CROSSRIVERRAIL
Delivery Authority

Environmental Impact Statement

Request for Project Change

Roma Street Coach Terminal Relocation
and
Amendments to Imposed Conditions of June 2017

June 2018

Table of Contents

1. Introduction 5
1.1 Purpose 5
1.2 Proponent 5
1.3 Process for Evaluation of Project Changes 5
1.4 Scope of Project Change 6
2. CRR Project as currently evaluated 8
3. Temporary Coach Terminal 9
3.1 Location 9
3.2 Current Site Use 10
3.3 Options Development 13
3.4 Temporary Coach Terminal Design 15
3.5 Construction 22
3.5.1 Parkland Crescent Coach Terminal 22
3.5.2 Parkland Boulevard Passenger Drop-Off / Pick-Up 22
3.5.3 Construction Methodology 23
3.6 Operations 23
3.7 Delivery Program 24
3.8 Reasons for the proposed change 24
3.8.1 Meets Current Coach Terminal Operation Needs 24
3.8.2 Incorporation of Coach Operator Design Requirements 25
3.8.3 Market Demand 27
4. Changes to the CRR Project 28
4.1 Changes to the CRR Project Design 28
4.2 Changes to the CRR Project Delivery 28
4.3 Detailed Land and Environmental Assessment 32
4.3.1 Land Use and Tenure 34
4.3.2 Air Quality 34
4.3.3 Noise and Vibration 35
4.3.4 Traffic Impact 41
4.3.5 Visual Amenity and Lighting 43
4.3.6 Possible Cumulative Effects 44
5. Delivery Strategy 45
5.1 Approvals Pathway 45
5.2 Impact Management 45
5.3 Public and Stakeholder Consultation 47
5.3.1 Stakeholders 47

5.3.2 Stakeholder Matrix 48
5.3.3 Consultation Program 50
5.3.4 Key Stakeholder Consultation Outcomes 52
5.3.5 Public Consultation 53
6. Volume 3 Design Drawings 54
7. Amendments to 2017 Imposed Conditions 55
8. Conclusion 57
9. References 58
APPENDIX A – Air Quality Technical Note 59
APPENDIX B – Noise Technical Note 60
APPENDIX C – Traffic Technical Note 61
APPENDIX D – Visual Amenity and Lighting Technical Note 62
APPENDIX E – Targeted Consultation Report 63
APPENDIX F – Volume 3 Design Drawing 64

Executive Summary

It is a requirement under the 2017 Coordinator-General Change Report that the Roma Street Coach Terminal is relocated in consultation with coach operators, prior to demolition of the Brisbane Transit Centre (BTC) west tower. The demolition of the BTC is critical for the Cross River Rail Project (the Project), therefore a Request for Project Change (RfPC) is being submitted to facilitate relocation of the coach terminal prior to commencing Project Works.

A temporary solution is proposed for the relocation of the Roma Street Coach Terminal to a site adjacent to Platform 10 of Roma Street Railway Station on Parkland Crescent (Proposed Site). This site is within the Roma Street North Worksite, which is currently part of the Project that has been evaluated by the Coordinator-General. The temporary solution comprises a ground level terminal with five coach bays, two mini bus bays, an on-platform ticketing kiosk and amenities. The works also include the provision of a passenger drop-off and pick-up at Parkland Boulevard which is linked to the coach terminal by existing vertical passenger (escalator) access way. The construction is planned to occur over an approximate 38-week period with the coach terminal having a design life of 10 years. This will allow for a permanent solution to be developed as part of broader Roma Street precinct planning.

The proposed design provides adequate capacity to meet the current coach terminal demand. Coach operator requirements have been considered through a series of consultation sessions with key operators at the terminal. The preferred design has been refined to respond to these coach operator requirements.

The Cross River Rail Delivery Authority (the Delivery Authority) has commissioned a number of technical assessments be undertaken to assess the key potential impact areas. These technical reviews are presented for consideration in this RfPC. Air quality technical assessments undertaken determined that the predicted air quality impacts expected during both construction and operation of the temporary coach terminal are less than those presented in the 2011 EIS or 2017 RfPC. The proposed solution is also unlikely to result in exceedances of the Project's air quality goals. Noise technical assessments undertaken determined that the maximum noise levels from the operation of the coach terminal are unlikely to materially alter the existing noise environment, and construction noise expected from construction of the temporary coach terminal will be no worse than the noise that would have been generated from the construction works previously evaluated under the 2017 RfPC. Visual amenity assessment has determined that the proposed development will not adversely impact on the adjacent residences beyond the short construction period of 38 weeks. Construction lighting can be appropriately managed and incorporated into the design to minimise any impacts. Visual impact experienced during the operational phase will be less than that which would have been experienced under the previously evaluated 2017 RfPCs five-year construction period. While there will be minor traffic impacts, these have been managed through the design process and appropriate mitigation measures developed in consultation with the relevant stakeholders. The duration of construction-related impacts has been reduced from five years to approximately 38 weeks. The operational impacts of the temporary coach terminal are consistent with that of the general area, which currently supports existing large-scale transport infrastructure operations.

The Delivery Authority has developed a solution which would facilitate delivery of the Project, whilst ensuring the environmental outcomes are achieved. The solution proposed is on State land, provides a better user experience, and is an appropriate use of the area given its surrounds. It has undergone detailed design workshops to ensure services are maintained and coach operator requirements are accommodated.

1. Introduction

The Cross River Rail (CRR) Project was declared a significant project (now a coordinated project) for which an Environmental Impact Statement (EIS) was required. The EIS relating to the CRR Project was evaluated by the Coordinator-General (CG) in a report dated 20 December 2012. The Coordinator-General Evaluation Report (CGER) recommended that the Project could proceed, subject to conditions for the minimisation and management of the environmental impacts of the Project in its delivery and implementation.

A Request for Project Change (RfPC) was made on the 5 December 2016. This RfPC was evaluated by the CG in a Coordinator-General Change Report (CGCR) on 9 June 2017. As part of this RfPC, it was identified that the Roma Street Coach Terminal would need to be relocated from the Brisbane Transit Centre (BTC) west tower to allow for the demolition of the BTC west tower for the CRR Project. A proposed temporary solution for the relocation has been developed in consultation with key stakeholders including the coach operators. This relocation is required to be progressed early in the works program to allow for demolition of the BTC to facilitate construction of the broader CRR Project.

1.1 Purpose

The purpose of this RfPC is to request the CG to assess a change to the Project, and changes to Imposed Conditions of the Project, in accordance with Part 4, Division 3A of the *State Development and Public Works Organisation Act 1971* Qld (SDPWO Act).

This report:

- Describes the proposed Project change, being the temporary coach terminal relocation design and works;
- states reasons for the change;
- includes relevant information about the proposed change and its effects on the Project, to allow the CG to make the evaluation, including:
    - the assessment of the environmental impact of the changes to the Project, and
    - proposed mitigation measures to inform the CG decision process for this RfPC application;
- Updates current Project documentation, including Volume 3 Design Drawings, to ensure the latest information and nominated scope for the temporary coach terminal is captured; and
- Proposes amendments to the existing Imposed Conditions (including definitions) to facilitate delivery of the CRR Project, while also achieving the required environmental outcomes and performance criteria.

1.2 Proponent

The Cross River Rail Delivery Authority (the Delivery Authority) is the proponent for the Project. The Delivery Authority was established by the *Cross River Rail Delivery Authority Act 2017* Qld.

1.3 Process for Evaluation of Project Changes

The process by which the changes to the Project are to be addressed are established in Part 4, Division 3A of the SDPWO Act. The temporary coach terminal relocation triggers the requirement for the Proponent to request that the CG assess:

- changes to the Project; and

- changes to the Imposed Conditions of the Project.

Depending on the nature of the change, the CG may require the Project Proponent to publicly notify the proposed change, and its effects on the Project, in a way decided by the CG.

In evaluating the proposed change to the Project, the CG must consider:

- nature of the proposed change and its effect on the Project;
- environmental impacts of the proposed change, if any;
- any properly made submissions on the application for Project Change; and
- any other material deemed relevant by the CG.

The CG must prepare a change report that makes the evaluation. The change report may state conditions or make recommendations, including amendments to Imposed Conditions or recommendations set down in the CGER or CGCR.

The CGCR is given to the proponent, and must be publicly notified.

1.4 Scope of Project Change

This RfPC relates to the proposed location for the Temporary Coach Terminal at the Roma Street North Worksite, adjacent to Platform 10 as shown in **Figure 1**. It also includes requested changes to the Project's Imposed Conditions, including definitions, as currently nominated in the CGCR. No changes are proposed to other components of the Project as part of this RfPC.

The relocation of the current Roma Street Coach Terminal and subsequent demolition of the BTC west tower is required to enable construction of the CRR Roma Street Station. The proposed demolition and excavations are currently expected to occur in early 2020. At the time of the 2017 RfPC, an alternative location for the coach terminal was not known. Since the CGCR, a suitable relocation site has been determined within the Project's approved Roma Street North Worksite.

Under the current Project, as evaluated, the Roma Street North Worksite is to be used for five years during the Project's construction phase for construction laydown, vehicle and plant movement, maintenance and other construction-related activities and uses. The proposed temporary coach terminal will have a significantly shorter construction period of approximately 38 weeks. Along with the shorter construction program, the design of the temporary coach terminal has been completed in a manner to minimise further impacts to the surrounding residents and environment from those which were approved under the 2011 EIS and 2017 CGER. To quantify these impacts, further technical assessments have been completed to assess key potential impact areas including noise, air quality, traffic and visual amenity.

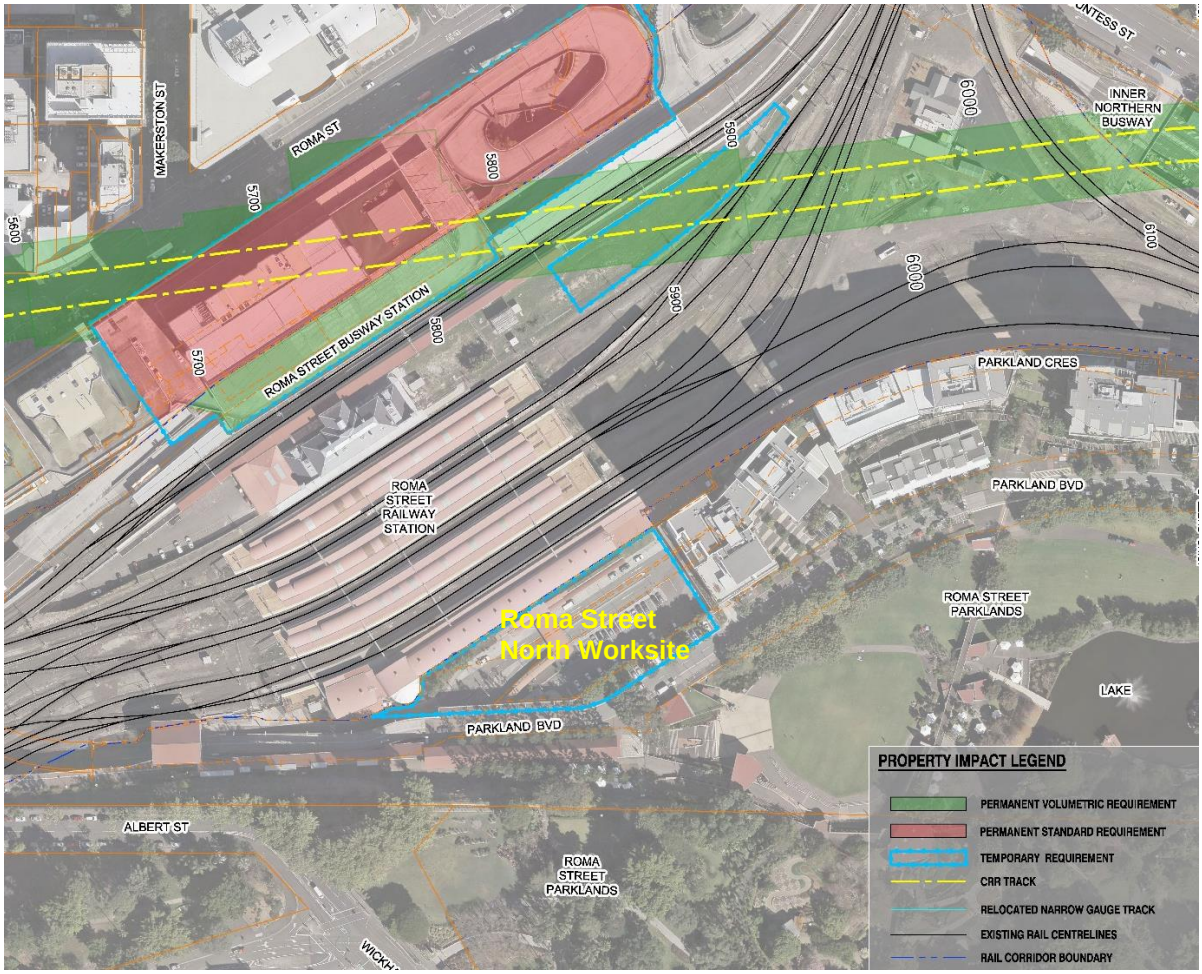

Figure 1 Roma North Worksite area

This RfPC provides relevant information about the proposed change and its effects on the Project to allow the CG to make the evaluation. This RfPC:

- demonstrates that there has been consultation with the coach operators as part of the design;
- demonstrates that there is no significant increase to the impacts approved under the 2017 CGCR; and
- makes recommendations for mitigation measures that are proportionate to potential impacts.

2. CRR Project as currently evaluated

The CRR Project is the Project as currently evaluated through both the CGER and the CGCR. A complete description of the CRR Reference Project is provided in the EIS (Volume 1, Part A, Chapter 4) dated July 2011, and the EIS RfPC dated February 2017, including an amended Volume 3 Design Drawings publicly notified in April 2017.

The 2017 CRR Project had the Roma Street North Worksite, the proposed temporary coach terminal site location, assessed as a general construction site area which would accommodate the storage and handling of construction materials for a construction period of five years. A summary of the CRR Project work at this worksite as evaluated under the CGCR is outlined in **Table 1**.

Table 1: CRR Project construction activities at Roma Street North Worksite (CGCR June 2017)

Aspect	Construction Activities / Approved Design
Parking	- Loss of use of parking within the worksite footprint for five years during construction.
Impacts to Parkland Crescent	- Occupation of the westbound lane of Parkland Crescent, between the long-distance train platform and the Parkland Boulevard intersection utilising the eastbound lane in a contraflow traffic arrangement.
Pedestrian and Cycle Access	- Closure of the pedestrian footpath on the southern side of Parkland Crescent, with a pedestrian detour provided. - Cyclist detours put in place due to the closure of the westbound lane. - Multiple footpath changes approved for the duration of the construction phase (five years).
Traffic Generation	- Spoil haulage from the three construction worksites at Roma Street Station will use Roma Street and Parklands Boulevard for truck access. Only construction worker access to the Roma Street sites permitted via Parklands Crescent. - Minor movement of equipment between the construction worksites, site office and workshop via Parkland Crescent. - Heavy vehicle movements from this worksite would peak at about six trucks per hour at peak during demolition and site establishment. - The traffic impacts on the surrounding road network would be minor.
Surrounding Road Network Changes	- Removal of the existing Parkland Boulevard roundabout, 50 metres north of the Roma Street intersection to prevent u-turns, for vehicles over 4.5 metres in height from entering Parklands Boulevard from Roma Street and for all traffic travelling south along Parklands Boulevard to turn left into Parkland Crescent as the geometry on the intersection does not permit that direct turn.
Workforce and Hours of operation	- At the peak of construction, an estimated 137 workers would be on site at any one time. - Monday to Saturday, 6:30am – 6:30pm - Extended work hours, 6:30pm – 10:00pm - Spoil haulage and material equipment delivery, Monday to Friday, 6:30am – 7:30am, 9:00am – 4:30pm, 6:30pm – 10:00pm. Saturday, 6:30am – 6:30pm.

Under the 2011 EIS, the area adjacent to the Roma Street North Worksite was proposed as a construction worksite for the construction of the northern plant shaft and a building for the relocation of the Roma Street Station toilet facilities.

3. Temporary Coach Terminal

3.1 Location

It is proposed to temporarily relocate the Roma Street Coach Terminal to Parkland Crescent adjacent to Platform 10 of Roma Street Railway Station. This area is currently approved as a worksite (laydown and storage) under the CGCR. The site is a small portion of the larger freehold lot described as Lot 60 on SP207215, refer **Figure 2**.

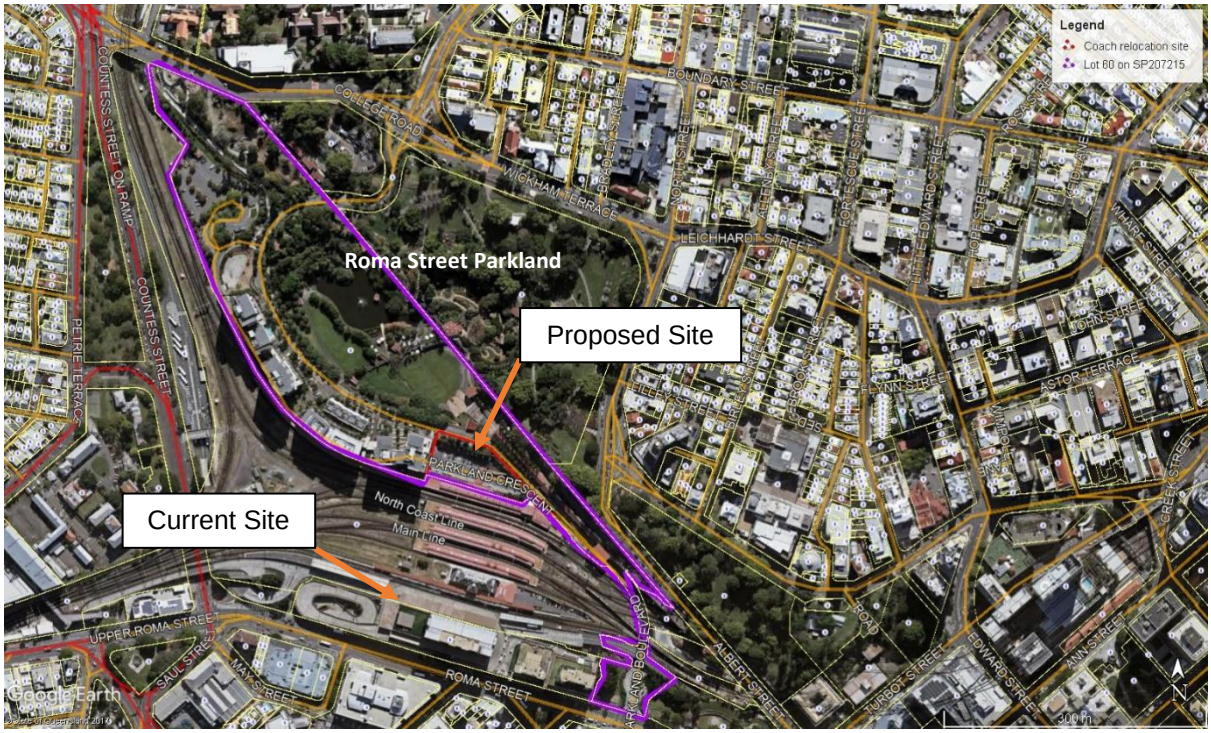

Figure 2: Coach terminal relocation site

The site is also subject to a number of rights and interests which are listed in **Table 2** and shown in **Figure 3 and 4** (Title Reference 50777133).

Table 2: Property tenure and interests

Right/Interest	Tenure	Use
Freehold – Estate in Fee Simple	Lot 60 on SP207215	Roma Street Parklands (Part)
Freehold – Estate in Fee Simple	Lot 44 on SP152171 (Volumetric)	Access roadway through Roma Street Parklands known as 'Parklands Boulevard' and 'Parklands Crescent'
Easement No. 706224195	EMTs BA, BB, BC and BD on SP152188 (Volumetric)	Access, drainage, encroachment and services easement in favour of Queensland Rail
Easement No. 706224199	EMT BE on SP152188 (Volumetric)	Access easement in favour of Queensland Rail
Easement No. 706035654	Lot 44 on SP152171 (Whole)	Access along roadway constructed within Lot 44 on SP152171 in favour of adjoining landowners including Queensland Rail, residential Body Corporate schemes at 'Parklands Boulevard CTS', Queensland Rail and DHPW

Figure 3: Volumetric interests over site

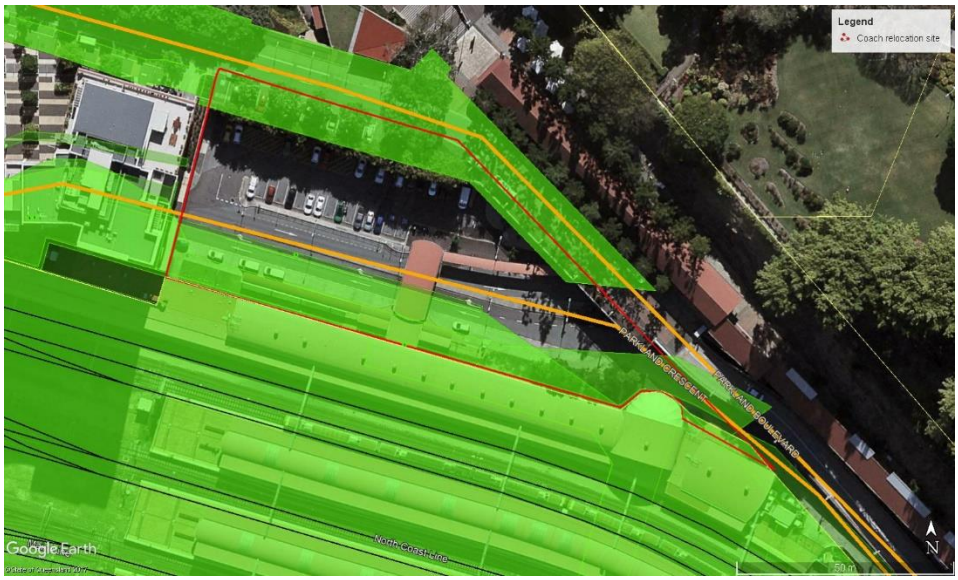

Figure 4: Easement interests over the site

3.2 Current Site Use

Parkland Crescent

The site is currently being used as passenger drop-off and pick-up area, Brisbane City Council (BCC) leased car parking and occasionally for buses for rail replacement services. It is also used as thoroughfare for traffic along Parkland Crescent, which is located within an easement on the freehold lot. The site is entirely sealed and developed, refer **Figure 5 to 7**.

Figure 5: Parkland Crescent looking east to site exit

Figure 6: Parkland Crescent looking west toward residential apartments

Figure 7: Pedestrian access to Platform 10 (looking north and south)

The site is surrounded by Roma Street Parklands to the north and east, a residential complex to the west along Parkland Boulevard and railway yard/station operations to the south. Below the residential complex is an entrance to a commercial carpark operated by Cornerstone Parking. This public carpark is located underneath the Roma Street Parklands with lift access on either end of the carpark out onto

Parkland Boulevard. The carpark is open 24 hours, seven days a week and is unattended but remotely monitored.

Parkland Boulevard

Parkland Boulevard is a popular route for cyclists and is identified as a priority cycle route on the South-East Queensland Principal Cycle Network Plan (SEQPCNP) (TMR, 2007). The area proposed for the passenger pick-up and drop-off is a current carriageway shared zone with a low speed environment, refer, **Figure 8 and 9**.

Figure 8: Parkland Boulevard Shared Zone

Figure 9: Parkland Boulevard end of Shared Zone

There is a small café and a vertical transport (escalators) which connects the area to Parkland Crescent, refer **Figure 10**.

Figure 10: Vertical passenger transport from Parkland Crescent to Parkland Boulevard

Further along Parkland Crescent are a number of public carparking spaces to the south, situated above the top of the existing retaining wall. To the northern side is a bus zone with a sheltered picnic area, as shown in **Figure 11**.

Figure 11: Parkland Boulevard Car Parking

3.3 Options Development

The proposed location of the temporary coach terminal is based on a number of factors, including:

- Access to the future CRR Station and Roma Street Railway Station;
- Access to major arterial roads, for material haulage (construction) and coach journeys (operation);
- minimising property impacts, including use of sites already required for permanent works; and
- Minimising potential impacts on neighbouring properties, residents and stakeholders.

A number of locations for the Roma Street Coach Terminal relocation were examined, however with future redevelopment of the Roma Street precinct, it is considered appropriate that the master planning process should be completed before a permanent solution is determined. The design life proposed for the temporary solution is consequently for up to a 10-year period.

Several concept design options were considered during the project development. Each option was reviewed against key criteria which included:

- Operational capacity;
- Operational performance;
- Positive community impacts;
- Safety;
- Customer experience;
- Program risk;
- Capital costs;
- Environmental impacts; and
- Key stakeholder impacts.

Preferred option

The preferred option has the temporary coach terminal located on ground level, with a lounge at Boulevarde Level over the coach bays, see **Figures 12 and 13**.

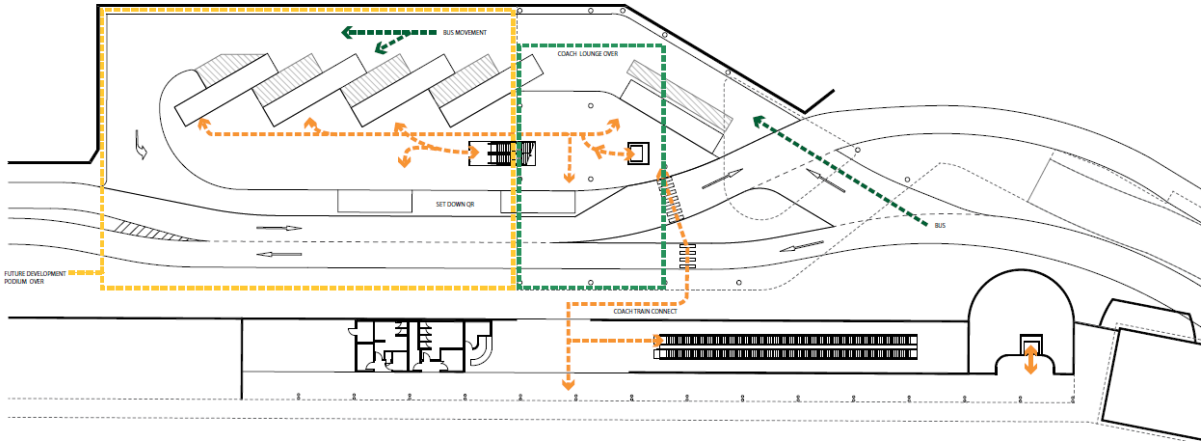

Figure 12: Preferred option ground level

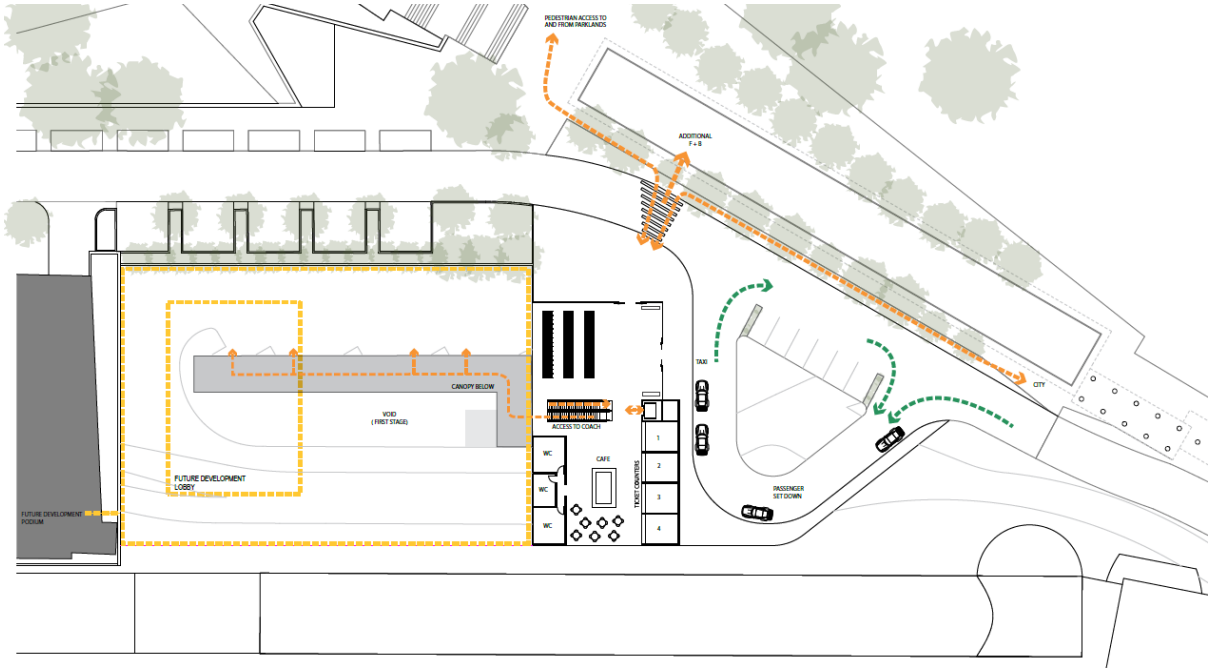

Figure 13: Preferred option first level

This preferred option has the least impact to stakeholders and mitigatable impacts in terms of safety and capital cost. This option was progressed and modified based on consultation with the coach operators.

3.4 Temporary Coach Terminal Design

Following consultation undertaken with Greyhound, the predominant coach operator, the preferred option design was rationalised to remove the mezzanine and relocate ticketing and seating. The concept design of the temporary coach terminal is shown in **Figure 14** and **Figure 15**.

Compared to the other options assessed, this design has following advantages:

- All facilities are located at grade;
- No requirement for suspended structure or new vertical transport;
- Lower traffic impacts than other options assessed;
- Increased safety aspects compared with other options;
- Easement requirements can be accommodated; and
- Minimal impacts to surrounding sensitive receptors.

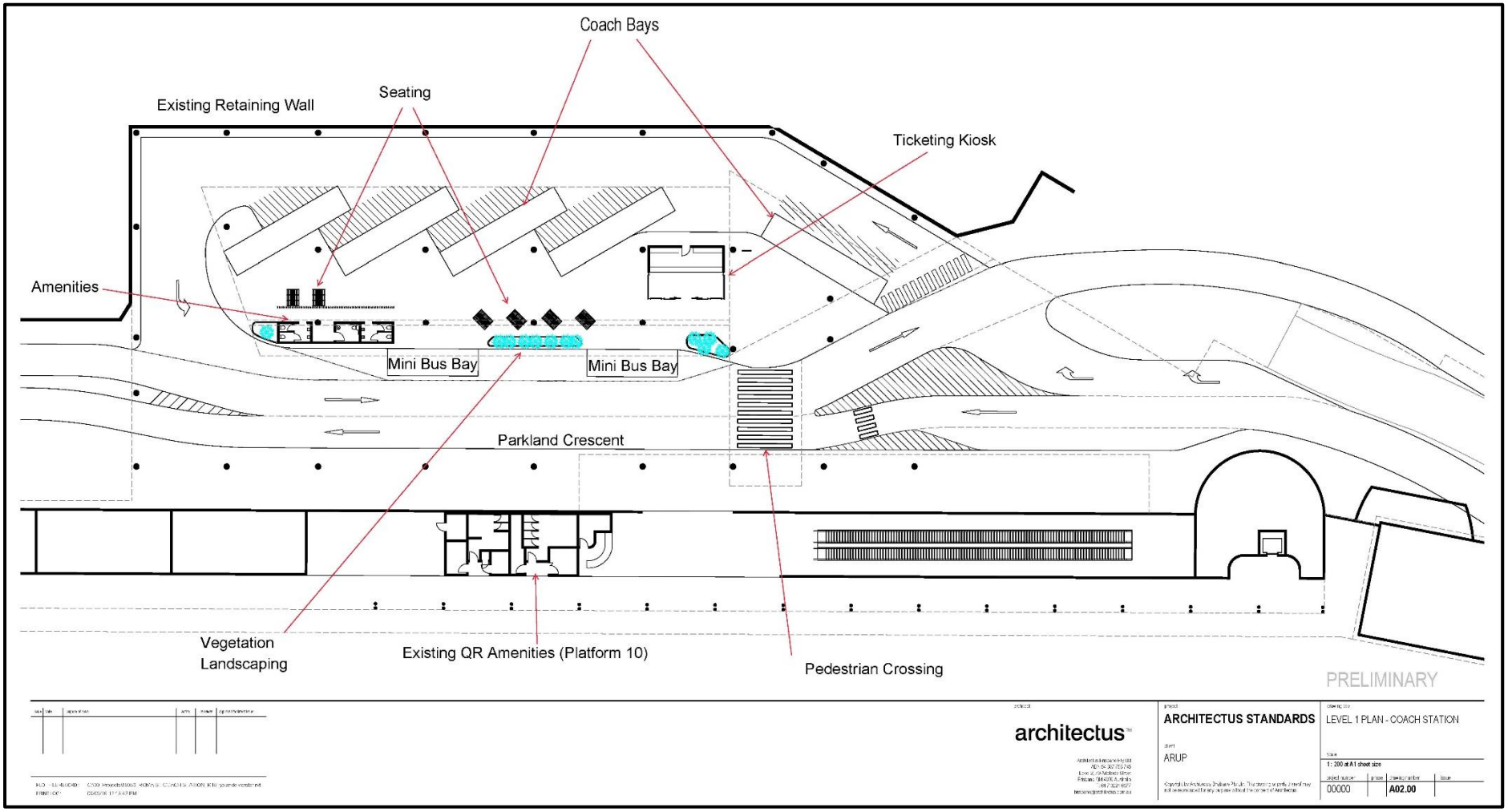

Figure 14: Proposed coach terminal concept design site plan level 1

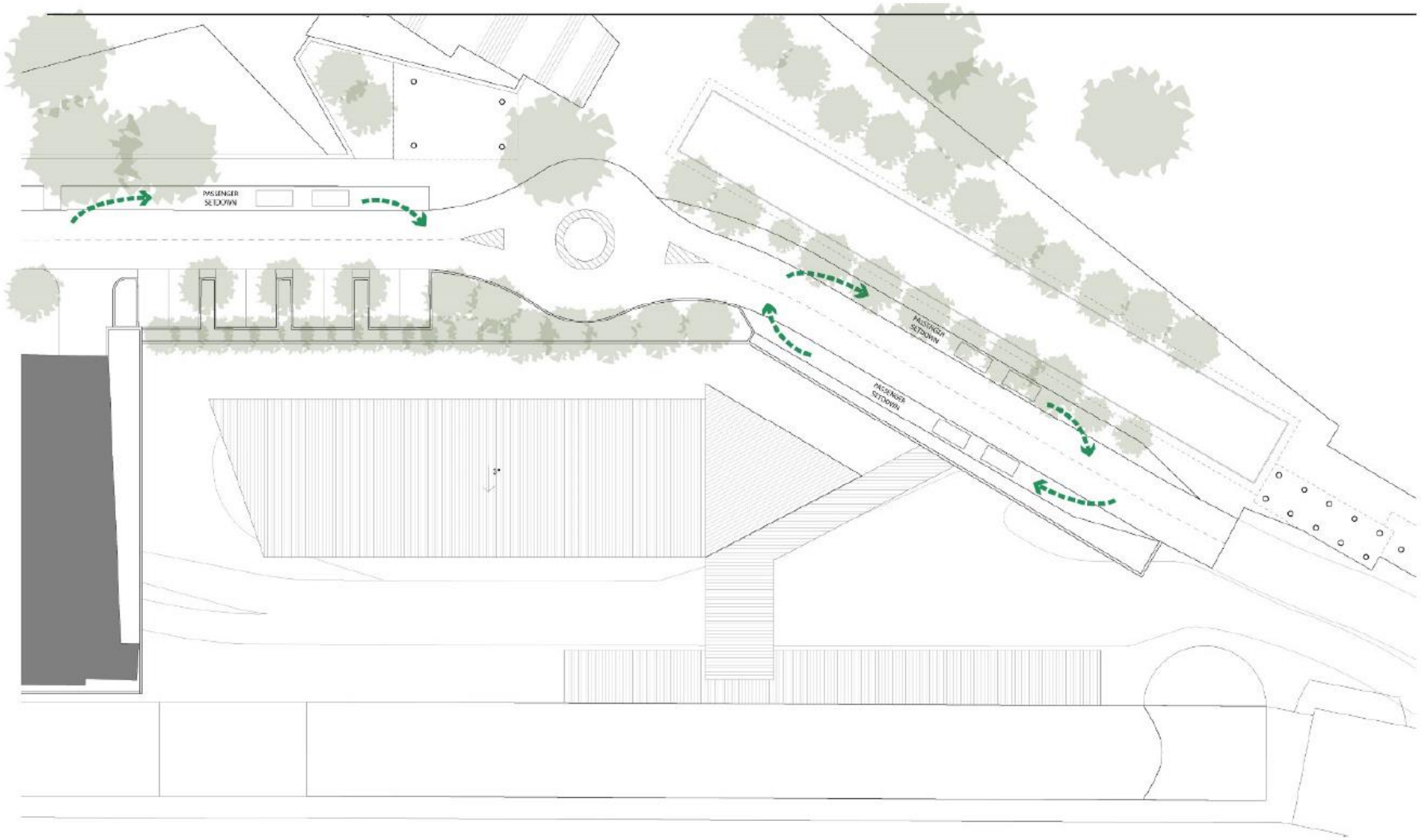

Figure 15: Proposed coach terminal concept design cross section level 2

The temporary coach terminal conceptual design is a ground level terminal located at Parkland Crescent which includes:

- Five coach bays on a central platform to accommodate 14.5 m length coaches;
- An awning roof structure over the terminal and pedestrian access ways;
- Two mini bus bays;
- On-platform ticketing kiosk;
- Provision for platform amenities;
- Passenger pick-up and drop-off on Parkland Boulevard;
- Maintenance and works to improve reliability of the council vertical transport for access to parkland; and
- Pedestrian crossing to connect to long distance rail.

Awning roof structure and terminal – A large open awning will cover the terminal platform in entirety, as well as key pedestrian accessways. The design and materials of the roof have been selected to avoid glare. All lights will be located under the roof to minimise light spill. The awning will provide cover to the terminal area and allow the covered loading and unloading of passenger luggage during rain events. The awning roof structure will be below the Parkland Boulevard level, thus minimising visual impacts at this level. A concept image of the terminal and awning is provided in **Figures 16** and **17**.

Figure 16: Visual concept of terminal and awning

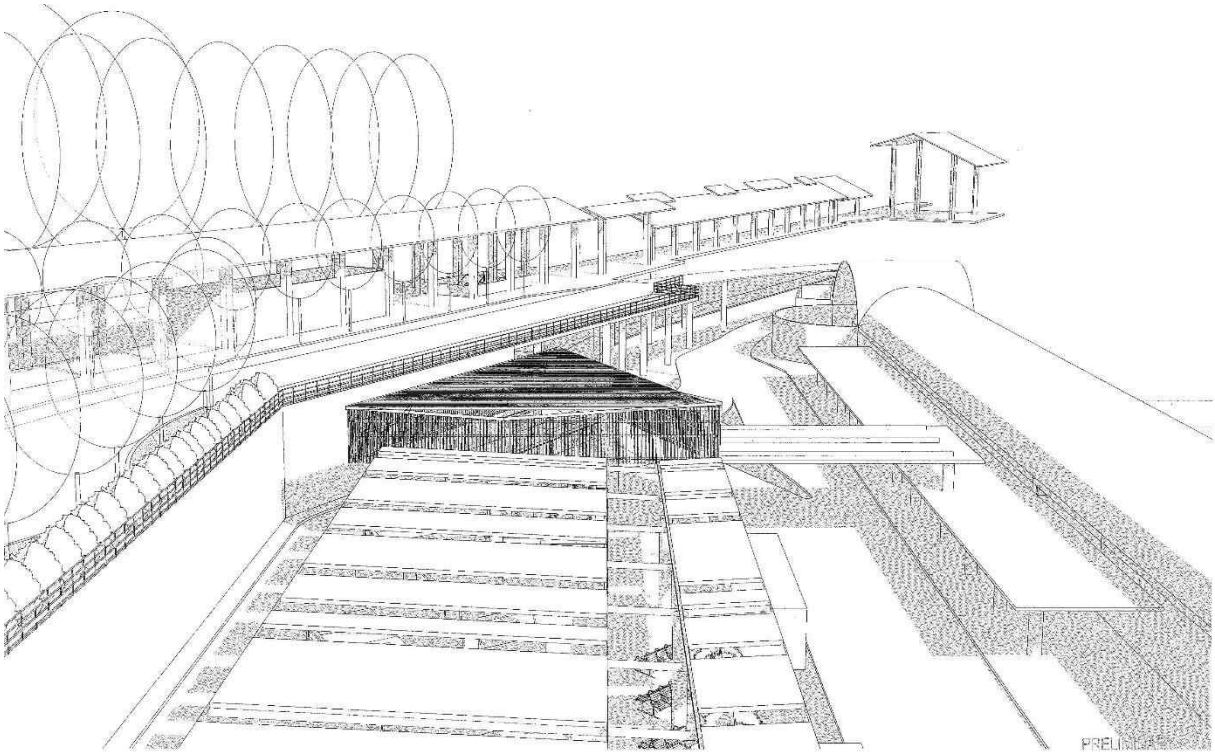

Figure 17: Visual concept of terminal looking east to entrance

Amenities – Provision for two unisex cubicles and one disabled cubicle will be provided with a privacy wall separating entrances from the terminal area, as shown in **Figure 18**.

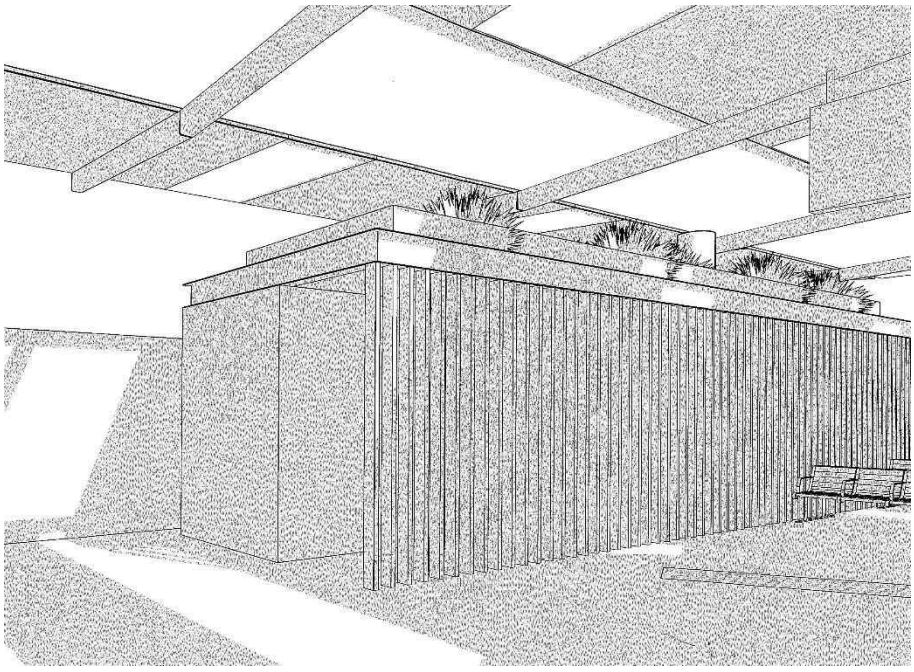

Figure 18: Visual concept of amenities

Ticketing kiosk – Four to five ticketing sales counters will be provided within a shared ticketing kiosk for those operators that presently offer onsite ticketing services at the current terminal. Other operators undertake ticketing and sales online and do not require facilities.

