

# Environmental Impact Statement

Request for Project Change 4

Response to Submissions Report

June 2019



**Queensland**  
Government

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# 1. Introduction

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

- RfPC-1 made on 5 December 2016 and evaluated on 9 June 2017 resulting in a modified project of a smaller scale with reduced potential impacts and enhanced affordability;
- RfPC-2 made on 28 June 2018 and evaluated on 31 August 2018 which addressed the temporary solution for the relocation of the Roma Street Coach Terminal; and
- RfPC-3 made on 19 November 2018 and evaluated on 14 March 2019 for the extended demolition works of the Brisbane Transit Centre.

The Evaluated Project is the authorised CRR Project as described in Condition 1 of the Coordinator-General's Project Wide Imposed Conditions, including RfPC-1, RfPC-2 and RfPC-3.

The Evaluated Project is a 10.2km rail line between Dutton Park and Bowen Hills, including 5.9km of twin tunnels under the Brisbane River and Brisbane central business district (CBD) and four new high-capacity underground stations at Boggo Road, Woolloongabba, Albert Street, and Roma Street. The Evaluated Project also includes an upgraded all-days station at the RNA Showgrounds and an upgrade to the existing Dutton Park Station.

Since the 2017 Change Report, the Delivery Authority has sought proposals from the private sector for the Project, and has selected two preferred tenderers to undertake the Project. As a result of innovations and enhancements through the request for proposals process, a number of design and delivery changes have been identified for the Project. These changes have been assessed in terms of environmental impacts in RfPC-4, which was publicly notified from 20 May 2019 to 14 June 2019.

Following public notification, the Delivery Authority was requested by the Coordinator-General to respond to issues raised in submissions about the Proposed Changes to the Project as described in RfPC-4. This Response to Submissions Report is part of this request.

## 1.1 Process for Evaluation of Project Changes

The process by which the changes to the Project are to be addressed and assessed is established in Part 4, Division 3A of the SDPWO Act.

The Proposed Changes to the CRR Project since the March 2019 Coordinator-General's evaluation report triggered the requirement for the Delivery Authority to request that the Coordinator-General assess:

- changes to the Project
- changes to the conditions of the Project.

In April 2019, an application was made to the Coordinator-General to formally evaluate the Proposed Changes to the Project. RfPC-4 also requested that some amendments be made to the existing Imposed Conditions.

The Coordinator-General determined that public notification of the Proposed Changes was required. The Proposed Changes to the CRR Project was publicly notified on 20 May 2019 for a period of four weeks, closing at 5pm on 14 June 2019.



## 1.2 Purpose of this report

This Response to Submissions Report forms part of the information requested by the Coordinator-General in order to inform the evaluation of the Proposed Changes to the CRR Project. The Report and its appendices and attachments address issues raised in written submissions received by the Coordinator-General about the Proposed Changes.

Detailed responses to issues raised in all properly made submissions received by the Coordinator-General are provided at **Attachment 1**.

### 1.2.1 Structure of the Response to Submissions

The Response to Submissions report comprises the following:

1. **Response to Submissions Report (this document)**
2. **Attachment 1 – Proponent Response to Submissions**
3. **Attachment 2 – Proponent Consultation Report**

## 1.3 CRR Environmental Impact Statement

### 1.3.1 Coordinator-General's Evaluation Report

The objective of an EIS is to ensure that potential environmental, social and economic impacts of the Project are identified so the benefits may be captured and adverse impacts avoided or minimised and mitigated. An EIS for CRR was prepared over 2010 and 2011 in accordance with Terms of Reference issued by the Coordinator-General.

Specifically, the EIS (July 2011) described:

- the need for the Project, alternatives to it and options for its implementation
- the existing environment of the study corridor or other areas potentially affected by the Project
- the potential impacts of the Project on the natural, social and economic environment, including beneficial and adverse impacts, and direct, indirect and cumulative impacts
- measures for avoiding, managing or mitigating the adverse impacts and maximising or enhancing the benefits of the Project.

The EIS was released for formal public consultation in August to October 2011 and a supplementary report was released in July 2012 at the request of the Coordinator-General. In December 2012, the Coordinator-General's evaluation report on the EIS was released. This report represented the final formal statutory step in the process of assessing the Project and included:

- Imposed Conditions under section 54B of the SDPWO Act on potential Project matters requiring control for which no other statutory mechanism is available and nominated the entities responsible for those conditions
- stated conditions, as appropriate, where subsequent approvals have been identified as being required under other legislation
- general recommendations on other matters for which enforceable conditions would be inappropriate.

### 1.3.2 Request for Project Change

An application for consideration of project changes is a formal step in statutory processes established through the SDPWO Act. The process allows projects that have already received an EIS evaluation report to request that the Coordinator-General consider a potential change in environmental effects resulting from a project change. It also provides a process for the Coordinator-General to evaluate requested changes to conditions.



