative transport is in place to mitigate the impacts to public transport users. This will be supported by an early and frequent engagement, travel advice and information through both owned, partner agency owned and paid for channels.

5.4.4 Predictive Noise Assessment

Modelling and assessment of airborne noise impacts from construction activities were determined by modelling the noise sources, receiver locations, topographical features, and possible noise mitigation measures using the Cadna-A computer noise model.

The model uses the ISO9613 algorithms to calculate the contribution of each noise source at identified sensitive receiver locations and allows for the prediction of the total noise from a site for the various stages of the construction works.

The noise prediction models considered:

- Location of noise sources and sensitive receiver locations;
- Local ground and height of noise sources within the site, and 1 metre digital ground contours outside the construction site area;
- Noise source levels of individual construction plant;
- Separation distances between sources and receivers;
- Ground type between sources and receivers (mostly hard); and

- Attenuation from barriers (natural and purpose built).

5.4.5 Construction Noise Goals

Noise sensitive receivers surrounding the Project site have been divided into Noise Catchment Areas based on each area's similar acoustic environment before commencement of construction works, as shown in Volume 3, Construction Noise Report, Appendix B, Figures B1, B2 and B3.

External noise goals can be calculated and applied in accordance with the Imposed Conditions when internal building access is not available. The Construction Noise Report includes detailed information on adjusted external construction noise goals for noise sensitive receivers close to relevant worksites.

Some construction works such as Combined Service Route works will move incrementally along the rail corridor installing a conduit into a trench. Noise emissions from such activities will increase to a maximum and then decrease gradually as works move away from receiver locations. The nearest receivers may experience the high noise levels for a short period. Other works such as piling will be conducted in a fixed area.

Where mitigation is not available

At some receiver locations noise levels may be above the construction noise goals and there are no physical mitigation measures that can reasonably or feasibly be applied to achieve the construction noise goals. For example, it may be considered impractical to build an acoustic shield around a drill rig because it would require a large, purpose built shield which may not achieve the desired noise attenuation outcomes, while also increasing drill rig operational safety risks and increasing the total number of required rail possessions.

Imposed Condition 11(c) provides a process to authorise Project Works predicted to or monitored as generating noise levels more than 20dBA $_{(LA10\ adj\ (15\ min))}$ above the relevant goal where physical mitigation of the noise impacts cannot be achieved. That process involves advance notification and consultation with Directly Affected Persons, and the application of respite periods. This process is reflected in the OEMP, and will be implemented through the CEMP for specific works.

Predicted Noise Modelling

The Construction Noise Report (in Volume 3) presents construction noise goals for noise sensitive receivers close to the three works areas at Buranda, Park Road and Dutton Park. The potential for noise levels above the noise goal in the Imposed Conditions is a worst case and assumes all plant and equipment is active at the same time in the same location. This is unlikely to occur during the possession period, and the actual noise impacts are predicted to be both substantially less, and not occurring over a continuous period.

Predicted Noise Levels

Nearest Sensitive Receivers and Noise Catchment Areas (NCA's) have been divided into three main noise catchment areas, the Park Road Triangle, Buranda CSR Works, and Fairfield Dutton Park Works. The works likely to impact on these noise catchment areas is described in Figure 9.

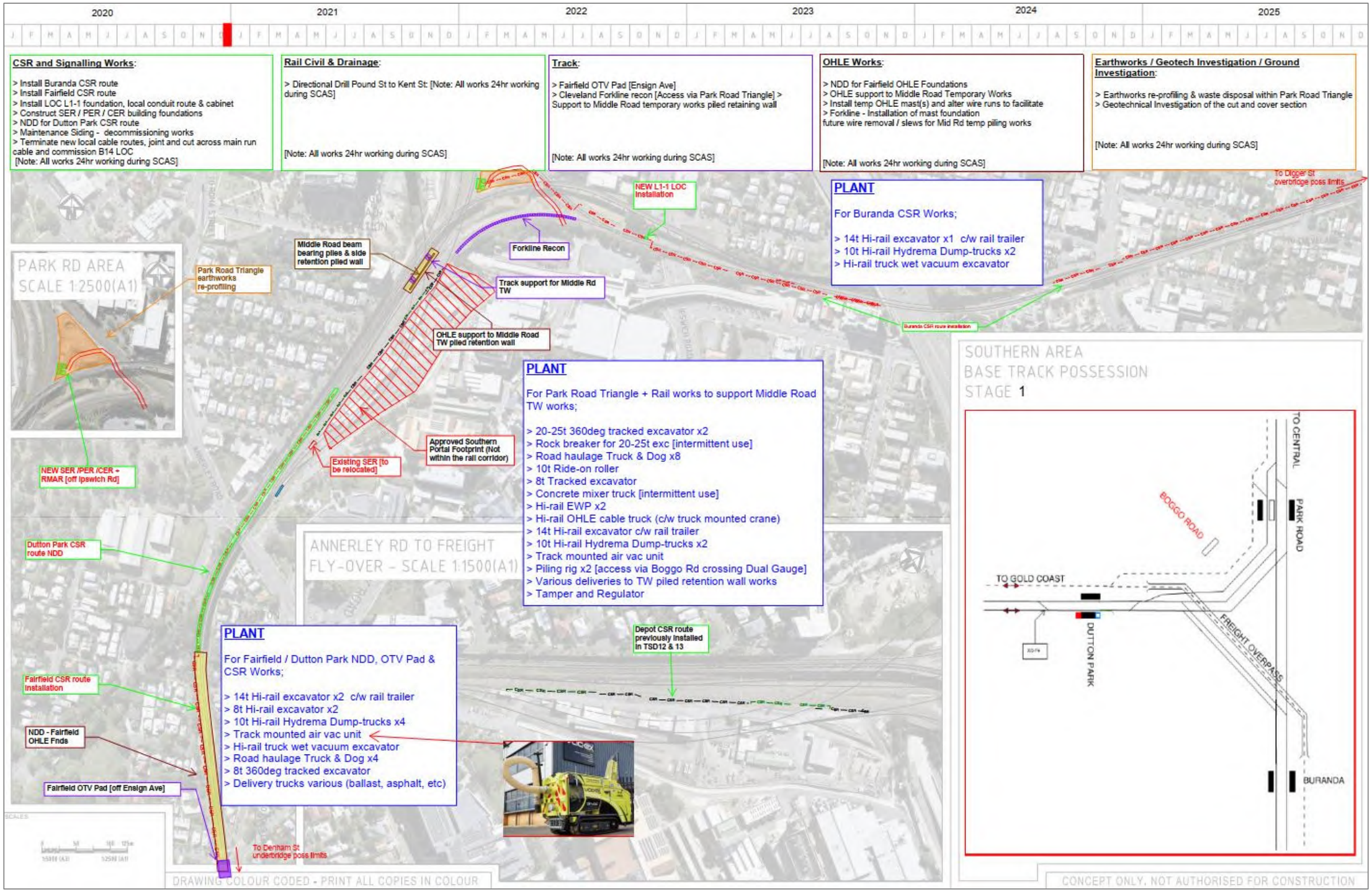

Figure 9: Southern area track possession scope – Stage 1

The Construction Noise Report sets out in detail the anticipated noise impacts for each of the three NCAs, based on a 5 day track possession. Refer to Volume 3 - Section 6.4 of Attachment D Construction Noise and Vibration Mitigation Design Report.

Table 8 summarises the predicted noise levels in each of the three NCAs.

In considering Table 8, it should be noted that:

- The predicted noise levels represents the highest predicted construction noise levels during a rail possession, assuming all equipment is operating simultaneously. The actual noise levels experienced are expected to be significantly lower;
- The predicted noise levels will increase to a maximum (as represented) and then decrease gradually as works move away from each receiver;
- The predicted noise levels will not occur for the duration of the rail possession. Most of the works within the rail corridor will move slowly along the alignment;
- By allowing rail possessions over an extended duration, there is improved opportunity for the contractor to program and manage works so that noisier works are undertaken primarily during day time work hours, with less intensive works at night;
- The works must be completed within the approved rail possession period, which for this scenario is 5 days.