Passenger pick-up and drop-off - The upper level within the existing shared zone and opposite the carparks on the top of the retaining wall, will be utilised for pick-up and drop-off (adjacent to escalators and café). This area is currently a shared zone and a low speed environment (10km/hr posted). Pedestrians can access the site using the existing vertical transport to access the coach terminal and Platform 10. BCC has reliability concerns with existing vertical transport and the Delivery Authority has an agreement in principle with BCC's City Parkland Services to address these issues and undertake required improvements to the vertical transport as part of the site redevelopment.

The construction of a roundabout is required on Parkland Boulevard, however the design has been developed to allow the row of pine trees in this area to be retained. It is scheduled to open the new roundabout on Parkland Boulevard prior to the commencement of construction.

Lighting – The coach terminal lighting requirements are as follows:

- For day-time use, translucent materials will be considered to allow natural lighting.
- For night-time, bright white artificial lighting will ensure a safe and visually attractive environment.
    - As part of design development, roofing material to avoid light spillage has been considered.

Lighting at bus stations must comply with the applicable requirements of lighting subcategory P6 within AS/NZ 1158.3.1 – Lighting for roads and public spaces. Most of the lights will be located under awning roofs illuminating pavement areas. Light spill will be largely contained.

Urban design - Urban design objectives will be integrated into the overall precinct design, particularly around Parkland Boulevard. The site is six metres below the main pedestrian circulation areas on Parkland Boulevard and the impact of the structure on the public space is minimised by its height and design. The design provides visual connection to the Parkland Boulevard level, with simple roofs linking the railway station, temporary coach terminal and vertical transport, using flush soffits and structures concealed above the roof, achieving a fine edge.

The key to the design is simplicity, clarity and a connection with the subtropical character of Brisbane. The BCC, Buildings That Breathe Guideline, supports the idea that the subtropical Brisbane character should be promoted within the terminal. The subtropical theme is captured through the use of planting and the provision of dappled sunlight across parts of the platform through roof light strips and battens.

The cantilevered roof and parapet perimeter will perform a number of functions:

- The triangular space will define the entry to the Temporary Coach Terminal;
- The space will provide natural light and shadow play across the floor;
- The parapet is able to carry the Brisbane Coach Terminal sign and not interfere with outlook from the existing residences;
- The batten walls to the east and south will provide an illuminated element to assist wayfinding and contribute to the identity;
- The lantern screens the view to the larger flat roof from the Boulevard; and
- The lantern becomes a marker and the identity of the Terminal.

The floor is expected to be concrete with some patterning and colour variation. Perforated patterns for the metal ceiling will be considered to enrich the space and incorporate relevant site related imagery.

Figures 19 to 21 show a number of cross sections of the proposed temporary coach terminal.

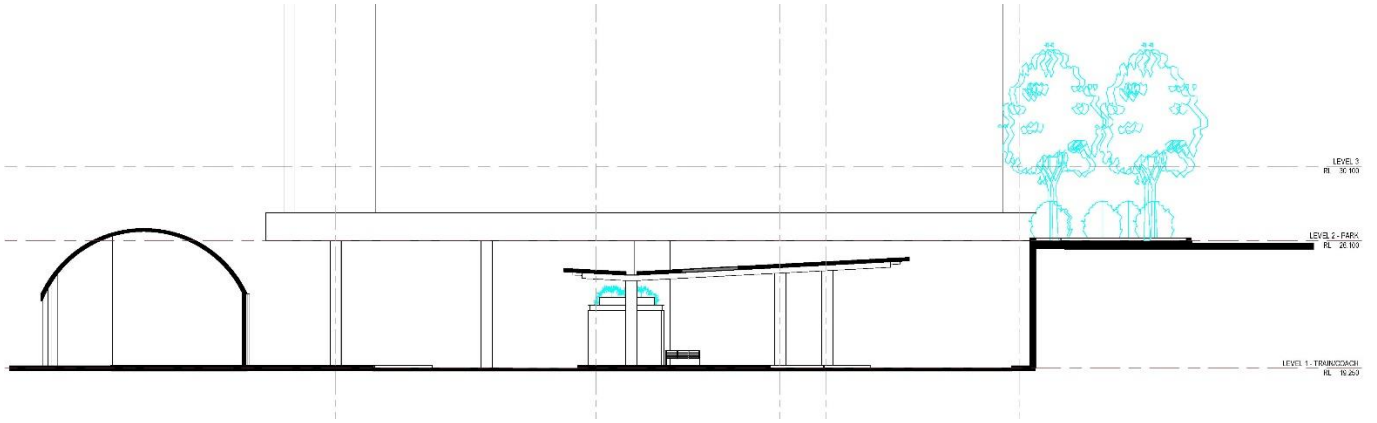

Figure 19: Cross Section A

Figure 19 is a cross section facing the west which shows the base level of the Parkland Apartments in the background.

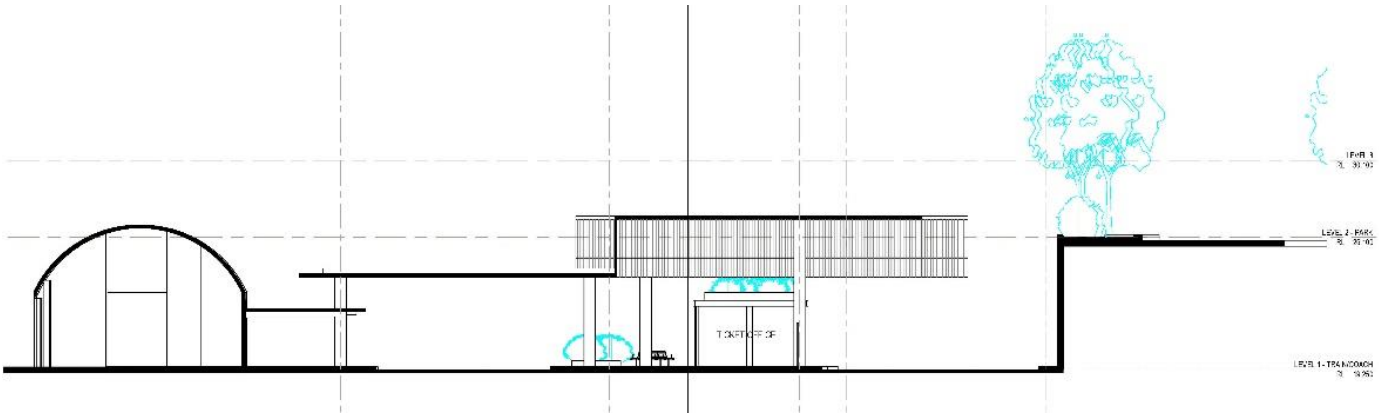

Figure 20: Cross Section B

Figure 20 is a cross section facing the west from the entrance of the site where the covered pedestrian access across Parkland Crescent is visible.

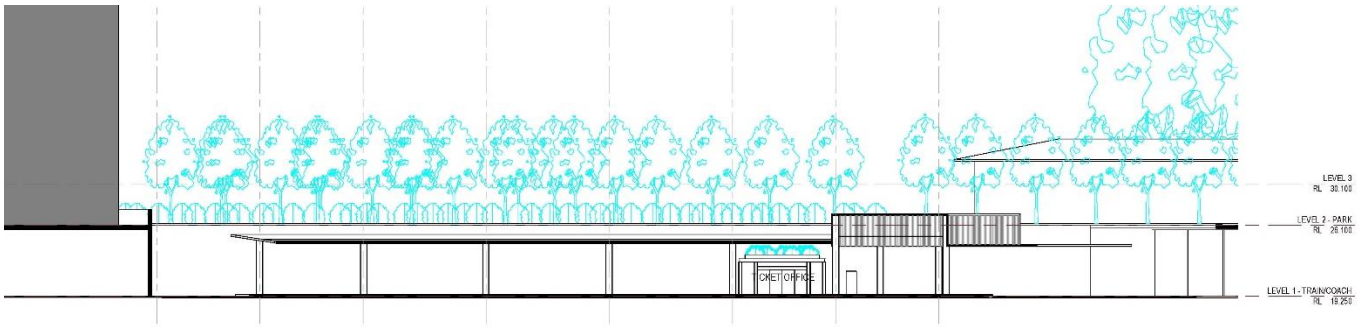

Figure 21: Cross Section C

Figure 21 shows a cross section facing north looking towards the retaining wall and Parkland Boulevard.

3.5 Construction

3.5.1 Parkland Crescent Coach Terminal

The construction of the coach terminal is expected to take approximately 38 weeks. It is anticipated that construction would commence in February 2019 and be completed by August 2019. Construction activities will include:

- Site set up including traffic and environmental controls;
- Removal of existing structures and pavement on the north side and installation of temporary pavement and line marking for north side access;
- Removal of road and pavement in a staged approach using traffic diversions;
- Installation and connection of underslab services. The intention is that all services would be either (i) run within the concrete slab / pavement, or (ii) utilise existing services, in order to eliminate excavation of the existing subgrade;
- Construction of traffic islands, curbing, placement of asphalt and concrete pavement;
- Concrete pad foundations to be laid in passenger loading and transfer areas where canopies are to be provided for weather protection to patrons;
- Road line marking and signage installation;
- Erect structural steelwork and purlins, installation of cladding, roofing, toilet and kiosk. The structures and buildings will be predominantly pre-fabricated offsite to minimise construction impacts and schedule. Canopies would be quick fix bolt down type modular steel frame with sheet metal cladding attached; and
- Installation of ticketing machines, lighting and digital signage.

It is anticipated that there will be two to three construction vehicle movements at peak over the construction period. During construction, access to Parkland Crescent will be maintained as well as pedestrian access and property access, although minor diversions will be required. Workforce parking will be provided within the construction site where possible. Utilisation of surrounding commercially provided carparks including Cornerstone Parking – Roma Street Parkland facility located under the Parkland apartment building will likely be required. Construction workers will be encouraged to avoid parking on the local streets, minimising the impact to visitors who typically make use of these parks. The design has eliminated the need for excavation, thereby reducing the risks associated with any potential impacts to matters of cultural heritage significance and the disturbance of potentially contaminated soil.

Although it is not intended to excavate for installation of services, in the event that excavation is in fact required for resolution of an unforeseen issue, the relevant public utility provider (PUP) owner would be engaged to undertake the work.

The site office will be a relocatable building located onsite. Hoarding will be provided to the edge of the Parkland Terrace area for the duration of construction to reduce impacts to visual amenity. Existing lighting present at the site will be retained as far as possible.

3.5.2 Parkland Boulevard Passenger Drop-Off / Pick-Up

Construction of a passenger drop-off and pick-up area is expected to take approximately five to six weeks, with construction anticipated to commence in November 2018 and be completed by January 2019. Construction activities will include:

- Site set-up including traffic and environmental controls;
- Removal of existing bollard structures and pavement;
- Reconfiguration of existing carriageway and parking;
- Minor works to raise the road pavement surface to create a shared vehicle, cyclist and pedestrian zone;
- Paving and line marking; and

- Installation of cyclist access and signage.

No structures are proposed to be installed as part of these works. The construction of the roundabout at the end of the shared zone may require the removal and pruning of vegetation on the western end of the Café.

3.5.3 Construction Methodology

Working Hours

Construction of noise generating activities will be undertaken during standard construction hours, being 6.30am to 6.30pm Monday to Saturday. No works will be undertaken during public holidays. Additional extended work hours may be required for activities which may potentially cause unnecessarily impacts to traffic or pedestrian movement. Receipt of oversize deliveries or unloading structural components where traffic controls and measures would be required will be scheduled during extended work hours where works can be undertaken without significantly impacting surrounding stakeholders. These works will be undertaken in such a way as to stay within the noise and dust Project goals established in the existing conditions. Any oversized deliveries to this site will be completed as per the restricted delivery hours as nominated below.

Deliveries

The Roma Street precinct area experiences congestion during peak traffic hours of 7:30am to 9:00am and from 4:30pm to 6:30pm as a result of work commuter traffic. Material deliveries on heavy vehicles will be limited such that they occur during the current approved Project hours:

Monday to Friday	6.30am - 7.30am 9.00am - 4.30pm 6.30pm - 10:00pm
Saturday	6.30am - 6.30pm

3.6 Operations

It is anticipated that the temporary coach terminal will have 75 coaches/mini buses per day during operations, with a maximum of 13 arrivals and departures per hour. The vehicles will enter the terminal from Roma Street / Parkland Boulevard intersection. The temporary coach terminal will operate from approximately 5:00am to 10:00pm, with majority of the services using the terminal from 7:00am to 3:00pm.

At full capacity (five coaches and two mini buses, 100% seats occupied with a 46-seat capacity at the site) taking into account peak arrival and departure rates, there would be a maximum of 602 customers at the passenger pick-up and drop-off location. This is assuming 50% arriving and 50% leaving and full capacity on the terminal services. The passenger drop-off and pick-up area can therefore accommodate approximately 95 vehicles during the peak hour if required.

3.7 Delivery Program

The proposed delivery program for the relocation of the Roma Street Coach Terminal to the Temporary Coach Terminal location is presented in **Table 3** below. As the relocation is necessary prior to the demolition of the BTC, this construction schedule will occur before the construction works identified within the currently-approved CRR Project.

Table 3. Delivery program

	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020Q3	2020Q4
Permanent Coach Terminal (Platform 10)												
Design												
Land Access and Acquisition of Platform 10												
Accepted Request for Project Change (RfPC)												
Procurement												
Construction												
Operational Acceptance and Migration												

3.8 Reasons for the proposed change

As part of the 2017 CGCR, it was identified that the Roma Street Coach Terminal would need to be relocated from the Brisbane Transit Centre (BTC) west tower to allow for the demolition of the BTC west tower for the CRR Project. A proposed temporary solution for the relocation has been developed in consultation with key stakeholders and the coach operators. This relocation is required to be progressed early in the works program to allow for the demolition of the BTC and subsequent Project works including construction of the Roma Street CRR station.

The proposed location, design and capacity of the temporary coach terminal meets the operational demand level of the current coach terminal and the needs of the key coach operators. The market demand for coach services is in decline and, as such, no allowance for the expansion of terminal operations has been provided for.

3.8.1 Meets Current Coach Terminal Operation Needs

ARUP were commissioned to undertake an analysis of the existing coach terminal operations to determine capacity requirements for the temporary coach terminal. Using a combination of timetable analysis and physical survey, it was determined that on average 75 coaches use the existing terminal on a daily basis. The timetable indicates typically five or fewer buses are at the facility at any one time. This was exceeded once during the survey (at approximately 2.30pm) when eight buses were predicted to be at the facility. **Figure 22** shows the number of coaches and buses at the facility throughout the day.

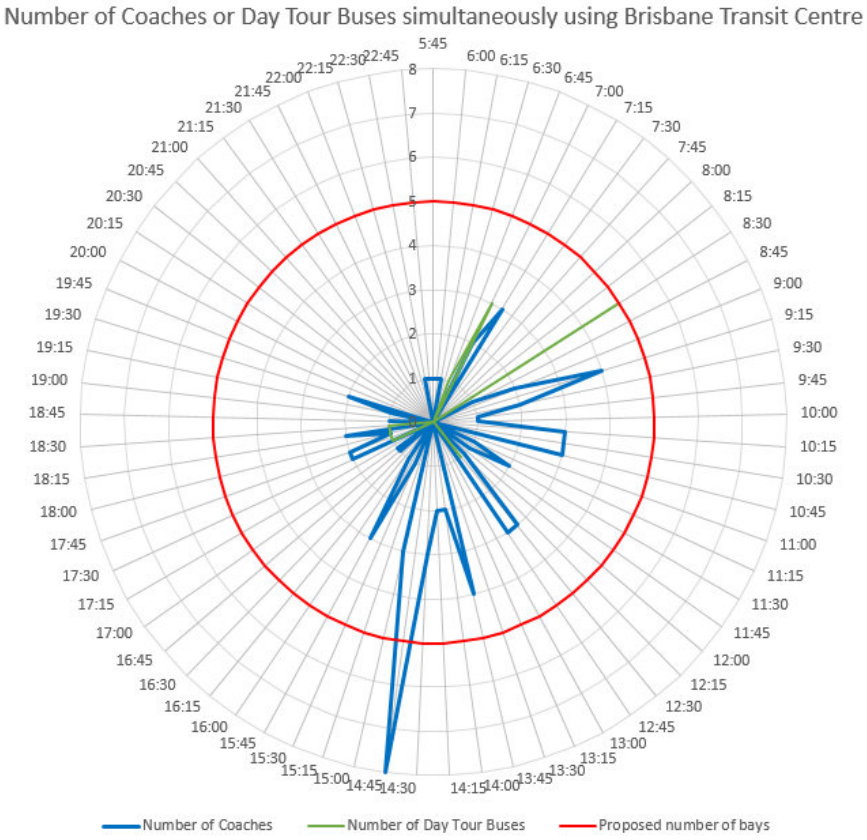

Figure 22: Number of coaches at the facility throughout the day

The surveyed coach arrivals and departures showed that Fridays and Saturdays were critical for coaches and Mondays for minibuses. Analysis of the peak demand at the coach terminal found:

- During the Friday peaks at 1:00pm and 3:00pm there are seven bays in use for approximately 10 minutes with a four-minute period of overlap.
- During the Saturday critical peak there is a 15-minute overlap of seven coaches and one mini bus.

Therefore, with minor timetable adjustments it was concluded that the proposed capacity of five bays and two mini bus bays would meet the current operational needs. The timetable adjustments have been agreed with the key operators.

3.8.2 Incorporation of Coach Operator Design Requirements

There are a select number of coach operators that currently use the existing coach terminal within the BTC, as outlined in **Section 5.3.1**. A series of meetings have been held with Greyhound, the key operator with over 75% use of the terminal. A comparison of the final design against its ability to meet operator requirements has been undertaken and where feasible incorporated into the terminal design. The meeting outcomes are presented in **Table 4**. The proposed terminal design has been assessed against these requirements to demonstrate that the temporary coach terminal will meet operator requirements.

Table 4. Assessment of coach operator design requirement suitability

Operator: Greyhound	Suitability of New Coach Terminal
Concrete pavement is required in tight turning areas due to potential for asphalt damage due to screwing action of 3 axle coaches	Met in design
Allowance for 14.5 m long coaches (including access requirements)	Met in design
Dynamic signage would be preferred to audio announcements	Met in design
Waiting areas do not need to be enclosed / airconditioned, however must provide rain / sun shelter	Met in design
Shared ticketing counter is acceptable, with one bay per operator	Met in design
Driver facilities are not required	Met in design
Baggage handling facilities are not required	Met in design
The extent of the awning must cover the luggage loading bays on both sides of the coaches	Met in design
That coaches currently utilise a reversing alarm	Met in design
The Controlled Access Route must be amended to include the Parkland Crescent approach and departure from the new terminal	Met in design

Other actions undertaken with the coach operators to ensure suitability included:

- Capacity survey analysis was provided to each operator for feedback and confirmation; and
- Greyhound coaches traversed through Parkland Crescent to determine suitability for coach traffic and a sweep path analysis of 14.5m coach (see **Appendix C**).

A further meeting was held with the smaller operators, including:

- Greyhound Australia;
- Murrays;
- Transport for NSW / Countrylink;
- Sunstate Coaches;
- Sunset Safaris;
- Premier Motor Services;
- Cross Country Tours/QBIC;
- Bus Queensland;
- JPT Tour Group; and
- Fun over Fifty.

Concerns regarding connection and capacity, driver facilities and the long-term solution were identified, and ongoing consultation and actions are being explored to mitigate and address the concerns raised to ensure the design will meet all operator needs as part of the consultation program outlined in **Section 5.3**. These concerns initially identified have not resulted in any change to the design as operators appreciate that the site constraints limited opportunities for any additional driver facilities.

3.8.3 Market Demand

An Australian Market Research Report (IBIS World, 2017) states that the number of establishments in the industry is purported to have declined at an annualised 1.3% over the last five years through 2017-18. Falling demand has led to many smaller operators leaving the industry and a consolidation increase in the industry.

There is also potential for long-distance bus services to head toward point-to-point mobility as a service supported by smart booking technology, as a substitute for conventional bus services (Hensher, 2017). These technologies could further reduce demand for coach terminal bays.

Based on market research and these figures, it is appropriate that the design capacity of the temporary coach terminal meets the current capacity needs, with no provision for future growth.

4. Changes to the CRR Project

4.1 Changes to the CRR Project Design

The temporary relocation of the coach terminal to Parklands Crescent will not involve changes to the current CRR Project design other than minimal changes to the local road network as summarised in **Table 5**.

Table 5. Summary of changes to the assessed CRR Project design

Design Aspect	Proposed Change
Relocation of Coach Terminal	Relocation site and design defined
Alignment	No change
Station	No change
Pedestrian Access to CRR Roma Street Station	No change
Demolition of BTC (West)	No change
Road Network and Parking	Reduced change – no removal of roundabout on Parkland Boulevard, installation of roundabout west of shared zone on Parkland Boulevard and minor alterations to allow passenger drop-off and pick-up.
Surface Works	No change
Portals	No change
Feeder Stations	No change
Systems	No change

4.2 Changes to the CRR Project Delivery

The changes to the CRR Project delivery are limited to the Roma Street North Worksite area and Parkland Boulevard. It is proposed that the Roma Street North Worksite changes to a temporary coach terminal, with an estimated 38-week construction period and a design life of up to 10-years. Additional vehicles and passenger presence will occur at Parkland Boulevard with minor road design changes to accommodate the passenger drop-off and pick-up area. A summary of the impacts in both the CGER and CGCR and a comparison of the changed use impacts for the temporary coach terminal solution is outlined in **Table 6**.

Table 6. Description of the change and its effects on the project

Aspect	Change	CRR Project Impacts (2011)[1]	CRR Changed Project Impacts (2017)[2]	Temporary Coach Terminal Relocation (2018) - Description of Changed Impact
Impacts to Parkland Crescent	**Minor change**	- Worksite proposed on the eastern end of the crescent. - Access to pick-up and drop-off to be retained.	- Construction laydown area. - Occupation of the westbound lane of Parkland Crescent, between the long-distance platform and the Parkland Boulevard intersection utilising the eastbound lane in a contraflow traffic arrangement. - Access to pick-up and drop-off not addressed, however assume this would be impacted if the westbound lane of Parkland Crescent was required to be closed for construction.	- Proposed temporary coach terminal site. - Access to Parkland Crescent is to be maintained at all times. Construction may require occupation of some segments of the roadway adjacent to the site. Management of this closure may include implementing a contraflow traffic arrangement. - Previously required partial road closures on Parkland Crescent for the five-year construction period now reduced to 38-week construction period.
Impacts to Parkland Boulevard	**Minor Change**	- Permanent closure of roundabout immediately north of Roma Street. - Access to construction worksite would be from Parklands Boulevard. - Alternative route via College Road / Gregory Terrace intersection. -	- Closure of Parkland Boulevard roundabout not discussed – assumed to be as per 2011 EIS (i.e. removed). - No changes to the upper level proposed.	- No proposed changes to the roundabout. - Upper level to be utilised for pick-up / drop-off (adjacent to escalators and café). - Installation of new roundabout at the pick-up and drop-off area.
Parking	**Minor change**	- Car park to be retained.	- Loss of use of BCC parking within the worksite footprint for five years approved.	- Increased time for loss of the BCC parking on Parkland Crescent from 5 to 10 years. Car parking relocation requirements will be considered within broader CRR Project agreement and negotiations with BCC. - Workforce parking would be within the construction site where possible, supplemented by paid public parking below the Parklands apartments. Local street parking is to be avoided by construction workers. Parking will create minor early impacts to parking for 38 weeks during construction.

Aspect	Change	CRR Project Impacts (2011)[1]	CRR Changed Project Impacts (2017)[2]	Temporary Coach Terminal Relocation (2018) - Description of Changed Impact
				- Additional set-down for coaches.
Pedestrian access	**Minor change**	- Worksite C would require closure of the pedestrian footpath on the southern side of Parkland Crescent. A pedestrian detour would be required commencing at the Parkland Boulevard / Roma Street intersection and diverting pedestrians though the Roma Street Station.	- Closure of the pedestrian footpath on the southern side of Parkland Crescent, with pedestrian detour provided. - The long construction timeframe at this site will result in many footpath changes for the duration of the construction. - Minor modifications to the intersection of Roma Street and Parklands Boulevard to accommodate a new pedestrian crossing on the eastern side of the intersection.	- Diverted access through from Parkland Boulevard to Roma Street Station will be reduced from five years to the 38-week construction period. - No change to council underpass tunnel. - Pedestrian access to be maintained at all times during construction. In some instances, this may involve detours and/or minor delays.
Cycle access	**Minor change**	- The worksite is not anticipated to significantly impact cycle activity, although cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.	- Cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent during 5-year construction use. - Assumed as returning to existing state (prior to construction) for operational period.	- Cyclists will have to follow detours put in place for vehicles due to the temporary lane closure on Parkland Crescent during 38-week construction. - Cyclists required to share Parkland Boulevard with coaches and additional generated traffic during operations.
Traffic generation	**Minor change**	- From the Roma Street North Worksite an average rate of 12 trucks/day (nine spoil and three deliveries) and 29 trucks/day in peak time (23 spoil and six deliveries) over five years. - From Roma Street general site area peak construction traffic of 10 loads / hour, up to 145 trucks/day (103 spoil haulage and 27 deliveries). - Spoil haulage will use Roma Street and Parklands Boulevard for truck access.	- From the Roma Street North Worksite only minor movement of equipment between worksites and the site office and workshop via Parkland Crescent. - From Roma Street general site area peak construction traffic of six loads / hour, up to 66 trucks/day at peak (39 spoil and 27 deliveries) over five years. - Spoil haulage from Roma Street Station worksites will use Roma Street and Parklands Boulevard for truck access. - Only construction worker access to the Roma Street sites permitted via Parklands Crescent.	- Two to three heavy vehicle movements at peak of construction vehicles accessing the site (compared to 2017 RfPC). - Reduction in traffic using Parkland Crescent for parking (32 + vehicles a day); - ~75 coaches / day (150 total coach movements) anticipated to access the facility. Maximum coach arrivals/ departures are 13 per hour and average three to four per hour. - Movement of ~95 vehicles during peak hour accessing the site for pick-up / drop-

Aspect	Change	CRR Project Impacts (2011)[1]	CRR Changed Project Impacts (2017)[2]	Temporary Coach Terminal Relocation (2018) - Description of Changed Impact
			- The transport of demolition waste was expected to have minimal impact on existing traffic as demolition truck activity is unlikely to coincide with the main construction activities.	off (190 total vehicle movements) from Parkland Crescent to Parkland Boulevard. - Temporary coach terminal likely to result in reduced cumulative impacts, due to spoil and demolition haulage no longer utilising Roma Street as part of the scope of this RfPC.
Surrounding road network changes	**Minor change**	- Removal of the existing Parkland Boulevard roundabout, 50 metres north of the Roma Street intersection to prevent u-turns for vehicles over 4.5 metres in height from entering Parklands Boulevard from Roma Street and for all traffic travelling south along Parklands Boulevard to turn left into Parkland Crescent as the geometry on the intersection does not permit that direct turn.	- Closure of Parkland Boulevard roundabout not discussed – assumed to be as per 2011 EIS (i.e. removed). - Minor traffic impacts on the surrounding road network.	- Introduction of signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements to manage safety issues. - Construction of a roundabout to facilitate the pick-up / drop-off area.
Workforce and hours	**Minor change**	- An estimated 175 workers on site at any one time, and at the construction peak 280.	- At the peak of construction, an estimated 137 workers on site at any one time. - Spoil haulage limited to off peak hours.	- No impact to peak workforce due to work occurring earlier. - Shift of minor construction worker requirements earlier in schedule.
Property access	**No change**	- To be maintained. Possible minor diversions (and traffic control where required) in place at times.	- To be maintained. Possible minor diversions (and traffic control where required) in place at times.	- To be maintained. Possible minor diversions (and traffic control where required) in place at times during construction.

Notes:

[1] Subject site was referenced as Roma Street Central worksite in the 2011 EIS

[2] Subject site was referenced as Roma Street Central worksite in the 2011 EIS

4.3 Detailed Land and Environmental Assessment

The temporary coach terminal's potential construction and operational impacts were assessed to understand the impacts, if any, to various environmental elements. Technical assessments were completed, with a summary of the results presented in **Table 7** below.

Table 7. Project environmental and social impact changes compared against the 2017 RfPC

Aspect	Change	Details of Change
Climate, Natural Hazards	**No change**	- No change to level of impact.
Land	**No change**	- Site is on the Environmental Management Register (EMR), however the design has limited ground disturbance due to surface engineered footings.
Nature Conservation	**No change**	- Minor removal and pruning of significant urban vegetation is required for passenger pick-up and drop-off on Parkland Boulevard. - No other vegetation or habitat onsite at Parkland Crescent. - Improvement with landscaping boxes and plantings incorporated into temporary coach terminal design.
Land Use and Tenure	**Impact change**	- Change of use of laydown/construction area for five years to a long-distance coach terminal with a 38-week construction period and a design life of up to 10-years. - No change to existing easements required. - No change or interaction with existing retaining wall.
Surface Water Resources	**No change**	- No change as entire area entirely is an impervious surface and will remain in same condition with no change to drainage in design.
Ground Water Resources	**No change**	- The design has limited ground disturbance by surface engineered footings.
Flood Management	**No change**	- No change to flood risk or material fill or excavations required.
Air Quality	**Impact change**	- Construction dust would likely be negligible and temporary. - Reduction of construction vehicle emissions as a result of a decrease in traffic vehicle movements from 10 per peak hour approved in the EIS, to six per peak hour in the change report for a five-year period, to three per peak hour under this RfPC for a 38-week period. - There will be around 75 coaches per day, with a peak hour movement of approximately 13 coaches increasing the level of emissions from current background. The increase is expected to be within the applicable air quality objectives as identified in Table 1 of the Air Quality Technical Note, **Appendix A**.
Noise	**Impact change**	- The temporary coach terminal works will be located approximately 30 m from the nearest façade of the Parkland Crescent residential properties compared to 150 m for previously approved works. - An operating coach and an operating spoil haulage truck are considered comparable in noise emissions. Temporary

Aspect	Change	Details of Change
		coach terminal operation considered no worse than the delivery and spoil haulage truck noise levels resulting from the construction of both the EIS and the approved changed CRR Project. - Operation of coach terminal compliant with TMR Road Traffic Noise criteria. - Temporary coach terminal operation considered unlikely to materially alter the existing noise environment at the nearest residential properties on Parklands Boulevard.
Waste	**No change**	- Waste produced throughout the construction phase will be similar to that which would be generated at a worksite. - Operational waste requirements (general waste and sewage) will be provided for as prat of the detailed design.
Indigenous Heritage	**No change**	- The design has limited ground disturbance due to surface engineered footings.
Heritage	**No change**	- Limited views to Roma Street Heritage Station from site due to Platform 10. - Minimal vibration impacts predicted from the nominated scope. - Minimal dust impacts predicted from the nominated scope.
Traffic Impact	**Impact change**	- Low coach volumes not expected to impact local traffic and broader network. - Potential changed impacts identified but considered minor if recommendations implemented. These recommendations are: o minor infrastructure modifications and urban design review to manage the impacts of the relocation of the pick-up/drop-off zone . o a speed limit of 10km/hr to mitigate any increased safety risk for on-road cyclists from coaches. o signalization of the ramp merge of Parkland Boulevard and Crescent managed through signalization for eastbound movements for safety. o Coach access constraints into the terminal. This is to be managed through timetabling services and agreed operations coordination with coach operators.
Visual Amenity and Lighting	**Impact change**	- Construction visual impacts reduced from five years to 38 weeks. - Use of existing light towers during construction – no change of impacts. - Operational light spill will be largely contained from roof structures. Operational impacts have been assessed in the Visual Amenity Technical Note (**Appendix D**) - Recommendations include integrate urban design objectives, provision of hoarding to the edge of parkland terrace area, design and materials of roofs to minimise glare, location of lights under roof structures.
Economic & Social	**No change**	- Capacity of terminal to meet current operations. - No new sensitive receptors impacted. - Economic benefit with increased patronage to the Café with increased number of people accessing the coach terminal from this area.

4.3.1 Land Use and Tenure

The Department of Housing and Public Works (DHPW) owns the land and have been engaged throughout the preliminary design stage through inter-agency discussions. Interests of other parties are being managed via DHPW.

4.3.2 Air Quality

The expected impact to air quality associated with the construction and operation of the temporary coach terminal has undergone technical assessment. This has been compared to the previously-approved impacts in the EIS and 2017 RfPC. The full technical note (**Appendix A**) details the expected environmental effects.

Nature of Proposed Change and Effect of the Project

Planned construction activities associated with the temporary coach terminal are likely to include the removal of existing concrete slabs and pavement, minor ground works, laying of concrete foundations and pavement, and erecting new structures including shelters and ticketing machines.

The site currently has low traffic volumes and is used by vehicles accessing Platform 10 drop-off area, carparking or traversed by vehicles accessing the residential buildings and the carpark area via Parkland Crescent. The proposed change of use will generate 75 transit coach movements at the terminal per day with an estimated 13 peak hour movements. Thus, there will be an increase in heavy vehicles and a reduction of light vehicles with the loss of parking and a passenger drop-off and pick-up zones being located at Parkland Boulevard.

The key sensitive receptors potentially subjected to air quality impacts from the works include local residents, transient local community members and train passengers. Each of these receptors are currently subject to existing air emissions, primarily from vehicles along Parkland Crescent and Parkland Boulevard. Background air quality levels outlined in the 2017 RfPC indicate that concentrations are below the CRR Project air quality goals. These goals are in line with the National Environment Protection Measure (Ambient Air Quality) dated 3 February 2017 and Environmental Protection Policy (Air) (2008).

Current Approved Project Impacts

Project-wide quantitative modelling of construction air impacts was completed as part of the EIS and 2017 RfPC. The works proposed under the EIS and 2017 RfPC were deemed as having low potential for adverse air quality impacts and, given the proposed activities associated with construction and operation of the temporary coach terminal, qualitative assessment of this aspect has been completed.

The EIS assessed the peak generation of 10 heavy vehicles per hour or up to 130 per day from the Roma Street general site area. This included an average of 12 and a peak of 29 heavy vehicles per day from the Roma Street North Worksite during construction. The EIS consequently allowed for a traffic and emissions increase of 5.9% along Parkland Boulevard and 4.6% along Parkland Crescent.

The 2017 RfPC assessed the loss of the existing carpark area adjacent to Platform 10 for conversion to a laydown and storage area. This reduced the approved peak heavy vehicle volume to six per hour and up to 66 heavy vehicles per day over five years. With the site reverted from a major construction site to a laydown area in the 2017 RfPC, additional traffic movements were predicted to be lower through the implementation of best practice management measures. Again, it was deemed there was low potential for adverse air quality impacts during construction. The 2017 RfPC allowed for a traffic and emissions increase of 0.7% along Parkland Boulevard and 2.4% along Parkland Crescent, assuming the same proportion of construction generated heavy vehicle traffic would use Parkland Crescent as per the EIS.

Environmental Effects of the Proposed Change

Although the proposed works differ from those accepted under the EIS and 2017 RfPC, the construction impacts will still be primarily related to dust generation from removal of pavement and pavers, movement of equipment and wheel and wind generated dust from any exposed areas and vehicle emissions. Air quality will be impacted by vehicle and plant emissions based on the proposed two to three hourly vehicle movements across the 38-week construction period. The site is protected from

wind by surrounding buildings, the retaining wall and road infrastructure which provides an engineered existing mitigation from wind impacts. As such dust nuisance and health issues from poor air quality from the terminal construction are anticipated to be temporary and negligible.

The cafe tenant adjacent to the proposed Parkland Boulevard drop-off and pick-up area may incur construction dust nuisance on days with strong southerly to westerly winds. Close consultation with the tenant will allow individual property mitigation measures to be tailored with consideration of actual dust measurements and particular construction circumstances at the time. Standard management measures are likely to mitigate any potential dust impacts to surrounding sensitive receptors to acceptable levels.

The operational impacts are largely vehicle emitted air pollutants generated on local roads, at the pick-up and drop-off areas and from the coaches and buses using the facility. Coach services would result in an 11% increase in current daily traffic flows, thus a corresponding increase of emissions will occur. However, background pollutant concentrations are well below their respective goals and a small increase in concentrations from increased traffic movements is not expected to result in a non-compliance with the applicable air quality goals. Refer to Table 1 of **Appendix A** for background concentrations of air quality indicators against Project goals as nominated CGCR 2017.

A dust deposition monitor will be installed adjacent to the Parklands residential complex at Roma Street Station during these proposed early temporary coach terminal works and remain throughout the construction works. This location is approximately 100 m from the proposed temporary coach terminal and will provide an accurate representation of existing background levels as well as construction and operational impacts on local air quality from the coach terminal and broader cumulative impacts from the Roma Street CRR Project works.

Summary

The predicted construction air quality impacts are expected to be largely comparable with the outcomes presented in the EIS and 2017 RfPC, however, with a reduced impact period of 38 weeks for construction activities compared to the previous approved five-year period. The increase in vehicle movements and associated emissions as a result of the proposed temporary coach terminal are slightly higher than that approved for the Roma Street North Worksite, however, are equivalent to those originally assessed under the CRR Project EIS and will remain within the CRR Project goals. The air quality impacts from the operation of the temporary coach terminal are expected to be negligible when assessed in consideration of the surrounding environment.

4.3.3 Noise and Vibration

The expected impacts from noise and vibration associated with the construction and operation of the temporary coach terminal has undergone technical assessment. This has been compared to the previously-approved impacts in the EIS and 2017 RfPC. The full technical note (**Appendix B**) details the expected environmental effects.

Nature of Proposed Change and Effect of the Project

Planned construction activities associated with the temporary coach terminal are likely to include the removal of existing concrete slabs and pavement, minor ground works, laying of concrete foundations and pavement, and erecting new structures including shelters and ticketing machines.

Additional noise sources from the construction and operation of the temporary coach terminal include noise generated from passengers. The worst-case noise assessment has been based on a full passenger capacity scenario with a daily throughput of 3500 patrons over 75 full capacity coaches.

The operation of the terminal will use display screens rather than PA announcements to reduce the impact of noise to nearby sensitive receptors.

The site has a highly urban acoustic environment characterised by relatively constant high ambient noise levels, with contributions from railway operations and local and major roads. There are approximately 471 trains in the daytime period, 109 trains in the evening period and 93 trains in the night-time period passing through Roma Street Station. Existing ambient noise levels at the nearest apartment block to the terminal measured for the EIS indicate that the typical existing ambient noise environment is 64 to 77 dBL_{Aeq} during the day, 62 to 75 dBL_{Aeq} during the evening and 57 to 73 dBL_{Aeq} during night-time periods. The maximum noise events are likely to be train movements at Roma Street Station.

Sensitive receptors near to the proposed temporary coach terminal location include the residents and café tenant on Parkland Boulevard, Roma Street Station commercial premises, recreational users within Roma Street Parklands and other surrounding receptors identified within the Roma Street precinct in the EIS and RfPC. Given the urban environment it is likely that facade noise reductions for residential buildings located within the CBD are substantially higher than the 10 dB(A) assumed for this assessment.

Current predicted Project Impacts

The EIS assessed the North Shaft construction site on Parkland Crescent at the western end of Platform 10. The subsequent 2017 RfPC involved the realignment of the station and CRR route which avoided the need to construct the North Shaft site. However, the 2017 RfPC assessed the Roma Street North Worksite for use as a laydown and storage area. Both the EIS and the 2017 RfPC works allowed for a five-year construction period.

EIS traffic noise of peak heavy vehicle movements, calculated through CoRTN prediction algorithms, found an increase by 0.3 dBA in average traffic noise levels on spoil routes that pass residential receivers on existing road corridors between 6:30am and 6:30pm. It is generally recognised in acoustics that changes in noise levels of 2 dBA or less are undetectable to the human ear (Refer to **Appendix B**).

EIS construction noise impacts were quantitatively assessed through modelling, and the 2017 RfPC was assessed qualitatively against the project change. The EIS predicted noise at level peaks which could impact human health and wellbeing at Wickham Terrace Residential properties, Roma Street Station Commercial properties, Holiday Inn Residential property, and the Parkland Crescent Residences in all mitigation scenarios modelled. In the 2017 RfPC, the daytime airborne noise levels experienced at the Parkland Boulevard apartment building were predicted to comply with the noise goals. The predicted noise resulting from the temporary coach terminal will remain within these noise goals. The CG has accepted any noise-related impacts to stakeholder subject to conditions requiring the implementation of noise management measures. These measures include a complaints management system, restricted work and delivery hours, the requirement to achieve internal health and well-being noise goals allowing for building treatment mitigation, notifications of activities likely to exceed noise goals and predictive modelling for predicted vibrational impacts.

Vibrational impacts of 0.04 PPV (mm/s) are predicted at the Parkland Boulevard residences, which is lower than the 0.5 PPV (mm/s) night goal and well under the 25 PPV (mm/s) day goal for vibration. There will be no cumulative construction impact from construction of the temporary coach terminal and Roma Street Coach Terminal, as the temporary coach terminal works will be completed well in advance of construction commencing for the Roma Street Coach Terminal. Operational noise is predicted to be within rail noise goals (Refer to **Appendix B**).

Environmental Effects of the Proposed Change

The temporary coach terminal works will be located approximately 30 m from the nearest façade of the Parkland Crescent residential properties, compared to 150 m for previously approved works. A comparison between previously approved construction and operational activities and those that are likely to occur under the temporary coach terminal with relative distance calculations was used to assess the noise impacts from the Roma Street Coach Terminal relocation.

Noise and vibration are generated by construction activities and traffic movement. With construction plant and machinery located 30 metres from the Parkland Boulevard apartment façade, the worst-case unmitigated noise levels generated are likely to be 66 to 72 dB(A) during site establishment. There will be no cumulative construction impact from construction of the temporary coach terminal and Roma Street Coach Terminal, as the temporary coach terminal works will be completed well in advance of construction commencing for the Roma Street Coach Terminal.

Consideration has also been given to the potential for use of reversing alarms for coaches backing out of the parking bays. For the purposes of technical assessment, a worst-case scenario, in which noise levels of reversing alarm beepers fitted to coaches trigger at all times coaches are in reverse, has been adopted. In this instance, reverse alarms can be up to 97 dBL_{Amax} when measured at 1m. Extrapolating this noise level from the nearest coach parking bay in the proposed temporary coach terminal to the nearest Parklands Boulevard residential apartments would result in a noise level

from reversing beepers of 70 dBL_{Amax}, some 3 to 7 dB(A) lower than the existing typical maximum noise levels at the apartments day, evening or night.

It should be noted that the orientation of the coach parking bays relative to the nearest Parklands Boulevard residential apartments is such that the rear of the coach is facing away from the apartments, which would result in the body of the coach acting as an effective noise barrier between the apartments and the coach reversing alarms to reduce noise levels to a predicted minimum of 5-10 dB(A) at the residential apartments.

Operational noise levels from plant, equipment and patrons are not expected to be significant relative to existing noise levels. Coaches and trucks are comparable with each other in terms of noise emissions. Noise generated from the operation of the temporary coach terminal is comparable to the predicted noise that would have been generated at this site if it were a construction laydown, with 75 coaches and 95 light vehicles generating a similar level of noise to the 130 trucks that would have used this site. Thus, noise levels from operation of the terminal are expected to be similar to the previously assessed road traffic noise levels. Despite the 10-year duration for operations, the impact on the road network will be less than +0.3 dB(A). The likely maximum noise generated from a coach is during the coach's acceleration from the terminal. Calculations accounting for only distance and no other noise propagation loss show the maximum noise level at the nearest building façade is likely to be 70 dB(A). The maximum anticipated noise level is 2 dB(A) above the applicable noise criteria of 68 $dBL_{A10,\ 18hr}$ in the TMR Road Traffic Noise Code of Practice. As this acceleration impact is of a short duration (one minute) and can occur 75 times a day it is likely the exceedances would be within the 10^{th} percentile of noise contribution from road traffic noise averaged over an 18-hour period, and compliant with the road traffic noise criteria.