RfPC-4 identifies the proposed Project changes, the reasons for the changes and the potential effects of these changes. RfPC-4 lodged for CRR comprised the following:

- *Volume 1 – Request for Project Change*

Describes the Proposed Changes, the reasons for the Proposed Changes and the effects of the changes on the project.

- *Volume 2 – Design Drawings*

Design drawings including general arrangement drawings, longitudinal and cross sections, construction site layout plans, property impact plans and station design drawings.

- *Volume 3 – Technical Reports*

Technical information supporting RfPC-4 including transport, air quality, non-indigenous cultural heritage, noise and vibration, settlement, land use and tenure, landscape and visual, groundwater and cumulative impacts.

The RfPC documentation is on the Coordinator-General's website:

(<http://statedevelopment.qld.gov.au/assessments-and-approvals/cross-river-rail-project.html>).

Following consideration of the matters identified in s.35H of the SDPWO Act, the Coordinator-General will prepare a report evaluating the proposed changes to the CRR Project.

## 1.4 Consultation on the Request for Project Change

RfPC-4 was publicly notified between 20 May 2019 and 14 June 2019. The public notification period was conducted in accordance with the requirements of the SDPWO Act.

A range of consultation and engagement activities were managed by the Delivery Authority and undertaken throughout the public notification period:

- |   |   |
|---|---|
| - Revised Project Website                 | - Pop up displays   |
| - Project newsletters                     | - Potentially impacted landowner letters                        |
| - Project flyers at key project locations | - Landowner letters (volumetric)                                |
| - Regional Newsletters                    | - Static displays in libraries                                  |
| - Property owners and tenant's meetings   | - Distribution of materials at key transport interchanges       |
| - Social media                            | - Government departments, key stakeholders and community groups |
| - Industry briefings                      |   |
| - Public information sessions             |   |

A report summarising the Delivery Authority's consultation activities for RfPC-4 is provided at **Attachment 2**.

A total of 86 submissions were received by the Coordinator-General during the notification period. Copies of all submissions, including a breakdown of issues raised, were provided to the Delivery Authority by the Coordinator-General for consideration and response. Of the 86 submissions, 60 were received from private individuals, 22 from public organisations, 3 from state agencies and 1 from a local government.

## 1.5 Submissions on the Request for Project Change

### 1.5.1 Summary of issues raised

During the public notification period for RfPC-4, any person (individual, organisation or Government agency) could make a written submission to the Coordinator-General about the Proposed Changes to the Project. Copies of all submissions received were provided to the Delivery Authority.

A number of submissions have raised issues about the criteria used for assessment, and the process for assessing detailed construction planning.

The proposed changes to the Project need to be considered in the context of the environmental management framework that applies to the Project through the existing Imposed Conditions.

Through the Imposed Conditions, the Coordinator-General has established an environmental management framework for the Project that provides certainty in terms of environmental outcomes, while recognising that many detailed design elements of the Project will be developed as construction progresses.

The environmental management framework consists of:

- the Imposed Conditions, which establish requirements for construction, commissioning and the outcomes to be achieved through design;
- the engagement of an independent environmental monitor and an independent community relations monitor, to provide for environmental oversight and a point of contact for stakeholder interactions;
- detailed environmental management plans to be developed with oversight by the environmental monitor, with those environmental management plans to incorporate and respond to the imposed conditions, and be consistent with the outline environmental management plan that has been approved by the Coordinator-General;
- an auditing and reporting regime, to ensure compliance with the imposed conditions and the environmental management plans, and a transparent system of public reporting; and
- enforcement and oversight, through consultation requirements in the imposed conditions, the assigning of agencies with jurisdiction and the enforcement provisions in the SDPWO Act.

#### 1.1.1.1 Summary of key issues

To gain an insight into what were the key issues arising from the public notification process, key issues, as a percentage of the submissions were analysed and are presented in **Figure 1** below.