Table 8: Highest predicted construction noise levels during rail possession

NCA	Address	Receiver Type	Construction Noise Goals (CNG's), dB(A)				Predicted Noise Level Range, dB(A)	Potential noise levels above the CG Noise Goal, dB(A)
			Day ($LA_{eq\ 15min}$)	Day ($LA_{10\ 15min}$)	OOH ($LA_{eq)\ 15min}$)	Night (LA_{max})	($LA_{eq\ 15min}$)	($LA_{eq\ 15min}$)
Buranda CSR Works								
BUR01	O'Keefe St, Woolloongabba	Church	52	62	52 (when in use)	62 (when in use)	49-80	28
BUR05	Logan Rd, Woolloongabba	Commercial	67	77	-	-	28-79	12
BUR05	Vanda St, Woolloongabba	Residential	57	67	52	59	31-78	26
BUR06	Salisbury St, Woolloongabba	Residential	47	57	42	49	41-81	39
Park Road Triangle + Rail works to support Middle Road TW works								
BOG01	Railway Terrace, Dutton Park	Residential	47	57	42	49	62-75	33
BOG01	41 Peter Doherty St (Leukaemia Foundation)	Residential	57	67	52	59	72-79	27

NCA	Address	Receiver Type	Construction Noise Goals (CNG's), dB(A)				Predicted Noise Level Range, dB(A)	Potential noise levels above the CG Noise Goal, dB(A)
			Day ($LA_{eq\ 15min}$)	Day ($LA_{10\ 15min}$)	OOH ($LA_{eq)\ 15min}$)	Night (LA_{max})	($LA_{eq\ 15min}$)	($LA_{eq\ 15min}$)
BOG03	Burke St, Dutton Park	Commercial	67	77	-	-	57-79	12
Fairfield / Dutton Park NDD, OTV Pad & CSR works								
DUT01	Annerley Rd, Annerley	Residential	47	57	42	49	51-72	30
DUT01	Sampson St, Annerley	Residential	47	57	42	49	35-81	39
DUT01	Wilkins St, Fairfield	Residential	57	67	42	49	42-80	38

5.4.6 Evaluated Project - Community Noise Impacts

Overall, the predicted noise levels for the proposed Changed Condition are similar to those for the Evaluated Project. The effect of the proposed change however is that:

- The predicted noise levels are expected to be experienced over a longer period than the current 80 hours for continuous works;
- The predicted noise levels are not expected to be any greater than for the Evaluated Project (that is, same noise level, for a longer duration);
- Overall there are expected to be less rail possessions required, meaning that there will be fewer, but longer, rail possessions;
- The overall duration of rail possessions is expected to be less, as the rail possessions can be used more efficiently, with less time spent on establishment and returning the track at the end of the possession. By way of example, it is estimated that it will take approximately 6 hours from the time a rail possession begins until works commence, to allow for set up, isolation and handover of the track. It will take a further 5-6 hours from the completion of required work to hand the track back to QR, including for re-energising of the track. This means that approximately 11-12 hours of a track possession is spent in establishment and hand back, which will be reduced if longer, but fewer, track possessions can occur.

5.5 Mitigation Measures – extended rail possessions at Southern Portal, Dutton Park and Boggo Road

The predicted potential noise level in Table 8 is based on a 'worst case' scenario whereby all equipment is running simultaneously in the same location. The predicted potential noise level is therefore significantly above the noise goals in the Imposed Conditions, although the actual impacts are likely to be significantly less than predicted.

The Imposed Conditions, through the environmental management framework and Condition 11(d) already provides a process for management and mitigation of noisy works and that process remains appropriate and applicable to the proposed change to Condition 10. No change is proposed to Condition 11.

5.5.1 OEMP – Outline Noise and Vibration Management Plan

Through the imposed conditions, the environmental outcomes in the OEMP (including the Outline Noise and Vibration Management Plan) must be achieved. The environmental outcomes may be achieved by complying with the performance criteria in the OEMP (including the Outline NVMP).

The following environmental outcomes in relation to noise and vibration must be achieved for the CRR Project:

- Construction activities are designed, planned and implemented to maintain human health and wellbeing, to the extent reasonable and practicable.
- Construction activities generally are designed, planned and implemented to maintain daily patterns of activity, and to minimise sleep disturbance at night.
- Construction activities are managed to avoid vibration-related structural damage on all properties, to minimise vibration-related impacts on properties and sensitive plant and equipment.

The Outline NVMP sets out the following performance criteria that must be achieved throughout construction of the Project for Airborne Noise:

- Project Works are designed, planned and implemented to achieve the noise goals specified in Imposed Condition 11 to the extent reasonable and practicable.
- Where predictive modelling conducted prior to the commencement of works in a locality, indicates that the noise goals are likely to be exceeded:
    - potentially Directly Affected Persons must be identified and consulted regarding the potential impacts and the mitigation measures proposed to address the impacts;
    - mitigation measures must be developed in consultation with potentially Directly Affected Persons on a ‘case by case’ basis prior to commencement of the works; and
    - agreed mitigation measures must be included in a mitigation register and implemented prior to undertaking Project Works.
- Project Works occurring underground or within an effective acoustic enclosure and achieving the goals for human health and wellbeing set out in Imposed Condition 11, may progress continuously while monitoring indicates noise levels remain below the goals.

5.5.2 Outline NVMP – Mitigations

The Outline NVMP provides the following possible mitigation measures that may be implemented to achieve the environmental outcomes. Additional or different mitigation measures may also be applied to achieve the environmental outcomes.

- Prior to the commencement of Project Works in a locality, predictive modelling must be undertaken to identify the likely acoustic impacts.
- Where predictive modelling indicates either the noise or vibration goals would be exceeded, inform the Environmental Monitor and consult Directly Affected Persons to develop mitigation measures prior to the commencement of such work.
- Where the works in a locality are predicted to exceed the goals in Imposed Condition 11:

- initiate on-going and early consultation with potentially Directly Affected Persons and relevant agencies to notify them of the proposed works and to determine suitable mitigation measures; and implement the detailed CEMP and NVMP to achieve the outcomes developed in consultation with the potentially Directly Affected Persons.

5.5.3 Construction Environmental Management Plan (CEMP)

The Construction Environmental Management Plan provides that noise matters are addressed in the Noise and Vibration Management Plan (NVMP).

5.5.4 Noise and Vibration Management Plan

General Measures

The NVMP sets out a range of noise mitigation measures that may be implemented to achieve the environmental outcomes. Under the endorsed CEMP NVMP the approach for management and mitigation is as follows:

- Initiate on-going and early consultations with potentially Directly Affected Persons to notify them of the proposed works and to determine suitable mitigation measures;
- Monitor actual noise levels generated in the field; and
- Apply appropriate mitigations, as detailed in the NVMP, and referred to below in Section 5.7.

This approach:

- Validates modelled noise results with field monitoring upon commencement of new activities;
- Allows plant and equipment use to be modified to reduce noise levels if needed; and
- Enables ongoing review of the equipment being used to ensure noise levels adhere to project requirements.

At some receiver locations, noise levels may be above the construction Noise Goals and there are no physical mitigation measures that can be applied to achieve the goals. The NVMP identifies the management measures that can be applied to deal with residual impacts, including:

- noise monitoring;
- letter box drops;
- phone calls;
- individual briefings;
- respite offers; and
- consideration of short-term alternative accommodation where necessary.

Further mitigation measures may include changing operational procedures at evening / night in order to reduce noise impacts. The appropriate management measure would be determined by the degree of exceedance of the construction noise goals. Additional physical mitigation measures such as temporary site hoarding and full acoustic enclosures are not likely to be possible due to the type of construction activities involved and the location of sensitive places.

5.6 Changes to the OEMP - extended rail possessions at Southern Portal, Dutton Park and Boggo Road

The relevant management and mitigation arrangements for noise effects from extended rail possessions at the Southern Portal worksite, Boggo Road worksite and Dutton Park worksite are provided in the approved OEMP sub-plan (Noise and Vibration) at section 4.2.8.

Relevantly, the OEMP suggests:

> *Prior to the commencement of Project Works undertake predictive modelling to identify work likely to exceed the noise goals, and those properties likely to be impacted by such exceedances. If predictive modelling indicates that the construction noise goals would likely be exceeded during the Project Works, then:*
>
> *a) consult with Directly Affected Persons, local communities, particularly those south of Peter Doherty Street, west of Railway Terrace and the Quarry Street area north of the rail corridor about measures to mitigate night-time works in the rail corridor;*
>
> *b) erect a noise barrier along the north-west side of the on-site spoil route adjacent to the rail track if night-time spoil removal is required;*
>
> *c) implement all other practical and reasonable mitigation measures to reduce noise impacts from the Project Works; and*
>
> *d) undertake monitoring of construction noise at residential and commercial premises predicted to be affected by the works (e.g. immediately to the west of Railway Terrace and Joe Baker Street, and premises to the north of Park Road Station). Where monitoring detects exceedances of the goals for human health and wellbeing, develop and implement mitigation measures in consultation with the Directly Affected Persons as soon as practicable after monitoring.*

As the predicted noise levels are generally consistent with the Evaluated Project, no changes are proposed to the OEMP.

Should the Coordinator-General support the proposed changes to conditions, the current OEMP, at Appendix A, refers to the Project wide Imposed Conditions in the latest Coordinator-General's change report available on the Department of State Development, Tourism and Innovation website at www.dsdmip.qld.gov.au/crr.

5.7 Changes to the CEMP and NVMP - extended rail possessions at Southern Portal, Dutton Park and Boggo Road

The CEMP NVMP discusses the Southern Portal, Dutton Park and Boggo Road worksites and refers to activities assessed as having the greatest potential noise impact on the surrounding receivers.

As the predicted noise levels are generally consistent with the Evaluated Project, no changes are proposed to be required to the CEMP NVMP.

Under the NVMP, where modelling shows noise levels above the construction noise goals, mitigation measures to achieve the environmental outcomes, relevant to the extended rail possessions, may include:

- On-going and early consultations with potentially Directly Affected Persons to notify them of the proposed works and to determine suitable mitigation measures;
- Operators of construction equipment to be made aware of the potential noise/ vibration impacts and of techniques to minimise emission through continuous operator education;
- Enclose equipment generating higher noise levels, subject to confirmation of noise levels;

- Localised noise attenuation screens;
- Maintain plant and machinery, in good working order per contractors Construction Management System (CMS);
- Scheduling noisy work coinciding with high levels of ambient noise (e.g. during peak hour traffic), to minimise the impact of construction related noise during the quieter times of the day, evening and night;
- Substituting noisy demolition with quieter ones (e.g. using saw cutting instead of breaking);
- Lowest noise/vibration emitting plant and equipment that can economically undertake the work should be selected, wherever possible;
- Machines/ tools found to produce excessive noise/vibration compared to industry best practice should be removed from site or stood down until repairs or modification can be made - if repairs or modification are not possible then a suitable replacement should be found;
- Consultation with potentially affected entities to notify them of proposed works and determine suitable mitigations;
- Use of pre-fabricated materials for construction where possible;
- Switch plant and equipment off when not in use;
- Where appropriate fit effective residential class silencers to engine exhausts;
- Utilising existing noise walls and hoardings currently constructed between the work sites and surrounding residents, where feasible, to attenuate construction noise levels and impacts;
- Where Out of Hours works are unavoidable, they are to be undertaken in accordance with:
    - Project Out of Hours Work Protocol
    - After consultation with the DA and any Directly Affected Persons
    - This NVMP and any specific agreed mitigation measures.