Predicted operational noise levels at the façade of the nearest apartment building on Parklands Crescent overlooking the proposed terminal have been assessed taking into consideration timetable information for day, evening and night periods. These are presented in Figures 23 to 28, the shades of colour that trend towards green indicate that the predicted operational noise from the temporary coach terminal are lower than the existing noise environment and as such would not give rise to a cumulative increase in the noise environment over the existing.

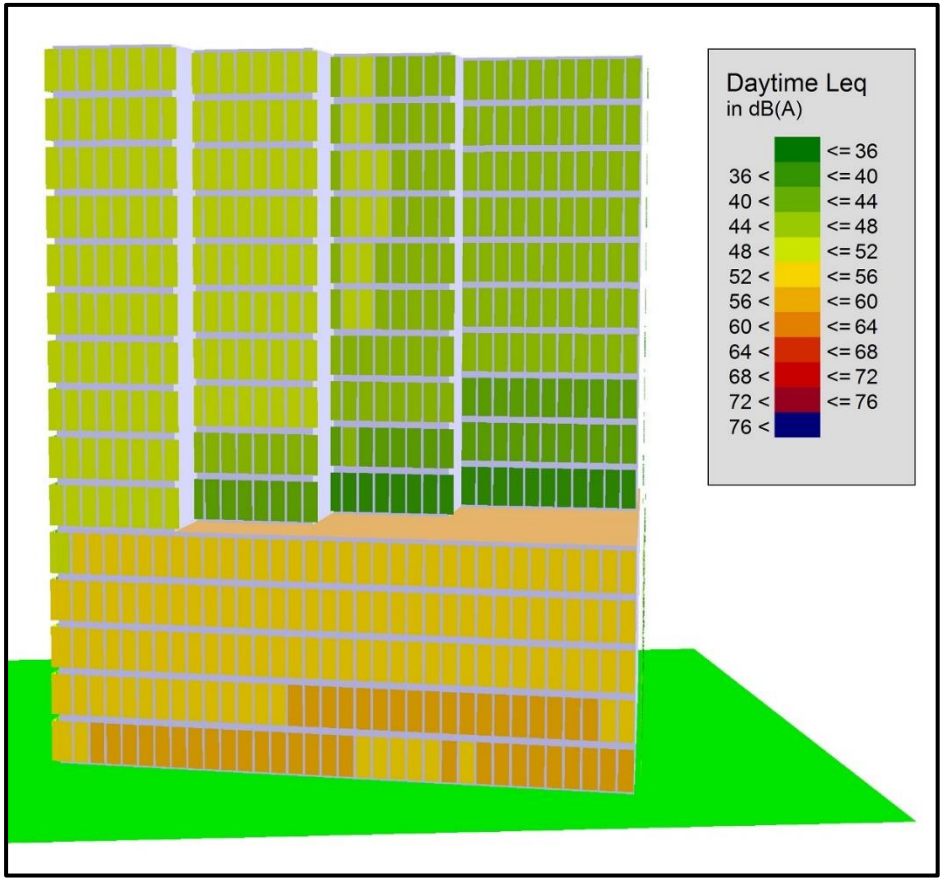

Figure 23 Average day noise levels

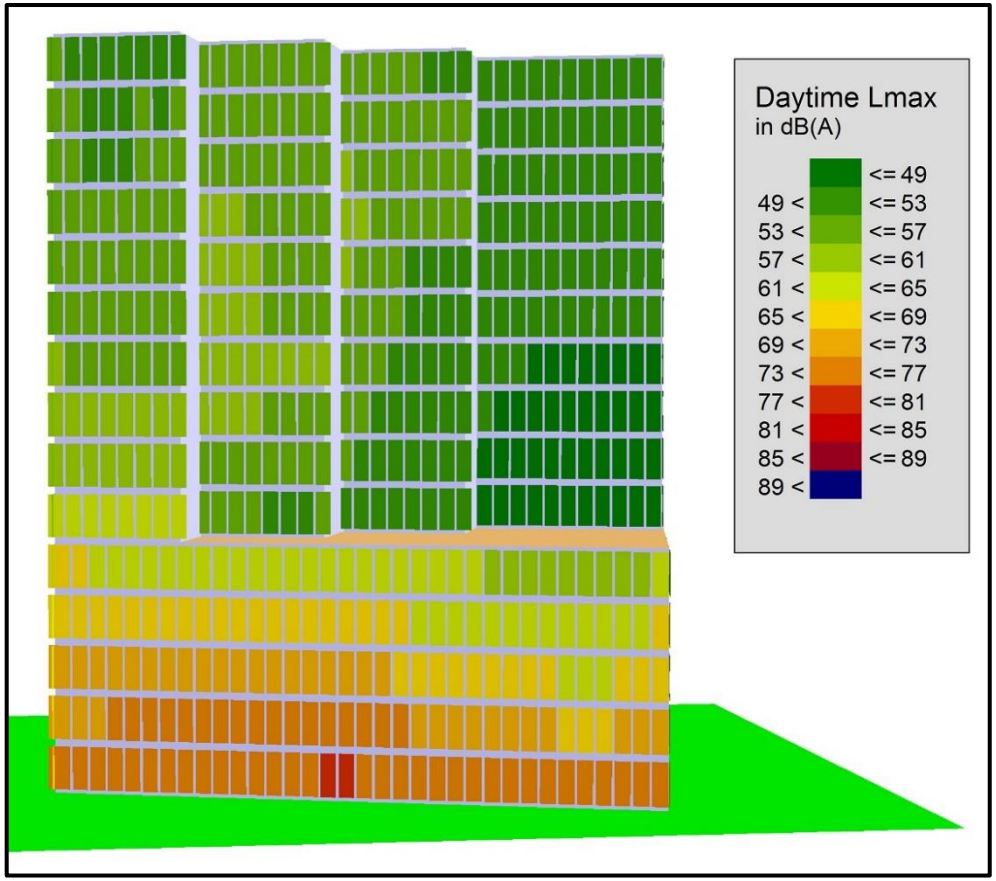

Figure 24 Maximum day noise levels

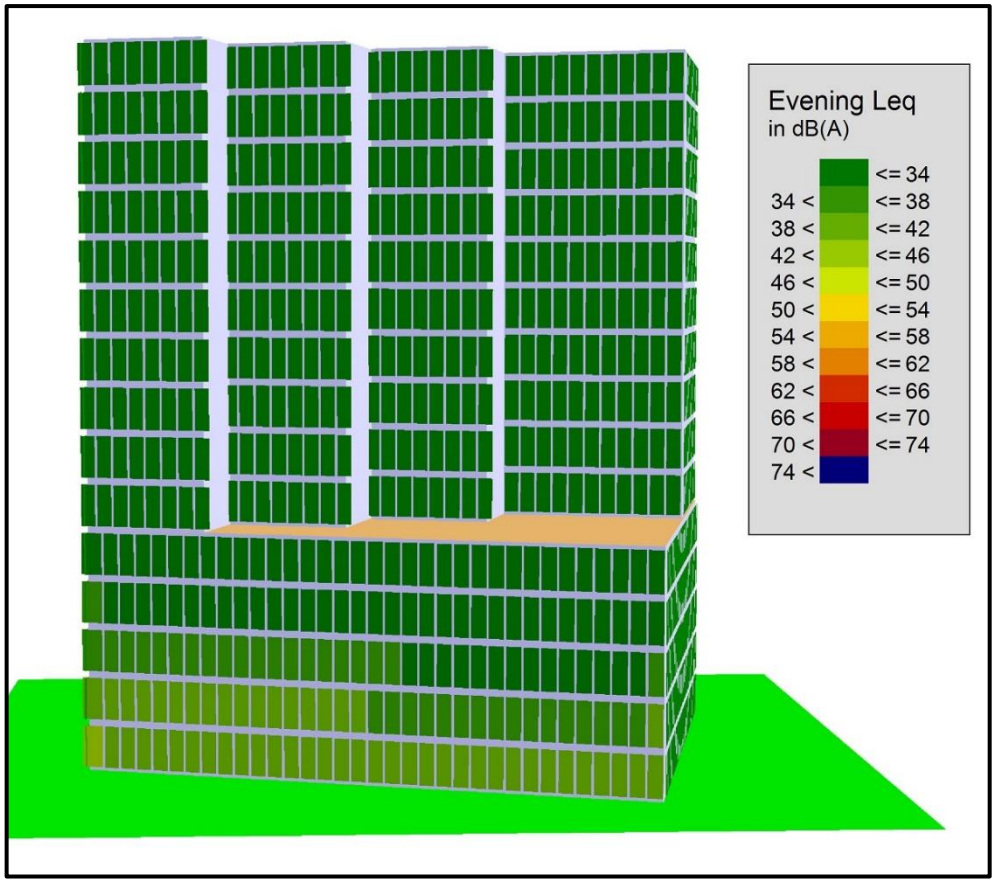

Figure 25 Average evening noise levels

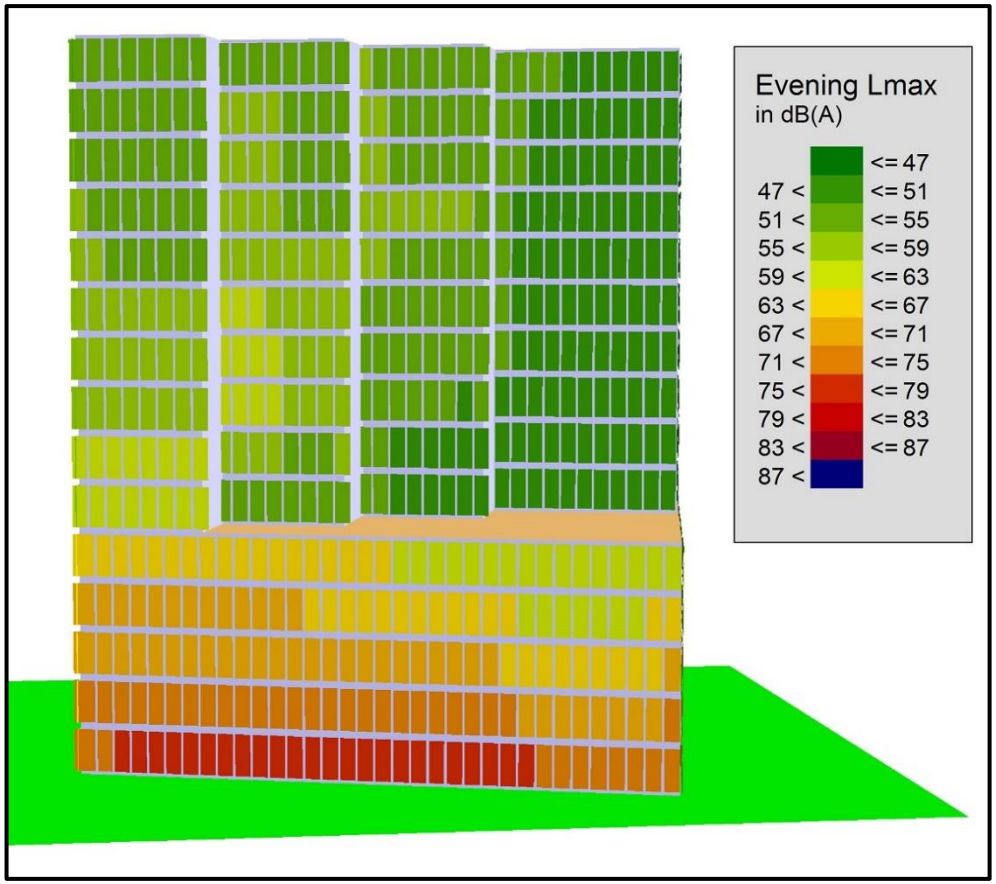

Figure 26 Maximum evening noise levels

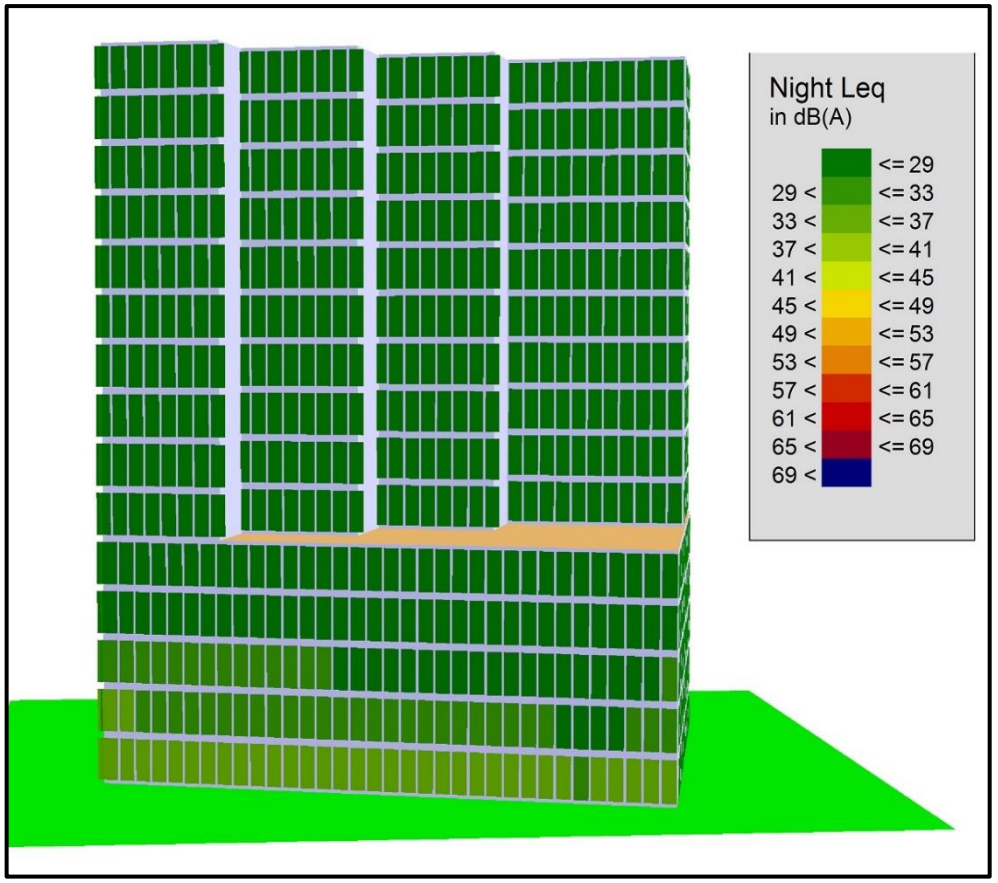

Figure 27 Average night noise levels

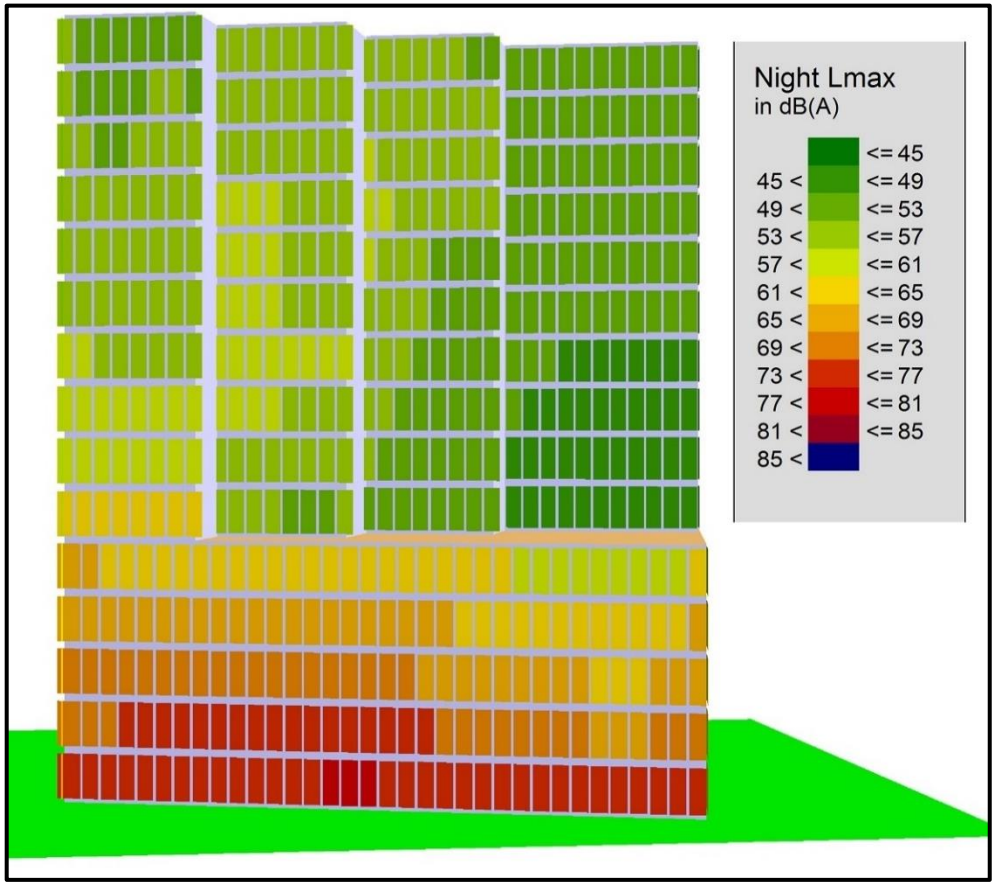

Figure 28 Maximum night noise levels

The figures show the average and maximum noise levels anticipated from the proposed temporary coach terminal are consistently lower than the current maximum noise levels experienced. Maximum noise level impacts are generally limited to the lower building levels (ground and first floors) which are commercial premises, staffed during the day.

The operation of the coach facility would result in an increased frequency of maximum noise events. With consideration of the 673 passenger train events, an additional 75 coaches passing through the proposed temporary coach terminal will give rise to approximately 12% increase in the number of events impacting the Parklands Boulevard apartments. Coach movements occur predominantly within daylight hours and are not expected to change the existing evening and night noise environment. High or full patron capacity times could lead to an increase in patron volume, however, such capacity compared to Roma Street Station patron levels are unlikely to materially change patron noise levels at the nearest noise sensitive properties.

Summary

The proposed changes will have equivalent construction noise level impacts for a shorter duration than the existing approved Project. With regard to frequency of maximum events, comparison between the number of train movements likely to be the cause of the existing maximum noise events and the proposed coach movement associated with the temporary coach terminal, provides a useful gauge of likely change associated with the proposed coach terminal. The terminal operation will increase noise impacts through increased frequency of high noise events. The overall impact, however, is comparable to the existing noise environment, likely to comply with noise level goals and unlikely to impact evening and night acoustic environments.

4.3.4 Traffic Impact

A traffic impact assessment was undertaken to examine the level of effects from the proposed change and the level of impact approved under the CRR Project. The assessment included a review of traffic volumes to Parkland Boulevard and Parkland Crescent, intersection assessments and swept path assessments of coaches along Parkland Crescent and Parkland Boulevard (refer to the full technical note provided in **Appendix C**).

Nature of Proposed Change and Effect of the Project

It is estimated there will be two to three peak hourly construction vehicle movements over the 38-week construction period. The operational capacity of the terminal will be equivalent to the current level of services and is determined to generate 75 coach movements daily.

The assessment of operational traffic volumes was based on the current number of coaches using the existing facility and an assumption that 17% of passengers are likely to arrive or depart by car and 7% by taxi. The proposed change requires a passenger drop-off / pick-up area with the capacity to service 95 + vehicles during peak hour. The relocation of pick-up / drop-off zones to Parkland Boulevard (from Parkland Crescent) may adversely affect the function of the existing shared zone due to an increase in vehicle volumes and movements. To enable this area to be constructed along the shared zone on Parkland Boulevard, network design changes proposed include: the installation of a roundabout and upgrades to cycle and pedestrian areas. During detailed design development, the exact configuration of the shared zone will be designed to minimise conflicts between vehicles, cyclists and pedestrians.

Current Approved Project Impacts

The EIS, then the 2017 RfPC assessed 10, then a reduced six peak hourly heavy vehicle movements in the Roma Street general site area during a five-year construction period.

The EIS Worksite C (Roma Street North) adjacent to the long-distance Platform 10 had site access via Parklands Crescent for average rate of 12 trucks/day and 29 trucks/day in peak time over five years. Such haulage is no longer required from this worksite and reduced impacts were assessed under 2017 RfPC for minor traffic volumes associated with a laydown area.

EIS network changes included the closure of the Parkland Boulevard roundabout and occupation of the westbound lane of Parkland Crescent, however, in the RfPC, the worksite area encompassed the entire carparking area and the loss of these 32 spaces during the construction period.

Environmental Effects of the Proposed Change

The construction vehicle traffic (estimated at two to three per hour at peak) generated over the 38-week period, is an impact reduction comparable with the use of the site as a laydown for five-year construction period. As construction impact occurs prior to the commencement of CRR Project demolition works at this precinct, cumulative impacts are avoided. As such, the minor construction movements will not generate unacceptable impacts to the local road network or traffic flow.

Coach volumes are not expected to negatively impact the traffic network; however, they may pose additional safety concerns to on-road cyclists within Parkland Boulevard. Guidelines such as TN128 indicate that cyclists and vehicles can safely mix at speeds below 30km/hr. It should, however, be noted that the speed limit through the existing shared zone on Parkland Boulevard is posted at 10km/hr (this speed limit is proposed to be retained), which is well below the 30km/hr posted speed recommended in TN128.

The intersection delay assessment was undertaken in accordance with the Guide to Traffic Impact Assessment (GTIA, TMR 2017) to ensure that the sum of intersection delays on base/background traffic does not significantly worsen (i.e. increase average delay by more than 5% in aggregate) as a result of the development. The two key intersections assessed were the Parkland Boulevard / Parkland Crescent (south) intersection and the Roma Street / Parkland Boulevard intersection. The results found there was under 5% increase (4.6%) in delay in the year 2023, which is nearing close to completion of the overall CRR Project. As such, the delay impacts of the surrounding road network in the opening year will likely not need to be mitigated.

The Parkland Boulevard / Parkland Crescent (south) is a priority-controlled intersection, with southbound traffic on Parkland Crescent required to stop for southbound through traffic on Parkland Boulevard (travelling down the ramp toward Roma Street). This intersection is likely to be the most adversely affected, as sight lines are limited due to the configuration of the ramp and concrete barriers. An increase in the volume of vehicles traversing this intersection is expected to increase risk of collision to both vehicles and cyclists. Signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements is proposed to manage these safety issues. The intersection analysis shows that the proposed signalisation will still result in the intersection performing well within acceptable limits (i.e. DOS≤0.9).

A swept path analysis of the proposed coach terminal layout was undertaken using the detailed terrain survey to ensure the design accommodates a 14.5m steerable coach. The analysis resulted in minor design adjustments which allows coaches to drive in / reverse out of all five bays. The swept path assessment of the access found that 14.5m steerable coaches are able to traverse Parkland Boulevard and Parkland Crescent to access / exit the terminal (using a 0.5m clearance envelope). This was based on limited detailed survey available only from north of the roundabout near Parkland Boulevard / Roma Street intersection. In lieu of a detailed survey for the southern segment (toward Roma Street), the Delivery Authority and Greyhound undertook a number of coach drive throughs which indicated that coaches are able to perform this manoeuvre. However, there are a number of locations which are constrained, with the vehicle body clearance overhanging the kerb and in places conflicting with minor obstructions (e.g. barriers, vegetation, signage) located immediately adjacent to the kerb. Conflict points identified are being investigated and will be addressed in detailed design by relocating kerbs and signs.

It is noted that a 13.5m non-steerable coach is a worst-case scenario with less manoeuvrability than a 14.5m steerable coach. Further stakeholder consultation is being undertaken to determine if any such coaches are within operator fleets.

Summary

During construction there is no expected increase in general vehicle traffic volumes compared with that approved under the existing Project and no increase in peak volumes being generated as part of the temporary coach terminal works. Local and temporary impacts will occur on parking demand in the area and mitigation measures are proposed in Table 9 to limit these impacts. The operation of the site imposes a number of traffic impacts to the local network and service, particularly on Parkland Boulevard, which will be satisfactorily managed with the implementation of the mitigation measures nominated herein, including by installing a roundabout and improving traffic, cyclist and pedestrian interaction adjacent to Café.

4.3.5 Visual Amenity and Lighting

A review of the temporary coach terminal's impact on visual amenity and lighting was undertaken by ARUP, with the full technical note provided in **Appendix D** of this RfPC.

Nature of Proposed Change and Effect of the Project

The Proposed Site is visible to the residents facing east within the Parkland Boulevard apartments, the shared use terrace at Parkland Boulevard and from Platform 10. The first apartment level is approximately 12 metres above the coach deck. The current outlook is to asphalt, line marking and a variable number of cars, with a six-metre retaining wall and the civil structures of elevated roads in the background, with existing tower street lights having a minor impact on residents.

From the Parkland Crescent approach, the overhead road structures and an array of covered walkways dominate the current view. The temporary coach terminal will result in a minor change for the non-coach traffic. The walkway roof across the road will be relocated and the higher temporary coach terminal roof will replace the lower covered walkways. Integrated landscaping will improve the general site appearance. The outlook from Platform 10 is currently restricted by the covered walkways and the awning across the road. The retaining wall is the main element visible, with the parkland planting more visible further from the platform entry. The proposed relocation of the road crossing will open up views to park level from Platform 10.

Construction activities are required to have enhanced lighting and security systems aligning with the parklands existing lighting and security. Construction will be predominantly completed in the standard hours outlined in **Section 3.5.3**, thus reducing the volume of lighting and hours it will be required. A visual hoarding to the Parkland Boulevard is envisaged, and pedestrian connections to Platform 10 from the lift and escalator would be safely enclosed. The use of existing light poles or small mobile lights will be used during construction, when nightworks are required.

Currently Approved Project Impacts

Both the EIS and RfPC assessed visual construction impacts at this location for a period of five years. The proposed design in the EIS had the potential visual impact of the ventilation shaft. It was envisioned that the site post construction would be reverted to its former use or be redeveloped as part of the larger Roma Street Station Precinct Master Plan. The coach terminal operational visual impacts were compared against the existing use of the site.

Environmental Effects of the Proposed Change

The temporary coach terminal construction will impact visual amenity for a period of 38-weeks on the site vantage points. This impact will be shorter than the approved five-year use of the site for CRR Project construction worksite. The use of existing lighting and limitations on construction hours will reduce the lighting demand and thus the associated light spill and glare impacts on surrounding sensitive receptors.

The passenger drop-off area will impact significant urban landscape vegetation, as some shrub planting and up to a total of three trees are required to be removed to provide space for a roundabout. Thus, a reduction of landscape quality may result during construction until replacement plantings are established. Given the expanse of green landscaping, this impact is minor in nature. The increase in signage, demarcation and vehicles along the shared use zone will diminish the pedestrian character. Sensitive urban design principals will be incorporated into the passenger pick-up and drop-off to ensure the structure and resulting works are consistent with the Parklands Boulevard character.

The terminal will be designed in accordance with relevant urban design principles and will be integrated into the surrounding urban environment. Most of the roof will be below park level and will have no adverse impact on sightlines. The operation of the terminal is likely to improve the visual amenity of the Proposed Site for the duration of the terminal operation. Key views to the parklands will not be impacted as the coach roof will be a similar level to the retaining wall. The lighting can be managed and incorporated into the design to minimise any impacts.

4.3.6 Possible Cumulative Effects

Through the City West Strategy and City Centre Master Plan, both the State and local government have identified the future need to develop Roma Street Rail Yards and the surrounding land to ensure that it remains the primary transit hub for Brisbane. It has been identified that an intensification of uses, such as new residential or commercial developments within the rail yards or around the existing BTC, is required for the area.

Key infrastructure projects and new developments proposed for Roma Street are only in initial planning stages. In March 2018, Brisbane Metro was confirmed as a High Priority Project on the nation's Infrastructure Priority List. On 23 April 2018, Council released the Brisbane Metro draft Design Report (BCC, 2018), which identifies the following work at Roma Street Station:

- Modification of existing outbound platform by approximately 13.5 m at the eastern end, requiring volumetric acquisition of BTC (west tower); and
- Station upgrades (e.g. passenger information displays, off-board ticketing).

A construction period of approximately six months is expected to be required to complete the extension of the outbound platform. Works at Roma Street are scheduled for 2021.

Brisbane Live is another key infrastructure project in the Roma Street precinct, however is still within early business case phase, therefore no information on the proposed construction schedule is available. With the temporary coach terminal being constructed in 2019, prior to the scheduled BTC demolition work and the other identified projects, cumulative impacts are not anticipated.

5. Delivery Strategy

5.1 Approvals Pathway

Relocation of the coach terminal is necessary to enable the demolition of the BTC (west tower) and, consequently, construction of the CRR Project. The CGCR states that "the demolition of the BTC (west tower) at Roma Street will necessitate the closure and relocation of the Roma Street Coach Terminal from its existing site".

This RfPC proposes changing the proposed use of the Roma Street North worksite from a construction staging and laydown area for Project Works, to a temporary coach terminal.

This RfPC demonstrates that impacts resulting from the change, while different in the initial construction period, do not increase the level of impact from those assessed and approved under the CGCR June 2017.

Accordingly, it is requested that the CGCR June 2017 definition of Project Works be amended to exclude the works for the relocation of the temporary coach terminal.

5.2 Impact Management

The following construction environmental management plans will be developed by the Contractor to manage and mitigate impacts from the construction of the temporary coach terminal:

- **Traffic Management Plan**
- **Stakeholder Engagement Plan**
- **Construction Environmental Management Plan** – This plan will nominate the environmental outcomes and performance criteria for each of the environmental elements that should be considered as part of the temporary coach terminal relocation works. The Site-Specific Construction Environmental Management Plan will be submitted to the CG 20 business days prior to construction commencing.

Key impact mitigation measures identified for this site are outlined in **Table 9** and will be implemented throughout the construction phase.

Table 9. Key mitigation measures to be implemented

Aspect	Mitigation Measures
Air Quality	• Prepare and implement an Air Quality Management Plan (as part of the Construction Environmental Management Plan), to achieve the environmental outcome for the duration of construction activities; • Monitor meteorological conditions, particularly wind speed and direction. When adverse meteorological conditions are experienced at worksites, such as dry windy conditions, take measures to avoid impacts of unreasonable dust or odour on adjacent properties. Such measures may include: – modification of construction methods; – increase in dust suppression measures; and • When no other reasonable or practical measure is available to manage a significant air quality impact, cessation of work until the meteorological conditions improve and the environmental outcome can be achieved; • If monitoring shows exceedances during construction, additional mitigation measures will be required, such as stopping dust generating activities during dry, windy conditions, undertaking additional audits of dust controls, increasing watering rates during dry periods, and undertaking targeted consultations with affected stakeholders.
Noise and Vibration	• Plant will be designed to meet planning design noise goals through the implementation of appropriate plant selection and attenuation if necessary;

	• Noise generating activities to be undertaken during Standard Construction Hours; • Capacity of the site to service coaches limited to 5 bays and 2 mini bus bays.
Traffic	• The pick-up / drop-off zone on Parkland Boulevard is available during periods of significant construction impact on the Parkland Crescent pick-up / drop-off zone, in order to maintain pick-up / drop-off functionality of the area; • A detailed active transport management plan and workforce car park management plan would be required. These plans will encourage construction workers to use public transport, provision of some carparking within the construction site and use of the Cornerstone paid public parking encouraged for construction workers to minimise impacts to local parking along Parkland Boulevard / Parkland Crescent; • Introduce signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements; • Localised speed reduction along Parkland Boulevard to 10km/hr to reduce speed differentials; and • Design to remove or relocate some obstructions (e.g. concrete apron on Parkland Boulevard southbound, vegetation clearing, sign relocation) if necessary.
Visual Amenity and Lighting	**Construction** • A visual hoarding to the Parkland Boulevard is envisaged, and pedestrian connections to the Platform 10 from lift and escalator would be safely enclosed. • Traffic management plan for the construction phase to include provision for safe pedestrian access to Platform 10 from Parkland Boulevard. **Operations** • Retain the screen planting along the top edge of the retaining wall; • Integrate sensitive urban design objectives with the changes in the precinct, particularly around Parkland Boulevard; • Provide hoarding to the edge of the terrace area, painted both sides for the duration of the construction; • Roof to be designed to minimise glare for sun reflection to residences; • Incorporate landscaping into terminal design; • Lighting to the roundabout to be focused on the roadway to avoid impact on residential tower and restaurant; • Lighting at bus stations must comply with the applicable requirements of lighting subcategory P6 within AS/NZ 1158.3.1 – Lighting for roads and public spaces; • Ensure all lights are located under roof to minimise spill to the residences; and • Careful integration of signage into the precinct, ensuring suitable wayfinding to the temporary coach terminal.

Key mitigation measures that can be considered throughout the detailed design phase are outlined in **Table 10**.

Table 10. Key mitigation measures to be considered during detailed design

Aspect	Design Commitments
Cultural Heritage	• Temporary infrastructure shall be designed to ensure there is no disturbance to natural ground as part of construction and operation of the temporary coach facility.
Noise and Vibration	• Plant will be selected to meet BCC planning design noise/vibration goals where possible. • Dynamic signage preferred to using audio announcements for service arrivals and departures.

Traffic	• Capacity of the temporary coach terminal site to service coaches is limited to five bays and two mini bus bays. • Pavement design to accommodate screwing action of three-axle coaches at full lock turn. • Access and swept paths to accommodate 14.5m long coaches • Introduce signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements; • Localised speed reduction along Parkland Boulevard to 10km/hr to reduce speed differentials. • Construct a roundabout on Parkland Boulevard for pick-up/drop-off facilities.
Visual Amenity and Lighting	• Retain the screen planting along the top edge of the retaining wall; • Integrate sensitive urban design objectives within the precinct, particularly around Parkland Boulevard; • Provide an on-platform ticketing kiosk and platform amenities; • Provision of pedestrian crossing connections to long distance rail platform; • Roof to be designed to provide suitable sun/rain shelter for bus terminal users and accommodate bus loading of luggage bays on both sides of coaches; • Roof to be designed to minimise glare for sun refection to residences; • Incorporate temporary landscaping into terminal design; • Lighting to the roundabout to be focused on the roadway to avoid impact on residential tower and restaurant; • Lighting at bus stations must comply with the applicable requirements of lighting subcategory P6 within AS/NZ 1158.3.1 – Lighting for roads and public spaces; • Ensure lights are located under roofs where possible to minimise spill to the residences; and • Careful integration of signage into the precinct, ensuring suitable wayfinding to the temporary coach terminal.

5.3 Public and Stakeholder Consultation

5.3.1 Stakeholders

The consultation strategy involves targeted consultation with the key stakeholders identified in **Table 11**.

Table 11. Key Stakeholders

Key Coach Terminal Stakeholders	
Operators	1. Greyhound Australia 2. Bus Queensland 3. Premier Motor Service 4. Crisp Coaches 5. Countrylink Coaches (TfNSW) 6. Murrays Coaches 7. Australian Sunset Safaris 8. Sunlover Holidays 9. Cross Country Tours 10. Queensland Bus Industry Council

Government	11. Department of Housing and Public Works (owner) 12. Department of Transport and Main Roads 13. Brisbane City Council (licensee) 14. Queensland Rail (lessee) 15. Parklands Management (adjacent land owner with shared access)
Other	14. Residents of Parkland Blvd 15. Cornerstone Parking 16. Bicycle User Groups (CBD and Brisbane North) 17. The building tenant at 1 Parkland Boulevard Roma Street Parklands

The Delivery Authority has undertaken early engagement with key stakeholders including:

- Coach operators.
- Residents of Parkland Boulevard (seven residential buildings).
- Department of Housing and Public Works (as land owner).
- Brisbane City Council (as licensee over the land).
- Queensland Rail (as lessee over the land).
- Department of Transport and Main Roads.
- Translink.

The outcomes of this consultation are detailed in **Section 5.3.4**.

5.3.2 Stakeholder Matrix

Table 12. Stakeholder Engagement Strategies

Stakeholder	Likely Concerns	Communication Strategy
Coach Operators	• Relocation of coach terminal • Access changes • Reduction in capacity • Timetable rearrangements • Dwell time restrictions • Changes in driver facilities and amenities • Service impacts • Passenger wayfinding and communication	• Phone calls/emails (**early engagement**) • Send initial letter stating requirement (**early engagement**) • Desktop research (**early engagement**) • Initial meetings or open operator forum (**early engagement**) • Regular check-in phone calls/emails • Individual meetings where requested • Provision of collateral for bus patrons on new location • Provision of copy to be sent in Electronic Direct Mail (EDMs) to customers of each company
Parkland Boulevard Residents	• Noise, dust, vibration, nightworks during construction • Access during construction • Loss of overflow carpark • Longer term operational issues including bus and passenger movements, noise and disruption at night	• Phone calls/emails to Body Corporate (**early engagement**) • Initial letter to all residents (**early engagement**) • Presentation to Body Corporate (**early engagement**) • Information stands in building foyer (**early engagement**) • Regular check-in phone calls/emails to Body Corporate • Individual meetings where requested • Consideration into operational issues during design so that design encompasses noise attenuation, positioning of waiting areas and lighting etc

Stakeholder	Likely Concerns	Communication Strategy
Parkland Boulevard Business	• Noise, dust, vibration during construction • Access during construction • Increased demand for potential local customer parking during construction • Economic benefits from increased patronage resulting from increase of people using pick-up and drop-off	• Initial letter to tenant of change application • Individual meeting with tenant prior to construction • Regular check-in phone calls/emails during construction to minimise access impacts and monitor general construction impacts
Cyclists	• Change in traffic arrangements and shared zones • Installation of new signalised intersections • Increased traffic in vicinity of cycle ways	• Briefings to Bicycle User Groups (CBD and Brisbane North) • Installation of clear wayfinding signage
Department of Housing and Public Works	• Land use / transfer of ownership • Road works	• Meetings and briefings • Development of Memorandum of Understanding (MOU) • Transfer of land documentation
Brisbane City Council	• Roma Street construction impacts to on-street bus stops • Roma Street operational impacts on local road network • Impacts to cyclists and pedestrians during construction and operationally • Interaction with Brisbane Metro project • Cumulative impact on CBD traffic and pedestrians • Local traffic impacts Roma Street Parklands • Precinct planning and station design	• Email/Phone call day of RfPC going public – set up meeting during the consultation period if required at this stage • Engage with stakeholder on a DG/CEO level • Explore opportunity for joint messaging and highlight/focus on project benefits • Differentiation of project – creative messaging • Collaborative approach at all times (liaison officer exchange) • Involvement in Stakeholder Coordination Group
Queensland Rail	• Removal or relocation of 10 x worker carparks within the required land • Impact on office space located behind/adjacent to Platform 10 • Construction impacts on long distance services operating from Platform 10 • Potential shared services/amenities such as ticket stands, café/s, and bathrooms	• Regular meetings with the Delivery Authority Relationship Manager • Involvement in Stakeholder Coordination Group • Explore opportunity to do joint messaging on project benefits • Collaborative approach at all times (liaison officer exchange)
Department of Transport and Main Roads / Translink	• Impact on the wider road network • Impact on increased traffic at intersection at Roma Street and Parkland Boulevard (concern of queueing through intersection)	• Regular meetings with the Delivery Authority Relationship Manager • Workshops undertaken and continuing to assess viability of proposed location and designs • Involvement in Stakeholder Coordination Group between DTMR / Translink/ the Delivery Authority whom meet on a fortnightly basis to discuss the coach terminal, and work together to find solutions for items such as; preferred location, broader road network planning, ideal transport outcomes, and ultimate asset ownership

5.3.3 Consultation Program

The below implementation plan demonstrates the Delivery Authority's proposed engagement, should the CG require public consultation in addition to the Delivery Authority's targeted consultation. A detailed consultation report is appended to this RfPC.

Table 13. Implementation plan

Activity		Content	Stakeholders
PRE-RELEASE CONSULTATION: ONE WEEK PRIOR TO PUBLIC RELEASE OF THE REQUEST FOR PROJECT CHANGE			
Courtesy phone calls	Contact key stakeholder to confirm imminent release of the Request for Project Change.	Advise of release of the Request for Project Change and book in a one-to-one briefing during the consultation period.	- Queensland Rail - Department of Housing and Public Works - Department of Transport and Main Roads / Translink - Brisbane City Council (incl. Parklands Management)
Elected representative letter and briefings	Personalised letters to offer briefings to elective representatives on: - Impacts of the concept design on their electorate - Change Report process and opportunity for comments / submissions Establish project contacts so constituents can be directed to the Delivery Authority team.	Provide letter offering briefing and info packs containing factsheet and Request for Project Change Executive Summary to display in electorate office.	**Federal:** - Member for Griffith (Labour) - Member for Brisbane (LNP) **State:** - Member for South Brisbane - Member for Brisbane Central **Local:** - Lord Mayor - Councillor for Central Ward

Activity		Content	Stakeholders
WEEK ONE			
Issue letter to residents	Owners and occupants of apartments within Parklands Boulevard	- Advise of change of use of land behind Platform 10 - Advise of RfPC consultation process and option to submit response - Offer for one-on-one meetings if requested	Residents of the seven residential buildings within Parklands development.
General advertising	Advertise the Request for Project Change is available for public comment. Advertise timing of public displays and information session.	- Courier-Mail - Quest local newspapers	South-East Queensland (if required)
Website	Project website to be updated with current information.	- Fact sheet - Link to Request for Project Change on OCG website.	All

Activity		Content	Stakeholders
EdM (TBC)	Electronic direct mail	- Fact sheet - Link to Request to Project Change on OCG website.	Cross River Rail database

Activity		Content	Stakeholders
WEEK TWO			
Information sessions – Residential towers on Parklands Boulevard	Commence schedule for information sessions in building foyers with detailed project information and various subject experts from the team on hand	Changes to the project as identified in the Request for Project Change including: - The previously approved use - Proposed concept design - Construction impacts - The project, history, its need, strategic context, benefits - Project timeframes - Consultation and how to be involved.	- Residents of the seven residential buildings on Parkland Boulevard
Meetings coach operators	Further discuss any issues raised during early engagement, and provide avenue for official submission if requested	Meeting format – will vary depending on stakeholder and level of detail available.	All coach operators including: - Greyhound - CountryLink - Sunstate - Australian Sunset Safaris - Premier - Bus Qld - Murrays Coaches - Cross Country Tours - National Tour Company - Fun over Fifty
Unstaffed displays	Display project posters and provide public access to hard copy project information in strategic locations relevant to the project area and future users.	Hand deliver info packs containing updated project information including: - Request for Project Change Executive Summary - Project fact sheets.	- Brisbane Transit Centre – Level 3 - Brisbane Transit Centre – Level 2 food court - Platform 10 – Long distance rail platform.
Personal briefings with key individual stakeholders around specific issues / topics related to the concept design.	Provide key stakeholders with project information around issues and opportunities.	Meeting format – will vary depending on stakeholder and level of detail available.	Residents and/or operators as required. Key stakeholder contacted in pre-consultation week as required.

Activity	Content	Stakeholders
POST CONSULTATION		

Close-out stakeholder enquiries	Follow-up and close out any outstanding enquiries from consultation period.	Provide information as per enquiry or questions. Follow-up meeting if needed.	As needed
Collate feedback for OCG	Assist CG with collation of all feedback received during consultation.	Provide Consultation Manager Report and meeting minutes regarding the Request for Project Change to the CG.	CG

5.3.4 Key Stakeholder Consultation Outcomes

Consultation with the key stakeholders is a stated requirement outlined within the CGCR. **Table 14** below outlines the consultation already undertaken and key outcomes from consultation meetings with key stakeholders.