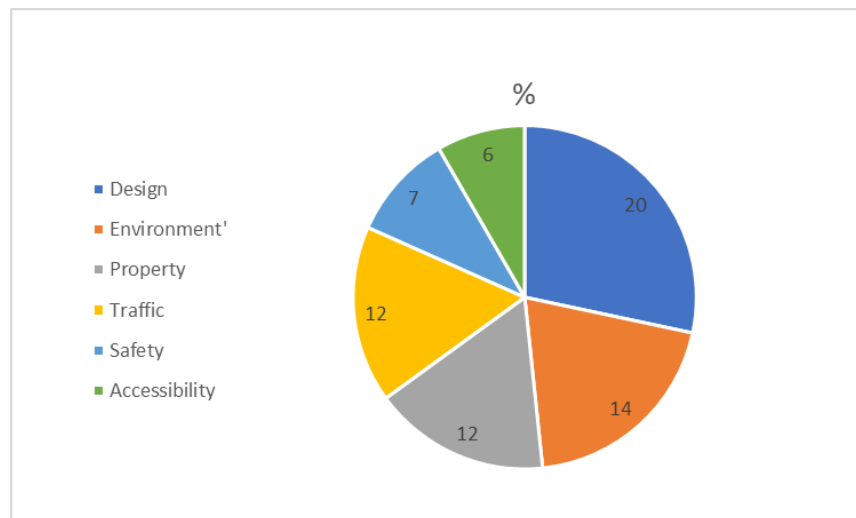


Figure 1: Key issues raised in submissions

**Table 1** provides a further detailed 'snapshot' of issues raised in submissions, while **Attachment 1** contains a comprehensive listing of all submissions and issues raised and the Proponent's response to each issue.

Table 1 - Summary of issues raised in submissions

Issue category	Description of issue
Design	<ul style="list-style-type: none"> <li>Request for an overpass across Ipswich Road</li> <li>Stations (Fairfield in particular) needing to have a design sympathetic to the character streets around the station</li> <li>Station shelter designs</li> <li>Need for Dutton Park Station</li> <li>Dutton Park Station and overpass location to south (rather than north)</li> <li>Dutton Park Station pedestrian overpass</li> <li>Widening of Annerley Road bridge</li> <li>Project scope and broader precinct development</li> <li>Fairfield Station urban design</li> <li>Fairfield Station ramps</li> <li>Station design and location</li> <li>FOSD</li> <li>Pedestrian connectivity</li> <li>Cycle connections</li> <li>Delivery of the Albert Street Vision - Greenspine</li> <li>Reinstatement of Platform 1 at Roma Street surface station</li> </ul>
Environment	<ul style="list-style-type: none"> <li>Removal of rail corridor noise barriers at Dutton Park</li> <li>Dust and noise from construction</li> <li>Visual pollution</li> <li>Operational noise from QR Rail PA system</li> <li>Construction work hours</li> <li>Construction dust and noise</li> <li>Rail operational noise</li> <li>Operational noise and lighting</li> <li>Operational air quality impacts</li> <li>Construction vibration</li> <li>Impact from construction works (noise and vibration) on heritage listed property</li> <li>Removal of fig trees at RNA</li> </ul>
Property	<ul style="list-style-type: none"> <li>Impacts on food manufacturing industry at Moorooka</li> <li>Property acquisition, including volumetric and surface acquisitions</li> <li>Business/Property impacts</li> <li>Cope Street future land use</li> <li>Land value</li> <li>Future land use of BTS at Victoria Park</li> </ul>
Traffic	<ul style="list-style-type: none"> <li>Management of traffic and transport impacts on Roma Street and Parklands Boulevard</li> <li>Traffic and pedestrian movements and counts through the Roma Street precinct</li> <li>Spoil haulage</li> <li>Local road impacts</li> <li>Wider network traffic impacts</li> <li>Traffic congestion and peak hour lockouts</li> <li>Operational traffic and impacts on Cope Street</li> <li>Traffic and parking</li> <li>Northern exit onto College Road</li> </ul>
Safety	<ul style="list-style-type: none"> <li>Station safety</li> <li>Pedestrian and cycle safety Dutton Park Station</li> </ul>



Issue category	Description of issue
	<ul style="list-style-type: none"> <li>Potential road hazards</li> <li>Potential pedestrian hazards on footpath</li> <li>Station safety</li> </ul>
Accessibility	<ul style="list-style-type: none"> <li>Pedestrian access to stations (including disability access)</li> <li>Dutton Park Station pedestrian access</li> <li>Fairfield Station Accessibility</li> <li>Pedestrian access and traffic impacts (operations)</li> <li>Station accessibility</li> </ul>
Facilities	<ul style="list-style-type: none"> <li>Park &amp; Ride availability at stations</li> <li>Parking</li> <li>Bicycle Parking</li> <li>Commuter Parking</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>Flood modelling</li> <li>Flood protection - underground stations and impacts</li> <li>Hydraulics</li> </ul>
Consultation	<ul style="list-style-type: none"> <li>Ongoing stakeholder consultation / community working group</li> </ul>
Heritage	<ul style="list-style-type: none"> <li>Preservation of heritage and timber bridges</li> <li>Station heritage and urban design</li> <li>Yeerongpilly heritage character</li> </ul>
Access	<ul style="list-style-type: none"> <li>Hospital access (emergency and pedestrian) - PAH, RBWH, RBH</li> <li>Worksite access</li> </ul>
Planning	<ul style="list-style-type: none"> <li>Cumulative traffic impacts</li> <li>Public transport – rail interchanges with bus network</li> </ul>
Finance	<ul style="list-style-type: none"> <li>Project cost and project business case</li> <li>Rates and Taxes</li> </ul>
Network Operations	<ul style="list-style-type: none"> <li>Sectorisation</li> <li>Freight operations</li> </ul>
Construction	<ul style="list-style-type: none"> <li>Closure of Dutton Park Station during CRR construction</li> <li>Construction traffic impacts on Cope Street</li> </ul>
Approval Process	<ul style="list-style-type: none"> <li>Project change process and sufficiency of assessment</li> </ul>
Spoil Disposal	<ul style="list-style-type: none"> <li>Spoil disposal locations</li> </ul>
Social	<ul style="list-style-type: none"> <li>Homelessness</li> </ul>

## 1.5.2 Traffic management

A key issue identified through submissions was in relation to detailed construction traffic planning and impacts.