Specific mitigation measures discussed in the NVMP for the Southern Portal, Dutton Park and Boggo Road Station Works include:

- Notify in advance with Directly Affected Persons and near neighbours about the station and portal works and the surface works in the designated rail corridor between Dutton Park Station and Park Road Station;
- Notification must identify the activities likely to approach or above the noise and vibration goals for the Project;
- Notify with the PA Hospital, TRI Building, ESA Village (Leukaemia Foundation) and the Ecosciences facility to minimise the effects of construction on people and sensitive equipment (e.g. Transmission Electron Microscopes or TEM). Confirm the technical specifications of the Ecosciences TEM vibration isolation system prior to commencement of vibration intensive Project Works;
- Prior to the commencement of relevant Project Works, undertake predictive modelling to identify work likely to be above the noise goals, and those properties likely to be impacted by those predictions. If predictive modelling indicates that the noise levels are above the construction noise goals during the Project Works, then mitigations to achieve the environmental outcomes may include:

- Notification to Directly Affected Persons, local communities, particularly those south of Peter Doherty Street, west of Railway Terrace and the Quarry Street area north of the rail corridor about measures to mitigate night-time works in the rail corridor;
- Erect a noise barrier along the north-west side of the Boggo Road on-site spoil route adjacent to the rail track if night-time spoil removal is required;
- Implement all other practical and reasonable mitigation measures to reduce noise impacts from the Project Works; and
- Undertake monitoring of construction noise at residential and commercial premises predicted to be affected by the works (e.g. immediately to the west of Railway Terrace and Joe Baker Street, and premises to the north of Park Road Station). Where monitoring detects noise levels above the goals for human health and wellbeing, develop and implement mitigation measures in consultation with the Directly Affected Persons as soon as practicable after monitoring.

5.8 Effect of the proposed changes to Condition 10 - extended work hours (Project Works other than rail corridor works)

A noise screening assessment was undertaken to determine the potential noise impacts associated with the extended work activities under the proposed changes to Condition 10(d). This screening assessment is provided in Volume 3 of this RfPC (Technical Report: Construction Noise Assessment).

Based on the activities identified to be undertaken during the extended work hours, five separate scenarios were assessed for fourteen of the main construction sites along the alignment including Salisbury, Rocklea, Moorooka, Yeerongpilly, Yeronga, Fairfield Stations, Woolloongabba site, Albert Street site, Roma Street site, Exhibition Station and Mayne Yard/Breakfast Creek. Only three scenarios were assessed for Dutton Park, Southern Portal and Boggo Road Station due to further detailed assessment being completed for the Rail Possession works within these areas. These scenarios included:

Scenario 1 Works within the rail corridor - overhead line and signal upgrade work

Scenario 2 Works within the rail corridor - construction

Scenario 3 Project Works within a road reserve

Scenario 4 Project Works involving the transport, assembly or decommissioning of oversized plant, equipment, components of structures

Scenario 5 Project works that require continuous construction support, such as continuous concrete pours, pipe-jacking or other forms of ground support necessary to avoid a failure or construction incident.

For each scenario the plant and equipment types required to complete the works were included in the assessment. Construction noise levels from each of the construction worksites were predicted using source noise levels from BS5228.1 and AS2436-2010. A range of noise levels were predicted for each nearest noise sensitive receiver (to each station worksite on the Cross River Rail route). The resulting noise predictions therefore represented a worst case, meaning the downwind propagation at the closest point of approach and all plant and equipment in use at the same time (which is unlikely or short lived in duration). This gave the worst-case noise level at a receiver for the purposes of assessment.

Table 9 summarises the outcomes of the noise screening assessment completed along the alignment which is presented in full in Volume 3. The screening assessment determined eleven of the receivers would experience an increase in noise levels, ranging from a moderate to very significant increase compared to the previously evaluated project. This impact was predominantly the result of works being completed for Scenario 3 - Project works within a road reserve. Of these sites, nine would be

considered high impact which would trigger the implementation of Imposed Condition 11(c) to manage the Directly Affected Persons (DAP). Five of the sites would be considered as medium impact and would not trigger Imposed Condition 11(c). However, to ensure these impacts were further mitigated, additional detailed noise assessment and planning would need to be completed prior to these works commencing.

Table 9: Noise impact associated with extended work hours

Location	Noise Impact			Scenario with the worst impact	Time	Potential Impact Comparison Against Evaluated Project	Significance of Change [4]
	Low	Medium	High				
	< Goal	Goal + <20 dBA	Goal + >20 dBA				
Salisbury	No	No	Yes	1+3	Night	Consistent	Nil
Rocklea	No	No	Yes	3	Night	Increase	Significant
Moorooka	No	Yes	No	3	Night	Increase	Very Significant
Yeerongpilly	No	No	Yes	3	Night	Increase	Marginal
Yeronga	No	No	Yes	3	Night	Increase	Marginal
Fairfield	No	No	Yes	3	Night	Increase	Marginal
Dutton Park	No	No	Yes	3	Night	Increase	Marginal
Southern Portal	No	No	Yes	3	Night	Consistent	Nil
Boggo Road	No	No	Yes	3	Night	Increase	Very Significant
Woolloongabba	No	Yes	No	3	Night	Increase	Very Significant
Albert Street	No	No	Yes	3	Night	Increase	Marginal
Roma Street	No	Yes	No	3	Night	Increase	Significant
Exhibition	No	Yes	No	3	Night	Increase	Very Significant
Mayne / Breakfast Creek	No	Yes	No	3	Night	Consistent	Nil

Referring to Table 9 above and using Table 2-4 of the Transport Noise Management Code of Practice, Department of Transport Main Roads, refer to Table 18 in volume 3, as a guide to understanding the change in loudness based on the significance of the proposed change in noise levels, it can be determined that a 'Marginal' change will result in a noticeable change in loudness, a 'Significant' change will result in the noise level sounding twice as loud, and a 'Very Significant' change will result in the noise sounding three times as loud.

To understand the potential traffic noise impacts as a result of concrete pours potentially occurring during the extended work hours, an example of an actual extended concrete pour which was completed at the Woolloongabba Site was assessed. This assessment considered the existing traffic counts on the local roads as well as the proposed number of additional concrete trucks using the road over an extended period of time. The assessment demonstrated the additional traffic resulting from the extended concrete pour would have an insignificant impact on the noise levels of the local roads.

Following assessment of the potential noise impacts associated with each of the five scenarios associated with extended work hours, it was determined there would be an increase in noise

[4] Table 2-4 of the Transport Noise Management Code of Practice, Department of Transport Main Roads

impacts at eleven of the fourteen sites compared to the Evaluated Project. The major increase resulting from works within the road reserve (Scenario 3). However, even with this increase, it was considered the existing Imposed Condition 11, with its escalating scale of management requirements, the DAP consultation process and the endorsed Environmental Management Framework provided a sufficient and robust system to manage any potential noise impacts resulting from these activities. This assessment also demonstrated that the potential noise impacts on local roads associated with extended concrete pours are considered insignificant with an additional noise increase of less than 3 dBA.

As the proposed modification to Imposed Condition 10(d) still requires compliance with the specific environmental management framework, it is considered this modification will not cause additional impact on the surrounding environment and sensitive receptors compared to the currently Evaluated Project.

5.9 Conclusion

The proposed changes to Condition 10 will provide for greater flexibility in delivery of the Cross River Rail Project, remove some inconsistencies and uncertainties in the drafting of Condition 10, and align project work hours with the permitted hours from other regulators, including for rail, road and busway possessions, and the transport of oversized equipment.

The road and busway permits, made available through BCC and or DTMR, will provide a framework of defined/permitted hours which will have been determined to minimise potential impacts to infrastructure users.

The assessed impacts resulting from this change conclude that there will be an increase in noise impacts resulting from works compared to the previously Evaluated Project. While individual possessions are predicted to occur for longer overall durations, the total number of possessions required to complete the full scope of works will decrease because of efficiencies associated with a longer possession. In addition, users of road, rail and busway infrastructure will experience fewer overall disruptions compared to the Evaluated Project.

It also considered the Environmental Management Framework that has been conditioned as part of the Evaluated Project provides a robust approach to manage identified impacts, achieve a reasonable level of amenity, whilst allowing the Project to proceed.

6. Summary - proposed changes to Imposed Conditions

Appendix 1 provides a full set of the Imposed Conditions, marked up to show the changes requested as part of this Request for Project Change. In addition to the changes to Imposed Conditions outlined at sections 4.6 and 5, an administrative change is required to delete Condition 1(c) which is redundant now that the Coordinator-General has deleted Appendix 3, and the temporary coach terminal works are complete. A further administrative change is required to condition 3(a) to refer to Schedule 1 instead of Schedule 2.