Table 14. Summary of consultation with key stakeholders

Stakeholder	Consultation and Outcomes
Greyhound	The Delivery Authority met with Greyhound on the 24 April 2018 to seek input to feasibility and design. Greyhound advised that its location preference is Roma Street due to its proximity to CBD, rail and Translink bus services. Greyhound advised that timetable adjustments and restricted layover can be accommodated in principle.
Coach Operators	On 1 June 2018, the Delivery Authority hosted a forum with all operators currently utilising the coach facilities within the BTC. During this forum, operators were briefed on; the requirement for relocation from the BTC (due to demolition), traffic counts and timetable analysis undertaken, operational models, and the concept design. Areas of primary concern for operators include capacity constraints, lack of luggage storage facilities, and lack of certainty around a long-term plan for coach facilities in Brisbane.
Brisbane City Council	BCC has a lease for the 32 metered public car spaces which provide revenue. Six meetings have occurred with the Delivery Authority/BCC Working Group on the following dates: - 17 April 2018 - 8 May 2018 - 21 May 2018 - 29 May 2018 - 7 June 2018 - 19 June 2018 These meetings included discussion on the temporary coach terminal solution, property, leases and land discussions, site inspection, Parkland Boulevard upgrade design workshop. BCC has been continually engaged on the coach terminal matter through regular working groups. In addition, BCC and Parklands Management have met with the Delivery Authority frequently and have worked closely with the Delivery Authority to design the current solution (collaborative approach to traffic management, pedestrian management, tie in to broader road network and use of the vertical transport). The Delivery Authority will continue to work in consultation with BCC.
Department of Housing and Public Works	Consultation with DHPW has occurred during end April and early May regarding the land transfer process. Terms of agreement for the transfer are continuing with DHPW. Other interests are to be extinguished by agreement, or taken over by the Delivery Authority.

Queensland Rail	The Delivery Authority provided a high-level verbal description of the proposed location and arrangement for the Platform 10 Coach Terminal solution at the Delivery Authority/QR Roma Street regular working group meetings on 20 April 2018 and 4 May 2018. QR advised that it had no objections to the proposed solution. QR was satisfied with the concept design presented, noting that it does not impact on rail operations.
Department of Transport and Main Roads	The Delivery Authority has advised TMR of the proposed location and arrangement for the Platform 10 temporary coach terminal solution. TMR is supportive of the proposed solution. The most recent engagement session took place on 28 May 2018.

5.3.5 Public Consultation

Previous public consultation undertaken during the EIS and 2017 RfPC processes resulted in a number of submissions. These were reviewed and those issues relevant to the Roma Street precinct area have been considered in the development of the Roma Street Coach Terminal Relocation solution and the temporary coach terminal design. The key relevant issues and how these issues are being managed are summarised in **Table 15** below.

Table 15. Summary of key relevant social concerns and proposed management

Key Issues	Management Measures
Reduced parking increases pressure on already limited parking spaces along Parkland Boulevard and at Platform 10	Loss of the 32 BCC car parks for a five-year period is already an impact of the Project. Loss will be extended to up to 10 years, however, car parking is envisioned to be provided within the broader Roma Street Precinct Master Plan.
Reduced parking for parkland visitors	Retention or reduced use of the temporary Car Park (College St) during construction is being considered to retain visitor parking.
Access to residential car parks from Parkland Crescent	Property access will be maintained at all times.
Increased noise and dust impacts on Parkland apartments	See **Section 4.3.2** and **4.3.3.**
Visual amenity	See **Section 4.3.5** and **Appendix D**
Interface of Roma Street station to the Roma Street parkland and improved connectivity should be considered	The design maintains existing connectivity from Roma Street Station to the parklands. There will be minor diversions during the 38-week construction period and a traffic management plan for the construction phase will include provision for safe pedestrian access to the Platform 10 from Parkland Boulevard.

Under the RfPC process, the CG will determine if further public consultation is required as outlined in **Section 1.3**.

6. Volume 3 Design Drawings

The Roma Street North Worksite area had been nominated as a ‘General Site Area’ in the 2017 reference design drawing (CRR-0002-CD-RP-105). This design drawing has been revised to capture the new land use of a ‘Temporary Coach Terminal’ (Refer **Appendix F**).

7. Amendments to 2017 Imposed Conditions

This RfPC – Roma Street Temporary Coach Terminal and amendments to Imposed Conditions has been developed to:

- Propose a change in the approved use of the Roma Street North Worksite area from a temporary construction worksite to a temporary coach terminal;
- Propose specific mitigation measures to manage the construction and operation of the temporary coach terminal; and
- Request amendments to Imposed Conditions and Definitions prescribed in the 2017 Coordinator-General Change Report to facilitate design, construction and operation of the Project Works.

The detailed proposed amendments with justifications are outlined in **Table 16** below.

Table 16 – Proposed Imposed Condition amendments and reasons

Section Reference	Condition Reference	Condition Amendment	Reasons
Part A. Imposed Conditions (General)	Condition 1. General conditions **(a)**	The project must be carried out generally in accordance with the Cross River Rail Request for Project Change dated February 2017, including the amended Volume 3 Design Drawings publicly notified in April 2017 and amendments to the Project identified in the Cross River Rail Request for Project Change dated June 2018.	Proposed change to capture the 2018 change.
	Condition 1. General conditions **(c)**	(c) The Roma Street Coach Terminal Relocation must be carried out in accordance with the conditions imposed at Part E.	This additional condition has been proposed to ensure it is clear this scope is being delivered under a separate set of conditions.
	Condition 2. Outline Environmental Management Plan **(a)**	~~Six~~ Two months prior to the commencement of Project Work submit a final Outline Environmental Management Plan to the Coordinator-General for approval.	A nominated 8-week review and approval timeframe has been proposed as an acceptable timeframe to minimise the risk of project program delays resulting from this process.
	Condition 2. Outline Environmental Management Plan **(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.	This additional condition has been nominated to ensure any additional OEMP requirements resulting from Requests for Project Change (RfPC) are captured. Approval of amendments is not proposed, as OEMP amendments will only occur in response to any additional or amended conditions resulting from RfPCs, with amendments transparent to the community (via publication on the Delivery Authority's website).

Section Reference	Condition Reference	Condition Amendment	Reasons
Part C. Imposed Conditions (Construction)	Condition 6. Reporting **(c)**	The Monthly Report must be provided to the Coordinator-General and the Environmental Monitor, and be made available on the project website within ~~one~~ four 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.	Due to the timeframes required by the contractor to obtain all required information for the monthly report, including environmental monitoring data, this timeframe was identified as being too short. Four weeks is proposed based on assumption of obtaining laboratory data at the end of the month (2 weeks), interpreting and reporting on the data to the Delivery Authority for review (1 week), and submitting the final report (1 week).
	Condition 17. Surface Water **(a)**	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.	To ensure consistency with the nominated guideline (Section E3.2, Best Practice Erosion and Sediment Control Guidelines, 2008 (International Erosion Control Association))
Schedule 3.	Definitions	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; • the relocation of the Roma Street Coach Terminal.	This definition change will remove the temporary coach terminal works out of the full Project scope, which will be managed under its own condition set and Construction Environmental Management Plan (CEMP), remove the trigger for the OEMP six months prior to Project Works, and remove the need for an Independent Environmental Monitor and Community Relations Monitor.

8. Conclusion

Under the current CRR Project, the existing carpark and land adjacent to Platform 10 was identified and approved for laydown and storage purposes for a five-year construction period.

The purpose of this RfPC is to request that the CG evaluate a proposed change to the Project to use this area as a temporary coach terminal with an intended 38-week construction period and a design life of 10 years, in order to facilitate demolition of the BTC and construction of the CRR Project.

Technical reviews of key environmental aspects which may have been impacted from the works have demonstrated that the overall impacts of construction and operation of the temporary coach terminal would be similar or less than the impacts already evaluated and approved for this location. The design and location will have urban integration and will retain key access from the coach terminal to both CRR Roma Street Station, Brisbane Busway and the existing Roma Street Station.

The Delivery Authority has developed a solution which would facilitate delivery of the Project, whilst ensuring the environmental outcomes are achieved. The solution proposed is on State land, provides a better user experience, and is an appropriate use of the area given its surrounds. It has undergone detailed design workshops to ensure services are maintained and coach operator requirements are accommodated.

The proposed solution for the temporary coach terminal has been designed and developed in consultation with coach terminal operators, QR, TMR and BCC, and provides an adequate temporary solution, to allow for a permanent solution to be integrated into broader Roma Street precinct master planning.

9. References

Brisbane City Council (BCC), (2018), Brisbane Metro Draft Design Report, Chapter 05 Project Description, at: https://yoursay.brisbane.qld.gov.au/34726/documents/75470

CRR Joint Venture (SKM/ Aurecon), (2011a), EIS Technical Report No1 – Transport, Part B, pg 7-415.

CRR Joint Venture (SKM/ Aurecon), (2011b), EIS Chapter 4 – Project Description, pg 4-77.

CRR Joint Venture (SKM/ Aurecon), (2011c), EIS Chapter 5 – Transport, pg 5-171.

Department of Transport and Main Roads (DTMR) (2017), Guide to Traffic Impact Assessment, at: https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Guide-to-Traffic-Impact-Assessment

Department of Transport and Main Roads South East Queensland Principal Cycle Network Plan (SEQPCNP) (2007) at: https://www.tmr.qld.gov.au/Travel-and-transport/Cycling/Principal-Cycle-Network-Plans

IBIS World, (2017), Long Distance Bus Transport - Australia Market Research Report, viewed 23/04/2018, at: https://www.ibisworld.com.au/industry-trends/market-research-reports/transport-postal-warehousing/road/long-distance-bus-transport.html

Hensher, D.A, (2017), Working Paper: *Future bus transport contracts under mobility as a service regime in the digital age: are they likely to change?*, Institute of Transport and Logistics Studies, The University of Sydney Business School, Sydney, Australia, at: http://sydney.edu.au/business/__data/assets/pdf_file/0011/283691/ITLS-WP-16-15.pdf

APPENDIX A – Air Quality Technical Note

Technical Note

ARUP

To	Cross River Rail Delivery Authority	Date	22 June 2018
Copies		Reference number	261603-02
From		File reference	
Subject	Air quality impacts at proposed coach terminal relocation at Roma Street Station		

1 Introduction

This technical note relates to Roma Street Station and the immediate surrounds and considers the existing situation, the proposed use identified in the 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) Project and subsequent Request For Project Change (RFPC) approved in 2017, with regard to air quality.

Parkland Crescent is used to access Roma Street Station by vehicle and provides passenger pick-up and set-down locations, a taxi rank and public car park. This was the case at the time of writing of the EIS and remains the current situation.

The 2011 EIS for CRR originally contained a construction site for the North Shaft construction on Parkland Crescent at the western end of Platform 10, that necessitated the closure of Parkland Crescent at the intersection with Parkland Boulevard. The road closure also resulted in all access to the construction site for the North Shaft construction being via Parkland crescent. This is shown diagrammatically in Figure 1.

The subsequent previously approved 2017 Request for Project Change (RFPC) realigned the station and CRR route, avoiding the need to construct the North Shaft site identified in the EIS. As such, the need for physical construction activities to occur in proximity to Platform 10 of Roma Street Station was excluded from the previously approved RFPC.

However, under the previously approved RFPC a “general site area” was included taking the whole of the land area. The area including the existing car park and passenger pick-up and set-down locations adjacent to Platform 10 and the residential buildings on Parkland Boulevard is known as the Roma Street North Worksite, and was identified for use for laydown and storage purposes. This is shown diagrammatically in Figure 2.

Both the EIS and previously approved RFPC works adjacent to Platform 10 entailed a five-year construction period.

The subject of this current RFPC is to consider repurposing the Roma Street North Worksite (Proposed Site) from a laydown and storage work site to a temporary long distance coach terminal with an intended 38-week construction period and 10 year life span. A site locality plan for the proposed coach terminal is shown in Figure 3. The preferred design layout (at the time of writing)

for the proposed coach terminal for Parkland Crescent and Parkland Boulevard are shown in Figure 4 and Figure 5 respectively.

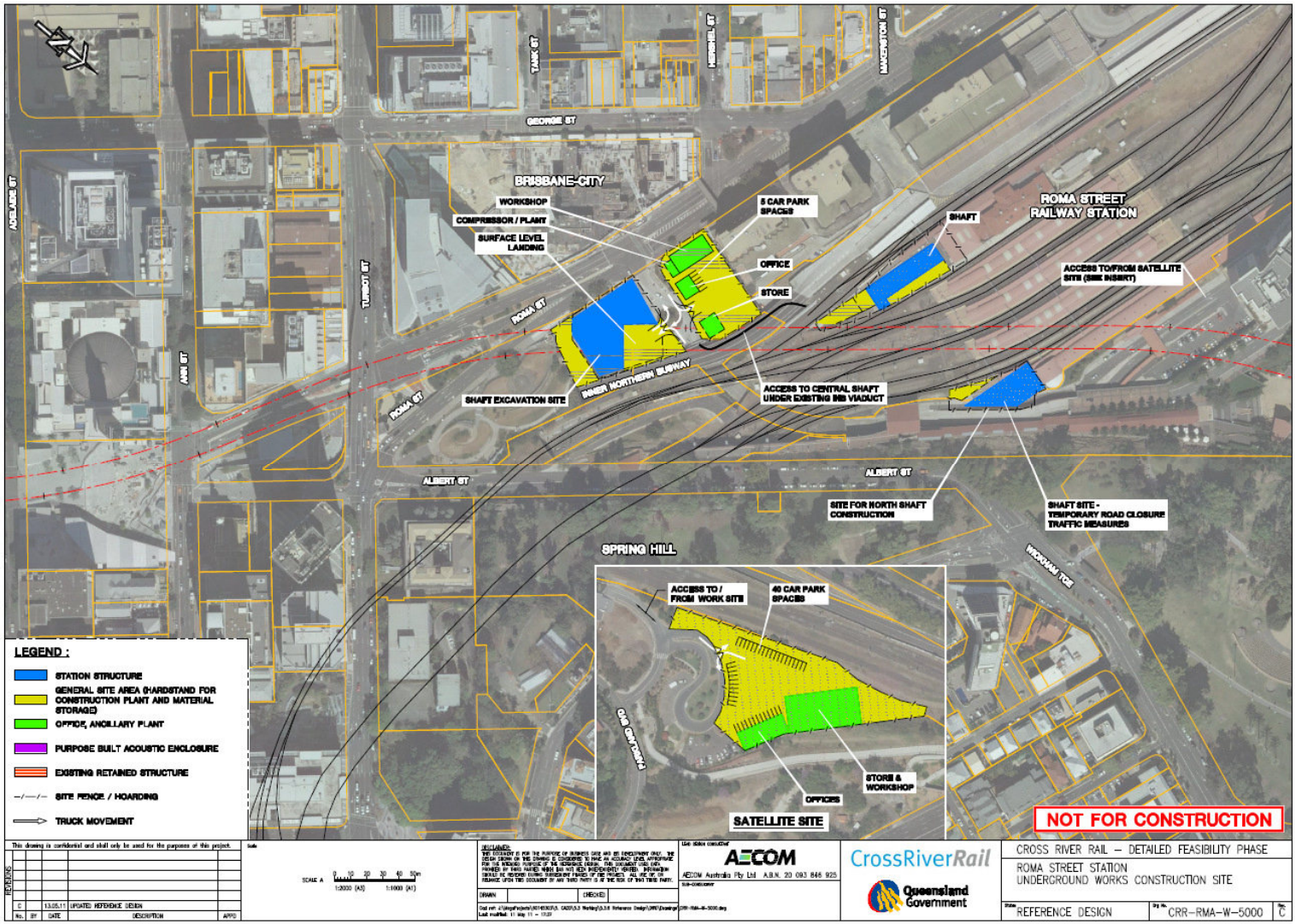

Figure 1: 2011 EIS Construction Site – Roma Street

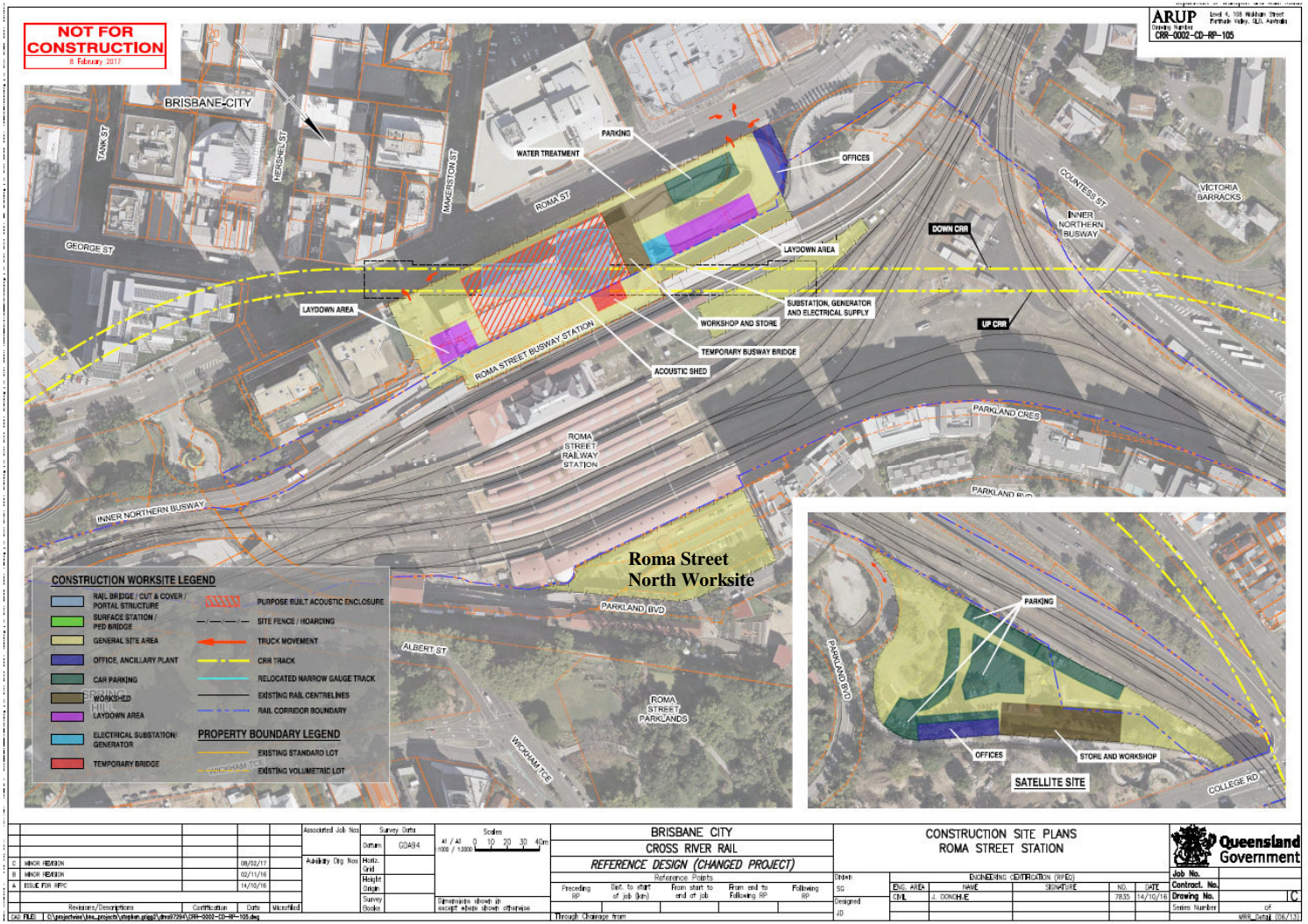

Figure 2: 2017 RFPC construction site – Roma Street North Worksite

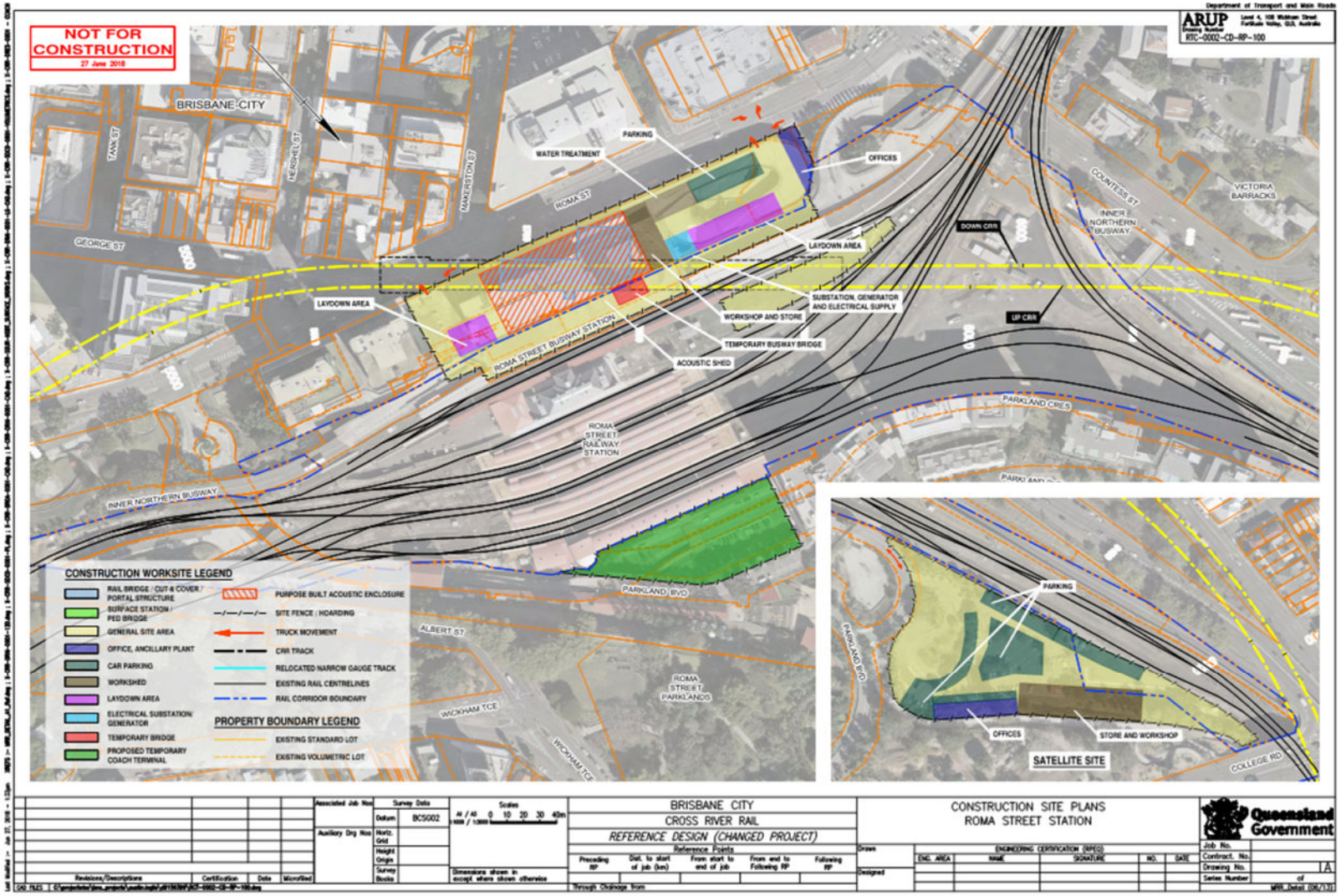

Figure 3: 2018 proposed coach terminal site locality plan

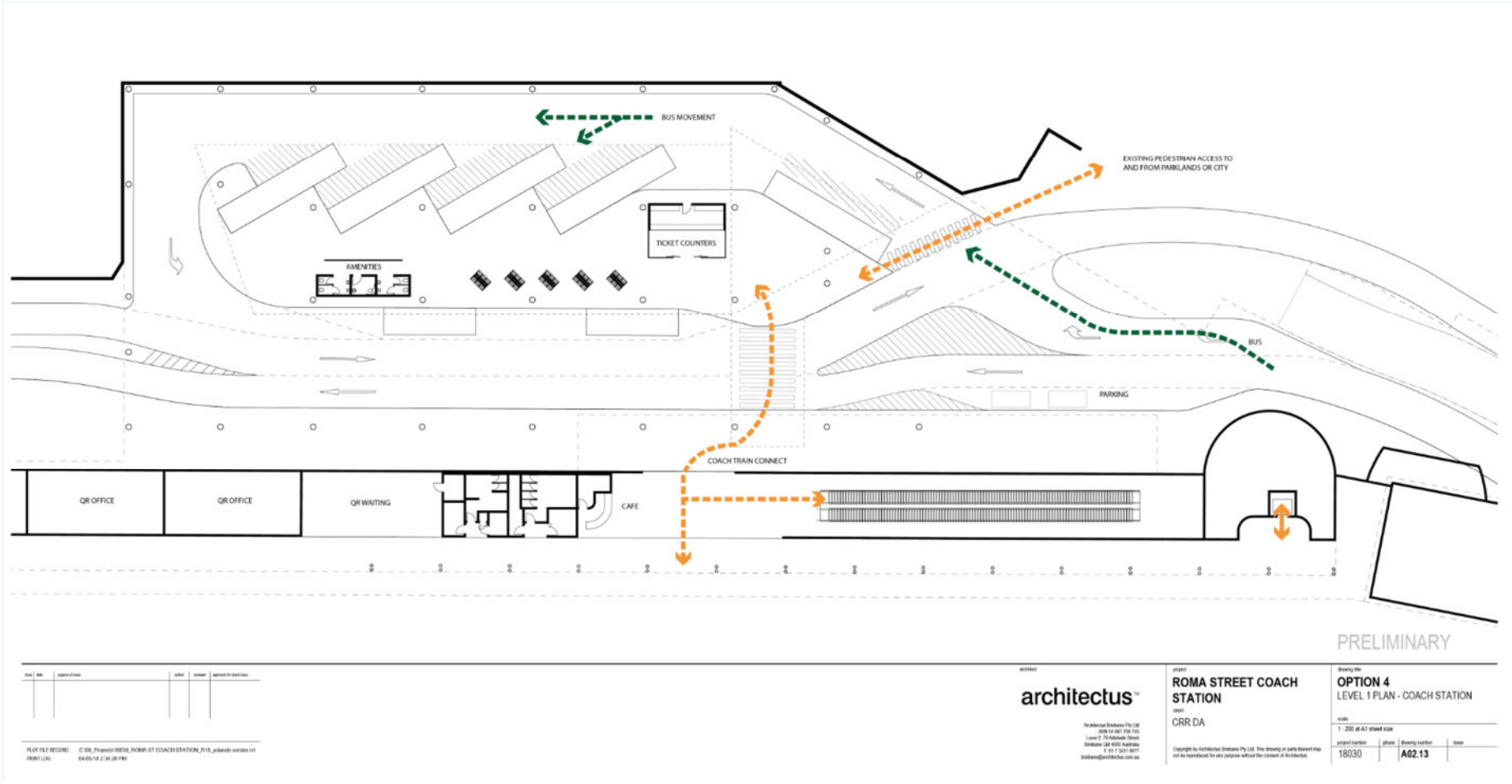

Figure 4: 2018 proposed coach terminal layout at Parkland Crescent

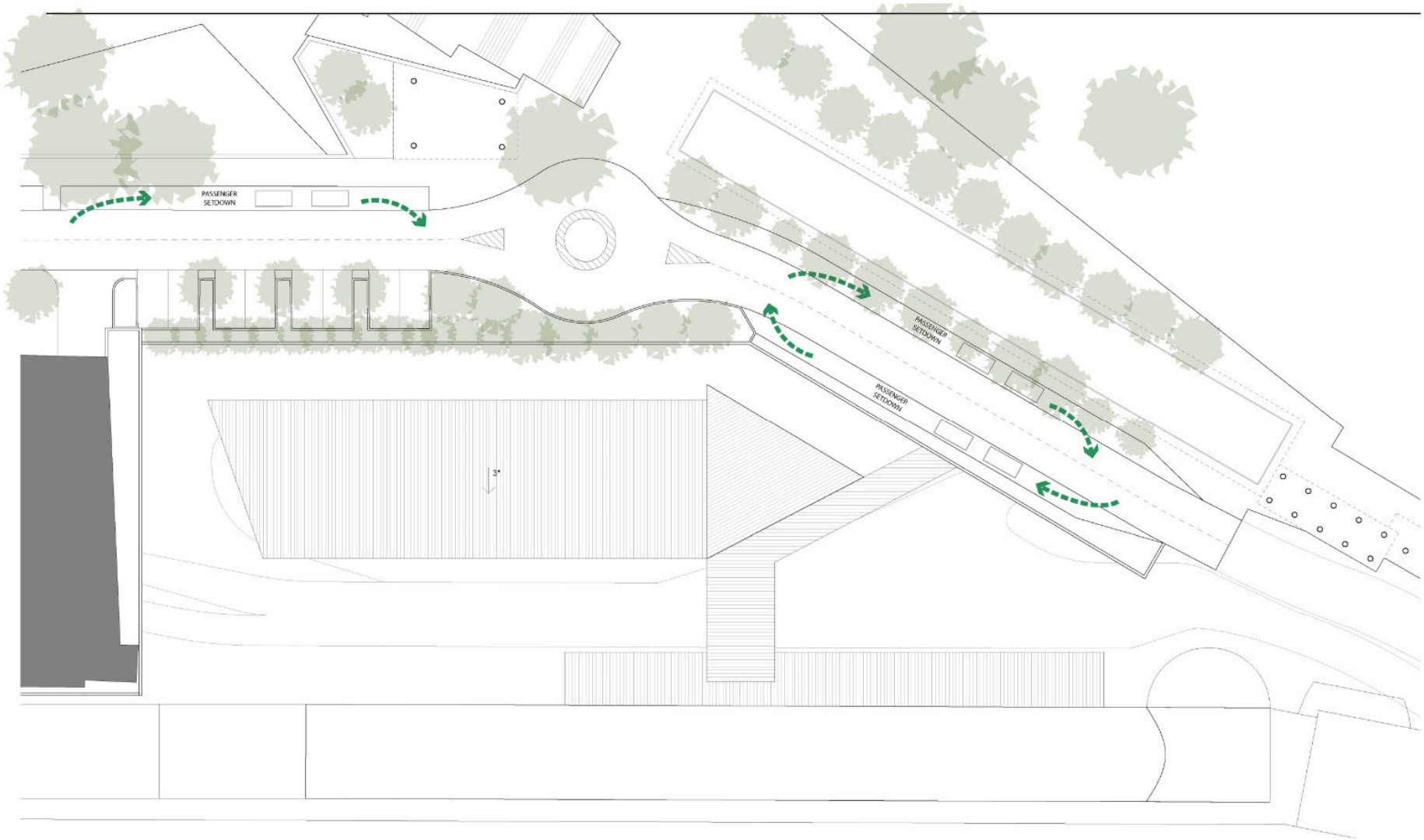

Figure 5: 2018 proposed coach terminal layout at Parkland Boulevard

2 CRR Project Approved Work and Impacts

2.1 Construction

Construction phase air quality impacts associated with dust generated at Roma Street Station were not quantitatively assessed in the 2011 EIS as the works would occur in the shaft or purpose-built shed. In addition, no quantitative assessment of air quality impacts associated with additional construction vehicles travelling to and from the site was carried out.

Under the EIS, during peak construction, the Roma Street general site area generates 10 heavy vehicles per hour or up to 130 vehicles per day (103 spoil and 27 deliveries). This results in 260 heavy vehicle movements per day (i.e. 130 movements to access the site and 130 movements to leave the site).

The assessment established that through the implementation of best practice management measures, including for construction traffic, there would be a low potential for adverse air quality impacts during construction.

The 2017 RFPC identified that the whole of the existing car park area adjacent to Platform 10 will be converted to a laydown site / storage area. This reduced peak heavy vehicle movements to 6 heavy vehicles per hour with up to 66 heavy vehicles (39 spoil and 27 deliveries) per day. This would result in 132 heavy vehicle movements per day accessing and exiting the site. With the Proposed Site reverted from being a major construction site to a non-construction site by the 2017 RFPC, additional traffic movements would be lower than those approved via the 2011 EIS, therefore, the expected air quality impacts were established to be negligible.

2.2 Operation

The following key findings from the operational air quality assessment in the EIS were determined to be applicable across the alignment:

- Predicted changes to motor vehicle use and emissions from CRR are unlikely to affect regional air quality; and
- Predicted changes to train movements and emissions from CRR are unlikely to affect regional air quality.

As the previously approved RFPC did not affect operational vehicle use or train movements, the outcomes for the previously approved RFPC are the same as established in the EIS.

Operational effects on local air quality at Roma Street Station and the surrounding area as a result of CRR were not assessed as part of the EIS or previously approved RFPC, as these were considered to be negligible.

3 Material Changes to Impacts

3.1 Assessment Methodology

A qualitative assessment approach has been completed to determine any potential material changes to the predicted air quality impacts detailed in the 2011 EIS and 2017 RFPC, for land earmarked for the proposed coach terminal (hereafter referred to as the 'site').

The methodology used is as follows:

- Determine the type and proximity of sensitive receptors from the site.
- Review and document the established background pollutant concentrations.
- Establish the predicted traffic (i.e. coach) movements at the site.
- Provide commentary on the likelihood of localised air quality impacts and potential mitigation measures.

3.2 Results and Discussion

3.2.1 Site Location

The site is located in an urban area within the Brisbane CBD. Adjacent to the site are high rise residential buildings (west), recreational areas (north/east of Parkland Boulevard) and Roma Street Station (south). Sensitive "receptors" are likely to include local residents (above ground level), community members and train passengers entering/leaving the station complex. All of these receptors are currently subject to vehicle (mainly idling) emissions within the car park and drop-off areas, and vehicle emissions along Parkland Crescent and Parkland Boulevard. Average daily traffic movements on parkland Boulevard and Parkland Crescent is currently about 4,200 and 1,200 respectively.

3.2.2 Background Air Quality

Background air quality information shown in the previously approved RFPC and summarised in Table 1 was established based on data from four monitoring stations (Cannon Hill, Brisbane CBD, South Brisbane, Rocklea). The data indicates that with the exception of annual $PM_{2.5}$, background concentrations are well below their respective air quality goals within the CRR Project Imposed Conditions.

Table 1: Background concentrations of Air quality indicators against CRR Project goals 2017

Air quality indicator	Averaging period	Units	Background concentration	Air quality goal	Criterion
TSP	Annual	µg/m^3	24	90	Human Health
PM_{10}	24 hours	µg/m^3	17	50	
	Annual	µg/m^3	14.5	25	
Dust Deposition	30 days	mg/m^2/day	60	120	Nuisance
TSP	24 hours	µg/m^3	26	80	

3.2.3 Potential Construction Impacts

The RFPC identified the Roma Street North Worksite as a general site area to be used for laydown and storage purposes. It is anticipated that construction works to deliver the general site area would have involved general clearing of the site (e.g. removing existing structures like the walkway canopy).

In addition to the general clearing described, construction of the proposed coach terminal is likely to also include further site preparation works, erection of new structures (e.g. coach canopy, ticket kiosk), and some minor works at the northern extent of Roma Street Station. Although the construction works at the site will vary as a result of the proposed coach terminal, they are not anticipated to be extensive and any additional impacts, primarily in relation to construction dust, would likely be negligible and temporary. With regard to construction traffic, the EIS specified that a maximum of 10 heavy vehicles per peak hour were anticipated to be accessing the North Shaft construction area and the RFPC specified a maximum of 6 heavy vehicles per peak hour were anticipated to be accessing the Roma Street North Worksite. The peak hour truck volume for the construction of the proposed coach terminal is expected to be three per peak hour – this is discussed in more detail in the Traffic Technical Note. Therefore, predicted air quality impacts during the construction phase are expected to be comparable with the outcomes presented in the EIS and RFPC.

It should be noted that the duration of works at the site under the proposed RFPC (i.e. 38 weeks) will be shorter than under the previously approved EIS and RFPC (i.e. five years).

The previously approved RFPC provides mitigation measures that should be implemented during the construction period. It is anticipated that these would also be implemented during the construction of the proposed coach terminal. Further, the previously approved RFPC allows for monitoring of dust deposition to be completed adjacent to the residential complex at Roma Street Station during construction works. This location is in close proximity (approx. 100m) to the proposed coach terminal, so would provide an accurate representation of existing background levels and the impact of construction (and operation) on local air quality from the proposed coach terminal.

3.2.4 Potential Operational Impacts

During the operation of CRR this area would have been returned to the existing situation prior to construction with Parkland Crescent open to vehicles and the car park reinstated. If use of the reinstated area is comparable to the existing situation, no change in air quality would be anticipated.

It should be noted that the commencement of operation of the proposed coach terminal would overlap with the construction phase of the EIS and RFPC. As noted previously, the site had approval as a general site area and this included some construction traffic movements to and from this area. Prior to the RFPC, the area would have also been used by vehicles travelling to the North Shaft construction site as approved in the EIS.

Using information provided by the transport planning team for CRR it was established that there would be around 75 coaches per day (i.e. 150 total coach movements – 75 coaches in and 75 coaches out), with a peak hour movement of approximately 13 coaches. This would result in a 11% increase in daily traffic flows. Table 2 shows the percentage increase in traffic associated with the previously approved situations and the percentage increase in traffic associated with the operation of the proposed coach terminal.

The EIS states that a maximum of 130 heavy vehicles per day are anticipated to access the Roma Street station worksites during construction. Of these 130 vehicles, a maximum of 29 are anticipated to access the Roma Street north worksite via Parkland Crescent. Therefore, a total of 58 movements per day have been accounted for when determining the percentage increases for Parkland Crescent. All 130 vehicles are still anticipated to be accessing Parkland Boulevard due to the location of all three worksites.

The RFPC states that a maximum of 66 heavy vehicles per day are anticipated to access the Roma Street station worksites during construction. However, the RFPC does not differentiate between vehicles accessing the main worksite (directly via Roma Street) or vehicles accessing the general site area on Parkland Crescent. In lieu of this information, it has been assumed that a similar percentage to the EIS will be accessing Parkland Boulevard and Parkland Crescent (i.e. 29/130 = 22%). This equates to a maximum of 15 heavy vehicles accessing Parkland Boulevard and Parkland Crescent per day, which is equivalent to 30 heavy vehicle movements.

Table 2: Additional traffic associated with each situation

	Parkland Boulevard, south of ramp (both directions)	**Parkland Crescent (both directions)**
Existing daily traffic volume	4178	1206
% increase in vehicles for the EIS	5.9%	4.6%
% increase in vehicles for the 2017 RFPC	0.7%	2.4%
% increase in vehicles for the proposed coach terminal	3.5%	11.1%

Table 2 shows that the proposed coach terminal is likely to result in a greater percentage increase in daily traffic movements compared to both the EIS and RFPC for Parkland Crescent. Furthermore, the coach terminal is likely to result in a greater percentage increase in daily traffic along Parkland Boulevard compared to the RFPC, however the previously approved EIS would result in a larger increase in daily traffic movements than the proposed coach terminal

However, the incremental increase in vehicle movements as a result of the proposed coach terminal are still not anticipated to have significant impacts from an air quality perspective and furthermore would be highly unlikely to result in exceedances of the CRR project goals. As noted in Section

3.2.2, background pollutant concentrations are well below their respective objectives and therefore a small increase in concentrations as a result of increased traffic movements associated with the proposed coach terminal is not expected to result in a non-compliance with the applicable air quality goals.

4 Recommendations and Conclusion

This Technical Note established that the construction of a proposed coach terminal in the approved 'general site area' north of Roma Street Station is not expected to result in any material change to the predicted air quality impacts presented in the 2011 EIS or 2017 RFPC, during both the construction and operational phases. Although the coach terminal is anticipated to have a greater percentage increase in traffic volumes along Parkland Crescent compared to the 2011 EIS and 2017 RFPC, it is not anticipated to exceed the CRR Project air quality goals based on existing levels in the area and the predicted increase in traffic associated with the development.

To implement best practice mitigation measures and minimise any adverse air quality impacts, it is recommended that (where possible) coach engines are shut-off when at the terminal, and any idling is reduced as far as practicable.

APPENDIX B – Noise Technical Note

Technical Note

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Project title	Cross River Rail	Job number	261603-02
cc		File reference	
Prepared by		Date	22 June 2018
Subject	Noise impacts of proposed coach terminal relocation at Roma Street Station		

1 Introduction

This technical note relates to Roma Street Station and the immediate surrounds and considers the existing situation, the proposed use identified in the reference project and documented in the 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) Project and subsequent Request for Project Change (RFPC) approved in 2017, with regard to noise and vibration.

Parkland Crescent is used to access Roma Street Station by vehicle and provides passenger pick-up and set-down locations, a taxi rank and public car park. This was the case at the time of writing of the EIS and remains the current situation. The 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) originally contained a construction site for the North Shaft construction on Parkland Crescent at the western end of Platform 10, that necessitated the closure of Parkland Crescent at the intersection with Parkland Boulevard. The road closure also resulted in all access to the construction site for the North Shaft construction being via Parkland crescent. This is shown diagrammatically in Figure 1.

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However, under the previously approved RFPC a “general site area” was included taking the whole of the land area. The area including the existing car park and passenger pick-up and set-down locations adjacent to Platform 10 and the residential buildings on Parkland Boulevard is known as Roma Street North Worksite and was identified for use for laydown and storage purposes. This is shown diagrammatically in Figure 2.

Both the EIS and previously approved RFPC works adjacent to Platform 10 entailed a five-year construction period.

The subject of this current RFPC is to consider repurposing the Roma Street North Worksite (Proposed Site) within the general site area from a laydown and storage work site to a temporary long distance coach terminal with an intended 38-week construction period and 10 year life span. A site locality plan for the proposed coach terminal is shown in Figure 3. The preferred design layout (at the time of writing) for the proposed coach terminal for Parkland Crescent and Parkland Boulevard are shown in Figure 4 and Figure 5 respectively.