The environmental management framework that has been established by the existing Imposed Conditions requires that the Construction EMP includes a construction traffic management plan, and a construction vehicle management plan.

For traffic and transport, the existing Imposed Conditions (condition 14) already requires that:

- Project construction traffic must be managed to avoid or minimise adverse impacts on road safety and traffic flow, public transport, freight rail movements, pedestrian and cyclist safety, and property access;
- The Outline EMP must be supported by a road safety assessment for the spoil haulage route;

- Construction traffic must operate within the requirements of a construction traffic management sub-plan, incorporated within the Construction Environmental Management Plan;
- The Construction Traffic Management Plan must include, amongst other things:
  - the proposed access to worksites;
  - a process for advance notice to Directly Affected Persons and local communities within the vicinity of the spoil haulage routes and worksite accesses;
  - local traffic management measures development in consultation with Brisbane City Council for key intersections including in Bowen Hills, the CBD (Albert Street, Roma Street), Woolloongabba and Dutton Park (including Boggo Road);
- Project Works must be designed, planned and implemented to maintain acceptable footpath and cycle paths in areas adjacent to project works. The proponent must consult with the Brisbane City Council and Queensland Rail about changes in pedestrian and cycle paths required to facilitate Project Works.

The environmental outcomes and performance criteria for those management plans is prescribed in the approved OEMP. The environmental outcomes and performance criteria in the approved outline EMP must be incorporated in the construction EMP. Relevant to construction traffic, environmental outcomes include:

- Project construction traffic is managed to avoid or minimise and mitigate adverse impacts on road safety and traffic flow, public transport, pedestrian and cyclist safety, property access, freight rail movements and parking, existing road pavements and railway tracks. This is also reflected in Imposed Condition 14(a)
- Traffic access for emergency services to construction worksites and adjoining properties is maintained throughout the construction phase.
- Access is maintained to properties throughout the construction phase or an acceptable alternative solution is agreed with the property owner prior to closure of any access.

Performance criteria relevantly include:

- Disruptions to the operation of the road network and the public transport network due to Project Works must be avoided during peak periods, where possible, and managed during off-peak periods
- Spoil haulage vehicles are managed in real time to and from work sites and spoil sites to avoid speeding, queueing in local streets, congested areas and traffic incidents, and to manage and avoid over loading, spills and safety incidents.

The detailed CEMP, including the construction traffic management plan, must be developed to incorporate the above measures, with suitable mitigation measures to ensure that the environmental outcomes are achieved.

In addition, the construction traffic management plan in the approved outline EMP sets out a number of requirements for the contractor's sub-plan, which must be included in the final construction traffic management plan in order for it to be endorsed by the environmental monitor.

Construction traffic management plans will need to be updated, refined and reviewed as construction commences, to take account of the different phases of construction and changing traffic requirements that will apply throughout the construction phase.

Following review of the submissions, two key areas of the Project have been identified as requiring detailed planning consideration while preparing individual Construction Traffic Management Plans (CTMPs). These include Roma Street and the Central Business District (CBD), in particular Albert Street.

Preparation of the CTMPs for Roma Street and the CBD will include conducting further traffic modelling, as well preparing a Spoil Haulage Plan which will be informed by a Road Safety Audit of the proposed spoil haulage routes. These plans will be reviewed in consultation with Brisbane City Council (BCC) and need to be endorsed by the Environmental Monitor prior to commencing relevant

Project works. This methodology implements the outcomes required by the existing Imposed Conditions

Submitters also requested that further information be provided to better understand traffic an intersection performance impacts on Roma Street as a result of diverting 2000 buses per day onto Roma Street to facilitate the relocation of the Roma Street section of the Inner Northern Busway (INB).

Additional intersection performance assessment has been undertaken in relation to the proposed changes at the Roma Street worksite. This assessment is summarised below and provided at **Appendix 1**.

The addition traffic impact assessment considers BCC traffic data, Project construction haulage vehicles, buses diverted from the INB and peak coach movements associated with the temporary long distance Coach Terminal.

The assessment considered the level of service (LOS) for key intersections along Roma Street, including Parkland Boulevard, Herschel St, Makerston St and Countess St. The LOS assessment was conducted on an 'approach by approach' basis as well as an average for the whole intersection.