7. Conclusion

This RfPC requests changes to the Evaluated Project and to the Imposed Conditions to facilitate efficiencies in Project Delivery.

The impacts of the CRR Project, including the proposed changes, would continue to be governed and managed consistently with environmental management plan that establishes the environmental outcomes and performance criteria that must be achieved by the proponent throughout construction.

The existing Imposed Conditions generally remain appropriate for managing the effects of the proposed changes, with changes proposed to improve project delivery efficiencies.

The Cross River Rail Delivery Authority, as the proponent for the CRR Project, requests that the Changed Project proceed, subject to the Imposed Conditions, including the changes to those Imposed Conditions set out in this RfPC.

Appendix 1: Consolidated amendments to imposed conditions

Appendix 1. Project-wide Imposed Conditions

Part A. Imposed Conditions (General)

Condition 1. General conditions

(a) The project must be carried out generally in accordance with:

(i) the Cross River Rail Request for Project Change dated August 2020;

(ii) the drawings provided at Volume 2, Cross River Rail Request for Project Change dated August 2020;

~~(i)~~(iii) the Cross River Rail Request for Project Change dated May 2020;

~~(ii)~~(iv) the drawings provided at Volume 2, Cross River Rail Request for Project Change dated May 2020;

~~(iii)~~(v) amendments to the Project identified in the Cross River Rail Request for Project Change dated June 2018;

~~(iv)~~(vi) amendments to the Project identified in the Cross River Rail Request for Project Change dated November 2018;

~~(v)~~(vii) the Cross River Rail Request for Project Change dated April 2019.

(b) The proponent must notify the Coordinator-General and all nominated entities in Schedule 2~~3~~ in writing of the commencement of Project Works and the commencement of the commissioning and operational phases of each 'construction site' at least 20 business days prior to the relevant commencement date.

~~(c) The temporary coach terminal works must be carried out in accordance with the conditions imposed at Appendix 3.~~

Condition 2. Outline Environmental Management Plan

(a) Two months prior to the commencement of Project Work submit a final Outline Environmental Management Plan to the Coordinator-General for approval.

(b) The Outline Environmental Management Plan must:

(i) Include the environment outcomes and performance criteria for each environmental element from the draft outline EMP except as amended by these conditions;

(ii) include possible mitigation measures, monitoring and reporting for each environmental element to achieve the environmental outcomes;

(iii) include an outline of:

(A) the Construction Environmental Management Plan

(B) the Commissioning Environmental Management Plan

(iv) be consistent with the Environmental Design Requirements in Schedule 1

(v) include the following sub-plans:

(A) Community and Stakeholder Engagement Plan

(B) Construction Worksite Management Plan

(C) Construction Traffic Management Plan (CTMP)

(D) Construction Vehicle Management Plan

(E) Water Quality Monitoring Plan

(F) Erosion and Sediment Control Plan

(G) Spoil Placement Management Plan

(H) Noise and Vibration Management Plan

(I) Air Quality Management Plan

(J) Settlement Management Plan

(K) Non-Indigenous Cultural Heritage Management Plan

(L) Indigenous Cultural Heritage Management Plan

(vi) Be made available on the proponent's website once approved by the Coordinator-General and for the duration of the construction of the project and for a period of five years from commencement of operation.

(c) Any further amendments to the Coordinator-General approved Outline Environmental Management Plan will be issued to the Coordinator-General 20 business days prior to the commencement of Relevant Project Works.

Part B. Imposed Conditions (Design)

Condition 3. Design

(a) The project must achieve the Environmental Design Requirements in Schedule ~~2~~1.

Part C. Imposed Conditions (Construction)

Condition 4. Construction Environmental Management Plan

(a) Prior to the commencement of Project Work, a Construction Environmental Management Plan for those works (Relevant Project Work) must be developed by the Proponent and endorsed by the Environmental Monitor as being consistent with the Outline EMP and these imposed conditions.

(b) The endorsed Construction Environmental Management Plan must be submitted to the Coordinator General at least 20 business days prior to the commencement of Relevant Project Works.

(c) The Construction Environmental Management Plan must:

(i) describe the Relevant Project Work;

(ii) be based on predictive studies and assessments of construction impacts which have regard to the scale, intensity, location and duration of construction works, and location of Directly Affected Persons;

(iii) be generally consistent with the Outline EMP and incorporate its environmental outcomes and performance criteria;

(iv) incorporate and respond to the Imposed Conditions (Construction);

(v) demonstrate that the Imposed Conditions (Construction) will be complied with during Relevant Project Work;

(vi) incorporate the community engagement plan, including the complaints management process, in accordance with Condition 9;

(vii) where predictive studies indicate impacts beyond those provided for in the performance criteria, incorporate mitigation measures to achieve the environmental outcomes;

(viii) establish specific mitigation measures and processes for consultation with Directly Affected Persons for Project Works under Conditions 9(c), 11(c), and 11(e);

(ix) contain a program and procedures for ongoing monitoring to identify the effectiveness of mitigation measures in achieving the Imposed Conditions (Construction) and the environmental outcomes in (iii)

(x) include a process for regular review and if required updating of the Construction Environmental Management Plan, including a process to review and implement additional or different mitigation measures in response to monitoring results;

(xi) incorporate the EMP sub-plans required by the Imposed Conditions or as required by the approved Outline EMP.

(d) The Construction Environmental Management Plan must be implemented for the duration of Relevant Project Work.

(e) Relevant Project Work is authorised if it is undertaken in accordance with the Construction Environmental Management Plan.

(f) The Construction Environmental Management Plan must be publicly available on the project website for the duration of the construction phase.

(g) The Construction Environmental Management Plan may be updated.

(i) updates to the Construction Environmental Management Plan that include new or additional Relevant Project Work must be endorsed by the Environmental Monitor as being consistent with condition 2 before Relevant Project Work may proceed.

(h) Updates to the Construction Environmental Management Plan that are limited to new or different mitigation measures for Managed Work may be endorsed by the Environmental Monitor.

Condition 5. Compliance

(a) The proponent must notify the Environmental Monitor and the Coordinator-General in writing, within 48 hours after becoming aware of a Non-Compliance Event.

(b) The notification must include:

(i) a description of the Non-Compliance Event, including details of the location, date and time of the Non-Compliance Event;

(ii) the name and contact details of a designated contact person;

(iii) an outline of actions that have been or will be taken to respond to the Non-Compliance Event.

(c) Within 14 days following the notification of a Non-Compliance Event, written advice detailing the following information must be provided to the Environmental Monitor and the Coordinator-General:

(i) a description of the Non-Compliance Event, including details of the location, date and time of the Non-Compliance Event;

(ii) the name and contact details of a designated contact person;

(iii) the circumstances in which the Non-Compliance Event occurred;

(iv) details of any complaint in relation to the Non-Compliance Event;

(v) the cause of the Non-Compliance Event;

(vi) a description of the environmental effects of the Non-Compliance Event;

(vii) the results of any sampling or monitoring performed in relation to the Non-Compliance Event;

(viii) actions taken to mitigate the environmental effects of the Non-Compliance Event;

(ix) proposed actions to prevent a recurrence of the Non-Compliance Event, including timing and responsibility for implementation.

(d) The Non-Compliance Event report must be made available on the project website and remain available for the duration of the construction phase for the project.

Condition 6. Reporting

(a) The Proponent must prepare a Monthly Report that summarises compliance and monitoring results for the duration of construction works.

(b) The Monthly Report must include:

(i) monitoring data required by the imposed conditions or Construction Environmental Management Plan undertaken for the period and, where required, an interpretation of the results;

(ii) details of any Non-Compliance Event, including a description of the incident, resulting effects, corrective actions, revised construction practices to prevent a recurrence, responsibility and timing;

(iii) reporting of complaints, including the number of complaints, description of issues, responses and corrective actions.

(c) The Monthly Report must be provided to the Coordinator-General and the Environmental Monitor, and made available on the project website within six weeks of the end of the month to which the report relates, and continue to be available on the project website until commissioning is complete.

(d) The Proponent must provide annual reports to the Coordinator-General and the Environmental Monitor (Annual Report) no later than 31 July in any year during the construction phase about compliance with the imposed conditions.

(e) The Annual Report must include:

(i) a compliance evaluation table detailing the relevant imposed condition, whether compliance with the condition was achieved and how compliance was evaluated;

(ii) an evaluation of compliance in relation to the CEMP and its sub-plans;

(iii) a summary of any Non-Compliance Events during the reporting period;

(iv) a summary of any Non-Compliance Events during the previous reporting period, with details of site remediation activities, corrective actions taken or to be taken and revised practices implemented or to be implemented (as relevant).

Condition 7. Environmental Monitor

(a) The Proponent must engage an independent, appropriately skilled and experienced entity, approved by the Coordinator-General, as the Environmental Monitor for the duration of construction.

(b) The Proponent must ensure that the Environmental Monitor has reasonable site access and access to all information required to perform its function, including, without limitation:

(i) all approvals;

(ii) the Construction Environmental Management Plan;

(iii) results of all monitoring required under the Imposed Conditions (Construction) including through the Construction Environmental Management Plan;

(iv) all information relating to complaints, including access to the complaints database.