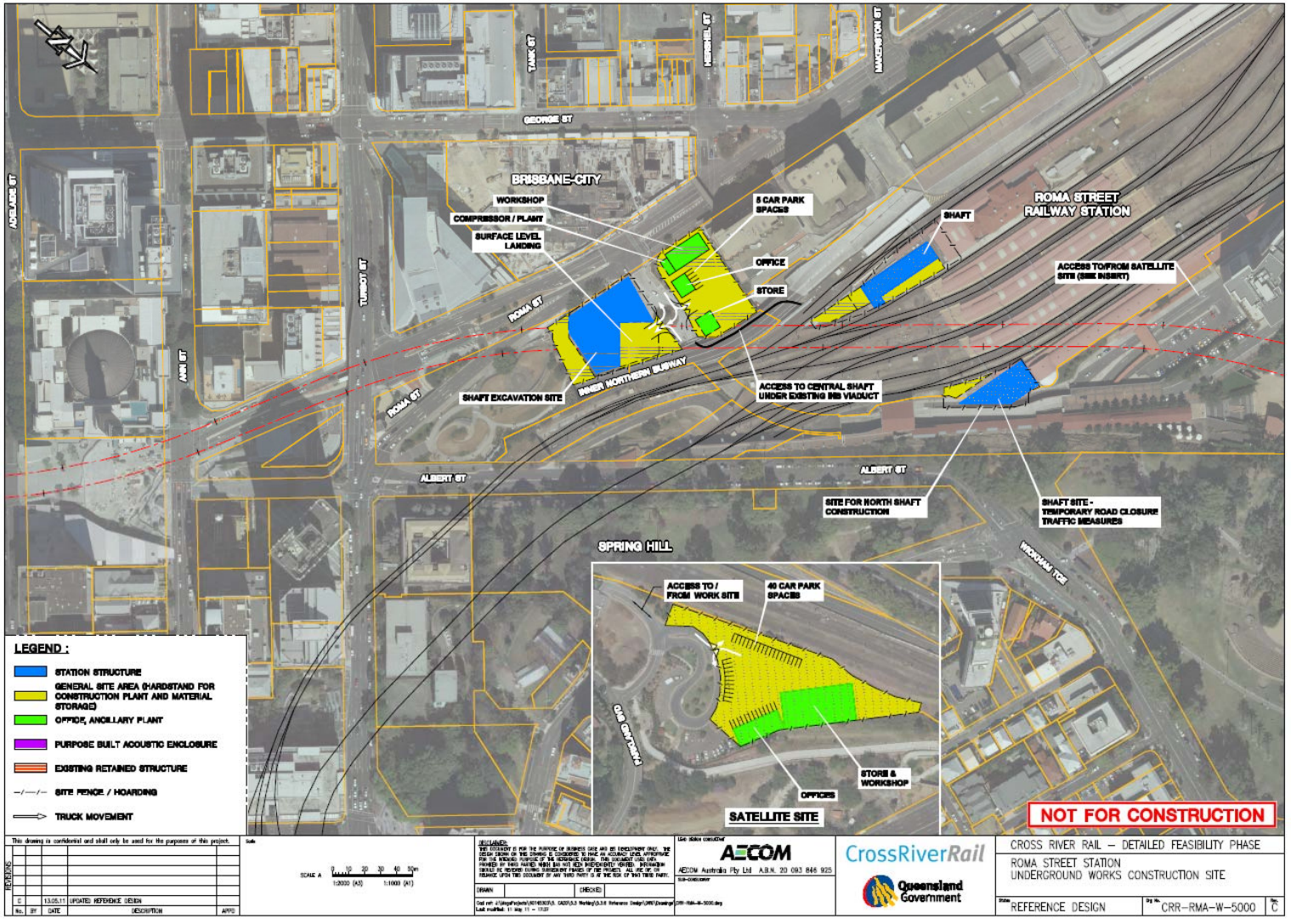

Figure 1: 2011 EIS Construction Site – Roma Street

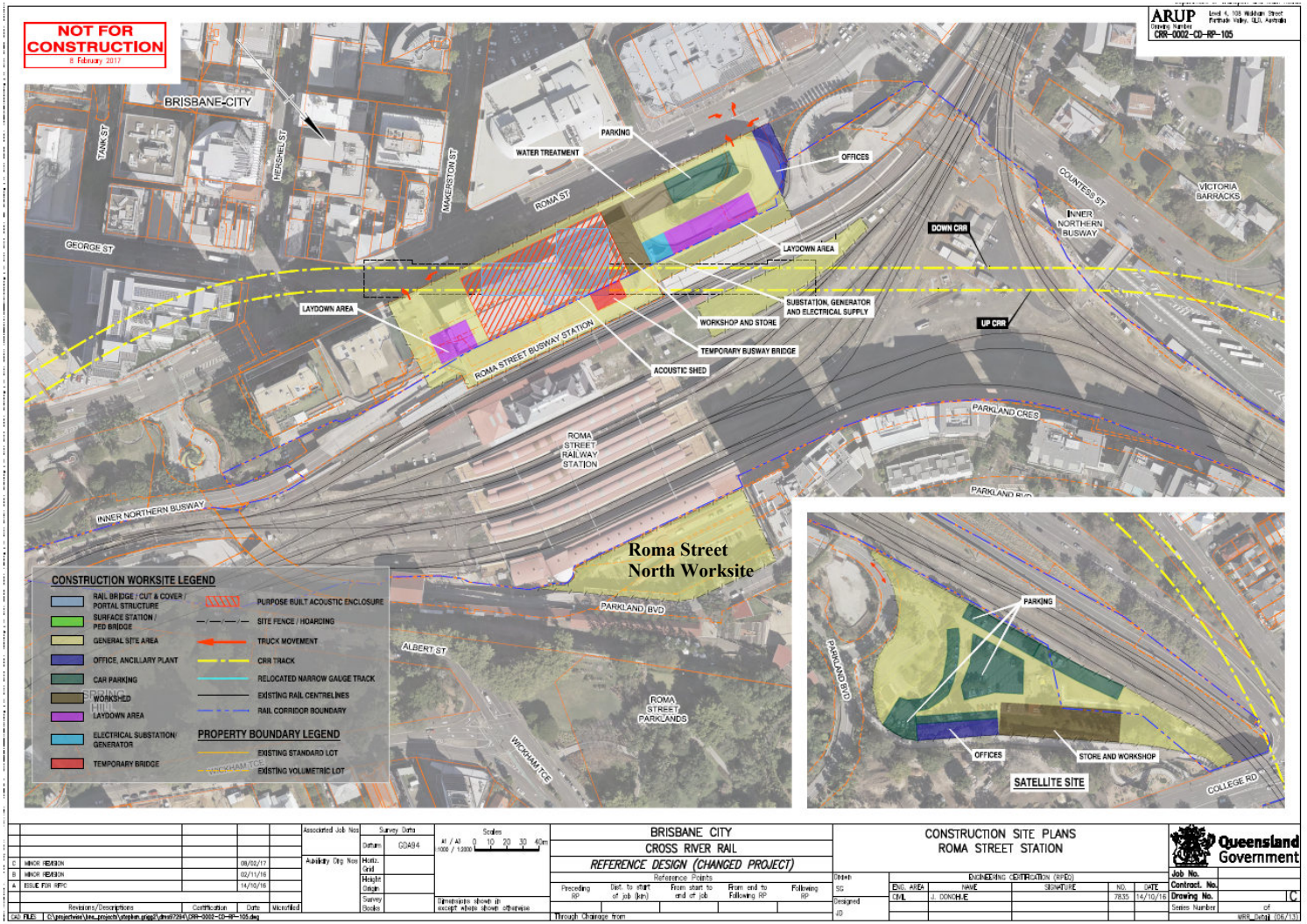

Figure 2: 2017 RFPC construction site – Roma Worksite North

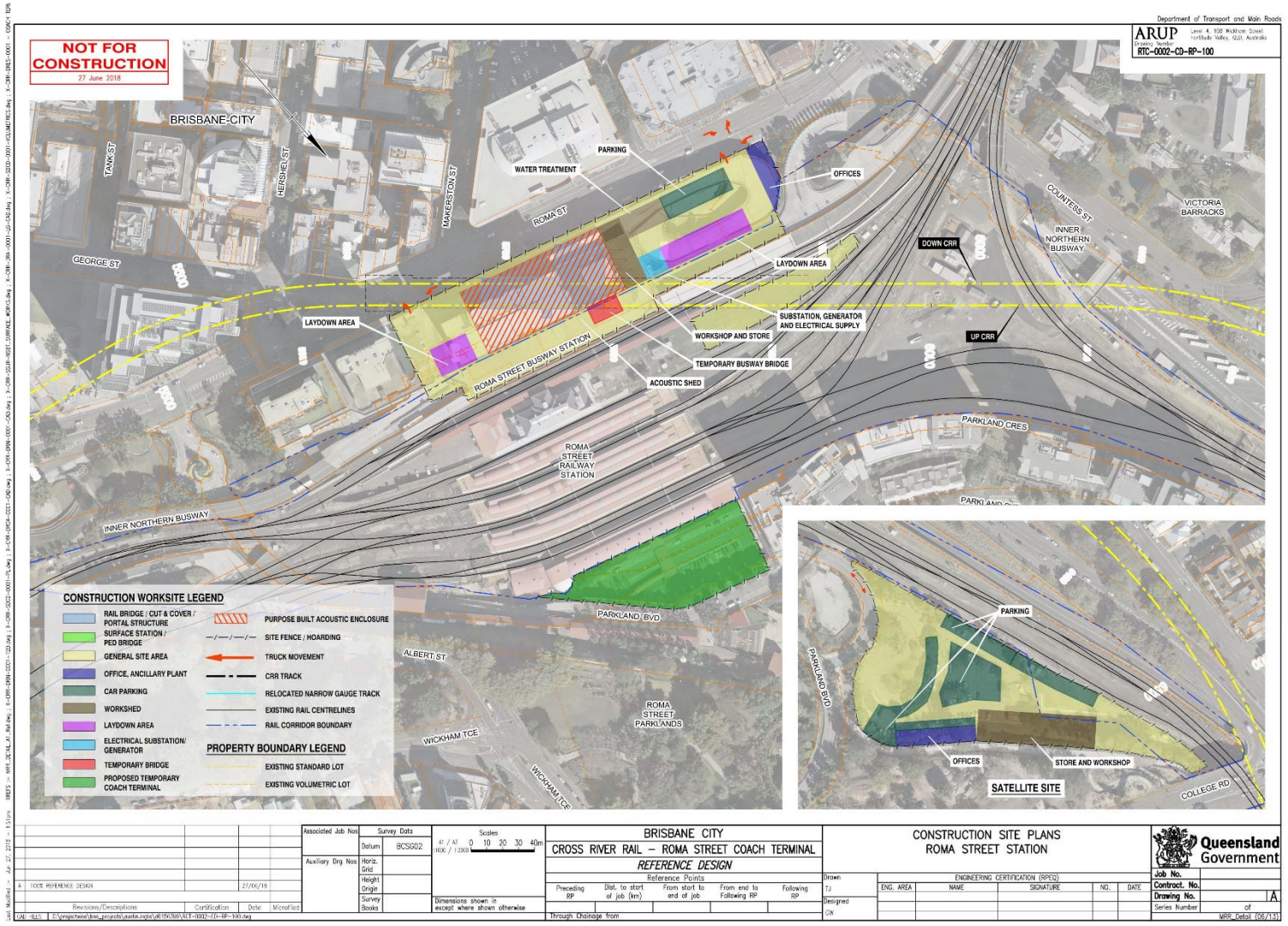

Figure 3: 2018 proposed coach terminal site locality plan

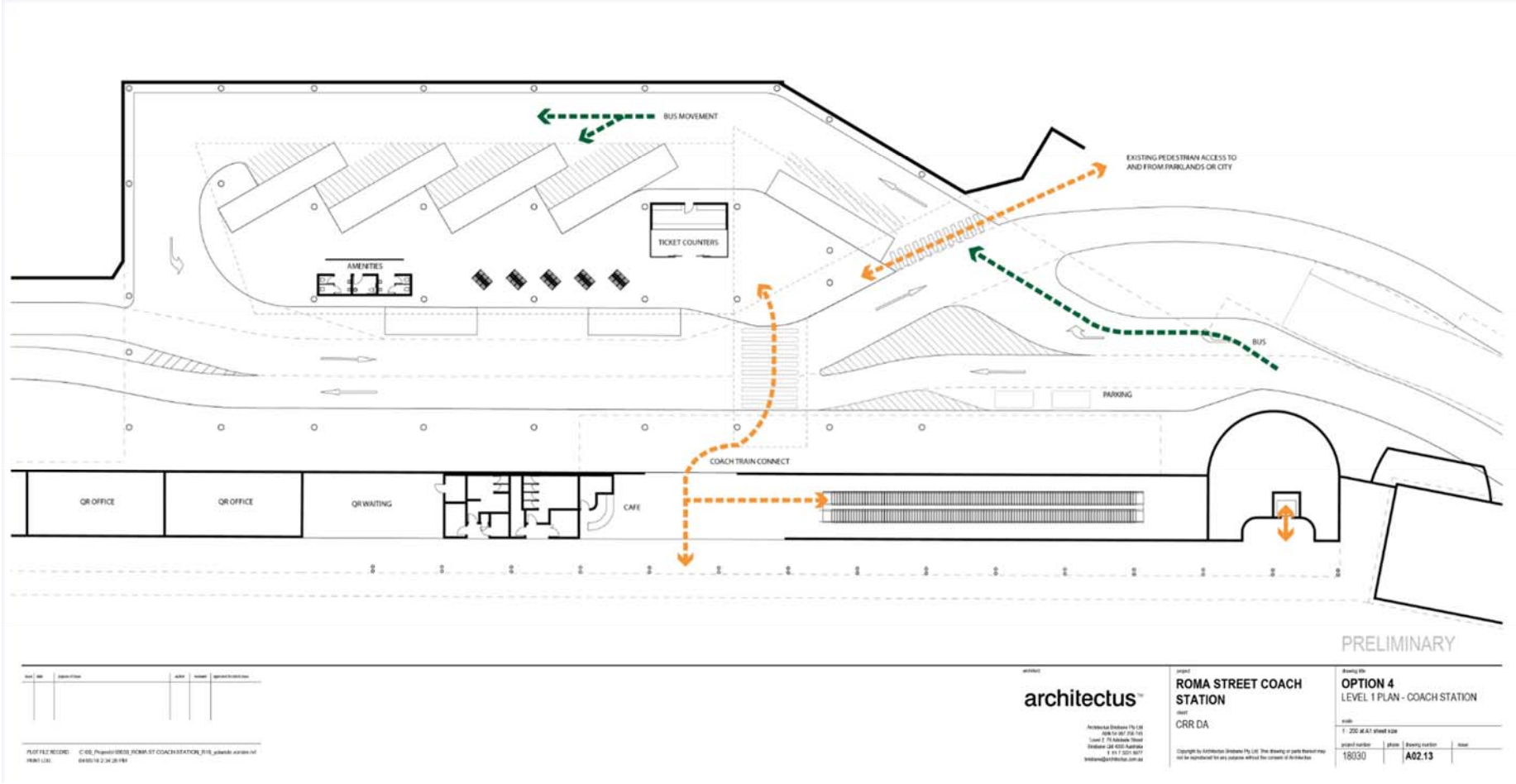

Figure 4: 2018 proposed coach terminal layout at Parkland Crescent

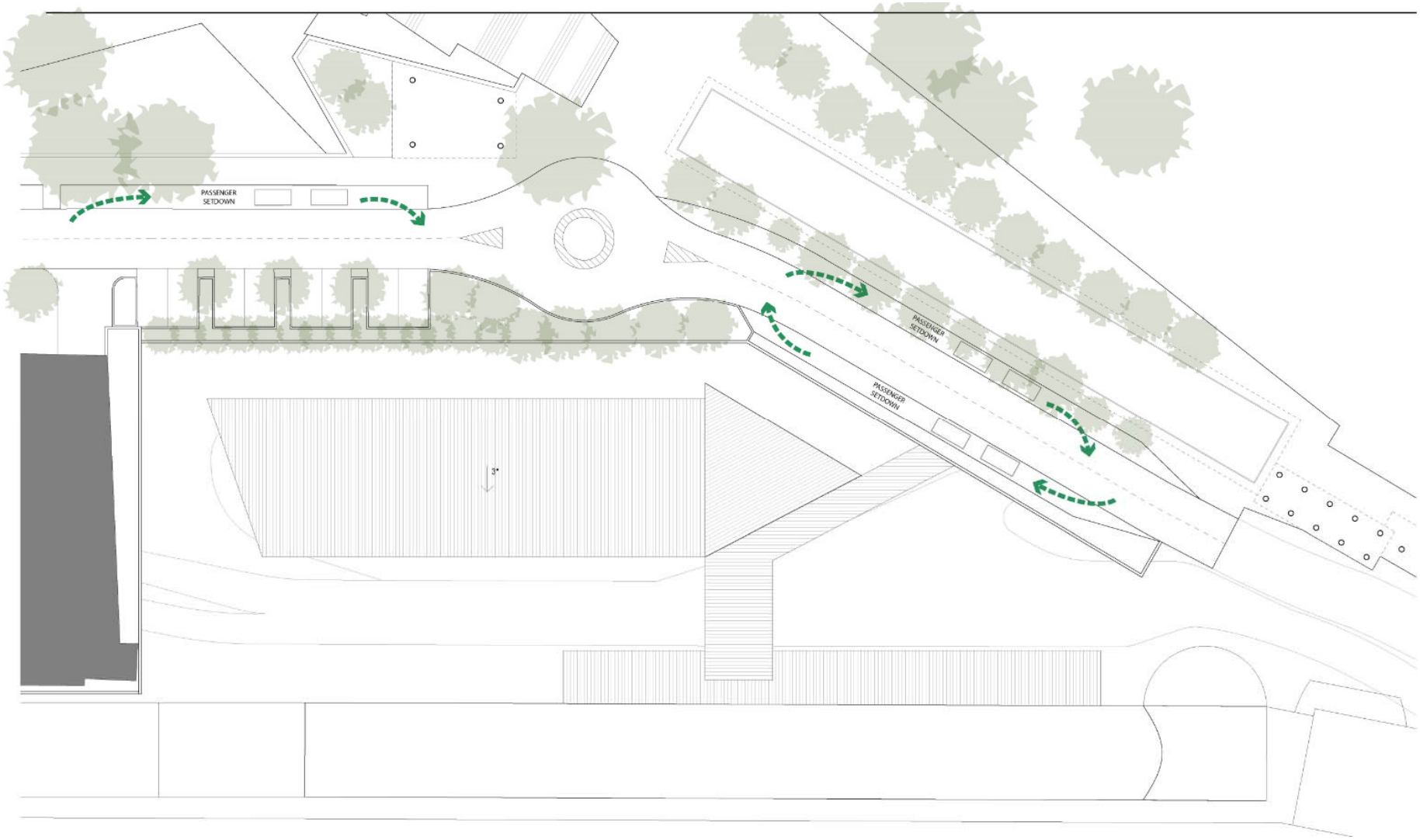

Figure 5: 2018 proposed coach terminal layout at Parkland Boulevard

2 CRR Project Approved Works and Impacts

2.1 Construction

2.1.1 Traffic Noise

For both the EIS and the RFPC, demolition and site establishment would be expected to be for less than six months. The frequency of truck movements is expected to not exceed that of the excavation stage. The peak hourly construction traffic during site establishment and demolition for both the EIS and RFPC is presented in Table 1.

Table 1: Previously approved peak hourly construction traffic (one way movements) for site establishment and demolition

Construction Worksite	**Peak Traffic Movements (Loads / Hour)**	
	2011 EIS	2017 RFPC
Roma Street	10	6

For both the EIS and RFPC, peak daily spoil and delivery vehicle movements are compared in Table 2.

Table 2: Previously approved construction peak daily traffic (one way movements) for spoil and material haulage

Construction Worksite	**Peak Spoil Movements (Loads / Day)**		**Peak Delivery Movements (Loads / Day)**	
	2011 EIS	2017 RFPC	2011 EIS	2017 RFPC
Roma Street	103	39	27	27

Predicted change in traffic noise levels for construction traffic on haul routes was predicted in the EIS using the following parameters:

- L_{A10} (18hour) for between 6 am and 12 midnight; and
- L_{A10} (1hour) for the peak number of heavy vehicle movements during any hour between 12 midnight and 6 am.

The predicted change in traffic noise due to construction traffic in the EIS is presented in Table 3.

Table 3: Predicted change in road traffic noise in the EIS attributable to construction traffic on haul routes

Worksite	**Road Segment**	**Change in Road Traffic Noise Level due to CRR**
Roma Street Station	Roma Street adjacent to existing station	L_{A10} (12hr) +0.3

For the RFPC, it was noted that the EIS traffic volumes where compliant with road traffic noise criteria, therefore the RFPC would also comply with criteria given that construction traffic movement were no greater, and in many cases lower.

2.1.2 Construction Works

Construction activities identified in the EIS at the North Shaft Construction site adjacent to Roma Street Platform 10 were as identified in Table 4.

Table 4: EIS approved construction activities at Roma Street North shaft site

Roma Street Station worksite - north shaft

	Element	Estimated durations (weeks)	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
			Year 1																									
A	Site clearance and establishment	6																										
B	Establish piling rigs on site	4																										
C	Install piles	8																										
D	Excavate to formation level	12																										

Notes:
A: Dominant noise sources include excavators and cranes (mostly daytime construction works)
C: Dominant noise sources include piling rigs (mostly daytime construction works)
D: Dominant noise sources include jumbo drill rigs, excavators and front end loaders

The nearest identified noise sensitive receivers to the North Shaft site were the residential properties on Parkland Crescent located at 150 metres from the proposed North Shaft construction site, referred to in the EIS as Receiver area J.

Worst case construction noise levels were predicted in the EIS for three scenarios as follows:

- Scenario 1 – Site establishment including demolition
- Scenario 2 – Pilling of access shafts
- Scenario 3 – Shaft excavation

The predicted worst case construction noise levels to the residential receivers identified in the EIS were as presented in Table 5.

Table 5: EIS predicted worst case construction noise levels

Receiver Area	Scenario	Period	Noise Goal (dBA)[1]	Predicted Noise Level[2] (dBA)	Noise Goal Exceedance with level of Noise Mitigation (dBA)		
					3 m Hoarding	6 m Hoarding	Enclosure
	2	Night	LAmax,adj – 57	68 – 77	20	15	n/a
	3	Night	LAmax,adj – 57	67 – 76	19	14	7
J – Parkland Crescent Residential	1	Day	LA10,adj – 62	52 – 58	-	-	n/a
	2	Day	LA10,adj – 62	54 – 58	-	-	n/a
	3	Day	LA10,adj – 62	52 – 57	-	-	-
	1	Night	LAmax,adj – 57	57 – 63	6	1	n/a
	2	Night	LAmax,adj – 57	59 – 63	6	1	n/a
	3	Night	LAmax,adj – 57	57 – 62	5	-	-

Note 1 – LA10,adj and LAmax,adj (night-time) assessment parameters applicable for non-steady state and intermittent noise sources. LAeq,adj assessment parameter applicable to steady state or continuous (night-time) noise sources.

Note 2 – Predicted noise levels include 3 m acoustic hoarding between noise sources and receivers.

The EIS identified that the predicted construction noise levels indicate that with provision for 6 m hoarding around each site (where practicable), night-time construction noise levels would be within 1 dB(A) of the sleep disturbance noise goal and therefore unlikely to interfere with the residents sleep. Further to this, it is likely that facade noise reductions for residential buildings located within the CBD are substantially higher than the 10 dB(A) assumed for this assessment.

Further, the EIS identified that in the case of CRR construction works required in the City precinct (i.e. Roma Street Station and Albert Street Station), it may prove onerous to apply absolute noise goals in acoustic environments characterised by relatively constant high ambient noise levels. For example, ambient night-time noise levels measured over a week at monitoring location 6 (i.e. Parkland Crescent) ranged between 75 to 80 dBL_{Amax} and 59 to 63 dBL_{Aeq}. Comparison of predicted night-time construction noise levels in Table 52 with a medium performance acoustic enclosure (e.g. residential receiver I-Holiday Inn L_{Amax} ,adj – 64 dB) indicates that worst case CRR construction noise levels would be below the range of existing night-time ambient (L_{Amax}) noise levels.

The RFPC identifies that the whole of the existing Roma Street Platform 10 car park area will become a construction worksite for the purposes of laydown and storage purposes, therefore under the RFPC, it was noted that the use of the site, whilst larger in area, would revert from a major construction site as identified in the EIS to a non-construction site.

Worst case construction noise predictions were for the Roma Street Station works which identify noise levels at the Parkland Boulevard residential properties, including a 3m site hoarding at worksites, as shown in Table 6.

Table 6: Predicted worst case construction noise levels (unmitigated) from the Roma Street Station worksite for the RFPC

Receptor	Predicted external construction noise levels $LA_{10,adj,15min}$		
	Scenario 1	Scenario 2	Scenario 3
A - Parkland Boulevard Residential	61 - 77	56 - 67	59 - 72

This shows that the mitigated construction airborne noise goals at Parkland Boulevard residential would potentially be exceeded for limited periods, the construction airborne noise goals are identified in Table 7.

Table 7: Construction airborne noise goals from the RFPC

Receiver Location/Type	Monday to Saturday 6:30 am to 6:30 pm		Monday to Saturday 6:30 pm to 6:30 am, Sundays and Public Holidays	
	Steady State (dBA $LAeq,adj,15min$)*	Non-Steady State (dBA $LA10,adj,15min$)*	Continuous (dBA $LAeq,adj,15min$)*	Intermittent (dBA LAmax)*
Parkland Boulevard Residential	67	77	57	64

2.2 Operation

The proposed design in the EIS had limited operational noise contribution from the area adjacent to Roma Street Platform 10. Operational noise sources consisted of Parkland Crescent plant and ventilation shaft with operational plant being located approximately 130 m from the nearest noise sensitive receivers. The residential apartments located on Parkland Crescent.

The identified noise goals for operation in the EIS are shown in Table 8.

Table 8: Operational Noise Goals from the EIS

Site Location	Ancillary Location	Distance to Nearest Sensitive Receiver (m)	Noise Goal (dBL_{A90})[1]	Maximum Acceptable Sound Power Levels emitted from the Ancillary Facility (dB(A))
Roma Street Station	Southern Entry	~80	47	93
	Parkland Crescent Plant and Ventilation Shaft	~130	47	97

In terms of operational noise assessment, the EIS simply defined the maximum acceptable sound power level identified in Table 8 for each worksite in order to achieve compliance with the noise goals.

Under the RFPC it was noted that the site area adjacent to platform 10 was no longer a source of operational noise unlike in the EIS due to the removal of the North Shaft site and associated ancillary equipment from the area. Therefore, operational noise was considered no further for the site adjacent to Platform 10.

3 Material Changes to impacts

3.1 Assessment Methodology

For the purposes of identifying the risk of change from previously approved works in the site area adjacent to Roma Street Platform 10 (i.e. the area of the proposed coach terminal), a comparison has been made between previously approved construction and operational activities and those that are likely to occur under the proposal for the coach terminal.

These comparisons also consider the relative distance of the proposed and previously approved activities as part of the identification of risk of change in noise impact.

These assessments are qualitative in nature and where risk of a change in impact level is identified a recommendation for further detailed assessment will be identified.

[1] Background creep noise goal in accordance with EPP (Noise). The background creep is the RBL + 0 assessed as the L_{A90} parameter.

3.2 Results and Discussion

3.2.1 Construction

At this early stage in the development of the design, the details of proposed construction requirements have not been established. Therefore, for the purposes of the noise assessment, the construction requirements for the proposed coach terminal have been assumed as follows:

- The existing car park and road surfaces in the proposed coach terminal location are likely to be adequate to form the running surface for the coach terminal where currently in place;
- Some or all existing concrete slabs will need to be removed;
- Some existing kerb lines may need removing / relocating and the ground surface making good;
- Some minor trenching may be required for utilities (e.g. cabling);
- Some minor ground works (levelling of ground not currently asphalted) may be required;
- Concrete pad foundations may need to be laid in passenger loading and transfer areas where canopies are to be provided for weather protection to patrons;
- Canopies would be quick fix bolt down type modular steel frame with sheet metal cladding attached;
- Road line marking would be required;
- Installation of ticketing machines and other similar equipment such as digital signage.

This extent of construction is relatively minor and would be expected to be undertaken over a 38-week period as required to provide an ongoing coach terminal ahead of the demolition of the existing coach terminal at the Brisbane Transit Centre (BTC).

It is anticipated that the construction duration for the proposed coach terminal would be 38 weeks, which is significantly shorter than the proposed five-year construction period for the same area, under the 2011 EIS and 2017 RFPC. In terms of construction activities akin to the Stage 1 site establishment activities which resulted in predicted construction noise levels of 52 to 58 dB(A) without mitigation at the Parkland Crescent residential buildings for a site located 150m distant.

It is likely that construction plant for the coach terminal would on average be located approximately 30 metres from the nearest façade of the Parkland Crescent residential properties. Simplistically correcting for the difference in distance of the EIS construction works compared to the coach terminal construction works would increase the stage 1 site establishment noise levels predicted in the EIS by 14 dB(A) due to the closer proximity of the temporary coach terminal construction works relative to the nearest apartment building on Parkland Avenue. Therefore, the likely worst case construction noise levels for the proposed temporary coach terminal are in the range of 66 to 72 dB(A).

This is considered likely to be representative of the construction noise levels that would be experienced at the nearest Parkland Crescent residential apartments from the construction of the coach terminal.

It should be noted that the identified noise goal for construction activities at the Parkland Crescent residential properties identified in the RFPC is 67$dB_{LA10adj, 15min}$ for steady state noise and 77 $dB_{LA10adj, 15min}$ for non-steady state construction activities.

Therefore, the proposed coach terminal construction activities are likely to comply with the construction noise goals at the Parkland Boulevard residential properties as identified in the RFPC.

With the nearest residential building on Parkland Boulevard directly overlooking the proposed coach terminal site it will not be possible for noise barriers to be used as a form of noise mitigation for construction activities, however, unlike tunnelling works and associated spoil removal activities it is anticipated that the coach terminal can be constructed within "Standard" daytime construction hours, being, 6.30am to 6.30 pm Monday to Saturday, and as such avoid potential impact at the more noise sensitive periods of the day.

This assessment and recommendations are based on construction methodology with limited earthworks, ground disturbance and reliance on prefabricated materials to limit noise generating activities on site. A detailed noise assessment is required in the event construction methods are substituted with high noise and / or vibration construction methods.

3.2.2 Operation

It is expected that the proposed coach terminal will accommodate all services (i.e. coaches and minibuses) currently operating out of the BTC, including long distance coaches and tour buses. Based on an analysis of the existing coach timetables and traffic surveys, it appears that a maximum of approximately 75 coaches per day currently access the facility. Typically, coaches arrive and depart the facility between the hours of 5am and midnight. Based on the coach terminal layout, a maximum of seven coaches / minibuses will be able to utilise the facility at a given time. Based on the timetable and traffic survey analysis, it is anticipated that the terminal will be operating at capacity a few times per day. Excluding the few peak periods during a given day, typically three to four coaches per hour are anticipated to access the facility.

Whilst the effect of traffic noise was not considered for operation in the EIS or RFPC, traffic noise from construction traffic for spoil removal and deliveries was assessed. Of note, the trucks associated with these movements where in the order of 130 movements daily on the Roma Street network and resulted in a change in traffic noise levels of +0.3 dB(A) on the road network. The proposed coach terminal will utilise less coaches than trucks as previously identified in the EIS for construction. Coaches and trucks are comparable in noise emissions, therefore negligible change in road traffic noise levels is expected for the operation of the coach terminal.

That said, consideration also needs to be given to the coach operation proximity, in particular to the Parkland Boulevard residential property adjacent to the proposed coach terminal. The coaches at the terminal would be approximately 30 metres distant from the building façade typically.

The number of vehicle movements associated with the development are too low to be able to calculate traffic noise in accordance with the calculation of road traffic noise methodology.

Therefore, consideration has been given to the likely maximum noise of a coach accelerating from the terminal as the worst case scenario. Based on simplistic calculations accounting for only distance and none other noise propagation loss it is likely that the maximum noise level at the nearest point of the building façade would be in the order of 70 dB(A).

For operational road traffic noise, the applicable noise criteria is 68 $dBL_{A10,\ 18hr}$ in accordance with the DTMR Road traffic Noise code of Practice. This is the 10th percentile of noise contribution from road traffic noise averaged over an 18 hour period. Given that the maximum noise level is anticipated to be 2 dB(A) above this for a short duration acceleration away from the terminal and that can only be expected 75 times in a given day, it is expected that total noise emissions from coach movements will be compliant with the road traffic noise criteria.

Consideration has also been given to the potential for use of reversing alarms for coaches backing out of the parking bays. Reversing alarms fitted to coaches come in many forms, some are activated by proximity centres and as such only activate if an obstruction is detected in the hazard area when a vehicle is reversing, however the worst case from a noise perspective are the beeper type reversing alarms that are activated when a vehicles reverse gear is selected. For the purposes of this assessment the worst case has been assumed for which noise levels of reversing alarm beepers fitted to coaches can be up to 97 dBL_{Amax} when measured at 1 metre. Simply extrapolating this noise level from the nearest coach parking bay in the proposed temporary coach terminal to the nearest Parklands Boulevard residential apartments would result in a noise level from reversing beepers of 70 dBL_{Amax}, some 3 to 7 dB(A) lower than the existing typical maximum noise levels at the apartments day, evening or night.

It should also be further factored in that the orientation of the coach parking bays relative to the nearest Parklands Boulevard residential apartments is such that the rear of the coach is facing away from the apartments which would result in the body of the coach acting as an effective noise barrier between the apartments and the coach reversing alarms to reduce noise levels yet further, likely a minimum of 5-10 dB(A) at the residential apartments.

It should also be noted that at this location adjacent to the railway tracks of Roma Street that the residential properties will also be exposed to railway noise and that the noise criteria applicable to the railway is a maximum of 87 dB(A), substantially higher than the anticipated maximum from coaches.

Further, existing ambient noise levels at the nearest apartment block to the proposed temporary coach terminal undertaken for the EIS indicate that the typical existing ambient noise environment is 64 dBL_{Aeq} during the day, 62 dBL_{Aeq} during the evening and 57 dBL_{Aeq} during the night-time periods. The typical maximum existing noise levels at the nearest apartment block to the proposed temporary coach terminal undertaken for the EIS are identified as 77 dBL_{Amax} during the day, 75 dBL_{Amax} during the evening and 73 dBL_{Amax} during the night-time period, the maximum noise events are considered likely to be associated with train movements at Roma Station.

Appended to this technical note is a table of predicted operational façade noise levels and façade noise maps for the façade of the nearest apartment building on Parklands Avenue overlooking the proposed temporary coach terminal. Both the noise table and the façade noise maps present predicted noise levels for the day, evening and night-time periods of operation for the proposed temporary coach terminal. These are presented for the average (L_{Aeq}) and maximum ($L_{A}max$) noise emissions predicted from operation of the proposed temporary coach terminal.

It should be noted that in both the predicted façade noise level table and the façade noise maps that the ground floor and 1st floor represent the commercial space of the building and that the first of the noise sensitive residential floors is on Level 2.

The colour scale associated with the façade noise maps has been set such that the predicted noise level on the façade will be in varying shades of colour from green through to purple with red indicating the noise level at which measured existing noise levels for the respective acoustic parameter during that period occurs. Shades of colour below red towards green indicate that the predicted operational noise from the temporary coach terminal are lower than the existing noise environment and as such would not give rise to a cumulative increase in the noise environment over the existing.

On this basis, cumulatively the maximum noise emissions anticipated from the proposed temporary coach terminal are likely to be lower than the prevailing maximum noise levels experienced at the nearest apartment block on Parklands Avenue and as such would only result in an increased frequency of maximum noise events.

With regard to frequency of maximum events, comparison between the number of train movements likely to be the cause of the existing maximum noise events and the proposed coach movements associated with the proposed coach terminal provides a useful gauge of likely change associated with the proposed coach terminal.

A review of the operational timetable for passenger trains passing through Roma Street Station has been undertaken and identified that week day daily services amount to 673 trains in a 24-hour period. They are split approximately 471 trains in the daytime period, 109 trains in the evening period and 93 trains in the night-time period.

Whereas there are 75 coaches passing through the proposed temporary coach terminal which will give rise to approximately 12% increase in the number of events that the Parklands Boulevard apartments would be exposed to. With the exception of 4 of the timetable coach movements, these movements would all occur during the daytime period and only one coach movement would occur in the night-time period.

Given the negligible quantity of coach movements during the evening and night-time periods this would not be perceptible cumulatively amongst the significantly greater number of train movements.

During the daytime period coach movements would have a marginally greater cumulative effect with approximately 1 coach movement for every 6.4 train movements, whilst this is more regular occurrence than the evening and night-time period, cumulatively the coach movements remain considerably less frequent than the existing trains and as such cumulatively would not be expected to give rise to a significant change in the existing noise environment.

Whilst the existing coach terminal uses PA to announce to passengers when coaches are boarding, the proposed coach terminal will use dynamic signage, this avoids the potential for annoyance of PA announcements at noise sensitive properties. Therefore, PA noise has not been considered any further.

The proposed coach terminal may have some small items of plant such as cooling fans for electrical items and possibly some enhanced cooling for shared QR/ Coach terminal facilities, should this be the case, the noise emissions from the plant would be designed to meet planning design noise goals

through the implementation of appropriate plant selection and attenuation if necessary. Therefore, this would be compliant with BCC planning noise criteria and cumulatively insignificant, therefore plant noise emissions have not been considered any further.

There is the potential for an increase in patron volume to occur as a consequence of the proposed coach terminal. Whilst the patron numbers associated with the proposed coach terminal have not been identified as this stage, it is reasonable to assume that a typical coach would hold approximately 46 passengers (weighted average based on five coaches with 56 person capacity and two minibuses with 22 person capacity) and with a maximum of 75 coach trips a day that would equate to a maximum of approximately 3500 potential patrons. In practice that is likely to be an overestimate as some passengers maybe through passengers and some coaches will not be at maximum capacity.

When compared with the patron levels associated with Roma Street Station, the patron numbers of the proposed coach terminal are unlikely to materially change patron noise levels at the nearest noise sensitive properties.

4 Recommendations and Conclusion

- The proposed coach terminal has been reviewed for construction noise and subject to assumptions about the scale and type of construction activities required for the development of the proposed temporary coach terminal is considered no worse than the construction works previously approved under the Project Change Request. The construction activities associated with the proposed temporary coach terminal are predicted to be in the range 66 to 72 dB(A), the previously approved construction noise levels under the Project change Request were in the range 56 to 77 dB(A).
- The proposed operation of the coach terminal has been reviewed and is considered no worse than the delivery and haul truck noise levels required for the construction phases of both the EIS and the RFPC.
- The proposed operation of the coach terminal has also been compared against DTMR Road Traffic Noise criteria, and traffic volumes arising from the operation of the coach terminal would be compliant with noise limits.
- The proposed operation of the coach terminal has also been considered from a maximum noise level perspective. Whilst reasonably high maximum noise levels, circa 70 dB(A) are predicted briefly during coach acceleration, the relatively low number of coach services from the proposed coach terminal operation would not materially change the existing noise environment which is dominated by train noise such as sounding of horns prior to departure, train cooling systems and wheel squeal.

  As also identified in previous assessment the existing noise environment in the vicinity is high, as is typical of urban city centres. Consequentially residential buildings constructed in a high noise environment would be constructed with a building envelope providing high sound insulation. As such maximum noise levels from the operation of the coach terminal are considered unlikely to materially alter the existing noise environment at the nearest residential properties on Parkland Boulevard.

DOCUMENT CHECKING (not mandatory for File Note)

Name			
Signature			

APPENDIX C – Traffic Technical Note

Technical Note

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Project title	Cross River Rail	Job number	261603-02
cc		File reference	TN01
Prepared by		Date	27 June 2018
Subject	Traffic impacts of proposed coach terminal relocation at Roma Street Station		

1 Introduction

The 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) originally contained a construction site for the North Shaft construction on Parkland Crescent at the western end of Platform 10, that necessitated the closure of Parkland Crescent at the intersection with Parkland Boulevard. The road closure also resulted in all access to the construction site for the North Shaft construction being via Parkland crescent. This is shown diagrammatically in Figure 1.

The subsequent previously approved 2017 Request For Project Change (RFPC) realigned the station and CRR route, avoiding the need to construct the North Shaft site identified in the EIS. As such, the need for physical construction activities to occur in proximity to Platform 10 of Roma Street Station was excluded from the previously approved RFPC.

However, under the previously approved RFPC a “general site area” area was included taking the whole of the land area, including the existing car park adjacent to Platform 10 and the residential buildings on Parkland Boulevard. The general site area located on the existing car park was identified for use for laydown and storage purposes. This is shown diagrammatically in Figure 2.

Both the EIS and previously approved RFPC works adjacent to Platform 10 entailed a five-year construction period.

The subject of this current RFPC is to consider repurposing the Roma Street North Worksite from a laydown and storage work site to a temporary long distance coach terminal with intended 38-week construction period and 10 year life span. A site locality plan for the proposed coach terminal is shown in Figure 3. The preferred design layout (at the time of writing) for the proposed coach terminal for Parkland Crescent and Parkland Boulevard are shown in Figure 4 and Figure 5 respectively.