For each approach, the average delay across the peak hour was calculated over five simulations, with an average taken from the five model simulation runs. This average delay was then compared to AUSTROADS criteria for delays at signalised intersections to determine LOS. The modelling included haulage in peak periods to determine worst case conditions, even though haulage from Roma Street is restricted during peak hours by the Coordinator-General's Imposed Conditions.

Table 2 of Appendix 1, describes the changes to intersection LOS without consideration of mitigating traffic management arrangements or the removal of haulage numbers during peak periods.

In this worst case (haulage in peak hour) assessment scenario, the level of service (LOS) for Roma Street/ Parklands Boulevard remains at LOS B, Roma Street/ Herschel Street changes from LOS B to LOS C, Roma Street/ Makertson Street changes from LOS B to LOS C in the AM peak and LOS A to LOS B in the PM peak, Roma Street/ Countess Street remains at LOS D in the AM peak and changes from LOS C to LOS D in the PM peak. Considering the CBD location of these intersections, the performance of each of these intersections in the peak periods is considered acceptable.

The CTMP for the Roma Street worksite will be developed in consultation with BCC. Particular emphasis will be given to considering whether amendments to the College Road/Wickham Terrace/Gregory Terrace/Parkland Boulevard could be accommodated to provide an alternative egress point for Roma Street Parklands residents, in order to reduce traffic loads on the Parkland Boulevard/Roma Street intersection.

The Delivery Authority is part of a cumulative traffic management stakeholder working group, the Traffic Management Liaison Group (TMLG). Other members of this group include BCC, Translink, and DTMR. The outcomes of the stakeholder working group will inform CTMPs as they are developed throughout the delivery lifecycle of the Project, ensuring that concerns and impacts from multiple projects are considered cumulatively.

Additional Roma Street traffic modelling, including SIDRA or other suitable modelling, will occur to inform the CTMP for the Roma Street worksite. The CTMP is required to be endorsed by the Independent Environmental Monitor 20 business days prior to relevant project works commencing at this worksite (Imposed Condition 4).

### 1.5.3 Flooding Impact

Another key issue raised in the submissions concerned the potential for an increase in flooding impacts at both Breakfast Creek and Moolabin Creek as a result of constructing new rail bridges.



The existing Imposed Conditions (Condition 17) requires that Project Works (the construction works) be designed and implemented to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.

Further, the Coordinator-General has set Environmental Design Requirements for the project (Schedule 1, Condition 5 (k)) such that the Project design will not cause property damage from flood impacts to third parties for events up to and including the 1 in 100 AEP flood event. Environmental design requirements also include that Project Works in Mayne Rail Yard must be designed on the basis of detailed flood modelling.

As it is a tidal waterway, the bridge construction in Breakfast Creek is likely to require a development permit for prescribed tidal works that is assessed by Brisbane City Council. Further detailed flood modelling will be required as part of that application.

To address issues raised in submissions, detailed hydraulic modelling will be conducted for all new bridges over waterways to assess impacts during construction and for the final design. Brisbane City Council will be consulted on hydraulic modelling which will inform construction methodology and bridge design. Consultation with Council will also include providing hydraulic modelling to Council for review and comment.

### 1.5.4 Boggo Bridge connectivity

As part of the RfPC-4 submission a new pedestrian bridge was nominated at the Boggo Road Station. This pedestrian bridge will link the Ecoscience precinct to the Princess Alexandra (PA) Hospital precinct. Submitters on RfPC-4 identified deficiencies associated with connecting each end of the bridge back into the adjoining precincts. A preliminary concept to better address connectivity to the Ecoscience and PA Hospital precincts has been prepared and is shown at **Figure 2** below. The improved connectivity will be further developed in consultation with BCC, Ecosciences, TMR, the PA Hospital and other relevant stakeholders.



Figure 2: Boggo Road Pedestrian Bridge Concept

### 1.5.5 Other State Approvals

While the Coordinator-General's Change Report provides the overall approval framework for the Project delivery, other key State and Local Government approvals are likely to be required. As the Project design is further developed and construction methodology finalised, a full review of other relevant State and Local Government legislation will be completed and, where identified, additional approvals will be obtained.

### 1.5.6 Drawing updates and submissions

In response to submissions requesting further detail about the Moorooka and Dutton Park Stations, updated drawings are provided in **Appendix 2** for both these stations.

The Property Impact Plan Sheet 11 has been revised to include an easement that would have been severed by the acquisition of properties in Cope Street required for the upgrade of Dutton Park Station.

The Property Impact Plan Sheet 24 has been revised to amend the land area to be affected by Project works associated with the demolition and removal of the truss bridge over Breakfast Creek downstream of the main rail bridge.

**Appendix 2** provides new drawings, or drawings that have been amended, in response to matters raised in submissions.

## 1.6 Conclusion

RfPC-4 outlined the Proposed Changes to the CRR Project, the reasons for these changes, and the potential environmental effects of the changes.