(c) The Environmental Monitor must:

(i) monitor compliance with the imposed conditions during the construction of the project;

(ii) monitor compliance with the Construction Environmental Management Plan and sub-plans;

(iii) maintain a register of mitigation measures agreed between the Proponent and Directly Affected Persons (Mitigation Register);

(iv) review the compliance reports required by Condition 5, and the monthly reports and annual reports required by Condition 6, and provide advice to the Coordinator-General and the Proponent on the contents and adequacy of those reports;

(v) review the results of monitoring, which may be verified by the Environmental Monitor including by independent monitoring;

(vi) provide advice to the Proponent about compliance with the Imposed Conditions for construction, including by providing the results of independent monitoring where required;

(vii) provide advice to the Proponent about issues raised in complaints and the response to complaints, including advice from the Community Relations Monitor;

(viii) endorse the Construction Environmental Management Plan as consistent with the Outline EMP and complying with the Imposed Conditions (Construction);

Condition 8. Community Relations Monitor

(a) The proponent must engage an independent, appropriately skilled and experienced entity, approved by the Coordinator-General, as the Community Relations Monitor for the duration of construction.

(b) The Community Relations Monitor must:

(i) review and provide advice to the Environmental Monitor on the community engagement plan required by Condition 9;

(ii) receive monthly reports from the proponent on complaints;

(iii) attend each meeting between the Proponent and a Directly Affected Person to consult on mitigation measures, including providing input on standard responses for similar impacts;

(iv) provide advice to the Environmental Monitor in relation to complaints, community engagement and consultation on mitigation measures;

(v) be available to members of the community in accordance with Condition 9(f)(vi).

Condition 9. Community engagement plan

(a) The Proponent must develop a community engagement plan as part of the Construction Environmental Management Plan consistent with the Outline EMP's Community and Stakeholder Engagement Plan.

(b) The community engagement plan must be given to the Community Relations Monitor for advice at least 10 business days prior to the Construction Environmental Management Plan being provided to the Environmental Monitor.

(c) The community engagement plan must provide for:

(i) Directly Affected Persons to be consulted prior to commencement of Project Works and ongoing thereafter about Project Works, predicted impacts and mitigation measures;

(ii) Directly Affected Persons to be consulted about possible mitigation measures;

(iii) local communities near Project Works to be informed about the nature of construction, including the timing, duration and predicted impacts of the works in advance of their commencement;

(iv) information to be provided to public transport, road users, pedestrians and cyclists about the predicted effects of Project Works on road, rail and pedestrian and cycle network operations, in advance of their commencement;

(v) specific community consultation plans for identified key stakeholders;

(vi) implementation of an Indigenous employment policy, providing for Indigenous training and employment opportunities;

(vii) a process for advance notification to local communities of Project Works, including the timing, duration, predicted impacts and mitigation measures, which is available on the project website and through other media.

(d) The community engagement plan must incorporate a complaints management system developed specifically for the Project, which is established prior to the commencement of Project Works.

(e) The complaints management system must deliver a prompt response to community concerns with relevant information, action where required, and reporting of incidents.

(f) As a minimum, the complaints management system must include the following elements:

(i) a procedure for receiving complaints on a 24 hour, seven days a week basis, during Project Works;

(ii) a mechanism for notifying the community of the complaints procedure and how it may be accessed;

(iii) a process for registering and handling complaints received, including a database for tracking of complaints and actions taken in response;

(iv) a procedure for verifying complaints through monitoring and detailed investigation, and escalating and resolving verified complaints;

(v) a procedure for complaints to be notified to the Community Relations Monitor, including information about the complaint and its resolution;

(vi) access by the community to the Community Relations Monitor; and

(vii) regular reporting via the monthly environmental report, to the community of complaints and corrective actions, maintaining appropriate confidentiality.

(g) All information regarding complaints, including the information collected in Condition 9(f)(iii) must be made available to the Community Relations Monitor.

Condition 10. Hours of work

(a) Surface works for the Project are authorised to be undertaken within the hours of work set out in Table 1A.

Table 1A. Construction hours

Worksite	Surface works- standard hours	~~Extended work hours~~	Managed Work	Spoil haulage and materials/ equipment delivery (excluding concrete deliveries)
Fairfield, Yeronga, Yeerongpilly, Rocklea and Salisbury stations	Monday to Saturday: 6:30am- 6:30pm	~~Monday to Friday: 6:30pm - 10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Saturday: 6.30am - 6.30pm
Moorooka	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday: 6:30pm - 10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Saturday: 6:30am-6:30pm
Clapham Yard	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~ ~~For approved rail possession 80 hours continuous work~~	24 hours, 7 days	Monday to Friday: 6:30am – 7:30am, 9:00am – 2:30pm, 4:30pm – 6:30pm Saturday: 6:30am – 6:30pm
Southern portal	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~ ~~For approved rail possession 80 hrs continuous work~~	24 hours, 7 days	24 hours, 7 days
Boggo Road Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~ ~~For approved rail possession 80 hrs continuous work~~	24 hours, 7 days	Monday to Friday: 6:30am – 7:30am, 9:00am – 2:30pm, 4:30pm – 6:30pm Saturday: 6:30am – 6:30pm Additional hours during gazetted school holidays: Monday to Friday: 7:30am – 9:00am, 2:30pm – 4:30pm
Dutton Park Railway station	Monday to Saturday:	~~For approved rail possession 80 hrs continuous work~~	n/a	24 hours, 7 days, except for:

Worksite	Surface works- standard hours	~~Extended work hours~~	Managed Work	Spoil haulage and materials/ equipment delivery (excluding concrete deliveries)
	6:30am-6:30pm			Monday to Friday: 7:00am – 9:00am, 4:30pm – 6:30pm
Woolloongabba Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~	24 hours, 7 days	24 hours, 7 days, except for: Monday to Friday: 7:00am – 9:00am, 4:30pm – 6:30pm
Albert Street Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~	24 hours, 7 days	Monday to Friday: 6:30am – 10:00pm Saturday: 6:30am – 6:30pm
Roma Street Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~	24 hours, 7 days	Monday to Friday: 6:30am – 7:30am, 9:00am – 4:30pm 6:30pm – 10:00pm Saturday: 6:30am – 6:30pm
Northern portal	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Friday: 6:30am – 10:00pm Saturday: 6:30am – 6:30pm
Exhibition Railway station	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	Monday to Saturday: 6:30am – 6:30pm
Mayne Railway Yard	Monday to Saturday: 6:30am-6:30pm	~~Monday to Friday:~~ ~~6:30pm - 10:00pm~~ ~~For approved rail possession for the duration of the possession~~	24 hours, 7 days	24 hours, 7 days

(b) Project Works that are underground, or in a ventilated acoustic enclosure, may be undertaken at any time provided the environmental outcomes are achieved.

(c) Works carried out because of an emergency that:

(i) is endangering the life or health of a person; or

(ii) is endangering the structural safety of a building; or

(iii) is endangering the operation or safety of community infrastructure that is not a building; or

(iv) is required to prevent environmental harm,

~~(iv)~~ may be undertaken outside the hours set out in Table 1.

(d) Despite Condition 10(a), t~~T~~he following work (including associated spoil haulage and materials/equipment delivery, and concrete delivery) may be undertaken during the extended work hours in Table 1B, ~~during Extended Work Hours as set out in Table 1 (despite any separate restrictions on equipment delivery hours listed in Table 1),~~ subject to compliance with a specific Construction Environmental Management Plan sub-plan in accordance with Condition 4:

Table 1B. Extended work hours

Description of works	Extended work hours
Project Works within rail corridor land	For the duration of an approved rail possession at all worksites except Clapham Yard. For Clapham Yard - for the duration of an approved rail possession - 80 hours continuous work
Project Works within busway land	During the hours authorised by DTMR for access to the busway for Project Works
Project Works within a road	During the hours authorised by Brisbane City Council or DTMR (as relevant) for access to the road for Project Works
Project Works involving the transport, assembly or decommissioning of oversized plant, equipment, components or structures	For transport, during the hours stated in the road access permit Otherwise, 6:30pm - 10:00pm, Monday to Friday

~~(d)~~

~~( ) Project Works within rail corridor land;~~

~~( ) Project Works within a road reserve or busway that cannot be undertaken reasonably nor practicably during standard hours due to potential disruptions to peak traffic flows or bus operations;~~

~~( ) Project Works involving the transport, assembly or decommissioning of oversized plant, equipment, components or structures;~~

~~( ) delivery of "in time" materials such as concrete, hazardous materials, large components and machinery;~~

~~( ) Project Works that require continuous construction support, such as continuous concrete pours, pipe jacking or other forms of ground support necessary to avoid a failure or construction incident.~~

~~(j)~~(e) The works detailed in 10(d) may also be undertaken outside the hours set out in Table 1A, only where written confirmation has been obtained from the entity with jurisdiction for Condition 10 prior to commencement of the specific works and subject to compliance with an updated and endorsed site-specific Construction Environmental Management Plan sub-plan in accordance with Condition 4.

~~(k)~~(f) Blasting must not occur on public holidays, and is only authorised to occur during the hours of 7:30am to 4:30pm Monday to Saturday, and not on Sundays or public holidays.

~~(l)~~(g) Prior to blasting events, at least 48 hours' notice must be provided to persons who may be adversely affected.

Condition 11. Construction Noise and Vibration

(a) Project Works must aim to achieve the project noise goals for human health and well-being presented in Table 2 at a Sensitive Place.