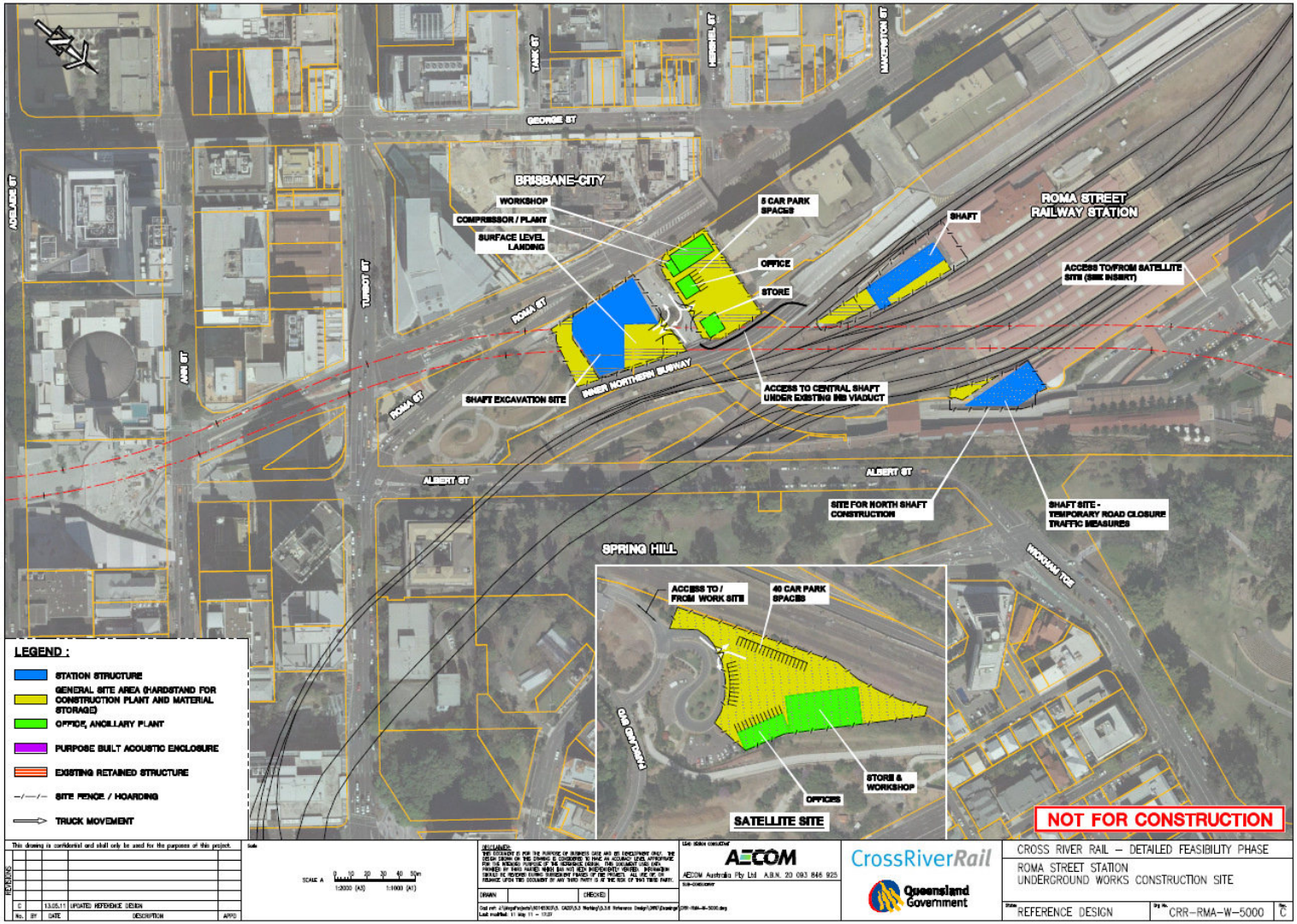

Figure 1: 2011 EIS Construction Site – Roma Street

Technical Note

261603-02 27 June 2018

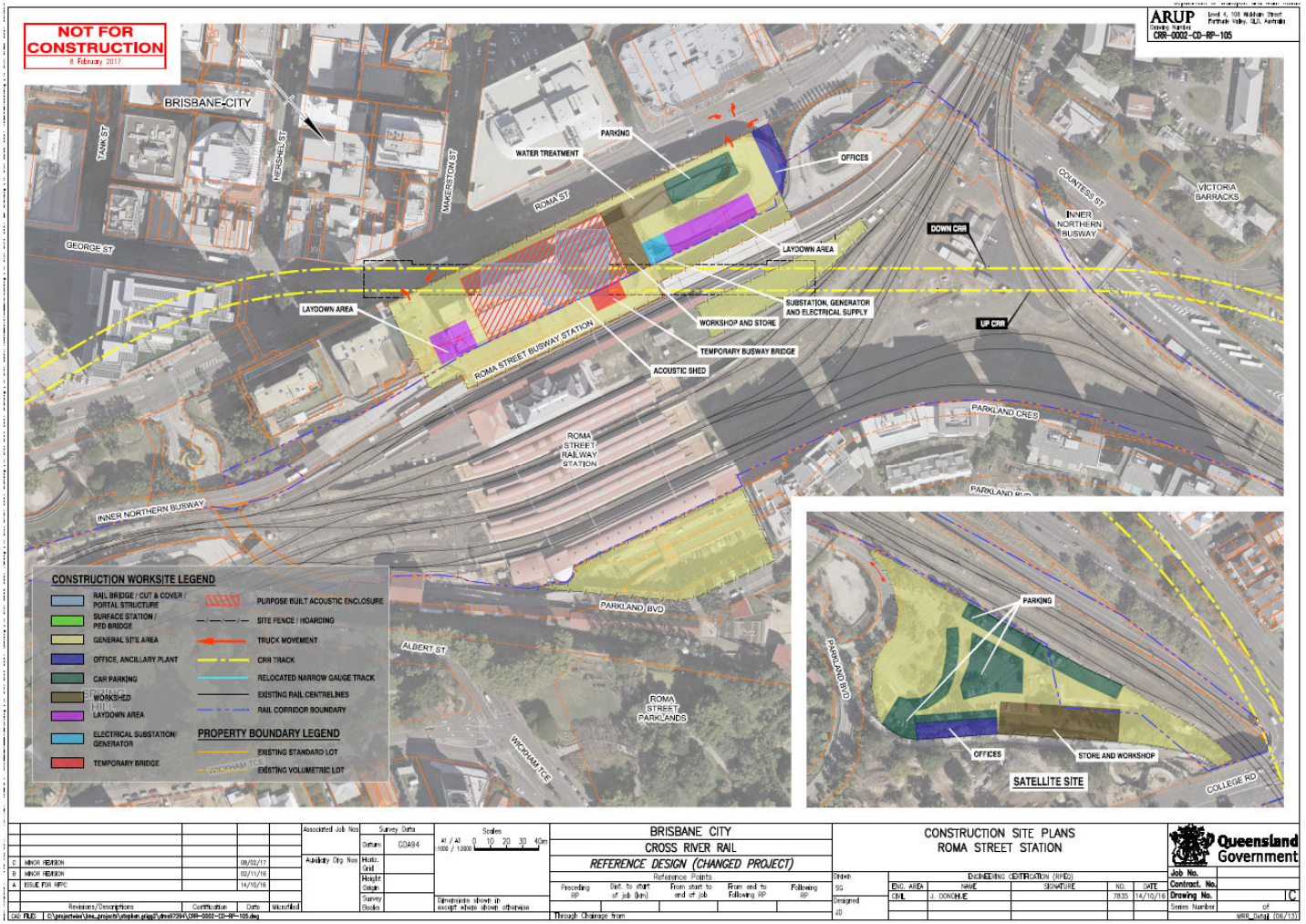

Figure 2: 2017 RFPC Construction Site – Roma Street

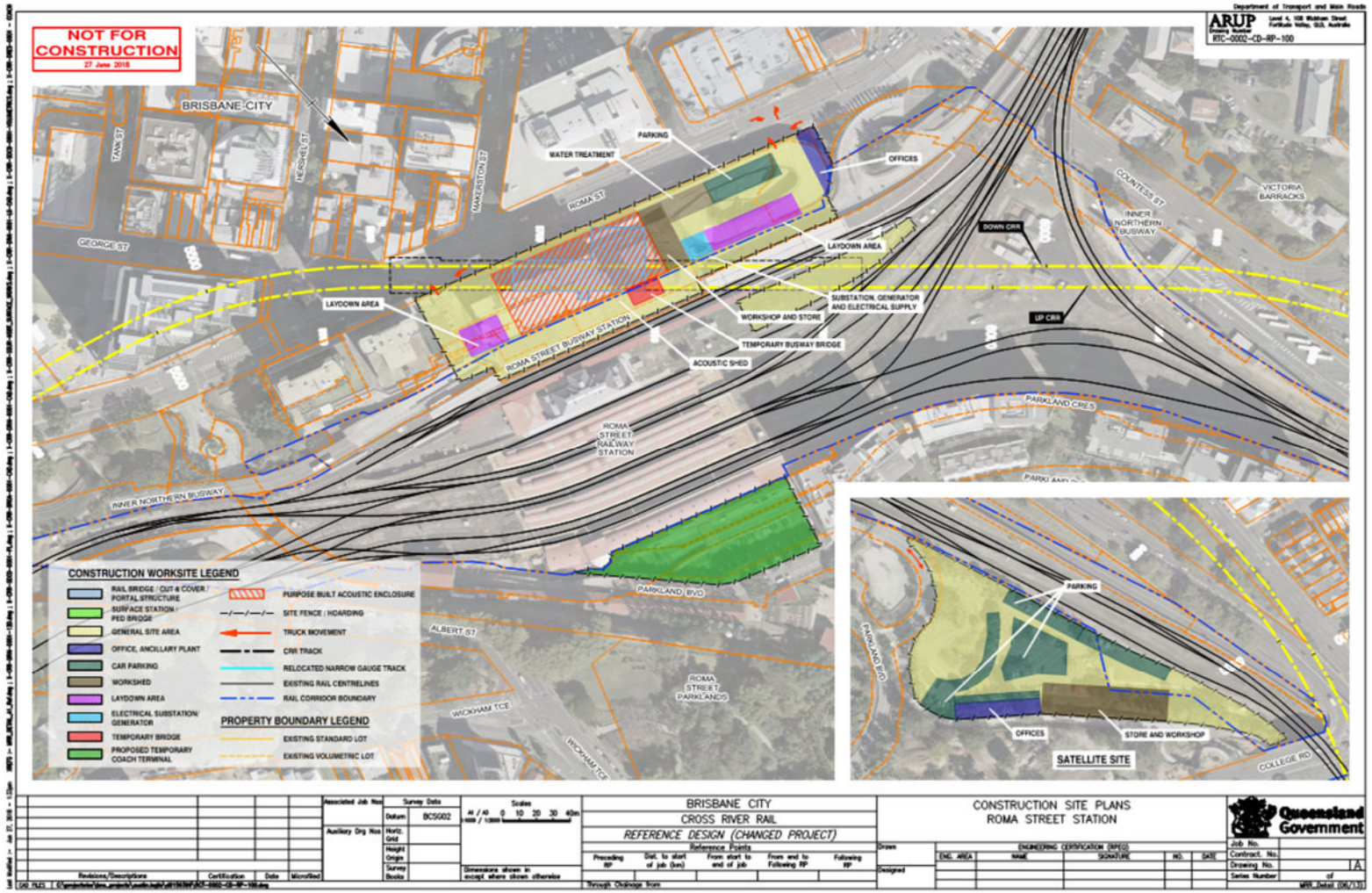

Figure 3: 2018 proposed coach terminal site locality plan

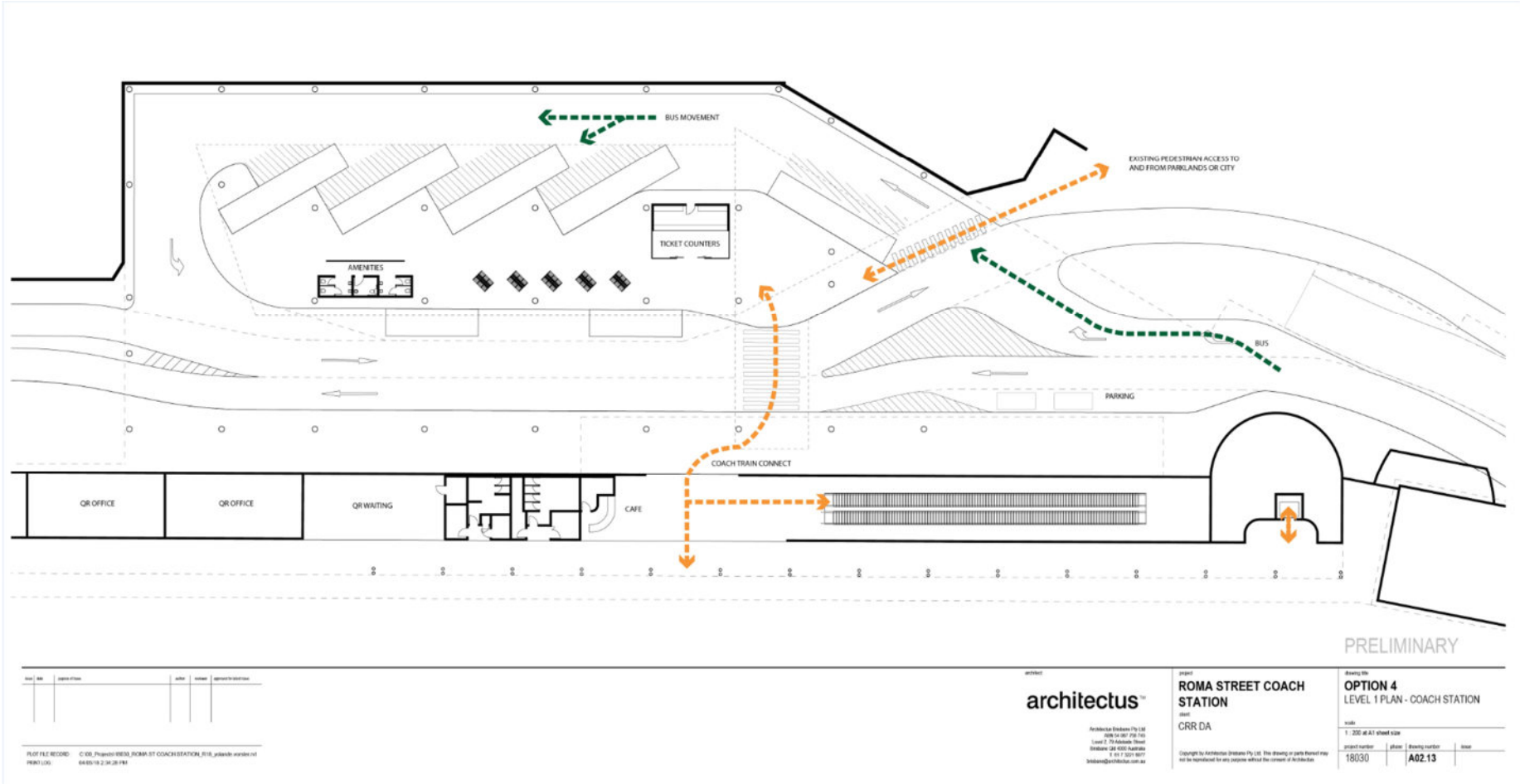

Figure 4: 2018 proposed coach terminal layout at Parkland Crescent

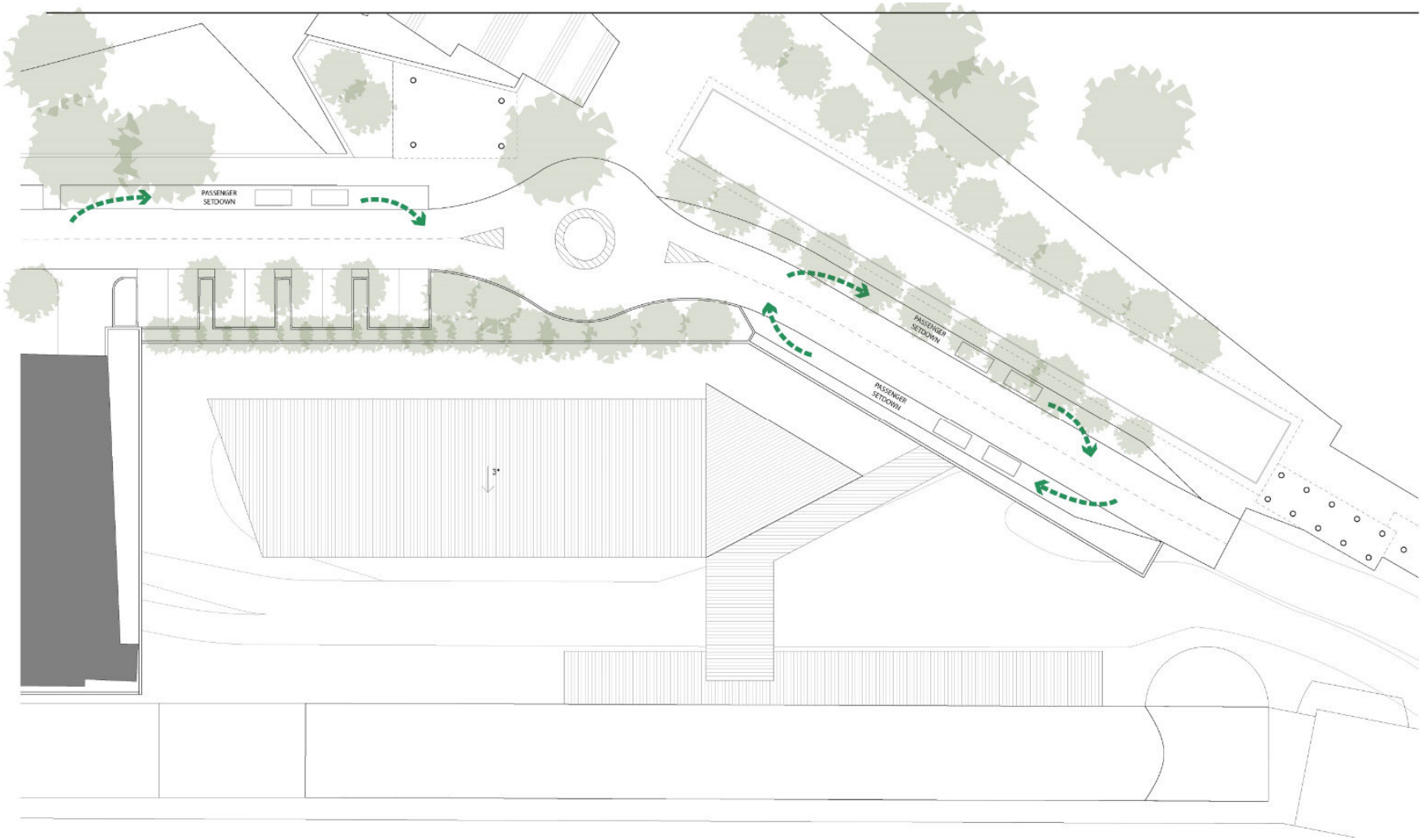

Figure 5: 2018 proposed coach terminal layout at Parkland Boulevard

Technical Note

261603-02 27 June 2018

1.1 Purpose

The purpose of this technical note is to review the EIS and 2017 RFPC traffic-related approved works and impacts and compare these with the works and impacts associated with the proposed coach terminal location and design.

The key aspects addressed in the EIS traffic technical report included strategic transport impacts and benefits, local transport impacts during project operations, and construction transport impacts for the CRR project as a whole. This report pertains specifically to the impacts to Roma Street station and the surrounds during construction and operation.

This traffic technical note is intended as an appendix to supplement the *Environmental Impact Statement, Request for Project Change: Roma Street Coach Terminal Relocation*. Full details of the proposed coach terminal works are summarised in the main body of the report.

2 CRR Project Approved Work and Impacts

The design progression of the sites relevant to this project are summarised in Table 1.

Table 1: CRR Progression

Location	2011 EIS	2017 RFPC	2018 Coach Terminal
Roma Street station	Redeveloped but remains in current location.	Relocates site approximately 150m to current BTC site.	As per 2017 RFPC.
Brisbane Transit Centre (including coach terminal)	No changes proposed.	Demolished as part of Roma Street relocation. Requires relocation of coach terminal (prior to demolition) and removal of ~600 car parking spaces.	As per 2017 RFPC.
Parkland Crescent carpark area	No changes proposed (however worksite proposed on the eastern end of the crescent).	Construction laydown area.	Proposed relocated coach terminal site.
Parkland Boulevard	Permanent closure of roundabout immediately north of Roma Street. Alternative route via College Road / Gregory Terrace intersection.	No proposed changes to roundabout or upper level.	No proposed changes to the roundabout. Upper level to be utilised for pick-up / drop-off (adjacent to escalators and café).

2.1 Construction

2.1.1 2011 EIS

The proposed worksites as per the EIS are shown in yellow in Figure 6.

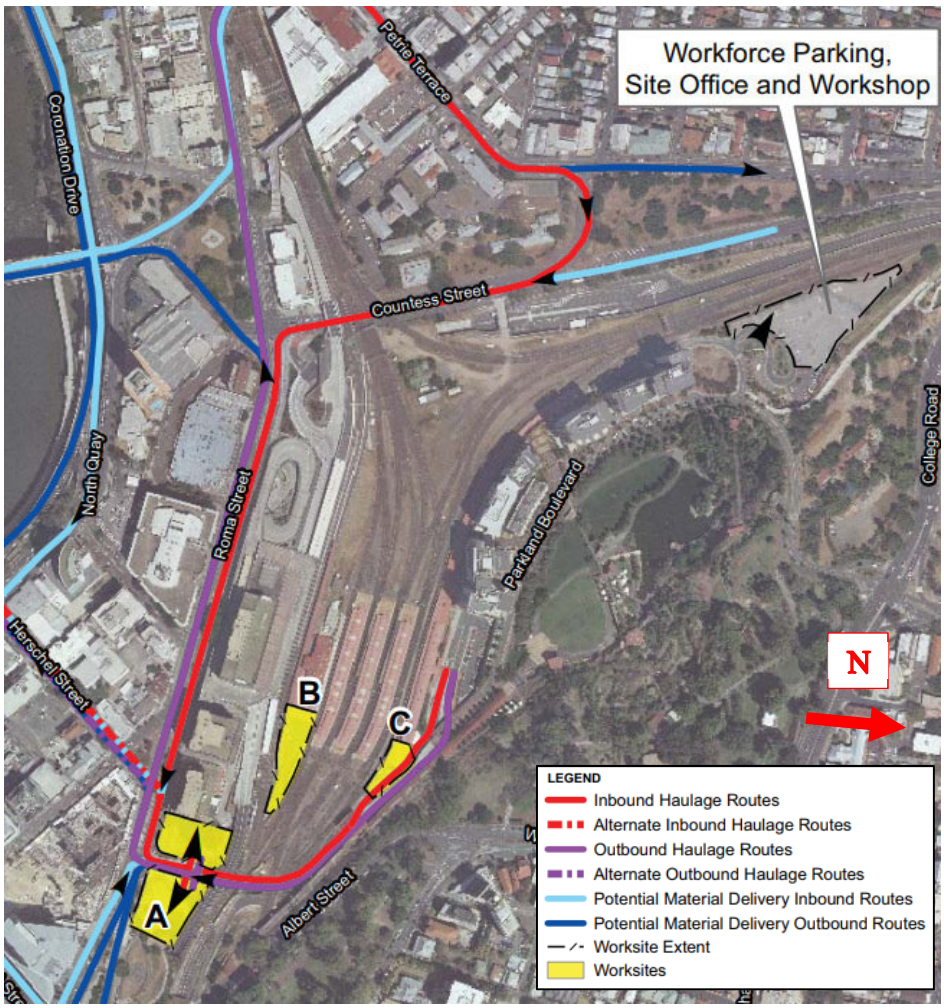

Figure 6: Roma Street Station worksites (2011 EIS)

Access points to each of the worksites were proposed to be located as follows:

- Construction worksite A (Roma Street south) – in parkland adjacent to the intersection of Roma Street and Parklands Boulevard (Emma Miller Place). Access to this construction worksite would be directly from Parklands Boulevard.
- Construction worksite B (Roma Street central) – in an existing car park that serves the Station Masters building between Platforms 7 and 8 of Roma Street Station. Access to this construction worksite would be from Parklands Boulevard.
- Construction worksite C (Roma Street north) – adjacent to the long distance Platform 10 and station luggage storage area on Parklands Crescent. Access would be via Parklands Crescent.

In addition, an area would be provided for workforce parking, site offices and workshops. This area would be located in an existing car park at the north western corner of Roma Street Parkland and accessed from College Close. Access to College Close is via Parkland Crescent and Parkland Boulevard.

In terms of traffic staging and network changes, the construction of Roma Street Station would occur predominantly off-road but would require two network changes – closure of the Parkland Boulevard roundabout and occupation of the westbound lane of Parkland Crescent. These changes and their associated impacts on all affected modes of transport are summarised in Table 2.

Table 2: Construction impacts as per 2011 EIS

Mode	Construction impacts as per 2011 EIS
Vehicle traffic	Closure of the roundabout on Parkland Boulevard (north of Roma Street) was identified as a permanent change but was brought forward to the construction stage. The removal of the roundabout would prevent any U-turn movements which are currently performed at this roundabout. This would result in a longer detour to undertake a U-turn (for vehicles coming from the north). Closure of the westbound lane of Parkland Crescent, between Platform 10 and the Parkland Boulevard intersection. This is proposed to be managed by utilising the eastbound lane in a contraflow traffic arrangement, which would result in minor delays in accessing and egressing the station.
Car parking at Parkland Crescent	Car park to be retained.
Pick-up / drop-off at Parkland Crescent	Access to be retained.
Pedestrians	Worksite C would require closure of the pedestrian footpath on the southern side of Parkland Crescent. A pedestrian detour would be required commencing at the Parkland Boulevard / Roma Street intersection and diverting pedestrians though the Roma Street Station.
Cyclists	The worksite is not anticipated to significantly impact cycle activity, although cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.
Coaches	Not addressed (not considered as coach site at this stage).
Property access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

2.1.2 2017 RFPC

As per the 2017 RFPC, the CRR construction worksite is located between the Inner Northern Busway and Roma Street covering the Brisbane Transit Centre (BTC) West Tower and coach ramps. A satellite site is also located between the Inner City Bypass (ICB) and Roma Street Parklands (i.e. the existing car park area off Parkland Crescent) and a laydown area is located at the end of Roma Street Railway Station (i.e. the existing car park area between Parkland Boulevard and Crescent). The locations of the worksite, satellite site and laydown area are shown in Figure 7.

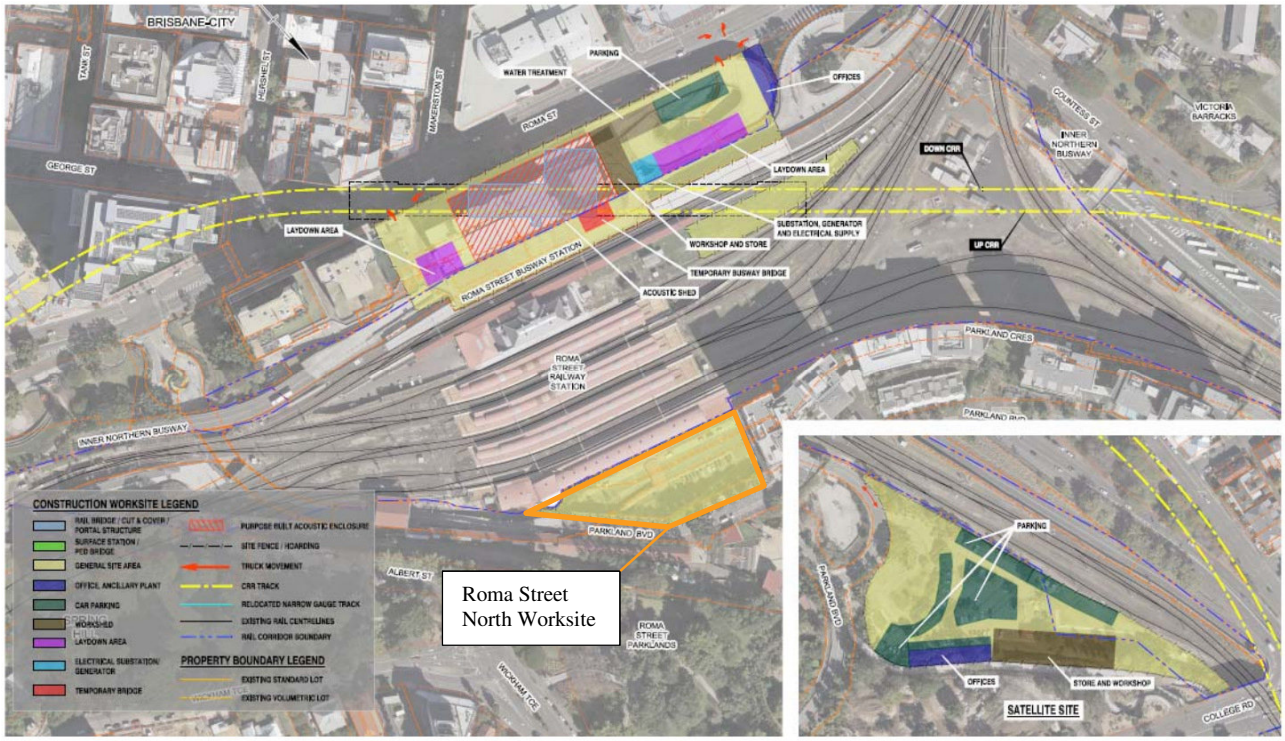

Figure 7: Roma Street Station worksites (2017 RFPC)

The worksite will require the demolition of the BTC West Tower and coach ramps. This will include demolition of the existing long distance coach terminal. Alternative arrangements will need to be identified for the existing long distance coach terminal which is used by a number of major coach services, commercial tenancies and tourist operators.

Table 3 summarises the construction impacts of the laydown site, as per the2017 RFPC, on the various modes of transport and existing uses of the area.

Table 3: Construction impacts as per 2017 RFPC

Mode	Construction impacts as per 2017 RFPC
Vehicle traffic	Construction may require occupation of the westbound lane of Parkland Crescent, between the long distance platform and the Parkland Boulevard intersection. Management of this closure may include utilising the eastbound lane in a contraflow traffic arrangement.

Mode	Construction impacts as per 2017 RFPC
	Closure of Parkland Boulevard roundabout not discussed – assumed to be as per 2011 EIS (i.e. removed).
Car parking at Parkland Crescent	Approval for the loss of the 32 car parks displaced by the worksite for the five-year construction period.
Pick-up / drop-off at Parkland Crescent	Not addressed, however assume this would be impacted if the westbound lane of Parkland Crescent was required to be closed for construction.
Pedestrians	Potential for worksite to require closure of the pedestrian footpath on the southern side of Parkland Crescent. If this is the case, it was proposed that a pedestrian detour would be provided.
Cyclists	The worksite is not anticipated to impact cycle activity, although cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.
Coaches	Not addressed (not considered as coach site at this stage).
Property access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

2.2 Operation

2.2.1 2011 EIS

The EIS noted the permanent closure of the Parkland Boulevard roundabout, immediately north of Roma Street. This closure would impact U-turning vehicles who would be required to take a longer detour to perform the U-turn manoeuvre.

Other than this permanent closure, no other operational impacts to stakeholders or existing uses / transport modes were addressed. However, it is assumed that, with the exception of Parkland Boulevard roundabout closure, that the site would be returned to its existing state (i.e. prior to construction).

2.2.2 2017 RFPC

The 2017 RFPC noted that, as a result of the relocation of Roma Street station and associated demolition of the BTC, the existing long distance coach terminal would need to be relocated prior to demolition. The report recommended that further investigation should be undertaken by the Proponent, in consultation with the operators, to find a suitable site for the coach terminal. No impacts to stakeholders or existing uses / transport modes were addressed. However, it is assumed that the site would be returned to its existing state (i.e. prior to construction).

3 Material Changes to Impacts

3.1 Assessment Methodology

As part of the 2017 RFPC, it was proposed that the BTC will be demolished. The Brisbane coach terminal, currently located within the transit centre, has been proposed to be relocated to the other side of the Roma Street railway station behind Platform 10. The location and access points of the existing and proposed coach terminal are presented in Figure 8.

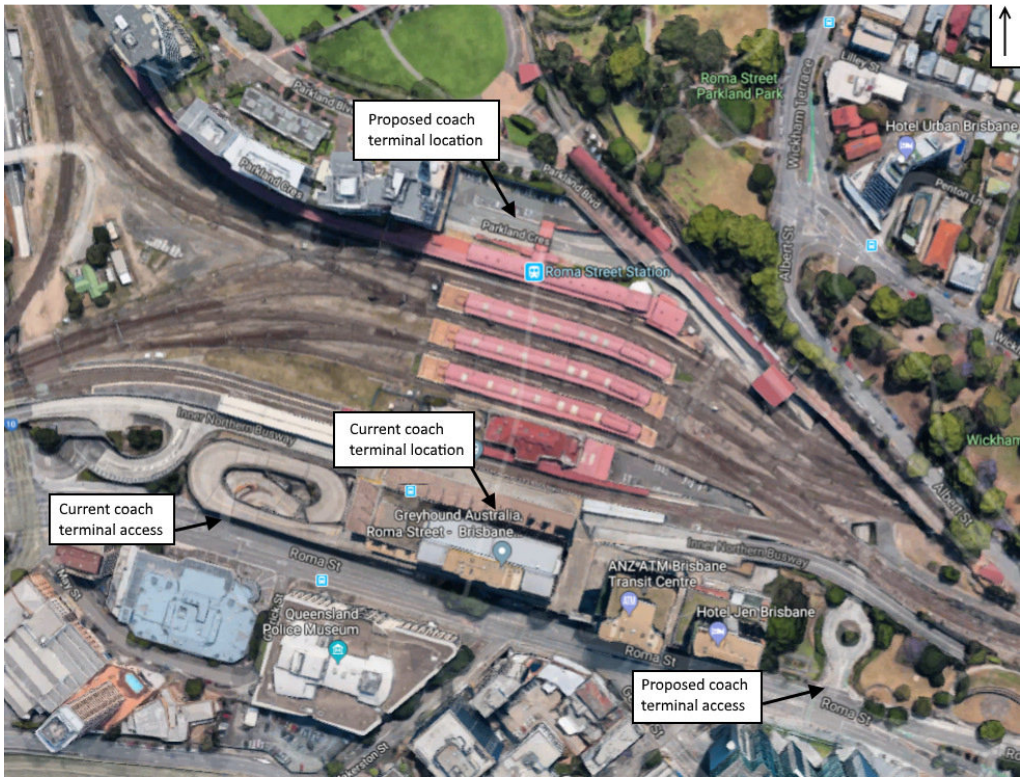

Figure 8: Site location

The assessments undertaken to determine the traffic effects of the relocation of the coach terminal include:

- Review of traffic volumes added to Parkland Boulevard and Parkland Crescent as a result of the coach terminal relocation in comparison with the baseline traffic flows. This included estimation of the Kiss 'n' Ride (also known as public pick-up / drop-off zone) demand generated by the coach terminal based on coach timetables, mode share and coach patronage;
- Intersection assessment (using SIDRA) of the key Roma Street / Parkland Boulevard intersection; and
- Swept path assessment of coaches along Parkland Crescent and Parkland Boulevard.

3.1.1 Traffic volume review

An estimate of the additional traffic generated at the site as a result of the coach terminal relocation was generated based on data relating to coach movements, coach capacity and coach passenger mode share (for the trip connecting to/from the coach). The assessment considered the following modes / types of vehicular traffic accessing the site:

- Coaches;
- Kiss 'n' Ride (K 'n' R) / taxi;
- General vehicle traffic; and
- Construction vehicle traffic.

Key assumptions for this assessment include:

Coaches –

- Based on an analysis of published coach timetables and traffic survey data; and
- Coach movements are unlikely to increase in the future.

K 'n' R / taxi –

- Mode share of arrivals/departures at the coach terminal was taken from surveys presented in the *2017 Proposal for Development of Coach Terminal at Gallipoli Park* report, with 17% by car and 7% by taxi;
- Volume of K 'n' R traffic on Parkland Boulevard increased, however remains below threshold of 800 veh/hr for impacts to functionality of on-street parking, as specified in AS2890.5;
- Maximum coach arrivals/departures per hour = 13 (based on analysis of current timetable). It is noted that as the new terminal is smaller than the existing, some timetable adjustments may be required. This adjustment is unlikely to result in an increase in the peak coach arrival/departure rate (due to the constrained number of available bays), but may result in a decrease. As the exact decrease cannot be determined at this stage, the current peak arrival/departure rate was adopted;
- Average capacity per bus = 46 persons (based on weighted average using 5 coach bays and 2 minibus bays);
- Seat turnover proportion = 100% (based on discussions with Greyhound – coaches are "full" during the summer months);
- Total number of customers = 602 (assume that 50% of these are arriving at the coach terminal and 50% are departing).

It should be noted that the above assumptions are a conservative estimate based on all bays in use and occupied by full coaches. In practice the actual K 'n' R volumes are likely to be less. SIDRA assessments of the affected intersections (including K 'n' R / taxi volumes) have been conducted and the results are detailed in Section 3.1.2

General vehicle traffic –

- General traffic volume (i.e. through traffic only) difference between EIS / RFPC and proposed coach terminal design anticipated to be negligible.

Construction vehicles –

- Estimate only at this stage (of volumes for proposed coach terminal), based on the size of the facility. Exact volumes and movements to be determined in a subsequent stage of the project, subject to further design development and the construction sequencing methodology (currently not able to be determined); and
- It is anticipated that the construction traffic for the proposed coach terminal site will be less than that for the entire Roma Street station site (i.e. as per the EIS and RFPC). The construction scope for the coach terminal is significantly smaller and the previously approved site was heavily utilised by spoil haulage vehicles (largely resulting from tunnelling), which is no longer the case.

The results of this assessment are summarised in Table 4.

Table 4: Difference in maximum anticipated traffic volumes between EIS / RFPC and proposed design

Mode	Construction		Operation	
	Max of EIS and RFPC	**Proposed coach terminal design**	**Max of EIS and RFPC**	**Proposed coach terminal design**
Coaches	0	No change	0	+75 coaches / day (150 total movements: in + out)
K 'n' R / taxi	-	No change	-	+95 vehicles during peak hour (190 total movements: in + out)
General vehicle traffic	-	No change	-	No change
Construction vehicle traffic	10 / peak hour over 5 years (max 130 trucks/day including spoil movements)	~2-3 / peak hour over 38 weeks	0	No change

3.1.2 2017 Intersection assessment

The critical intersection impacted by the relocation of the coach terminal is the Roma Street / Parkland Boulevard intersection. An assessment of the impact was conducted using the SIDRA Intersection 7 software package. Future traffic volumes were estimated based on volumes obtained from a traffic survey conducted on 15-16 March 2018, with annual growth rates adopted from those presented in the 2017 RFPC Transport Technical Report:

- 0.64% per annum compounding from 2018 to 2023; and
- 0.38% per annum compounding from 2023 to 2033.

3.1.2.1 Assessment based on GTIA

A review of the traffic performance based on the requirements presented in the Guide to Traffic Impact Assessment (GTIA, TMR 2017) was conducted to determine whether the traffic impacts of the coach terminal relocation are significant. In particular, a review of the network delay impacts was conducted. The outcome of this assessment is to ensure that the sum of intersection delays on base/background traffic in the impact assessment area does not significantly worsen (i.e. increase average delay by more than 5% in aggregate) as a result of the development.

The two key intersections that were assessed in this assessment were the Parkland Boulevard / Parkland Crescent (south) intersection and the Roma Street / Parkland Boulevard intersection, as they are the key intersections affected by the relocation of the coach terminal.

Indicative layouts of the two intersections are presented below.

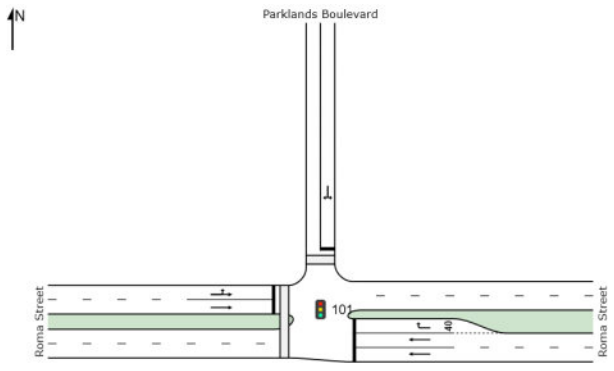

Figure 9: Roma St / Parkland Blvd intersection layout

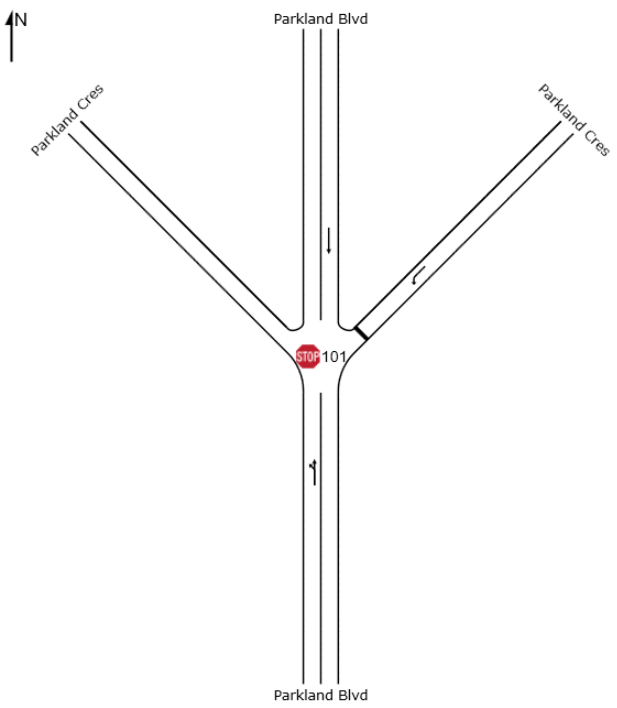

Figure 10: Parkland Blvd / Parkland Cres intersection layout

According to the GTIA, intersection delay assessment is to be conducted for the year of opening of the entire project. For the purposes of this assessment, the year of assessment was 2023 reflecting the year of opening for the CRR.

The increase in intersection delay with the proposed development was calculated using the following formula (see GTIA Section 11.3.1):

$$ID = \sum_{i=1}^{n} WD - \sum_{i=1}^{n} BC$$

Where:	ID	is aggregate intersection-delay impact vehicle-minutes
	WD	is with development intersection vehicle-minutes for design peak periods. This is calculated by multiplying the with development average delay by movement to the base case volume on each movement, thus not counting the impact as delays to development traffic, only to pre-existing traffic that is affected by these additional delays.
	BC	is base case intersection vehicle-minutes for design peak periods
	n	is the number of intersections in the impact assessment area
	i	is each intersection within the impact assessment area

This calculation is a multi-step calculation that requires the use of data from SIDRA models and spreadsheets to complete a series of consecutive calculations.

The key results of the calculation are:

- Sum of WD = 50,020 vehicle-seconds (834 vehicle-minutes)
- Sum of BC = 47,825 vehicle-seconds (797 vehicle-minutes)
- ID = 2,194 vehicle-seconds (37 vehicle-minutes)
- Percentage increase in delay = 4.6%.

The results demonstrate that development increases the intersection delay by less than 5%. As such, the delay impacts of the surrounding road network at the opening year will not need to be mitigated. With respect to the Parkland Boulevard / Parkland Crescent (South) intersection, it was noted that it is currently a priority-controlled (stop sign) intersection. The sight lines at this intersection are limited due to the configuration of the ramp and concrete barriers. Due to the relocation of the coach terminal to Parkland Crescent, the volume of vehicles traversing this intersection is expected to increase, thus leading to an increased risk of collision.

It was also noted that Parkland Boulevard is a popular route for cyclists and is identified as a priority cycle route on the South East Queensland Principal Cycle Network Plan (SEQPCNP). Traffic counts indicated over 160 cyclists were recorded travelling down the ramp during the morning peak hour. In order to mitigate the increased risk of collision, it is recommended that this intersection is converted to signalised operation. Signalisation of the southbound movement only is required – no changes are proposed to the northbound diverging movement. These signals would be operated on an actuated basis, with a green signal typically given to Parkland Boulevard (ramp) traffic and with Parkland Crescent receiving a green signal only if a vehicle (coach or car) is detected.

An indicative comparison between the existing (Figure 11) and proposed (Figure 12) layouts is presented below.

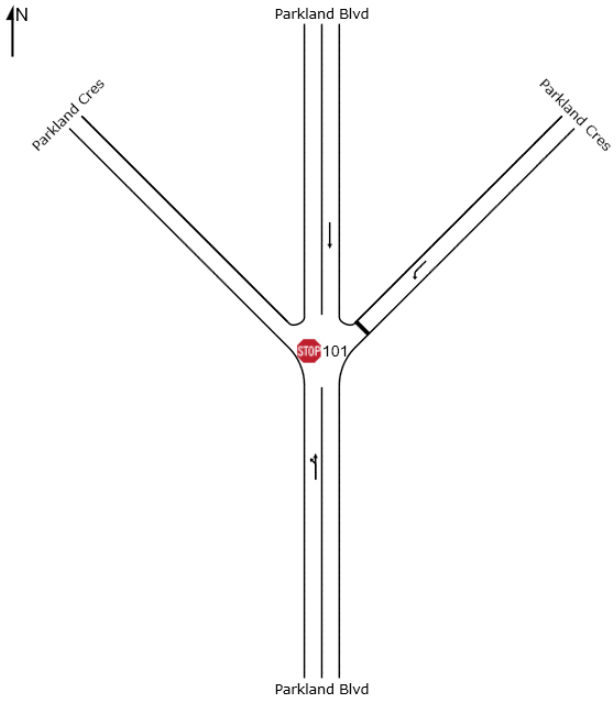

Figure 11: Existing Parkland Blvd / Parkland Cres (south) intersection layout

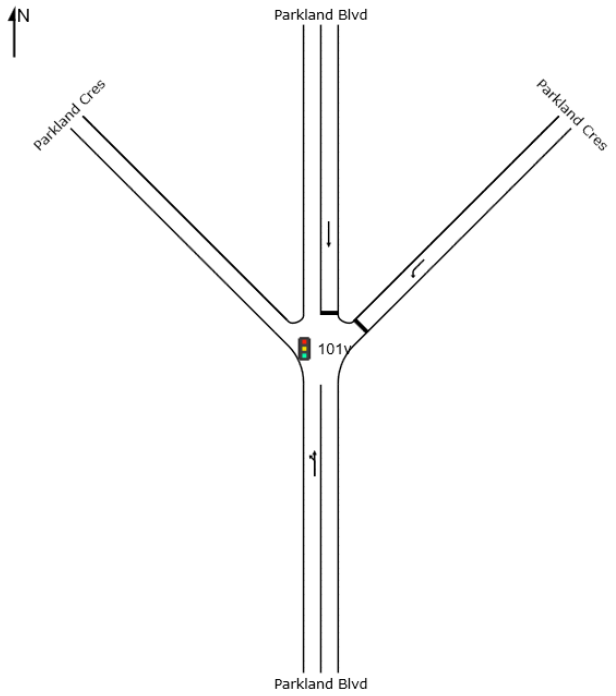

Figure 12: Proposed Parkland Blvd / Parkland Cres (south) signalised intersection layout

It is noted that this change will lead to a slight increase in delay for vehicles at this intersection. However, it is considered that the slight increase in delay is an acceptable impact to provide significant safety benefits. Further assessment of this intersection (presented in the next section) indicates that the intersection following signalisation will continue to operate satisfactorily with sufficient capacity and a level of service of A.