The Changed Project will deliver significant transport benefits to South East Queensland by increasing the capacity and reliability of the inner-city rail system. Since the assessment of the Evaluated Project, the Delivery Authority has undertaken further investigations into project delivery and design to maximise the benefits of the CRR Project. Compared to the Evaluated Project, the Changed Project will deliver a broader range of benefits and opportunities, including:

- changed construction methodologies, which will further mitigate the construction impacts of the Project through increasing the length of mined tunnel and reducing the length of cut-and-cover tunnel for CRR;
- realigning the underground stations to allow opportunities for co-location with stations for the proposed Brisbane Metro Project at Roma Street and Boggo Road, and upgrades to the Inner Northern Busway to allow co-location with the underground station at Roma Street, providing for improved transfer opportunities between different transport modes;
- upgrades to surface stations between Fairfield and Salisbury, providing enhanced accessibility to rail services for those local communities;
- realignment of the CRR tunnels, to be straighter, improving operations and reducing maintenance costs; and
- broader network upgrades, including the provision of a rail stabling yard at Clapham, an improved stabling facility at Mayne Yard and additional bridges over Breakfast Creek and Moolabin Creek, to facilitate increased capacity and operational flexibility.

The construction impacts of the Changed Project are generally similar to the Evaluated Project. Due to changes in alignment, and the extension of the Changed Project to include surface stations between Fairfield and Salisbury, and the Clapham stabling yard, some new areas will be impacted, and some other areas relieved of Project construction impacts.

Construction impacts will vary over time during the approximate 5-year construction period. Compared to the Evaluated Project, construction impacts from the Changed Project will include:

- changes to property impacts, with an increase in the number of surface acquisitions, a reduction in the number of volumetric acquisitions, and a change in the properties that will be impacted;
- changed noise and vibration impacts to nearby residents, as a result of changes to surface works, tunnelling works, and works in the rail corridor that will be undertaken outside of standard construction hours to minimise interruptions to services;
- changed traffic impacts as a result of changed and increased haulage and other construction vehicles travelling to and from the Project worksites, and local traffic changes that are required to accommodate changed and new construction worksites;
- changed surface water impacts, particularly associated with the construction of new bridges at Moolabin Creek and Breakfast Creek; and
- changed, and generally reduced, impacts on State, local and QR heritage places.

The Evaluated Project is subject to existing Imposed Conditions, that achieve a balance between the delivery of the Project and ensuring a reasonable amenity for communities that will be impacted by construction. As part of those Imposed Conditions, the Coordinator-General has also established Environmental Design Criteria that are required to be achieved in order to manage the operational impacts of the CRR Project.

In accordance with the Imposed Conditions, the Coordinator-General has approved an Outline Environmental Management Plan that establishes the environmental outcomes and performance criteria that must be achieved by the proponent throughout construction. Detailed Construction Environmental Management Plans that are consistent with the approved Outline Environmental Management Plan will be prepared prior to relevant construction works. These detailed plans must be endorsed by an independent Environmental Monitor before relevant construction works can proceed.

The existing Imposed Conditions, including the Environmental Design Requirements and the approved Outline Environmental Management Plan, remain appropriate and relevant for the design and delivery of the Changed Project, subject to minor changes that are designed to:

- apply the Imposed Conditions to the Changed Project;
- establish construction hours for new project worksites;
- provide an extended time for monthly reporting, to allow for quality assurance processes to be followed; and
- ensure ground-borne noise criteria applies only to underground stations and rail and align operational noise and vibration criteria with updated standards.

The Delivery Authority, as the proponent for the CRR Project, requests that the Changed Project proceed, subject to the Imposed Conditions, including the minor amendments outlined above in the RfPC-4 submission.



## **Appendix 1**

**Title: Roma Street Construction Assessment - Traffic**

**Subtitle:** Review of the impact of construction haulage vehicles, long distance coach services and the Inner Northern Busway Diversion on intersection performance along Roma Street

**Date:** 17/06/2019

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## Introduction

Construction of the Cross River Rail (CRR) station at Roma Street will require the closure of the Inner Northern Busway (INB) for a period of time. CRRDA, as part of a working group including Brisbane City Council and TransLink are continuing to develop plans to divert buses from the INB onto Roma Street between a new entrance at Countess Street and the current busway entrance at Turbot Street. This will increase the bus movements along Roma Street to over 2000 buses per day. This note describes the combined impact on general traffic of the bus diversion with construction haulage traffic and coach movements from the relocated long-distance coach terminal.