Table 2. Noise goals (internal) for Project Works

	Monday - Saturday 6.30am - 6.30pm	Monday - Friday 6.30pm - 10.00pm (Gabba , CBD only)	Monday - Saturday 6.30pm - 6.30am Sundays, Public Holidays	For Blasting Monday - Saturday 7.30am - 4.30pm only
Continuous	AS 2107	40 dBA	35 dBA	
($LA_{eq\ adj}$) (1hr)	Maximum design level	$LA_{eq\ adj\ (1hr)}$	$LA_{eq\ adj\ (1hr)}$	
Intermittent	AS 2107	50 dBA	42 dBA	130 dB Linear Peak
($LA_{10\ adj}$) (15min)	Maximum design level + 10dBA	$LA_{10,\ adj}$	$LA_{10\ adj}$	

Notes

1. All goals are internal noise levels for human health and well-being outcomes.
2. Where internal noise levels are unable to be measured or monitored, the typical noise reductions presented in the relevant State guideline, such as the Guideline Planning for Noise Control, Ecoaccess, DEHP, January 2017 (currently under review).
3. Adjustments (adj) will be applied as outlined in the Department of Environment and Science Noise Measurement Manual Version 4 August 2013.

(b) During construction monitor and report on noise and vibration in accordance with the Noise and Vibration Management Plan, a sub-plan of the Construction Environmental Management Plan.

(c) Project Works predicted to or monitored as generating noise levels more than 20dBA ($LA_{10\ adj\ (15\ min)}$) above the relevant goal in Table 2. are authorised to occur in a locality only:

(i) when advance notification and consultation has been undertaken with Directly Affected Persons or potentially Directly Affected Persons about the particular predicted impacts and the approach to mitigation of such impacts;

(ii) where mitigation measures addressing the particular predicted or measured impacts have been developed on a 'case by case' basis in consultation with Directly Affected Persons;

(iii) where the mitigation measures are incorporated in a mitigation register and implemented prior to undertaking the Project Works;

(iv) between the hours 7:00am to 6:00pm Monday to Friday, with a respite period between 12:00noon and 2:00pm each day with the respite only applying where generating noise levels more than 20dBA $LA_{10\ adj\ (15\ min)}$ at a Sensitive Place that is occupied;

(d) The works authorised by Condition 10(d) are not subject to the requirements of Condition 11(c)(iv)

(e) Project Works must aim to achieve the construction vibration goals in Table 3.

Table 3. The construction vibration goals

Receiver type	Cosmetic Damage			Human comfort (mm/s PPV)		Sensitive building contents (mms/PPV)
	Continuous vibration (mm/s PPV)	**Transient vibration (mm/s PPV)**	**Blasting vibration (mm/s PPV)**	**Day**	**Night**	
Residential	According to BS7385 reduced by 50%[4]	According to BS7385	50[1]	According to AS2670	0.5[2]	
Commercial	According to BS7385 reduced by 50%[4]	According to BS7385	50	According to AS2670	-	0.5[3]
Heritage structures	2	-	10	-	-	

Notes:

1. All residential receivers in the vicinity of the Project blasting sites are regarded as reinforced or framed structures (i.e. BS7385)
2. Residential sleep disturbance
3. Equipment specific vibration criteria are required for highly sensitive equipment (i.e. electron microscopes, MRI systems or similar), as part of future site-specific detailed investigations
4. If resonance is present, or if investigation to detect resonance were not able to be undertaken due to a lack of access

(f) Where vibration protection criteria are available for sensitive building contents, predictive modelling must take into account the manufacturer's specifications for tolerance to vibration. To the extent reasonable and practicable, those specifications apply in lieu of the construction vibration goals in Table 3. Where predictive modelling indicates the specified criteria would not be achieved by the Project Works, such works may proceed only in accordance with specific mitigation measures agreed with the potentially Directly Affected Persons.

(g) Project Works predicted to or monitored as generating vibration levels more than 2mm/s for continuous vibration and 10mm/s for transient vibration may occur only:

(i) between the hours 7:00am to 6:00pm Monday to Friday, with a respite period between 12:00noon and 2:00pm each day with the respite only applying where generating vibration levels more than those levels nominated in Table 3 (Human Comfort) at a Sensitive Place that is occupied; or

(ii) in accordance with the mitigation measures developed in consultation with and agreed by Directly Affected Persons that are incorporated in the Mitigation Register.

Condition 12. Property Damage

(a) Prior to the commencement of Project Works, predictive modelling must be undertaken of potential ground movement that may be caused by the Project Works. Such predictive modelling must ascertain the potential for damage due to ground movement being caused to property by Project Works.

(b) Where predictive modelling indicates the Project Works would lead to impacts above the vibration goals for cosmetic damage in Table 3. the proponent must prepare and submit a property damage sub-plan, prior to the commencement of such works, as part of the Construction Environmental Management Plan. The property damage sub-plan must set out the procedure for:

(i) advance communication with potentially Directly Affected Persons;

(ii) procedures for building condition surveys both in advance of and following Project Works, including provision for consultation with property owners and occupants;

(iii) monitoring to be undertaken for potential impacts to property; and

(iv) mitigation measures.

(c) Where a post-construction building condition survey identifies that property damage has occurred as a consequence of the Project Works, such damage must be repaired as soon as practicable by the Proponent at no cost to the property owners. Such repairs must be undertaken in consultation with the property owners and occupants and must return the premises at least to the condition existing prior to commencement of Project Works. The Proponent must agree the timing, method and extent of works required with the affected landowner and must gain permission to undertake such reparation works prior to their commencement.

Condition 13. Air quality

(a) Project Works must aim to achieve the goals in Table 4.

Table 4. Air quality criteria and goals

Criterion	Air quality indicator	Goal	Averaging period
Human Health	Total Suspended Particulates (TSP)	90 µg/m^3	1 year
	Particulate matter ((PM^{10})	50 µg/m^3	24 hours
		25 µg/m^3	1 year
Nuisance	TSP	80 µg/m^3	24 hours
	Deposited dust	120 mg/m^2/day	30 days

Notes:

1. When monitored in accordance with the most recent version of AS3580.9.6 Determination of suspended particulate matter – PM10 high volume sampler with size-selective inlet – Gravimetric method. OR AS/NZS 3580.9.9: 2017 Methods for sampling and analysis of ambient air
   Determination of suspended particulate matter - PM10 low volume sampler - Gravimetric method.
2. When monitored in accordance with the most recent version of AS/NZS 3580.9.3:2003 Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method or (TSP) low volume sampler – Gravimetric method.
3. When monitored in accordance with the most recent version of AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method

(b) During construction monitor and report on air quality in accordance with the Air Quality Management Plan, a sub-plan of the Construction Environmental Management Plan.

Condition 14. Traffic and transport

(a) Project construction traffic must be managed to avoid or minimise adverse impacts on road safety and traffic flow, public transport, freight rail movements, pedestrian and cyclist safety, and property access.

(b) During construction workforce car parking must be provided and managed to avoid workforce parking on local streets.

(c) Access for emergency services to project worksites and adjoining properties must be maintained throughout the construction phase.

(d) Practicable access is maintained to adjacent properties throughout the construction phase.

(e) Heavy construction vehicles use only designated routes for spoil haulage and deliveries of major plant, equipment and materials, in accordance with the Construction Environmental Management Plan. The designated haulage routes for each worksite must follow major or arterial roads to the extent practicable and be developed in consultation with the Department of Transport and Main Roads and the Brisbane City Council in preparation of the Construction Environmental Management Plan.

(f) The Construction Traffic Management Plan must be supported by a road safety assessment for the spoil haulage route.

(g) Construction traffic must operate within the requirements of a construction traffic management sub-plan (Construction Traffic Management Plan) incorporated within the Construction Environmental Management Plan.

(h) The Construction Traffic Management Plan must include:

(i) the proposed access to worksites, with local or minor roads only used where unavoidable to access a project worksite;

(ii) a process for advance notice to Directly Affected Persons and local communities within the vicinity of the spoil haulage routes and worksite accesses;

(iii) local traffic management measures developed in consultation with Brisbane City Council for key intersections:

(A) in Bowen Hills including Bowen Bridge Road, College Road and O'Connell Terrace;

(B) in the CBD including Albert Street, Charlotte Street, Elizabeth Street and Roma Street;

(C) at Woolloongabba including Leopard Street, Stanley Street, Vulture Street and Main Street;

(D) at Dutton Park including Annerley Road, Peter Doherty Street, Joe Baker Street and Boggo Road, as well as Kent Street, Cornwall Street and Ipswich Road;

(E) in the area of the Fairfield to Salisbury stations and Clapham Yard works.

(iv) specific traffic management measures developed in consultation with other key stakeholders, including:

(A) the department administering the *Economic Development Act 2012* with regards traffic management in the Queens Wharf Brisbane priority development area;

(B) Queensland Rail about maintaining access to railway stations; and

(C) the department administering the *Transport Infrastructure Act 1994* and the Brisbane City Council about maintaining operations for bus services along streets affected by the Project Works.

(v) Project Works must be designed, planned and implemented to maintain acceptable footpath and cycle paths in areas adjacent to project worksites in terms of capacity, legibility and pavement condition. The proponent must consult with the Brisbane City Council and Queensland Rail about changes in pedestrian and cycle paths required to facilitate Project Works.