3.1.2.2 Assessment based on GARID

In order to allow for comparison against the intersection assessment completed in the 2011 EIS and the 2017 RFPC, the intersections were first assessed using criteria for acceptable limits of operation for intersections specified by *Guidelines for Assessment of Road Impacts of Developments* (GARID, TMR 2006) has been adopted for this assessment. The acceptable limit of operation is reached when the DOS exceeds 90% for signalised intersections.

In order to quantify the intersection performance, the following performance measures of each intersection in the study area has been reported:

- Degree of Saturation (DOS) – ratio of demand flow to capacity; and
- Level of Service (LOS) – based on DOS, as per previous reporting (for example the 2017 RFPC Transport Technical Report).

The results of the intersection assessment are summarised in Table 5. Due to the low growth rate assumed, the results for 2018, 2023 and 2033 only differ marginally between each of the scenarios.

The results show that the introduction of the coach terminal does not adversely affect the operations of the intersection. The DOS remains below 0.9, corresponding to LOS C or better.

Table 5: Roma Street / Parkland Boulevard SIDRA results summary

Year	Period	AM Peak		PM Peak	
		Existing (without coach terminal)	Proposed (with coach terminal)	Existing (without coach terminal)	Proposed (with coach terminal)
2018	DOS	0.49	0.58	0.43	0.52
	LOS	A	A	A	A
2023	DOS	0.51	0.59	0.44	0.53
	LOS	A	A	A	A
2033	DOS	0.53	0.62	0.46	0.54
	LOS	A	B	A	A

Within the Roma Street Parklands area, it is anticipated that Parkland Boulevard / Parkland Crescent (south) is likely to be the most adversely affected intersection as a result of the relocation of the coach terminal. This is currently a priority-controlled intersection, with southbound traffic on Parkland Crescent required to stop for southbound through traffic on Parkland Boulevard (travelling down the ramp toward Roma Street). However, as noted in the previous section, signalisation of this intersection is recommended to reduce the risk of collision between southbound vehicles/cyclists on Parkland Boulevard and Parkland Crescent.

A review of the performance of the intersection with and without the coach terminal is presented in Table 6.

Table 6: Parkland Boulevard / Parkland Crescent SIDRA results summary

Year	Period	AM Peak		PM Peak	
		Existing (without coach terminal)	Proposed (with coach terminal)	Existing (without coach terminal)	Proposed (with coach terminal)
2018	DOS	0.07	0.38	0.05	0.34
	LOS	A	A	A	A
2023	DOS	0.07	0.39	0.05	0.35

Year	Period	AM Peak		PM Peak	
		Existing (without coach terminal)	Proposed (with coach terminal)	Existing (without coach terminal)	Proposed (with coach terminal)
	LOS	A	A	A	A
2033	DOS	0.07	0.40	0.06	0.35
	LOS	A	A	A	A

The intersection analysis shows that the proposed signalisation will still result in the intersection performing well within acceptable limits (i.e. DOS≤0.9). While the DOS of the intersection does increase, this is a typical outcome of signalising an intersection with low vehicle volumes such as this one, and the intersection still operates well below capacity. Furthermore, the resultant LOS A in all scenarios shows that the signalisation does not have a significant impact on vehicle delays.

3.1.3 Swept path analysis

A swept path analysis of the proposed coach terminal layout was undertaken using the detailed terrain survey. The analysis found that coaches are able to drive in / reverse out of all five bays.

The manoeuvre for a coach in bay 1 to pass a parked coach in bay 2 was extremely constrained, so the bay was required to be moved forward by 2m to enable this movement. This resulted in the available island space being reduced by 1m to a total of 7m (noting it is 8m elsewhere). Other than this, coaches in bays 2-5 are able to drive in / reverse out of their bays with no issues.

In addition, the swept path assessment found that coaches are able to traverse Parkland Boulevard and Parkland Crescent to access / exit the terminal (using a 0.5m clearance envelope). However there are a number of locations which are very constrained, with the vehicle body clearance overhanging the kerb. In some locations, the vehicle body clearance conflicts with obstructions (e.g. barriers, vegetation, signage) located immediately adjacent to the kerb.

It should be noted that the detailed survey was only available from north of the roundabout near Parkland Boulevard / Roma Street intersection. In lieu of a detailed survey for the segment located to the south (toward Roma Street), a Greyhound coach drive through was conducted on 29 May 2018, which indicated that coaches are able to perform this manoeuvre. Following this, there are no plans to conduct any further coach trials.

Additionally, Arup understand that Greyhound have conducted at least two drive throughs of the site using a 13.5m non-steerable coach, including the aforementioned site visit on 29 May (during which time representatives from Arup and CRRDA were also present). During this drive through, a number of minor issues were identified, which are currently being addressed as part of the detailed design stage (i.e. through the relocation of kerbs and signage). These issues are mostly relating to the constrained segment of Parkland Crescent located underneath the Parkland Boulevard ramp.

Furthermore, the design vehicle for this coach terminal is a 14.5m coach, however during the site visit, Greyhound indicated that a 13.5m non-steerable coach is a worse case than a 14.5m steerable coach. Greyhound stated that they do not have any 14.5m non-steerable coaches in their fleet.

3.2 Results and Discussion

3.2.1 Construction

The construction impacts on the various modes of transport as a result of the proposed coach terminal are summarised in Table 7.

Table 7: Construction impacts as per 2018 proposed coach terminal design

Mode	Construction impacts as per 2018 coach terminal design
Vehicle traffic	Access to Parkland Crescent is to be maintained at all times. Construction may require occupation of some segments of the roadway adjacent to the site. Management of this closure may include implementing a contraflow traffic arrangement. No expected increase in general vehicle traffic volumes compared with existing. Exact number of construction vehicles unknown at this stage, however expected to be less than that from the 2017 RFPC.
Car parking at Parkland Crescent	All car parking removed to accommodate coach terminal. Relocation requirements not considered as part of this project.
Pick-up / drop-off at Parkland Crescent	Unconfirmed at this stage if existing facilities on Parkland Crescent will remain open during construction. If this is not the case, it is recommended that a pick-up / drop-off zone on Parkland Boulevard shall be provided prior to commencement of construction on Parkland Crescent, in order to maintain pick-up / drop off functionality of the area.
Pedestrians	Pedestrian access to be maintained at all times during construction. In some instances, this may involve detours and/or minor delays.
Cyclists	The worksite is not anticipated to significantly impact cycle activity, although cyclists will have to follow detours put in place for vehicles as a result of lane closures on Parkland Crescent. Impacts during construction expected to be similar to the schemes presented in the 2011 EIS and the 2017 RFPC.
Coaches	No impacts (existing coach terminal at BTC remains open during construction of new facilities).
Property access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

3.2.2 Operation

The operational impacts on the various modes of transport as a result of the proposed coach terminal are summarised in Table 8.

Table 8: Operational impacts as per 2018 proposed coach terminal design

Mode	Operational impacts as per 2018 coach terminal design
Vehicle traffic	Network delay impacts to background traffic are predicted to be less than 5% in the aggregate. DOS<0.9 and better than LOS C at Parkland Boulevard / Roma Street maintained. No expected changes to general vehicle traffic volumes. Introduce signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements to manage safety issues caused by limited sight lines at the merge. This will result in some minor additional delay for vehicles along these roadways.
Car parking at Parkland Crescent	All car parking at the site removed to accommodate coach terminal. Relocation requirements not considered as part of this project.
Pick-up / drop-off at Parkland Crescent	Relocated to Parkland Boulevard. Currently no pick-up / drop-off is permitted in this location, so these additional parking manoeuvres may result in minor delays and additional vehicle/vehicle, vehicle/pedestrian and vehicle/cyclist conflicts. Anticipated that approximately an additional 95 vehicles (190 total vehicle movements) will be generated during peak hour at the site for the purposes of pick-up/drop-off.
Pedestrians	Minor diversion as a result of modification to existing pedestrian crossing location at the Parkland Crescent level. Additional pedestrian volumes will be generated on Parkland Crescent from the coach terminal. Additional pedestrian volumes will be generated on Parkland Boulevard as a result of the pick-up / drop-off zone. There will also be increased levels of pedestrian-vehicle interaction, so an urban design review of Parkland Boulevard is recommended to implement measures to manage this (e.g. modification to lane configuration or separation of vehicles from pedestrians).
Cyclists	Cyclists required to share Parkland Boulevard with coaches (between Roma Street and Parkland Crescent) and additional generated traffic. Analysis of the 2018 traffic counts indicated that the maximum observed cyclist count during any peak hour in either direction was 150 cyclists (travelling westbound along Parkland Boulevard). Some of these safety concerns may be mitigated by the signalisation of Parkland Boulevard / Parkland Crescent (south). Additional impacts could be mitigated by reducing the posted speed of the segment between Roma Street and Parkland Crescent from 40km/hr to 30km/hr in order to reduce speed differential between cyclists and coaches. At this speed, guidelines such as TN128 indicate that mixed cycle and vehicle traffic is appropriate. For example, TN128 states: *"Generally, bicycle riders can safely mix with motorised vehicles up to 30 km/h; above this speed cycle tracks separate bicycle riders to remove exposure and avoid conflicts. If it is not possible to*

Mode	Operational impacts as per 2018 coach terminal design
	separate motor vehicle and bicycle traffic, speed difference should be reduced to achieve a comfortable mixing speed." Furthermore, an urban design review of Parkland Boulevard is recommended to implement measures (e.g. modification to lane configuration or separation of vehicles from cyclists) to manage the introduction of the pick-up / drop-off traffic. It should however be noted that speed limit through the existing shared zone on Parkland Boulevard is posted at 10km/hr (this speed limit is proposed to be retained), which is well below the 30km/hr posted speed recommended in TN128. This is currently being addressed as part of detailed design development.
Coaches	~75 coaches / day (150 total coach movements) anticipated to access the facility. This is not anticipated to have a significant adverse impact on the traffic network and operations.
Property access	To be maintained.

4 Recommendations and Conclusions

The following findings and recommendations have been made as a result of this study:

- Greyhound encountered minor issues when manoeuvring a 13.5m coach through the site. In detailed design, this will be addressed by relocation of kerbs and signage;
- A pick-up / drop-off zone on Parkland Boulevard shall be provided prior to commencement of construction on Parkland Crescent, in order to maintain pick-up / drop off functionality of the area; and
- In order to not exceed the previously approved limits from the 2011 EIS, the construction traffic will not exceed ten heavy vehicles in each direction per hour.

A comparison between the identified impacts for each of the scenarios is included in Table 9.

Table 9: Summary of impacts to Parkland Crescent and surrounds

Mode	2011 EIS		2017 RFPC		2018 Coach Terminal	
	Construction	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Vehicle traffic	Closure of the westbound lane of Parkland Crescent. Managed by utilising the eastbound lane in a contraflow traffic arrangement resulting in minor delays. Closure of the roundabout on Parkland Boulevard.	Permanent closure of Parkland Boulevard Roundabout.	Closure of the westbound lane of Parkland Crescent. Managed by utilising the eastbound lane in a contraflow traffic arrangement resulting in minor delays. Closure of the roundabout on Parkland Boulevard (as per 2011 EIS).	Permanent closure of Parkland Boulevard Roundabout.	Closure of some segments of Parkland Crescent. Managed by implementing a contraflow arrangement. Relatively small number of construction vehicles accessing the site (compared to 2017 RFPC).	Network delay impacts to background traffic are predicted to be less than 5% in the aggregate DOS<0.9 and LOS C at Parkland Boulevard / Roma Street maintained. DOS<0.9 and LOS A at Parkland Boulevard / Parkland Crescent maintained. Introduce signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements to manage safety issues.
Car parking at Parkland Crescent	Car park to be retained.	Car park to be retained.	Car parking relocated to the existing car park at the north western corner of Roma Street Parklands.	Assumed as returning to existing location (prior to construction).	All car parking removed to accommodate coach terminal.	All car parking removed to accommodate coach terminal.

Mode	2011 EIS		2017 RFPC		2018 Coach Terminal	
	Construction	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Pick-up / drop-off at Parkland Crescent	Access to be retained.	Assumed as returning to existing state (prior to construction).	Access to be retained (as per 2011 EIS).	Assumed as returning to existing state (prior to construction).	Unconfirmed at this stage. A pick-up / drop-off zone on Parkland Boulevard shall be provided prior to commencement of construction on Parkland Crescent.	Relocated to Parkland Boulevard. Currently no pick-up / drop-off is permitted in this location, so this may result in minor additional delays and additional vehicle conflicts. ~95 vehicles during peak hour will be accessing the site for pick-up / drop-off (190 total vehicle movements).
Pedestrians	Closure of the pedestrian footpath on the southern side of Parkland Crescent, with pedestrian detour required.	Assumed as returning to existing state (prior to construction).	Closure of the pedestrian footpath on the southern side of Parkland Crescent, with pedestrian detour required.	Assumed as returning to existing state (prior to construction).	Pedestrian access to be maintained at all times during construction. In some instances, this may involve detours and/or minor delays.	Minor diversion as a result of modification to existing pedestrian crossing location at the Parkland Crescent level. Additional pedestrian volumes will be generated on Parkland Crescent and Parkland Boulevard as a result of the coach terminal and pick-up / drop-off zone.

Mode	2011 EIS		2017 RFPC		2018 Coach Terminal	
	Construction	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Cyclists	Cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.	Assumed as returning to existing state (prior to construction).	Cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.	Assumed as returning to existing state (prior to construction).	Cyclists will have to follow detours put in place for vehicles due to the temporary lane closure on Parkland Crescent.	Cyclists required to share Parkland Boulevard with coaches and additional generated traffic. Signalisation of Parkland Boulevard / Parkland Crescent introduced to assist in mitigating safety concerns for cyclists associated with this merge.
Coaches	Not addressed (not considered as coach site at this stage).	Not addressed (not considered as coach site at this stage).	Not addressed (not considered as coach site at this stage).	Not addressed (not considered as coach site at this stage).	No impacts (coach terminal not in operation during construction).	~75 coaches / day (150 total coach movements) anticipated to access the facility.
Property access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.	To be maintained.	To be maintained. Possible minor diversions (and traffic control where required) in place at times.	To be maintained.	To be maintained. Possible minor diversions (and traffic control where required) in place at times.	To be maintained.

The key impacts of the proposed coach terminal design which were not previously an issue (as per the 2011 EIS and 2017 RFPC) have been summarised in Table 10, along with potential mitigation measures.

Table 10: Summary of key traffic issues from the 2018 coach terminal design

Issue	Description	Impact	Potential Mitigation
Relocation of pick-up / drop-off zone	Relocation of pick-up / drop-off zone to Parkland Boulevard (from Parkland Crescent). This area is currently a shared zone and a low speed environment (10km/hr posted).	Function of Parkland Boulevard (i.e. shared zone) may be adversely affected due to an increase in vehicle volumes and movements.	The exact configuration of the shared zone should be designed to minimise conflicts between vehicles, cyclists and pedestrians. This may include relocation of bollards, modified / additional signage and line marking (such as to highlight the pick-up / drop-off locations). This is currently being addressed as part of the detailed design development.
Coaches on Parkland Boulevard and Parkland Crescent	There are a number of locations which are very constrained, with the vehicle body clearance overhanging the kerb. In some locations, the vehicle body clearance conflicts with obstructions (e.g. barriers, vegetation, signage) located immediately adjacent to the kerb.	Potential for coaches to collide with the obstructions, resulting in either damage to the coach, the obstruction or both.	The minor issues encountered by Greyhound when manoeuvring a 13.5m coach through the site will be addressed by relocation of kerbs and signage as part of detailed design development.
Coaches and cyclists sharing Parkland Boulevard and Parkland Crescent	Coaches now required to traverse Parkland Boulevard and Parkland Crescent (~75 coaches / day or 150 total coach movements). Parkland Boulevard is currently used by cyclists (counts indicated 160 cyclists / peak hour).	Low coach volumes are not expected to negatively impact the traffic network, however they may pose additional safety concerns to on-road cyclists.	Localised speed reduction along Parkland Boulevard to 30km/hr to reduce speed differentials. At this speed, guidelines such as TN128 indicate that mixed cycle and vehicle traffic is appropriate.
Ramp merge of Parkland Boulevard / Parkland Crescent	Existing give-way merge of eastbound Parkland Boulevard / Parkland Crescent lanes.	Additional traffic generated from the coach terminal (general vehicle and coaches) may pose safety issues due to limited sight lines.	Introduce signalisation of Parkland Boulevard / Parkland Crescent (south) for eastbound movements to manage safety issues. This will result in some minor additional delay for vehicles along these roadways.

Technical Note

261603-02 27 June 2018

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name			
Signature			

APPENDIX D – Visual Amenity and Lighting Technical Note

Technical Note

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Project title	Cross River Rail	Job number	261603-02
cc		File reference	Click here to enter text.
Prepared by	Architectus	Date	26 June 2018
Subject	Visual amenity and lighting impacts of proposed coach terminal relocation at Roma Street Station		

1 Introduction

The 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) originally contained a construction site for the North Shaft construction on Parkland Crescent at the western end of Platform 10, that necessitated the closure of Parkland Crescent at the intersection with Parkland Boulevard. The road closure also resulted in all access to the construction site for the North Shaft construction being via Parkland crescent. This is shown diagrammatically in Figure 1.

The subsequent previously approved 2016 Request For Project Change (RFPC) realigned the station and CRR route, avoiding the need to construct the North Shaft site identified in the EIS. As such, the need for physical construction activities to occur in proximity to Platform 10 of Roma Street Station was excluded from the previously approved RFPC.

However, under the previously approved RFPC a “general site area” area was included taking the whole of the land area, including the existing car park adjacent to Platform 10 and the residential buildings on Parkland Boulevard. The general site area located on the existing car park was identified for use for laydown and storage purposes. This is shown diagrammatically in Figure 2.

Both the EIS and previously approved RFPC works adjacent to Platform 10 entailed a five-year construction period.

The subject of this current RFPC is to consider repurposing the general site area in the location of the existing car park from a laydown and storage work site to a temporary long distance coach terminal with intended 38-week construction period and 10 year life span. A site locality plan for the proposed coach terminal is shown in Figure 3. The preferred design layout (at the time of writing) for the proposed coach terminal for Parkland Crescent and Parkland Boulevard are shown in Figure 4 and Figure 5 respectively.

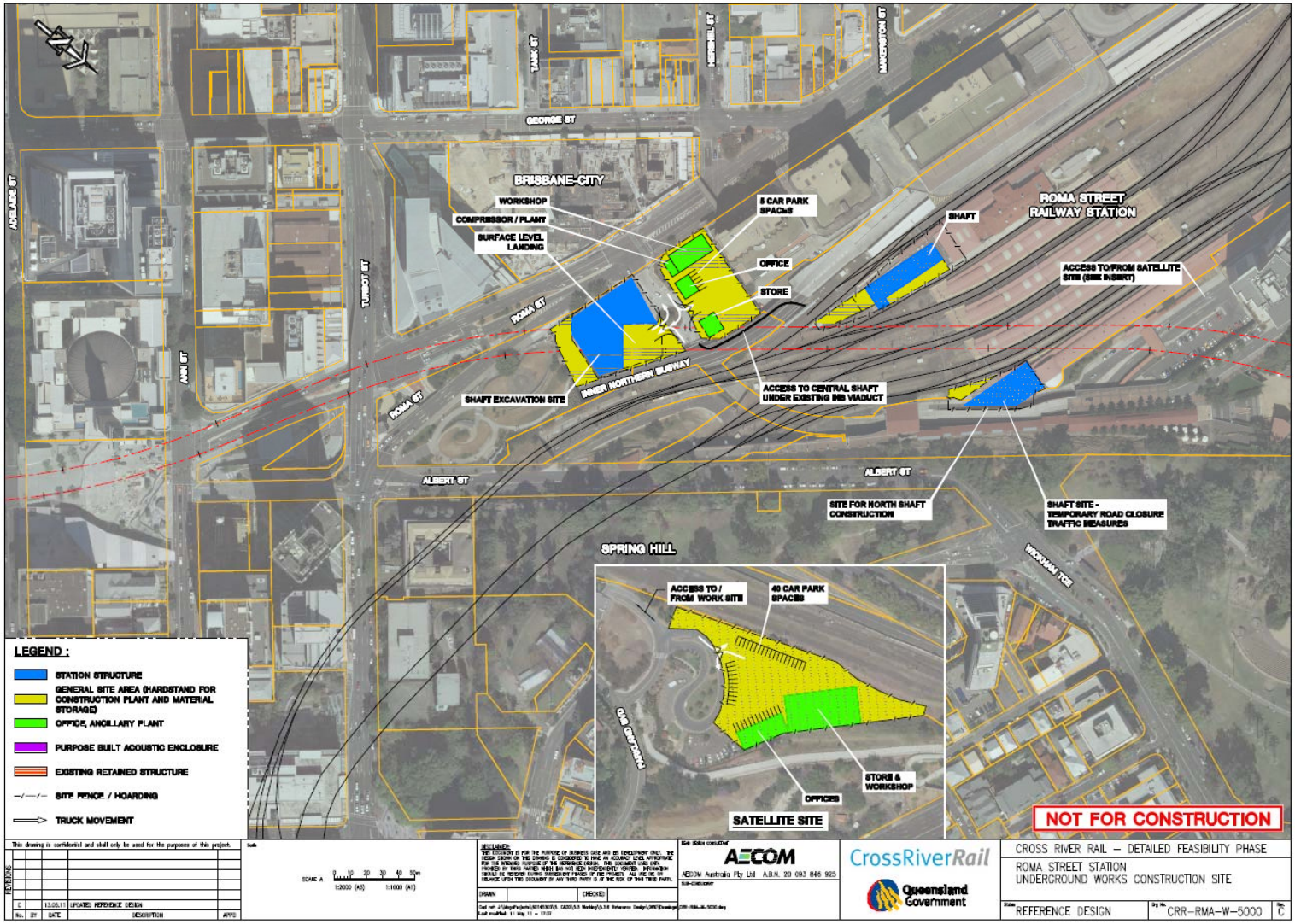

Figure 1: 2011 EIS Construction Site – Roma Street

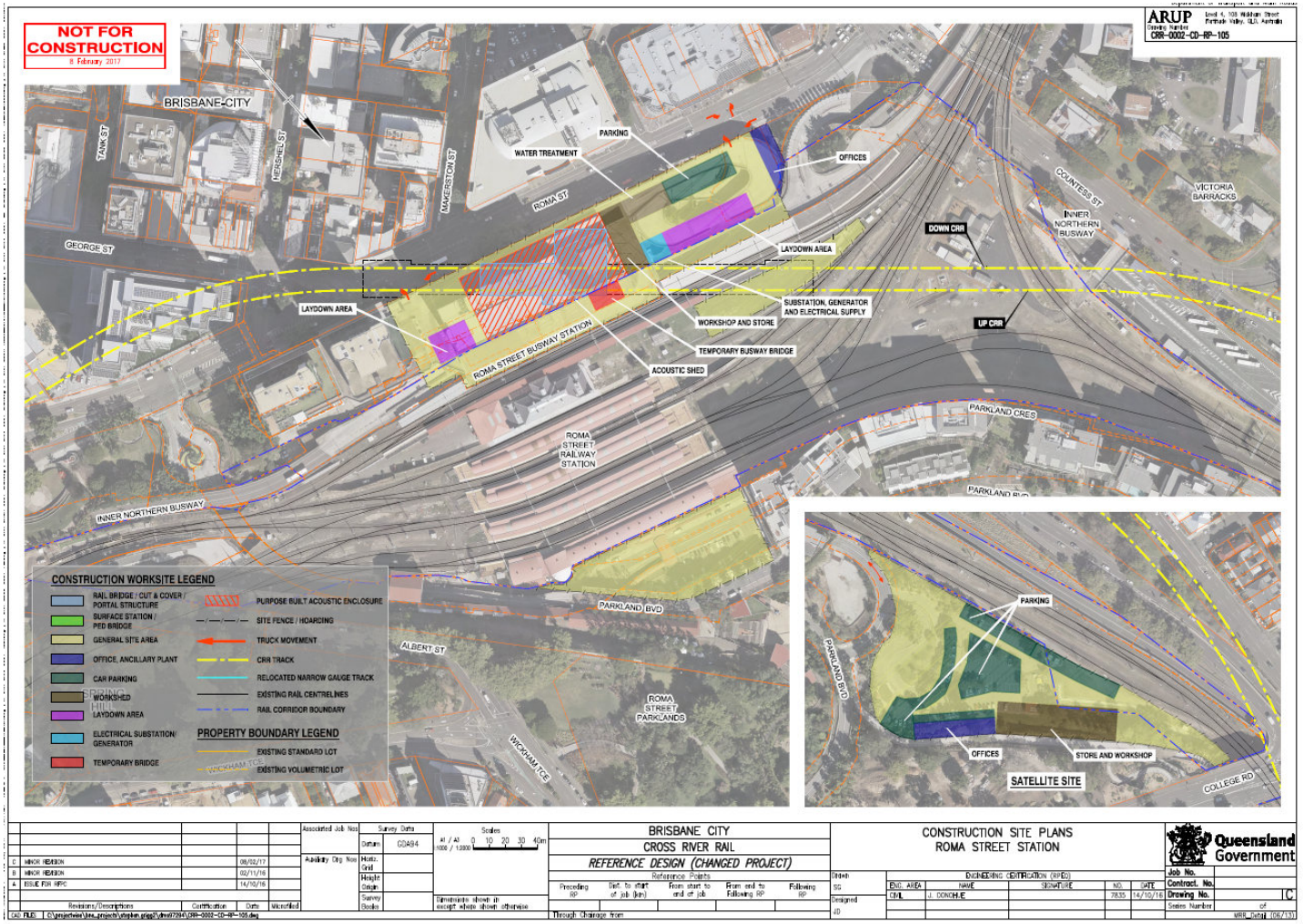

Figure 2: 2016 RFPC Construction Site – Roma Street

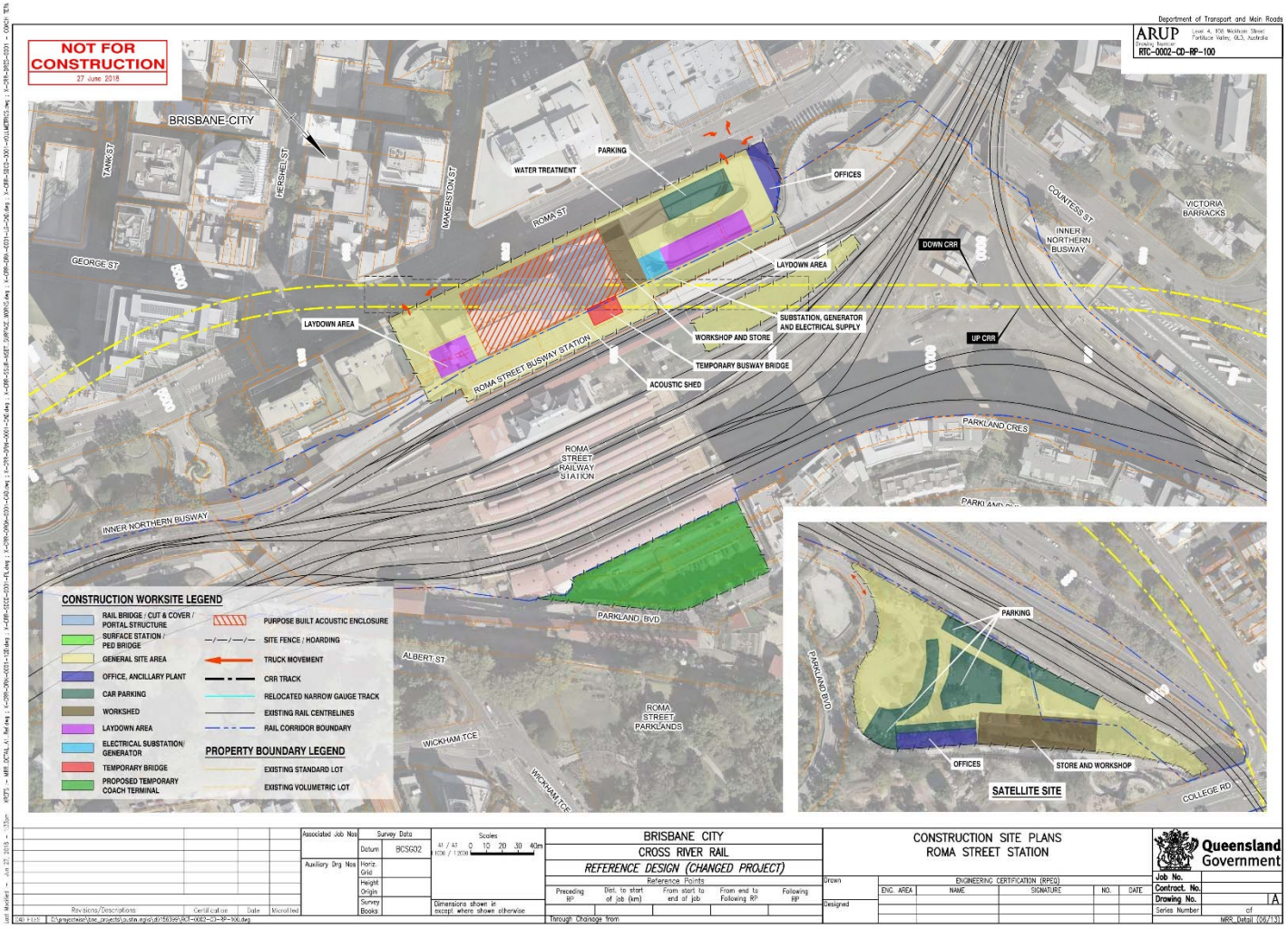

Figure 3: 2018 proposed coach terminal site locality plan

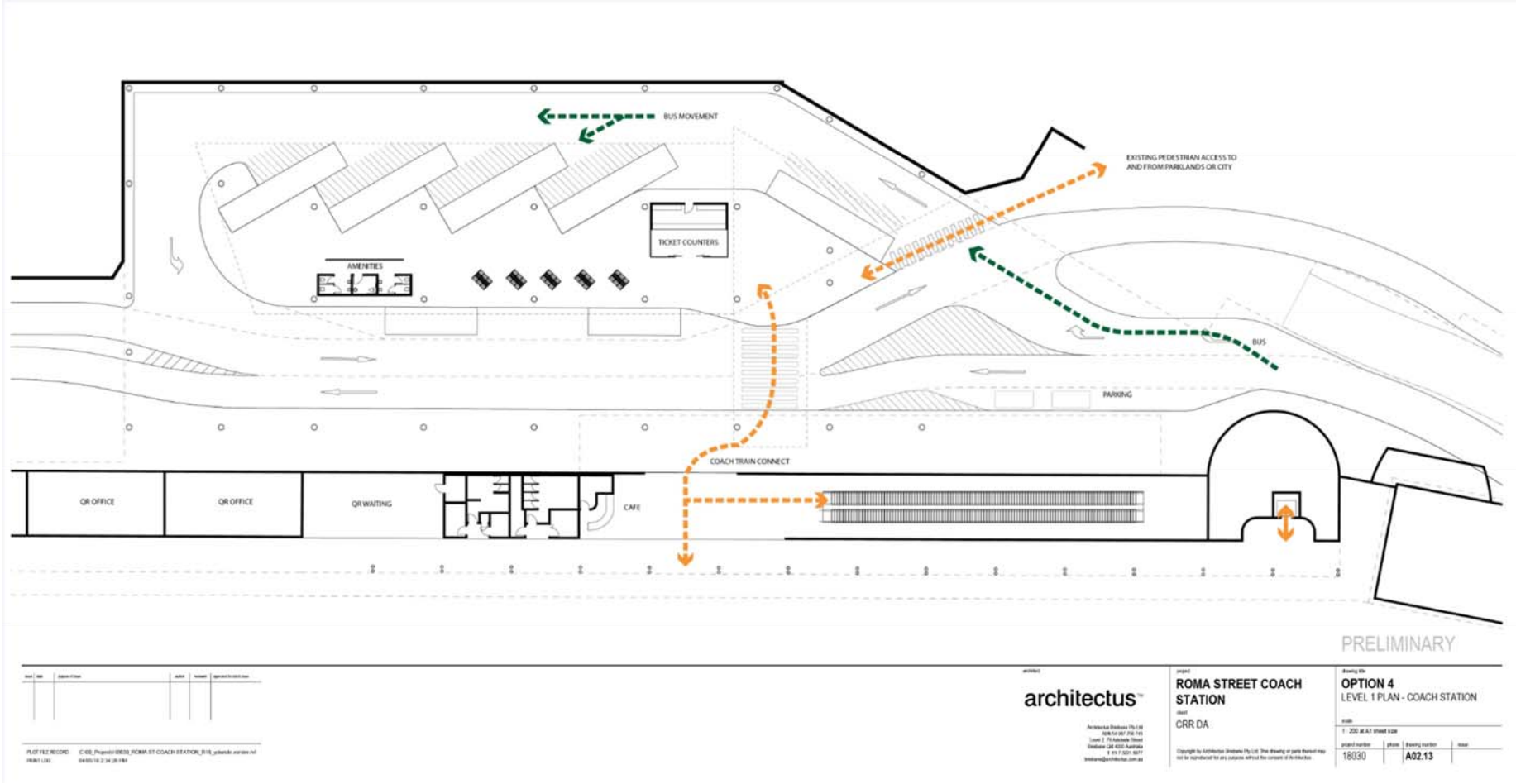

Figure 4: 2018 proposed coach terminal layout at Parkland Crescent

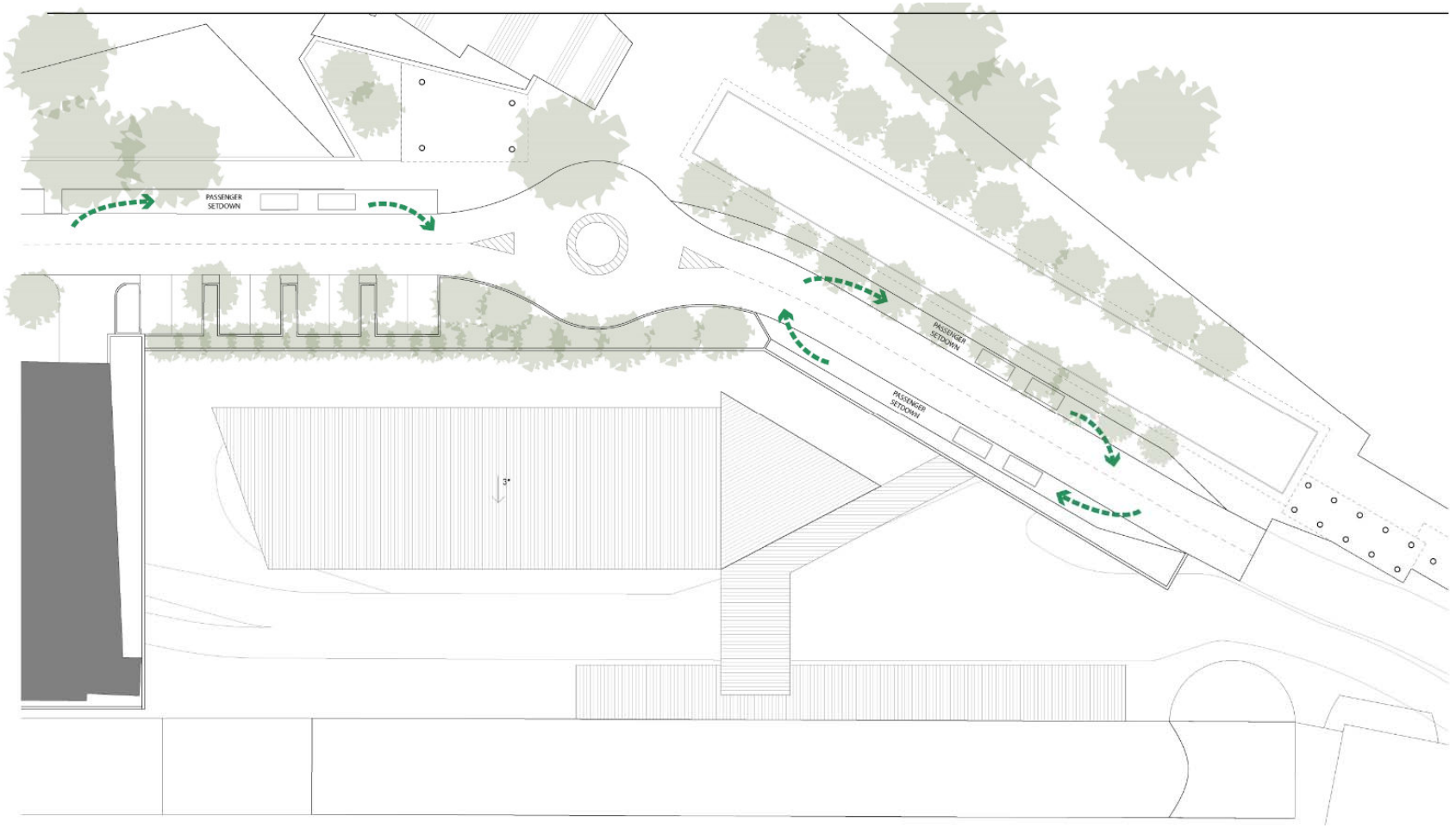

Figure 5: 2018 proposed coach terminal layout at Parkland Boulevard

2 CRR Project Approved Works and Impacts

2.1 Construction

2.1.1 Visual Amenity

For both the EIS and the RFPC, demolition and site establishment would be expected to be for less than six months.

For the RFPC the northern shaft construction would be screened to some extent, but screens would need to be over eight metres tall to restrict views from the Boulevard terrace area, but would still be overlooked by the residences.

The RFPC would provide a site primarily for construction lay down area. It would possibly be an unsightly outlook for the duration of the project and visible from the shared space of the terrace. A variety of building materials, storage spaces or shipping containers, truck deliveries and crane movement would dominate the space for the construction period.

2.1.2 Lighting

Construction activities identified in the EIS at the North Shaft Construction site adjacent to Roma Street Platform 10 were required to have enhance lighting and security systems aligning with the parklands existing lighting and security. A condition was applied to ensure that lighting, including security lighting must be designed and installed to minimise light spill into residential premises and general amenity of the parklands.

The RFPC identifies that the whole of the existing Roma Street Platform 10 car park area will become a construction worksite for the purposes of laydown and storage purposes, therefore under the RFPC it was noted that the use of the site, whilst larger in area, would revert from a major construction site as identified in the EIS to a non-construction site.

It is conceivable that the existing light poles and lighting would have been retained for general lighting of the compound.

During the construction of the coach terminal, the anticipated work hours would be consistent with other building sites and between 6.30am and 4.30 pm. Night works can be avoided, eliminating the need for lighting except as required for personal and property safety and security.

2.1.3 Landscape

For both the EIS and the RFPC, landscaping of the site is not directly referenced. However, there is an overarching principle to seek to provide enhanced landscape and streetscape amenity on the streets connecting to the stations.

2.2 Operation

The proposed design in the EIS had the potential visual impact of the ventilation shaft. The bulk of the site would have reverted to uses consistent with the Roma Street Parkland context.

Under the RFPC it was noted that the site area adjacent to Platform 10 was no longer a source of operational noise unlike in the EIS due to the removal of the North Shaft site and associated ancillary equipment from the area. Therefore, operational noise was considered no further for the site adjacent to Platform 10.

During the operational phase, it would likely revert to its former use, or be redeveloped as per the original development plan.

3 Material Changes to impacts

3.1 Assessment Methodology

For the purposes of identifying the risk of change from previously approved works in the site area adjacent to Roma Street Platform 10 (i.e. the area of the proposed coach terminal), a comparison has been made between previously approved construction and operational activities and those that are likely to occur under the proposal for the coach terminal. The operational impact phase is likely to be up to 10 years.

The analysis of character and visual amenity was based on a combination of on‐site assessment, desktop analysis and photographic recording of the context. On‐site assessment took into account existing roads, footpaths and viewpoints and places where access to the coach terminal is available. Landscape character has been assessed through visual inspection only. Lighting impacts will primarily assess the effect on residences above the coach terminal to the west.

Evaluation of views and impact on views to site from the positions as follows:

A. Parkland Boulevard

B. Apartment Building

C. Parkland Crescent Approach

D. Outlook from Queensland Rail Platform 10

Refer Figure 6 for the locations of each of these.

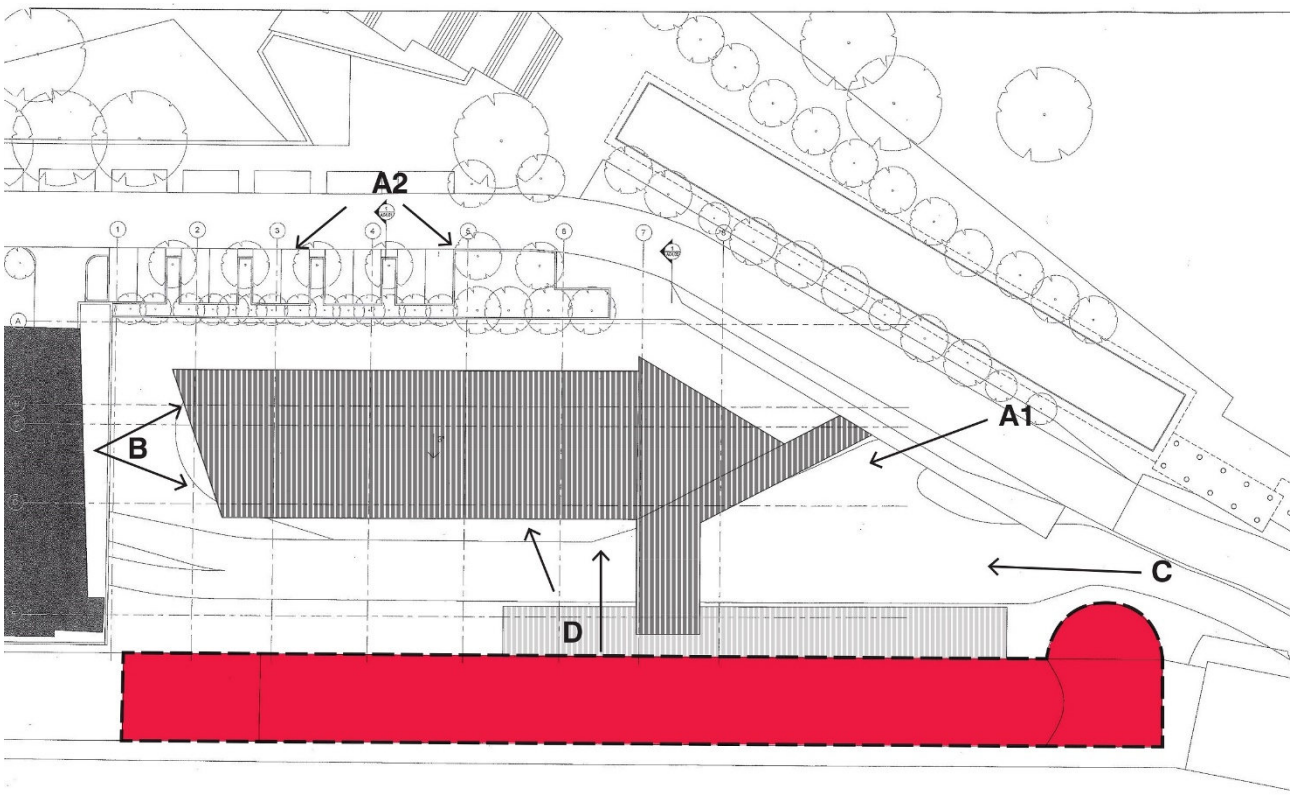

Figure 6: View Analysis Key plan

A. Parkland Boulevard

(1) Shared use terrace.

Unobstructed views over the existing carpark. Unobstructed views of the construction site. Lantern roof visible above the park level as a wayfinding element.

(2) Street parking area to the north-west.