The impact of the bus diversion has been tested by Brisbane City Council (BCC) using the combination of a SATURN model (to determine the network wide impacts of capacity or lane reductions along Roma Street) and a VISSIM microsimulation model of operations along Roma Street. The microsimulation model has been used to understand the performance of the network in detail. A number of alternative bus diversion layouts were assessed by BCC, however for this further analysis, the assessment has focussed on Option 1B, including the operation of a number of new on-street bus stops, bus priority at intersections and the addition of a bus lane along Roma Street in each direction between George Street and a new signalised access to the INB at Countess Street.

It is proposed that all construction haulage vehicles would operate outside of the peak periods. Similarly the peak coach movements are also outside the general traffic peaks. Nevertheless, to understand potential 'worst-case' impacts, peak heavy vehicle movements at Roma Street (15 trucks entering and 15 trucks exiting during the peak hour) as well as peak coach movements (15 coaches entering and 15 coaches exiting) were overlayed onto the BCC microsimulation model. The combined impact of these proposed changes has been assessed at four key intersections along Roma Street:

- Parklands Boulevard (which includes the long-distance coach movements and the peak haulage vehicle movements);
- Herschel Street;
- Makerston Street; and
- Countess Street.

Figure 1 and Figure 2 illustrates the configuration of these intersections in the VISSIM model network, as well as the peak hour traffic volumes for light vehicles, heavy vehicles and buses. This demonstrates the significant bus movements along Roma Street and the haulage and coach movements in and out of Parklands Boulevard.

The BCC VISSIM microsimulation model was used to estimate the level of service (LOS) at each of these intersections. The following has been assumed in estimating the likely level of service:

- LOS was calculated on an approach by approach basis as well as the average for the whole intersection. For each approach the average delay across the peak hour was calculated from

five simulations (the average of the five model runs). This average delay is then compared to Austroads criteria for delays at signalised intersections to determine LOS.;

- BCC's model is based on late 2018 count data and the assessment undertaken for a 2018 model year<sup>1</sup>. It is anticipated that traffic growth between 2018 and when the INB diversion is in place would slightly increase traffic levels. Given broad network and local constraints, growth from 2018 to a future construction year would unlikely be significant;
- Except for the changes described below, all components of the BCC VISSIM microsimulation model were adopted unadjusted. This includes traffic volumes, bus routes and frequencies, stop layouts, bus dwell times, signal timings and intersection and network layout (e.g. proposed bus lanes); and
- Haulage traffic and long-distance coach movements were added to the demand in BCC's model, while the small number of vehicles assumed to enter and exit the Hotel Jen were removed.

The summary LOS for each intersection along Roma Street is shown in Table 1 for the AM and PM peak hours, for both the scenario Without Construction traffic or the INB diversion (that is the base case) and the scenario With Construction traffic and the INB diversion (Option 1B) in place.

*Table 1: Impacts of construction along Roma Street – Intersection performance summary*

<b>Site</b>		<b>Peak</b>	<b>Without construction or bus diversion</b>	<b>With construction and bus diversion</b>
<i>Roma Street and</i>	Parklands Boulevard	AM	LOS B	LOS B
		PM	LOS B	LOS B
	Herschel Street	AM	LOS B	LOS C
		PM	LOS B	LOS C
	Makerston Street	AM	LOS B	LOS C
		PM	LOS A	LOS B
	Countess Street	AM	LOS D	LOS D
		PM	LOS C	LOS D

This data illustrates a marginal worsening of LOS along Roma Street, with all intersections remaining at LOS D or better during both the AM and PM peak hours. Specifically:

- The intersection of Parklands Boulevard and Roma Street remains at LOS B in both AM and PM peak periods;
- The intersection of Herschel Street and Roma Street worsens slightly from LOS B to LOS C;
- The intersection of Makerston Street and Roma Street (left in and left out only) worsens slightly from LOS B to LOS C in the morning peak hour and from LOS A to LOS B in the evening peak hour;
- The intersection of Countess Street and Roma Street remains at LOS D in the morning peak hour (and increases from LOS C to LOS D).

Table 1 illustrates the detailed performance of each intersection during the morning peak hour, including the LOS for each approach at each intersection.

<sup>1</sup> CRRDA has not seen the calibration / validation report for this model so have taken the traffic component of the model 'as-is'.



Table 2: Impacts of construction along Roma Street – AM Peak detailed performance