Condition 15. Water quality

(a) Discharge of groundwater from Project Works must comply with:

(i) the Brisbane River Estuary environmental values and water quality objectives (Basin no. 143 - mid-estuary) in the Environmental Protection (Water) Policy 2009;

(ii) in the vicinity of Moolabin Creek, Yeerongpilly - Oxley Creek - Lowland freshwater environmental values and water quality objectives (Basin no. 143 (part) - including all tributaries of the creek) in the Environmental Protection (Water) Policy 2009.

Note that surface water runoff and dewatering activities from sediment basins and surface excavations associated with surface construction works is managed in accordance with Imposed Condition 18.

(b) During construction monitor and report on water quality in accordance with the Water Quality Management Plan, a sub-plan of the Construction Environmental Management Plan.

Condition 16. Water resources

(a) Prior to the commencement of Project Works involving excavation, the Proponent must undertake predictive modelling of the potential for groundwater drawdown. The predictive modelling must be based on validated monitoring data and must address the likely extent of any drawdown over time, up to the time when such movement reaches equilibrium.

(b) Project Works must be designed, planned and implemented to avoid where practicable and otherwise minimise the inflow of groundwater to the Project Works, including excavations, the underground stations and tunnels, having regard for the predictive modelling.

(c) The Proponent must monitor the inflow of groundwater to the Project Works and compare monitoring data with the predictive modelling. If the rate of groundwater inflow rate exceeds 1L/sec in any worksite, the proponent must revise work methods and devise and implement mitigation measures as soon as practicable.

Condition 17. Surface water

(a) For underground tunnels and stations - Project Works, and worksites, must be designed and implemented to avoid inundation from stormwater due to a 2 year (6hr) ARI rainfall event and flood waters due to a 5 year ARI rainfall event.

(b) A Flood Management Plan that applies to all worksites affected by tributary or creek flooding (in a 5 year ARI flood event and stormwater during a 2 year ARI rainfall event) must be endorsed by the independent Environmental Monitor prior to the commencement of Relevant Project Work. A Flood Management Plan is not relevant to flooding of the Brisbane River (main channel).

(c) The Flood Management Plan must include, as a minimum:

(i) general description of the Relevant Project Works

(ii) flood assessment

(iii) specific flood management measures, including:

(A) appropriate storage of materials and equipment

(B) early warning indicators

(C) risk management for predicted rainfall events

(D) risk management for predicted tidal flooding events for works in the tidal zone

(E) risk management for unpredicted flood events

(iv) Tidal works management for works in the tidal zone, including:

(A) barge and marine equipment details

(B) barge mooring plan

(C) vessel traffic management plan

(D) marking of navigational hazards.

(d) Project works must be designed and implemented to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.

Condition 18. Erosion and sediment control

(a) An erosion and sediment control sub-plan that is consistent with the Guidelines for Best Practice Erosion and Sediment Control (International Erosion Control Association, 2008) and the Department of Transport and Main Roads' Technical Standard MRTS52 – Erosion and Sediment Control must be submitted as part of the Construction Environmental Management Plan.

Condition 19. Acid sulphate soils

(a) Acid sulphate soils must be managed in accordance with the methods and requirements of the latest edition of the *Queensland Acid Sulphate Soil Technical Manual*.

Condition 20. Landscape and open space

(a) Project Works are designed and implemented to minimise impacts on landscape and open space values.

(b) Project works and worksites in Victoria Park must be designed, planned and implemented to avoid, or minimise the loss of trees and ornamental plantings, and must minimise the area of the park directly impacted during such works.

(c) Worksites in Victoria Park must be enclosed with a visually solid screen and any night lighting including security lighting must be situated to minimise the spill of light beyond the worksite enclosures.

(d) Existing pathways and recreational facilities in Victoria Park must be relocated within the park for the duration of the works, in consultation with the Brisbane City Council. Upon completion of the project works, such pathways and facilities must be re-established in locations in the park in consultation with the Brisbane City Council.

Condition 21. Worksite rehabilitation

(a) Worksites for project infrastructure, such as the surface connections, stations and ancillary buildings must be rehabilitated as soon as practicable upon completion of the works.

(b) All other worksites required to support commissioning activities must be rehabilitated as soon as practicable on completion of commissioning or sooner where possible.

(c) Rehabilitation must address soil erosion and sedimentation, dust nuisance and landscape and visual impact.

(d) Any planting, landscaping and streetscape works undertaken as part of rehabilitation must be undertaken in accordance with landscape and urban design plans prepared in consultation with the Brisbane City Council.

Part D. Imposed Conditions (Commissioning)

Condition 22. Environmental design requirements

(a) The Proponent must conduct such testing and monitoring as is necessary to demonstrate that the Environmental Design Requirements in Schedule 1 have been satisfied.

(b) At the completion of Commissioning, the Proponent must give written notice to the Coordinator-General that the Project has achieved the Environmental Design Requirements in Schedule 1.

Condition 23. Commissioning

(a) Commissioning may be carried out in stages.

(b) Testing for commissioning must be supported by advanced notice to local residents and businesses.

(c) Testing for commissioning must not cause an exceedance of the goals in Table 2, Table 3, Table 4 or Condition 15.

Schedule 12. Environmental Design Requirements

1. Traffic and transport

(a) Emergency access and evacuation for each station and the tunnel is designed in consultation with the Emergency Service Authorities.

(b) Station plazas and forecourts are of a sufficient size and dimension to avoid peak pedestrian flows spilling onto adjacent carriageways. Where the overflow of pedestrians onto carriageways cannot be avoided, local traffic management measures addressing such circumstances must be designed and implemented prior to the commencement of Project operations.

(c) Pedestrian and cycle pathways in the vicinity of stations are designed in accordance with Rail Infrastructure Manager's and TMR's requirements.

(d) The design of driveways and roadworks for the Project avoid conflicts between construction traffic and cyclists and pedestrians.

(e) New footpaths, pedestrian walkways and pedestrian road crossings in the vicinity of stations are designed, in consultation with BCC and emergency services authorities, to allow safe and efficient pedestrian movement during peak periods and, where applicable, major events at the Brisbane Cricket Ground (Woolloongabba station), Lang Park (Roma Street station) and the RNA Showgrounds (Exhibition station).

(f) The Project design provides for pedestrian connectivity between the PA Hospital, Boggo Road Busway station and Park Road Railway station, and incorporates appropriate crime prevention through environmental design (CPTED) principles and Disability Discrimination Act 1992 (DDA) compliant vertical transport facilities.

2. Air Quality

(a) Ventilation outlets from underground stations are designed and sited so as not to cause an increase in air temperature of more than one degree Celsius, measured as an hourly average, or concentrations of ambient air contaminants that exceed air quality objectives.

(b) The Project is designed so that it does not cause the air quality objectives specified in Table 5 to be exceeded.

(c) The ventilation outlets are designed to avoid discharging directly into an air intake for any other ventilation or air conditioning system that is in place at the time of detailed design and construction of the relevant ventilation outlet.

Table 5. Ambient air quality outcomes

Pollutant	Air Quality Objective	Average Period
Total Suspended Particulates (TSP)	90 µg/m^3	Annual
Particulates as PM10 (<10 µm)	50 µg/m^3	24 hours
	25 µg/m^3	Annual

3. Noise and Vibration

(a) Where practicable, the Project is designed to achieve the following noise criteria for railway surface track airborne noise emissions:

(i) 65 dBA, evaluated as the 24 hour average equivalent continuous A-weighted sound pressure level;

(ii) 87 dBA, evaluated as a Single Event Maximum sound pressure level.

Note: The Single Event Maximum (SEM) Sound Level will be calculated as follows:

- If the number of single events due to train passing is larger than 15 over a 24-hour period, use the arithmetic average of the maximum levels for the highest 15 events.
- If the number of single events due to train passing is equal to or less than 15 over a 24-hour period, use the arithmetic average of the maximum levels for all the train events (e.g. if a total of 13 passes occur over a 24-hour period, use the arithmetic average of all 13 movements).
- Noise modelling or monitoring activities aimed at assessing performance against the Planning Levels must be undertaken 1 metre from the most exposed façade of an affected building an 0.5 metres below the eave height.

(b) Where practicable, the Project is designed to achieve the goals for ground-borne noise provided in Table 6 and for vibration provided in Table 7.

(c) Ventilation systems, mechanical plant, and electricity feeder stations at or near stations are designed and sited to operate within the noise goals outlined in Table 8.

Table 6. Ground-borne noise design criteria (rail operations) – tunnels and underground station

Receiver	Time of day	Internal noise design criteria (dBA)
Residential	07:00-22:00	40dBA
	22:00-07:00	35dBA
Schools, educational institutions, places of worship	When in use	40dBA to 45dBA
Retail areas	When in use	50dBA to 55dBA
General office areas	When in use	45dBA
Private offices and conference rooms	When in use	40dBA
Theatres	When in use	35dBA

Table 7. Ground-borne vibration design criteria (rail operations)

Receiver type	Period	Vibration goal (vibration velocity)
Residential	Day/night	106dBV (0.2 mm/s)
Commercial and community facilities (including schools and places of worship)	When in use	112dBV (0.4 mm/s)
Industrial	When in use	118dBV (0.8 mm/s)
Sensitive equipment within medical or research facilities	When in use	82dBV (0.013 mm/s)

Table 8. Mechanical plant noise goals (operations)

Receiver type	Time of day	Background (b/g) noise creep dBA LA_{90} (1 hour)	Acoustic quality objectives dBA LA_{eq} (1 hour)
Residential (for outdoors)	07:00 - 22:00	b/g + 0	-
	22:00 - 07:00	b/g + 0	50
Residential (for outdoors)	7:00 - 22:00	-	35
	22:00 - 07:00	-	30
Library and educational institution (for indoors)	When in use	-	35
Commercial and retail activity (for indoors)	When in use	-	45

4. Settlement

(a) Detailed design of the alignment and underground stations will be informed by a detailed ground settlement analysis, based on hydrogeological and geological modelling

(b) The settlement analysis will indicate the predicted horizontal and vertical extent of ground settlement for the Project Works and the time period over which such ground settlement would occur.