There is virtually no view to the proposed coach terminal site from this location due to existing landscape. No major changes to the landscape screening are proposed, but one(1) tree and some shrub planting at the eastern end of planter will need to be removed or relocated for the proposed roundabout. On the opposite side of boulevard, 2 additional trees will be removed for the roundabout.

B. Apartment Building

On the Ground Floor there is limited access to a terrace along the eastern edge and small area of glazing is setback from the edge of terrace. Current outlook to asphalt and carpark. Street lights above this level, minor impact.

The first apartment level is approximately 12 metres above the coach deck. The current view is to asphalt, line marking and a variable number of cars, with the six metre retaining wall and the civil structures of elevated roads in the background. Dense planting along the northern retaining wall will remain.

C. Parkland Crescent Approach

The overhead road structures and an array of covered walkways dominate the view from this approach.

D. Outlook from Queensland Rail Platform 10

The outlook from the rail platform is currently restricted by the covered walkways and the awning across the road. The retaining wall is the main element visible, with the parkland planting more visible further from the platform entry.

Precinct Landscape Character Assessment

The lower level subject site does not include any significant grounded landscape. There are three planters with small fig trees which can be relocated. These could have been repositioned as part of the CRR project works.

Parkland Boulevard has a well structured landscape with screen planting, beds and feature trees. A row of pine trees are a significant element in the proposed pick-up / drop-off area and must be protected.

3.2 Results and Discussion

Construction

Unlike the previously approved schemes, pedestrian access to the Platform 10 from the parkland Boulevard can be maintained during construction, with vehicle and pedestrian movement control.

A visual hoarding to the Parkland Boulevard is envisaged, and pedestrian connections to the Platform 10 from lift and escalator would be safely enclosed.

The lower level subject site does not include any significant grounded landscape. There are three planters with small fig trees which can be relocated. These could have been repositioned as part of the project works.

Early in the program, the site would host demolition and construction activities, large slab pours etc. After erection of the roof steel the view into the site will be quickly obscured.

The visual impact of the construction should be limited to 38 weeks, significantly less than the construction program of the previous approvals.

Operation

The operational impacts on the visual amenity and lighting with the proposed coach terminal are summarised in Table 1.

Table 1: Summary of operational impacts

Item	Location	Operational Impact of 2018 Coach Terminal Design
Visual Amenity	A1	Most of the roof will be below park level and will have no adverse impact on sightlines. However, part of the roof of the proposed coach terminal will be visible and carry signage to assist with wayfinding. Additional signage and wayfinding will be an essential modification to the pedestrian precinct and proposed set down on Parkland Boulevard.
	A2	The screen planting along the top edge of the retaining wall will be retained, so visual impacts of the coach terminal will be limited. The roof is no higher than the retaining wall and falling away from the road. Changes to the road and introduction of roundabout will require sensitive urban design input to ensure the changes are well integrated. Signage to be kept to minimum to avoid clutter.
	B	Key views to the parklands will not be impacted as the coach roof will be similar level to the retaining wall. Figure 6 illustrates the view across the coach terminal roof. Roof to be designed to minimise glare for sun refection to residences.
	C	The approach from Roma Street along Parkland Crescent will have minor change for the non-coach traffic. The walkway roof across the road will be relocated and the higher coach terminal roof will replace the lower covered walkways. Integrated landscape will improve the general site appearance.
	D	The impact on the outlook from Platform 10 is minor, with proposed relocation of the road crossing, thus opening up views to park level.
Lighting	Parkland Boulevard	Lighting to the roundabout would need to be focused on the roadway to avoid impact on residential tower and restaurant.
	Parkland Crescent	The coach terminal lighting requirements are as follows: For day-time use, consider translucent materials to allow natural lighting. For night-time, bright white artificial lighting should ensure a safe and visually attractive environment. Lighting at bus stations must comply with the applicable requirements of lighting subcategory P6 within AS/NZ 1158.3.1 – Lighting for roads and public spaces. Most of the lights will be located under awning roofs illuminating pavement areas. Light spill will be largely contained.
Landscape	Parkland Boulevard	Pick-up / drop-off zone. Changes to line demarcation and additional signage. More vehicles in this area will reduce the pedestrian character of the area. Additional wayfinding signage will be necessary to direct people to the coach terminal. Pillar signs and in building undercroft. Construction of roundabout. Some shrub planting and 3 trees total are removed to provide space for roundabout. 2 of the trees are on the norther side of boulevard. Urban design required to ensure changes are consistent with the precinct design.
	Parkland Crescent	Additional landscape integrated with the coach terminal will enhance the precinct at Platform 10 level.

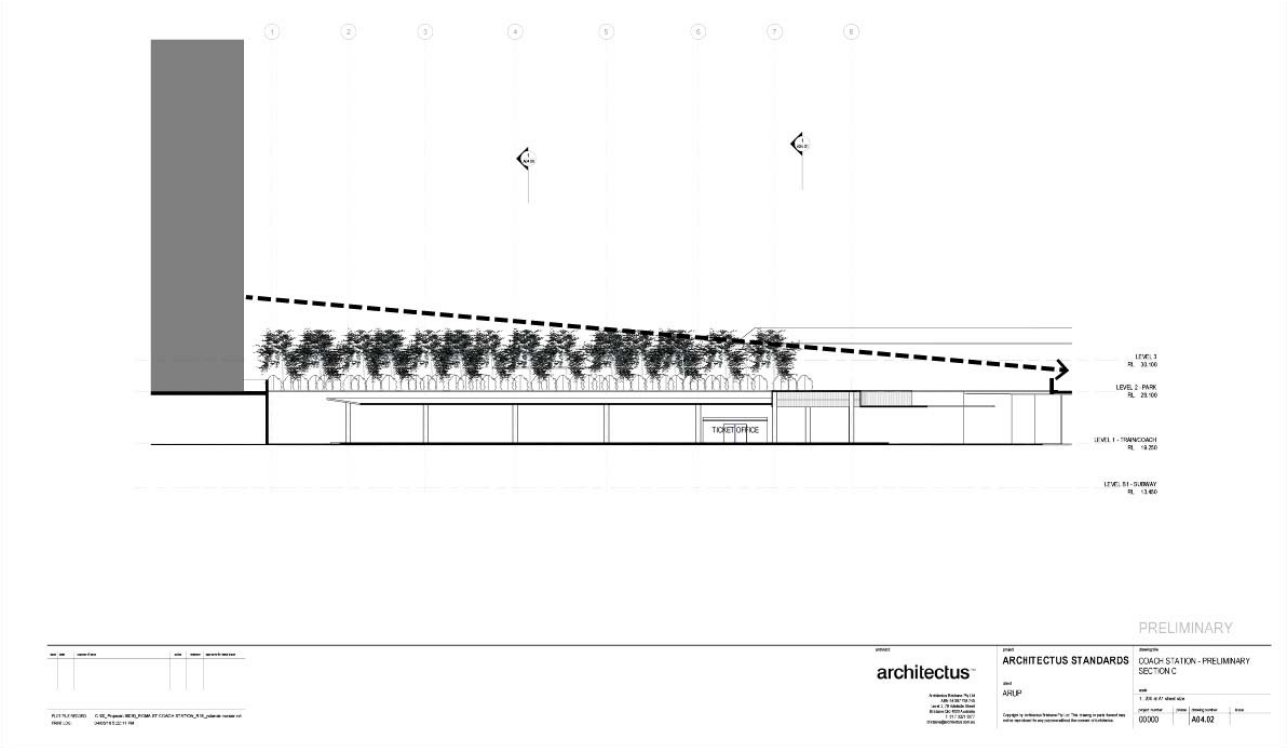

Figure 7: Section and view line across proposed coach terminal roof to Boulevard

4 Recommendations and Conclusion

The findings from this technical note have resulted in the following recommendations:

- Integrate urban design objectives with the changes in the precinct, particularly around Parkland Boulevard;
- Provide hoarding to the edge of the terrace area for the duration of the construction;
- Traffic management plan for the construction phase to include for safe pedestrian access to the Platform 10 from Parkland Boulevard;
- Design roof and select materials which do not produce glare for the residences;
- Ensure all lights are located under roof, as far as is practicable, to minimise spill up to the residences; and
- Careful integration of signage into the precinct and ensure suitable wayfinding to the new coach terminal.

Overall, from a visual amenity perspective, the proposed development of the coach terminal is not anticipated to adversely impact on the adjacent residences or Parkland Boulevard significantly beyond the short construction period of 38 weeks. The lighting can be managed and incorporated into the design to minimise any impacts.

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Architectus		
Signature			

APPENDIX E – Targeted Consultation Report

CROSSRIVERRAIL
Delivery Authority

Request for Project Change

Targeted Consultation Report
Roma Street Parklands Residents

June 2018

Table of Contents

1. Introduction 4
1.1 Purpose 4
1.2 Consultation Objectives 4
2. Engagement Approach 5
2.1 Written notifications 5
2.2 Information sessions 5
3. Consultation Outcomes 6
3.1 Comments Received 6
3.2 Resulting Actions 8
4. Conclusion 9
5. Communication Collateral 10
5.1 Letter to Residents 10
5.2 Flyer 11
5.3 Map 12
5.4 Architectural Renders 13
5.5 Engineering Drawings 14
5.6 Cross River Rail Alignment 15

Executive Summary

This report, prepared for the Coordinator-General, outlines targeted consultation carried out by the Cross River Rail Delivery Authority with residents of Parklands Apartments. This consultation addressed the relocation of the Roma Street Coach Terminal to a temporary location on Parkland Crescent, to allow for the demolition of the Brisbane Transit Centre as part of the Cross River Rail Project.

This consultation was undertaken between 18 June and 22 June 2018, using a range of traditional engagement methods, including:

- Meeting with Parklands Apartments on-site Building Manager, Principal Body Corporate Committee Chairperson, and Chairperson from Building Three Body Corporate Committee;
- Letter delivered to all properties within Parklands Apartments;
- Flyers affixed to notice boards and elevators within each building;
- Four staffed information sessions held at Parklands Apartments; and
- 24/7 project hotline and monitored email.

A detailed summary of feedback received during the consultation period, along with responses from the Cross River Rail Delivery Authority, is contained in this report. Key areas of enquiry are listed below:

- Project design
- Land tenure and property impacts
- Construction impacts
- Pedestrian and cyclist safety
- Change in amenity
- Traffic and transport impacts
- Timing and funding

Consultation activities undertaken meet the best practice principles of the Queensland Government Engaging Queenslanders guide and the International Association of Public Participation (IAP2) spectrum of engagement.

1. Introduction

The Cross River Rail (CRR) Project was declared a significant project (now a coordinated project) for which an Environmental Impact Statement (EIS) was required. The EIS relating to the CRR Project was evaluated by the Coordinator-General (CG) in a report dated 20 December 2012. The Coordinator-General Evaluation Report (CGER) recommended that the Project could proceed, subject to conditions for the minimisation and management of the environmental impacts of the Project in its delivery and implementation.

A Request for Project Change (RfPC) was made on the 5 December 2016. This RfPC was evaluated by the CG in a Coordinator-General Change Report (CGCR) on 9 June 2017. As part of this RfPC, it was identified that the Roma Street Coach Terminal would need to be relocated from the Brisbane Transit Centre (BTC) west tower to allow for the demolition of the BTC west tower for the CRR Project. A proposed temporary solution for the relocation has been developed in consultation with key stakeholders including the coach operators. This relocation is required to be progressed early in the works program to allow for demolition of the BTC to facilitate construction of the broader CRR Project.

As part of the design development, it was determined that the Parklands residents are the key impacted stakeholders and that additional targeted consultation with these residents should occur.

1.1 Purpose

This report sets out details of the Roma Street Parklands community engagement and stakeholder consultation that has been undertaken with residents. It supports the submission of a RfPC to the CG for the temporary coach terminal relocation work.

Consultation activities undertaken meet the best practice principles of the Queensland Government Engaging Queenslanders guide and the International Association of Public Participation (IAP2) spectrum of engagement.

1.2 Consultation Objectives

A range of consultation methods were utilised throughout the consultation period which aimed to:

- Inform the community and key stakeholders about the proposed temporary coach terminal solution;
- Inform the community about key design changes from the previously-approved RfPC, specifically relating to the temporary relocation of the Roma Street Coach Terminal and change in land use on Parkland Crescent;
- Provide stakeholders with an opportunity to raise concerns relating to the Roma Street Coach Terminal;
- Provide an avenue for those concerns raised by key stakeholders to be duly considered by the Authority and for timely responses to be provided to those stakeholders; and
- Communicate the RfPC process, including how the community can provide feedback to the Authority and/or the CG.

2. Engagement Approach

Consultation about the temporary relocation of the Roma Street Coach Terminal was undertaken between 18 June and 22 June 2018. This engagement was focused on one key stakeholder group - the residents of Parklands Apartments.

The engagement approach was developed in consultation with the Parklands Apartments On-Site Building Manager on Monday 11 June. The Delivery Authority's Stakeholder Engagement team met with the Building Manager, Chairperson of the Principal Body Corporate and the Chairperson of the Body Corporate Committee for Building Three (primary affected building). In this meeting, the following engagement approach was agreed:

- Letter to be delivered to all 400 residents of Parklands Apartments;
- Four drop-in information sessions to be hosted;
- 5pm-7pm as the ideal time to reach most residents (after standard working hours);
- Information sessions to be staffed by technical and engagement representatives; and
- Further updates to be provided via email to Body Corporate Managers (Archers Strata Management), for distribution to all residents and absentee owners.

2.1 Written notifications

A letter (**Section 5.1**) was hand delivered to 400 letterboxes at Parklands Apartments. This letter provided a brief summary of the Temporary Coach Terminal relocation, and encouraged residents to attend information sessions between Monday 18 June and Thursday 21 June each night from 5pm – 7pm. It also provided the Project team's contact details for further information.

An electronic version of the same letter was provided to the On-site Building Manager on Monday 18 June, for provision to absentee owners via Archers Strata Management company.

On Monday 18 June, a flyer (**Section 5.2**) was affixed to the notice boards and lifts within each individual building. This flyer provided a map illustrating the location of the temporarily relocated coach terminal and details regarding location of information sessions.

2.2 Information sessions

The information displayed at the community consultation sessions included:

- Architectural renders of the proposed Temporary Coach Terminal;
- Map of proposed Temporary Coach Terminal location;
- Engineering drawings and general arrangements of Temporary Coach Terminal;
- Roma Street Coach Terminal FAQ document; and
- CRR full alignment pull up banner.

The information sessions were staffed by Delivery Authority employees and consultants, including:

- Stakeholder Engagement Manager;
- Stakeholder Engagement Coordinator(s);
- Environmental and Approvals Coordinator;
- Early Works Project Manager;
- Design Manager;
- Technical Delivery Manager; and
- Lead Architect.

3. Consultation Outcomes

Approximately 110 residents were engaged throughout the four information sessions. Twenty-three residents requested that their comments be noted, and seven individuals requested responses to their comments/questions.

3.1 Comments Received

Specific concerns raised by residents and the Delivery Authority's responses, are detailed in Table 1 below.

Table 1: Comments and associated responses

Theme	Time raised	Specific concerns	Delivery Authority response
Pedestrian safety	**8**	- Increased traffic movements may cause safety risks for pedestrians who move through the Parklands. Specifically, hundreds of students from the schools on College Road and Gregory Terrace traffic this area before and after school each day.	- The Delivery Authority is aware that this is a thoroughfare for students of schools on College Road and Gregory Terrace. - The Delivery Authority will undertake a pedestrian count at peak times before and after school in early-mid July. - Should the results of these pedestrian counts suggest that current crossing widths/designs are not adequate, this will be addressed as a matter of priority.
Cyclist safety	**6**	- A significant number of cyclists use Parkland Boulevard daily. These cyclists travel at high speeds, already causing issues with existing traffic and pedestrians. An increase in traffic, caused by the coaches, could result in injuries or fatalities if this cyclist population is not considered.	- The Delivery Authority is aware, through discussions with Brisbane City Council and Parklands Management, that 4000 cyclists travel through the Parklands each day. - The Delivery Authority has amended the pavement type on Parkland Boulevard to force a significant reduction in cyclist's speed. - The Delivery Authority has committed to engaging with the local Bicycle User Groups to provide them with clarity around key changes, construction timelines, and personal safety considerations.
Traffic impacts	**12**	- There are significant existing issues with the intersection of Roma Street and Parkland Crescent. The signal timing generally only allows for one vehicle to exit and turn right, due to the priority given to crossing pedestrians. The addition of 70+ coaches per day will exacerbate this issue and cause significant queueing through that intersection and back to the Parkland Boulevard ramp.	- The Delivery Authority notes that this is a key issue, and is working closely with Brisbane City Council (BCC) to investigate the alteration of traffic signal phasing for this intersection.

Theme	Time raised	Specific concerns	Delivery Authority response
	9	- With the increased congestion on Parkland Crescent, is there potential for the intersection of Parkland Boulevard and College Road to be changed? Currently it only allows for traffic to turn left. If it was amended to allow left turns, right turns and continuation straight along Gregory Terrace, residents would be more likely to use that exit, reducing congestion on Parkland Crescent.	- The Delivery Authority stated that the intersection and associated roads are controlled by BCC, however stated that The Authority will table this as a suggestion at the next meeting with BCC. The Authority acknowledged however, that altering this intersection could cause Parkland Boulevard to be used as a key thoroughfare for local traffic.
	2	- With the drop off on Parkland Boulevard, and the new signals at the bottom of the ramp, taxis are likely to use Parkland Boulevard as a "rat-run" rather than using the roundabout to turn back onto Roma Street.	- The Delivery Authority suggested that an increase in taxi traffic along Parkland Boulevard would be likely, however also stated that there would still be drop-off facilities on Parkland Crescent.
	3	- Increased pressure on the intersection of Roma Street and Parkland Crescent could be avoided by forcing coaches to go underneath the residential buildings and exit via the College Road intersection.	- The Delivery Authority investigated this during the options analysis phase, however discounted it due to a number of reasons including; feedback from Parklands Management that this would harm visual amenity of the Parklands, and feedback from coach operators which suggested a direct Roma Street exit provides the most efficient outcome.
Disabled access	**2**	- The design drawings illustrate changed traffic conditions on Parkland Boulevard, to facilitate a new roundabout near the café. This requires the removal of two disabled parking bays.	- The Delivery Authority committed to working with BCC to reallocate two other nearby carparks for disabled use. - The Delivery Authority noted that this was of significant concern as there are a number of mobility-impaired residents living in Building Three, and that the café-end of the Parklands is a key access point for mobility-impaired visitors.
	2	- The single elevator is not sufficient as an access for disabled passengers to travel down from the drop-off zone on Parkland Boulevard to the Coach Terminal on Parkland Crescent. This elevator regularly fails.	- The Delivery Authority is aware that this elevator is not reliable and is in discussions with BCC and Parklands Management to discuss the potential of installing a new lift. - Further, there is a small drop-off zone located adjacent to the Coach Terminal, on Parkland Crescent. Mobility impaired passengers will be encouraged to utilise this drop-off zone.
Environmental impacts	**3**	- Concerns that waiting passengers will make excessive noise and that noise will carry to above apartments due to the open roof design. Residents would prefer if the roof was enclosed to limit this.	- The Delivery Authority showed residents the graph which illustrates expected noise levels compared to existing noise levels and explained the design of the roof structure. Residents did not request further clarification or evidence. The technical representative explained the design of the roof structure.
	1	- Lighting concerns impacting residents.	- The Delivery Authority stated that this design would not cause any increase in

Theme	Time raised	Specific concerns	Delivery Authority response
			light spillage compared to the current carpark infrastructure.
	2	- Concerned that idling coaches will cause pollution and that fumes will travel up to apartments on the southern end of Building 3.	- The Delivery Authority will install air quality monitors, to get baseline data readings and compare this to the operational air quality modelling. - The Authority stated that as a highly managed facility, with a very small number of bays, it is unlikely that coaches will idle in this location for longer than standard loading/unloading times.
Construction impacts	**2**	- Concerned that during construction of the Temporary Coach Terminal, workers will take up parking within the Parklands.	- The Authority is to provide alternative parking areas for construction contractors and to stipulate in the construction contract that workers must not utilise carparking bays within Roma Street Parklands.

3.2 Resulting Actions

Whilst all comments, concerns and questions have been noted, there were a small number of concerns raised which require further investigation or consideration by the Authority. The following actions or investigations are being undertaken by the Authority following this consultation period:

- Pedestrian count at peak school times, in mid-July (after school returns from holiday period);
- Seek commitment from BCC that the phasing of traffic signals at intersection of Roma Street and Parkland Crescent will be altered to allow for increased traffic movements;
- Install air quality monitoring equipment above the existing carpark facilities, to gather baseline data; and
- Designate alternative parking areas for construction contractors and set expectations that workers will not utilise on-street parking within Roma Street Parklands where possible.

4. Conclusion

The Delivery Authority has contacted all residents within the Parklands Apartments, informed them of the Temporary Coach Terminal solution, and provided a number of avenues for residents to comment, ask questions or raise concerns.

Of the 400 residents contacted, 110 were engaged during information sessions, 23 provided formal comment, and seven requested further contact. Of the comments made during consultation and detailed in Section 3.1, all have been sufficiently considered by the Delivery Authority. Four concerns raised require further investigation or action by the Delivery Authority as detailed in Section 3.2. These actions will be closed out by late-July, with findings incorporated into final design where necessary.

The concerns raised throughout this consultation period are able to be managed by the Delivery Authority through a combination of design solutions and on-site management. Timely construction of the Temporary Coach Terminal would therefore be able to commence pending CG approval of this RfPC.

5. Communication Collateral

5.1 Letter to Residents

The following letter to residents was hand delivered by the Delivery Authority to all resident mailboxes.

CROSSRIVERRAIL Delivery Authority

Cross River Rail Delivery Authority
123 Albert Street, Brisbane, QLD 4000
ABN: 21 542 690 798
1800 010 875
info@crossriverrail.qld.gov.au
www.crossriverrail.qld.gov.au

X June 2018

Dear Resident / Owner
Parkland Apartments

Cross River Rail – proposed change in land use

The Queensland Government has recently announced the companies that have been shortlisted to build Queensland's highest priority infrastructure project, Cross River Rail (the CRR Project). The CRR Project is a 10.2 kilometre dual track rail from Dutton Park to Bowen Hills, including 5.9 kilometres of tunnel.

The CRR Project is designed to remove a bottleneck at the core of our transport network where a single river crossing with capacity for 24 trains per hour already carries as many as 21. As our population grows, Cross River Rail will allow more trains to run more often and will integrate with new busways and new roads to help enable a turn-up-and-go transport network, that will benefit all of South East Queensland.

The Cross River Rail Delivery Authority (the Delivery Authority) is the statutory entity responsible for the delivery of the CRR Project on behalf of the Queensland Government.

In 2017, the CRR Project was approved by the Coordinator-General and received a full funding commitment from the Queensland Government. This approval included the acquisition and use of a parcel of land off Parkland Crescent (behind Roma Street Station), for construction laydown facilities (general site area) throughout the duration of the Project (**refer to enclosed map**).

The Delivery Authority is now working through a Request for Project Change for an amendment to this land use. The new proposed use will include construction of a temporary coach terminal facility, enabling relocation of the coach services currently utilising the Brisbane Transit Centre that will be demolished as part of the Project.

Information sessions

Given the proximity to the proposed temporary coach terminal, the Delivery Authority would like to engage with residents of Parkland Boulevard to discuss the change in land use, provide further detail about expected impacts and answer any questions residents may have.

The Delivery Authority has contacted the Body Corporate of your building and will be hosting information stands in the foyer of your buildings between Monday 18 June and Friday 22 June. Specific dates and times will be displayed on your building notice board in the coming days.

If you would like additional information or have any enquiries, please contact the Cross River Rail project team on 1800 010 875 or info@crossriverrail.qld.gov.au.

We look forward to keeping you informed as the project progresses.

Yours sincerely

Stakeholder Engagement
Cross River Rail Delivery Authority

5.2 Flyer

The below flyer was displayed on notice boards from 18 June 2018 for the week of consultation.

June 2018

Roma Street Coach Terminal Relocation

The Cross River Rail Delivery Authority would like to invite you to an information session regarding the relocation of the existing Roma Street Coach Terminal (Coach Terminal).

The Coach Terminal is currently located within the Brisbane Transit Centre (BTC) West Towerwhich is due for demolition as part of the Cross River Rail Project.

A proposed temporary relocation solution for the Coach Terminal has been developed in consultation with coach operators, Queensland Rail and Department of Transport and Main Roads.

Proposed new Roma Street Coach Terminal

Information Sessions

Come meet the Cross River Rail Project Team to better understand the Coach Terminal relocation and overall project scope:

When	Where	Time
Monday 18th June	Building 3, West foyer	5pm – 7pm
Tuesday 19th June	Building 3, Recreation Room	5pm – 7pm
Wednesday 20th June	Building 3, Recreation Room	5pm – 7pm
Thursday 21st June	Building 3, West foyer	briefings available upon request
Friday 22nd June	Building 3, Recreation Room	briefings available upon request

1800 010 875
info@crossriverrail.qld.gov.au
crossriverrail.qld.gov.au

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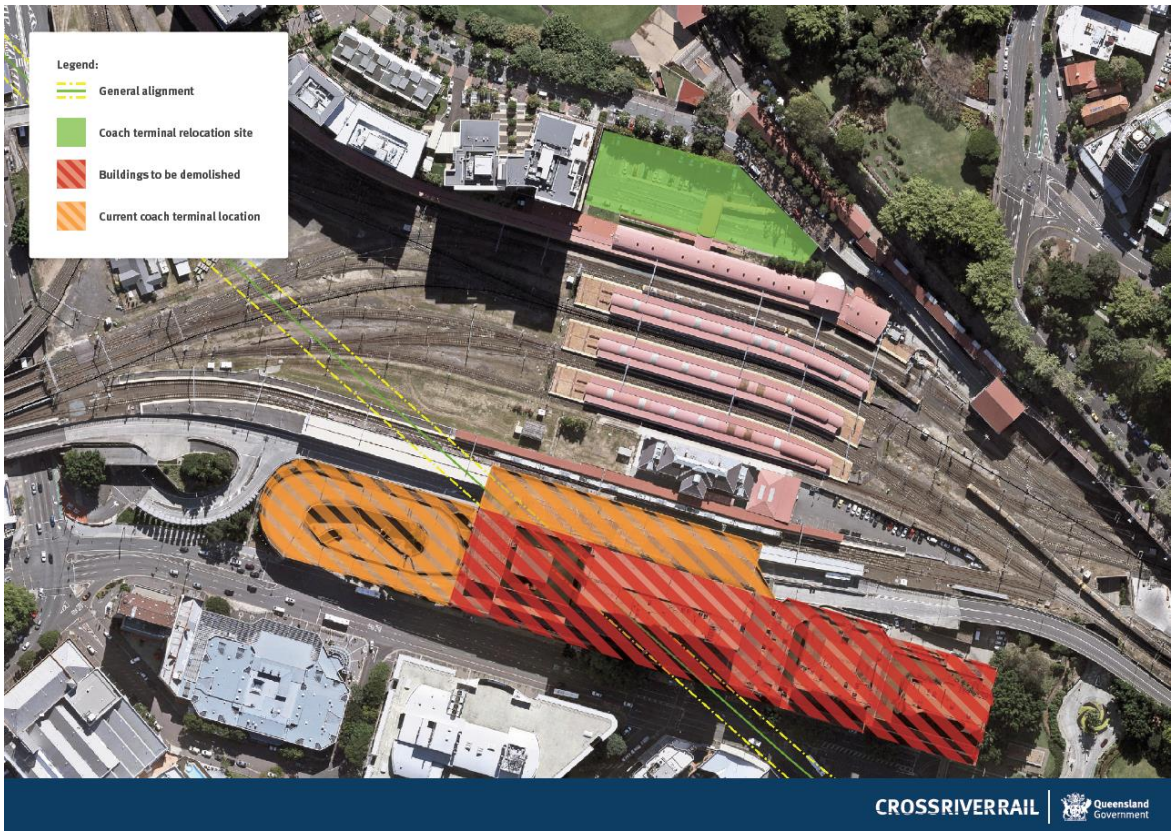
5.3 Map

The below map was displayed at information sessions.

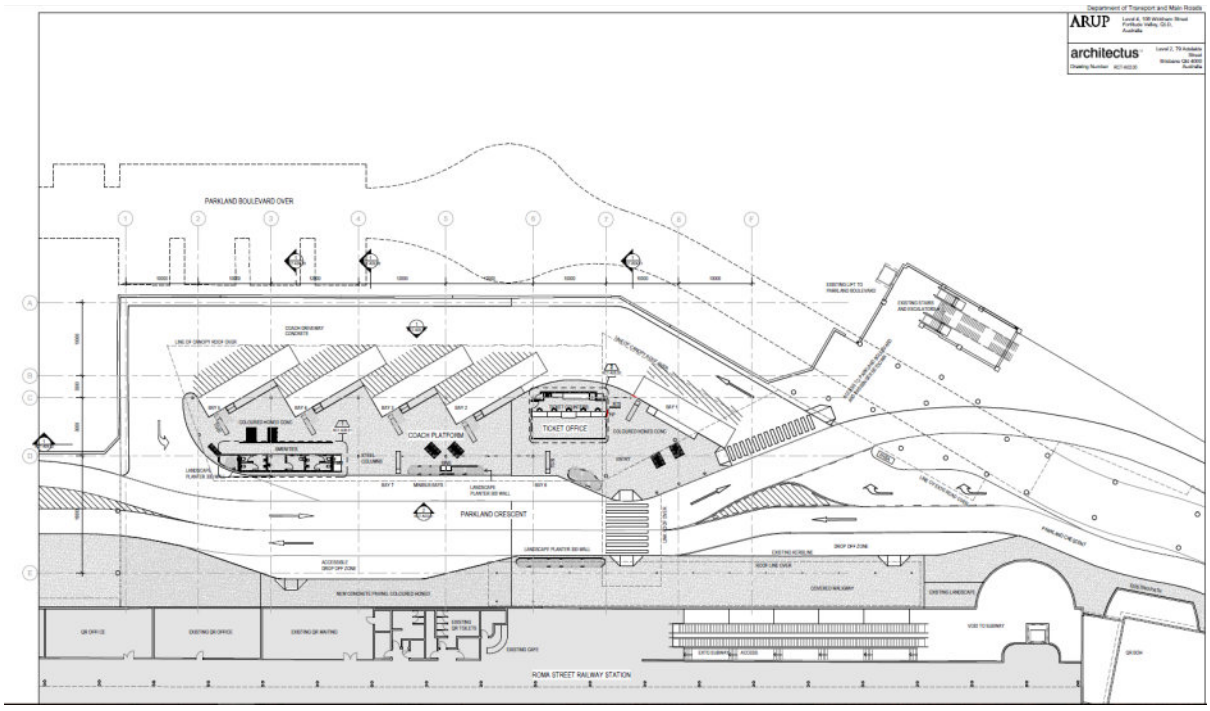


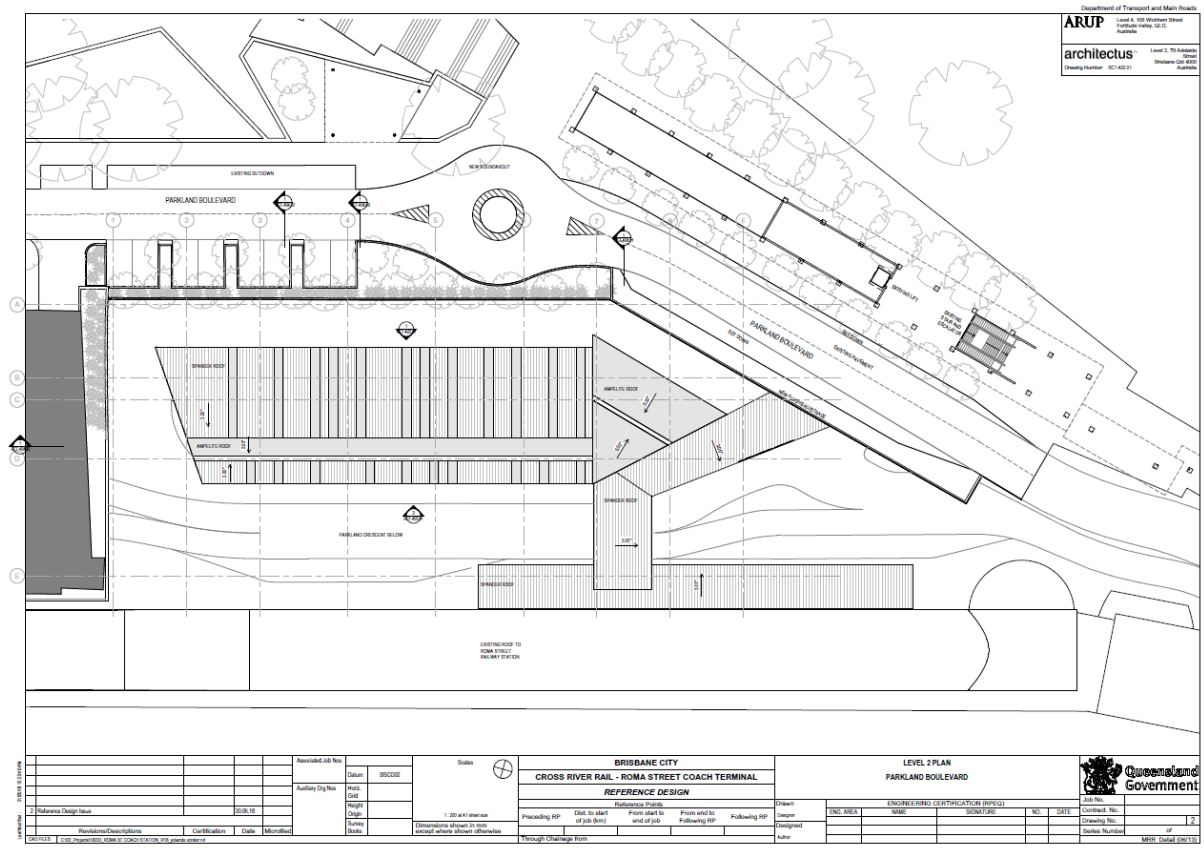
5.4 Architectural Renders

The following architectural renders were displayed at information sessions.

5.5 Engineering Drawings

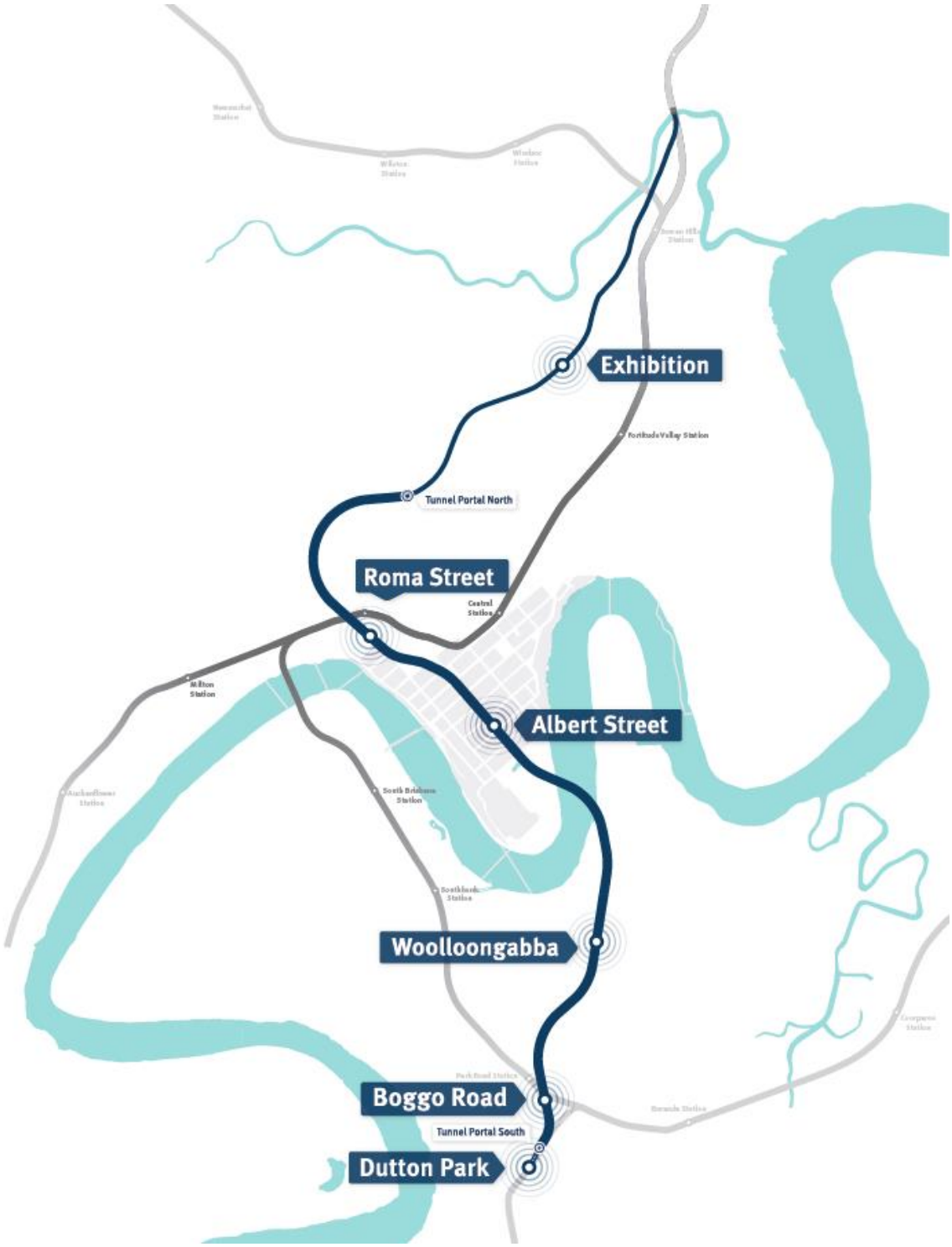
The following engineering drawings were displayed at information sessions.





5.6 Cross River Rail Alignment

The following Cross River Rail alignment map was displayed at information sessions.



APPENDIX F – Volume 3 Design Drawing

Department of Transport and Main Roads

ARUP
Level 4, 108 Wickham Street
Fortitude Valley, QLD, Australia
Drawing Number
CRR-0002-CD-RP-105

NOT FOR CONSTRUCTION
8 February 2017

BRISBANE-CITY
TANK ST
HERSHEL ST
MAKERSTON ST
GEORGE ST
ROMA ST
PARKING
WATER TREATMENT
OFFICES
COUNTESS ST
VICTORIA BARRACKS
INNER NORTHERN BUSWAY
DOWN CRR
LAYDOWN AREA
SUBSTATION, GENERATOR AND ELECTRICAL SUPPLY
LAYDOWN AREA
WORKSHOP AND STORE
UP CRR
ROMA STREET BUSWAY STATION
TEMPORARY BUSWAY BRIDGE
ACOUSTIC SHED
PARKLAND CRES
ROMA STREET RAILWAY STATION
PARKLAND BVD
INNER NORTHERN BUSWAY
PARKLAND BVD
ALBERT ST
ROMA STREET PARKLANDS
WICKHAM TCE
SPRING HILL
WICKHAM TCE

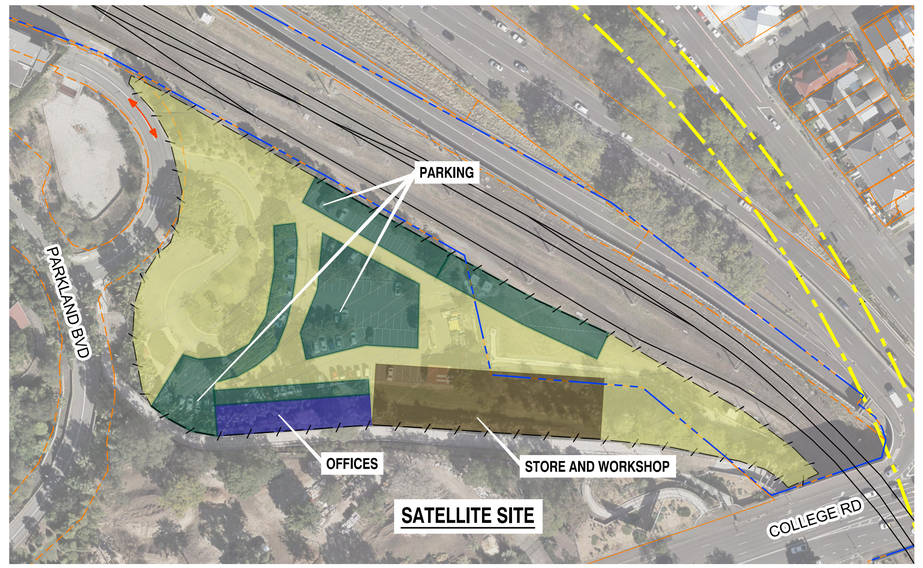
REVISED BY CRRDA TO SHOW TEMPORARY COACH TERMINAL LOCATION 27/06/2018

CONSTRUCTION WORKSITE LEGEND

- RAIL BRIDGE / CUT & COVER / PORTAL STRUCTURE
- TEMPORARY COACH TERMINAL LOCATION
- GENERAL SITE AREA
- OFFICE, ANCILLARY PLANT
- CAR PARKING
- WORKSHED
- LAYDOWN AREA
- ELECTRICAL SUBSTATION/ GENERATOR
- TEMPORARY BRIDGE
- PURPOSE BUILT ACOUSTIC ENCLOSURE
- SITE FENCE / HOARDING
- TRUCK MOVEMENT
- CRR TRACK
- RELOCATED NARROW GAUGE TRACK
- EXISTING RAIL CENTRELINES
- RAIL CORRIDOR BOUNDARY

PROPERTY BOUNDARY LEGEND

- EXISTING STANDARD LOT
- EXISTING VOLUMETRIC LOT



C	MINOR REVISION		08/02/17	
B	MINOR REVISION		02/11/16	
A	ISSUE FOR RFPC		14/10/16	
	Revisions/Descriptions	Certification	Date	Microfiled

Associated Job Nos
Auxiliary Drg Nos

Survey Data
Datum: GDA94
Horiz. Grid
Height Origin
Survey Books

Scales
A1 / A3 1:1000 / 1:2000 0 10 20 30 40m
Dimensions shown in except where shown otherwise

BRISBANE CITY
CROSS RIVER RAIL
REFERENCE DESIGN (CHANGED PROJECT)

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP

Through Chainage from

CONSTRUCTION SITE PLANS
ROMA STREET STATION
(TEMPORARY COACH TERMINAL LOCATION)

Drawn: SG
Designed: JD

ENGINEERING CERTIFICATION (RPEQ)				
ENG. AREA	NAME	SIGNATURE	NO.	DATE
CIVIL	J. DONOHUE		7835	14/10/16

Queensland Government

Job No.	
Contract. No.	
Drawing No.	C
Series Number	of

MRR_Detail (06/13)

CAD FILES C:\projectwise\bne_projects\stephen.grigg2\dms97294\CRR-0002-CD-RP-105.dwg

Last Modified :- Feb 08, 2017 - 10:11am XREFS :- MRR_DETAIL_A1_Ref.dwg ; X-CRR-DRAI-0001-12D.dwg ; X-CRR-DRAI-0001-LG-CAD.dwg ; X-CRR-SDCD-0001-VOLUMETRICS.dwg ; X-CRR-DRES-0001-CONSTRUCTION-CAD.dwg ; X-CRR-DRAI-0001-CAD.dwg ; X-CRR-SSUR-NSBT_SURFACE_WORKS.dwg ; X-CRR-DRAI-0001-LG-CAD.dwg ; X-CRR-SDCD-0001-PL.dwg ; X-CRR-DROA-0001-CAD.dwg ;