5. Hydrology

(a) A hydrogeological model will be developed during detailed design and before construction of relevant sections to determine ground conditions along the tunnel section.

(b) Further borehole investigations, groundwater monitoring and permeability testing at the station locations and along the tunnel alignment to identify and characterise any major transmissive features and better constrain the local hydrogeological model for detailed design.

(c) Review available bore construction records and target aquifers to determine the suitability of monitoring bores installed during the geotechnical investigations for ongoing groundwater monitoring for construction and commissioning. Following this review, additional bores may be proposed to address gaps identified in the groundwater monitoring network.

(d) Identify through surveys and consultation, water bores in the area potentially affected by groundwater drawdown and implement measures to mitigate potential effects on identified bores.

(e) In the event a new ‘groundwater feature’ (e.g. areas of high groundwater flow/ yield) is identified along the Project alignment, further detailed groundwater monitoring would be undertaken to characterise the feature and identify potential impacts to the environment. Additional management measures would be developed, where required.

(f) Develop and implement design measures and construction methods to minimise groundwater inflows in to the construction area.

(g) The Project design provides for the capture of groundwater seepage, should it enter the underground structures, and the subsequent treatment of such groundwater prior to its release to an approved discharge point.

(h) Where the project design anticipates groundwater entering underground structures, the design provides:

  (i) measures to minimise settlement due to project-induced drawdown;

  (ii) measures to ensure structural integrity and Project operational safety; and

  (iii) measures to minimise the risk of exposing acid sulphate soils to air or the chance for oxidation.

(i) The Project design achieves the water quality objectives stated for the Brisbane River Estuary environmental values and water quality objectives (Basin No. 143 mid-estuary) referred to in the Environmental Protection (Water) Policy 2009 for water, including groundwater, released from the tunnels and underground stations to surface waters.

(j) The project design achieves no increase in pollutant loads for water, including groundwater, released from the surface works to surface waters.

(k) The Project design is based on current flooding information to achieve flood immunity to the tunnel infrastructure and underground stations in a 1 in 10,000 year annual exceedance probability (AEP) regional flood event, and a 1 in 100 AEP overland flow event.

(l) The Project design will not cause property damage from flood impacts to third parties for events up to and including the 1 in 100 AEP flood event.

(m) Project Works in Mayne Rail Yard must be designed on the basis of detailed flood modelling.

6. Cultural Heritage

(a) The Project design reflects and minimises the impact on the cultural and historical significance of places where surface works occur, and where reasonable and practicable, avoids or minimises the direct impact on heritage values of such places.

(b) The Project design acknowledges a locality's historical significance or cultural significance to Aboriginal people through input to:

  (i) place naming;

  (ii) interpretative signage and other landmarks; and

  (iii) the themes for public art.

(c) In developing the Project design, the Proponent would provide opportunities for architectural design sympathetic to the cultural heritage landscape and streetscape.

7. Climate change and sustainability

(a) Project ventilation systems are designed to minimise energy consumption while achieving acceptable passenger comfort and air quality outcomes in both the ambient environment and the Project stations and tunnel system.

(b) The Project is designed to be adaptable to conditions that may arise as a result of climate change, including accommodating the predicted 1.0 m sea level rise scenario in 2100 (upper range).

(c) Sustainability initiatives, particularly in relation to energy consumptions and savings throughout the Project lifecycle are incorporated in detailed design and tracked via a Sustainability Tool (e.g. ISCA's rating tool) through to Project implementation.

(d) In design and construction, devise and implement a process for optimising energy efficiency in construction planning and delivery (e.g. component sourcing and transportation, spoil and materials handling – no double handling, programing to avoid re-work or redundant work).

(e) In operations, energy efficient design that meets the performance criteria of all Project plant and equipment would be included in the design specification.

8. Land use and tenure

(a) Minimise the 'footprint' of the Project during both construction and operations to reduce impacts on existing land uses through design refinement.

(b) The Project design seeks to optimise land use and transport integration with:

(i) PA Hospital, Boggo Road Busway station, Park Road Railway station and Boggo Road Urban Village;

(ii) Woolloongabba Priority Development Area (PDA);

(iii) Albert Street;

(iv) Roma Street; and

(v) Bowen Hills PDA.

(c) The Project is to be designed in consultation with:

(i) Rail Infrastructure Manager in relation to use of Railway land required for project worksites; and

(ii) Proponents for urban development projects at Boggo Road Urban Village, Woolloongabba PDA, Albert Street and Roma Street redevelopment and Royal National Agricultural and Industrial Association of Queensland (RNA) redevelopment.

(d) The Project design minimises the loss of public open space in Victoria Park during construction.

9. Visual amenity and lighting

(a) The Project design seeks to minimise the visual impact of the above-ground infrastructure with regards to its scale, height and bulk. Specific urban design and visual impact studies are required to inform detailed design for:

(i) the station ventilation outlets and intake structures;

(ii) the above-ground electricity feeder stations;

(iii) the portals and transition structures; and

(iv) noise barriers and other impact mitigation devices or structures.

(b) Where required, noise barriers are designed to reduce the visual impacts to surrounding properties and roadways by:

(i) incorporating urban design treatments and landscape elements such as massed plantings;

(ii) using clear or transparent materials to maintain existing expansive views beyond the rail corridor, subject to security and maintenance considerations being evaluated; and

(iii) avoiding the use of highly reflective materials and materials that support graffiti.

(c) Landscaping, urban design and public art treatments sympathetic to heritage landscape and streetscape values are incorporated into the design of Project Works at stations and thoroughfares accessing stations.

10. Social environment

(a) The design of stations and public spaces developed as part of the Project stations incorporate CPTED principles to maximise commuter safety.

11. Waste

(a) The Project is designed to minimise waste generation and maximise the reuse and recycling of waste materials generated by the Project during its construction and operation.

(b) Opportunities are investigated during the detailed design phase for the use of recycled materials, including for Project infrastructure produced from concrete, road base, asphalt and other construction materials.

(c) During detailed design, the feasibility of re-using material excavated from the Project is investigated.

Schedule 23. Nominated entities with jurisdiction for conditions

Table A1 lists the organisations/agencies responsible for each of the Coordinator-General's Imposed Conditions (Appendix 1).

Table A1. Entities with jurisdiction for Coordinator-General Imposed Conditions

Part	Approval	Condition no.	Entity with jurisdiction
A	General conditions	1	Coordinator-General
A	Outline Environmental Management Plan	2	Coordinator-General
B	Design	3	Chief Executive, TMR
C	Construction Environmental Management Plan	4	Chief Executive, TMR
C	Compliance	5	Chief Executive, TMR
C	Reporting	6	Chief Executive, TMR
C	Environmental Monitor	7	Coordinator-General
C	Community Relations Monitor	8	Coordinator-General
C	Community engagement plan	9	Chief Executive, TMR
C	Hours of work	10	Chief Executive, TMR
C	Construction Noise and Vibration	11	Chief Executive, TMR
C	Property Damage	12	Chief Executive, TMR
C	Air Quality	13	Chief Executive, TMR
C	Traffic and Transport	14	Chief Executive, TMR
C	Water quality	15	Chief Executive, TMR
C	Water resources	16	Chief Executive, TMR
C	Surface water	17	Chief Executive, TMR
C	Erosion and sediment control	18	Chief Executive, TMR
C	Acid sulphate soils	19	Chief Executive, TMR
C	Landscape and open space	20	Chief Executive, TMR
C	Worksite rehabilitation	21	Chief Executive, TMR
D	Environmental design requirements	22	Chief Executive, TMR
D	Commissioning	23	Chief Executive, TMR

Schedule 34. Definitions

Directly Affected Persons means an entity being either the owner or occupant of premises for which predictive modelling or monitoring indicates the project impacts would be above the performance criteria in the Imposed Conditions.

Construction Environmental Management Plan means the Construction Environmental Management Plan referred to in Condition 4.

Outline EMP means the Outline EMP approved by the Coordinator-General in Condition 2.

Managed Work means Project Work for which either the predicted or monitored impacts meet the performance criteria at a Sensitive Place.

Non-Compliance Event means Project Works that do not comply with the Imposed Conditions

Predictive Modelling means the use of appropriate analytical scenario testing, whether or not by numerical measurements, undertaken prior to the commencement of Project Works.

Project Work means any works, including early works, demolition works or site preparation works, for construction of the project. Project Work does not include:

- any works associated with the demolition of buildings and structures on State owned land;
- works involving the relocation or replacement of public utilities when undertaken by a public utility authority or provider;
- the placement and management of spoil at spoil placement locations
- works associated with the temporary Roma Street Coach Terminal.

Sensitive Place means:

- a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel)
- a library, childcare centre, kindergarten, school, university or other educational institution
- a medical centre, surgery or hospital
- a protected area
- a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment
- a work place used as an office or for business or commercial purposes, which is not part of the project activity(ies) and does not include employees accommodation or public roads.