Site		With construction and bus diversion					Without construction or bus diversion	
		Light vehicles	Heavy vehicles	Bus and coach vehicles	Average delay (secs)	LOS	Average delay (secs)	LOS
<i>Roma Street and Parkland Boulevard</i>	Parklands Boulevard (N)	225	17	15	52.2	D	51.7	D
	Roma Street (E)	343	13	61	23.1	C	12.9	B
	Roma Street (W)	847	48	142	6.3	A	5.0	A
	<b>Intersection Total</b>	<b>1415</b>	<b>78</b>	<b>218</b>	<b>17.3</b>	<b>B</b>	<b>14.3</b>	<b>B</b>
<i>Roma Street and Herschel Street</i>	Hotel Jen (N)	0	0	0	0.0	A	2.1	A
	Roma Street (E)	318	12	61	38.0	D	36.0	D
	Herschel Street (S)	124	6	0	55.0	D	25.7	C
	Roma Street (W)	729	42	143	15.1	B	3.9	A
	<b>Intersection Total</b>	<b>1171</b>	<b>60</b>	<b>204</b>	<b>25.0</b>	<b>C</b>	<b>13.6</b>	<b>B</b>
<i>Roma Street and Makerston Street</i>	Roma Street (E)	875	36	72	33.7	C	9.9	A
	Makerston Street (S)	42	2	0	78.7	E	39.3	D
	Roma Street (W)	735	43	144	17.2	B	11.2	B
	<b>Intersection Total</b>	<b>1652</b>	<b>81</b>	<b>216</b>	<b>26.9</b>	<b>C</b>	<b>11.3</b>	<b>B</b>
<i>Roma Street and Countess Street</i>	Countess Street (N)	3780	170	28	36.1	D	29.5	C
	Roma Street (E)	368	16	22	97.9	F	48.1	D
	Upper Roma Street (W)	410	17	48	88.9	F	79.2	E
	<b>Intersection Total</b>	<b>4558</b>	<b>203</b>	<b>98</b>	<b>46.5</b>	<b>D</b>	<b>36.2</b>	<b>D</b>

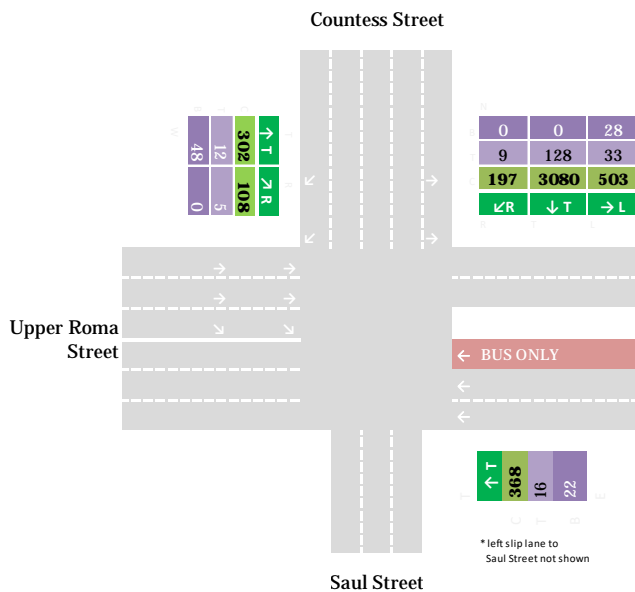
All approaches are estimated to operate at LOS D or better, except for:

- The southern approach from Makerston Street to Roma Street (left-only turn). This movement is estimated to operate at LOS E due to the impact of the bus lane (and stops) restricting the capacity of the left turn out of Makerston Street, although it is noted that this is for a very small number of vehicles (42 across the morning peak hour);
- The eastern and western approaches along Roma Street at Countess Street operating at LOS F due to the priority provided to the high demand approach from Countess Street at this intersection. This intersection also has the highest average delay (and LOS) without construction, with the approach from the west operating at LOS E. Overall this intersection is estimated to operate at LOS D With and Without Construction and the bus diversion in place.

### Roma Street and Countess Street Intersection

Scenario: BCC Option 1b (2018)

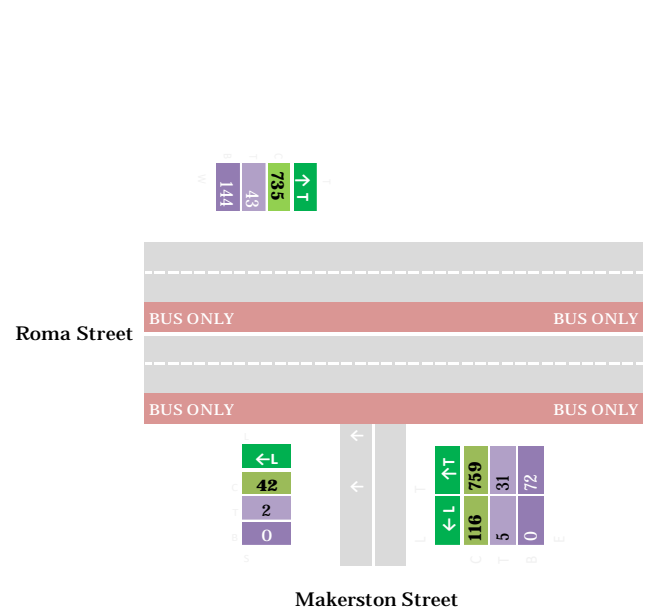
AM Peak Hour



### Roma Street and Makerston Street Intersection

Scenario: BCC Option 1b (2018)

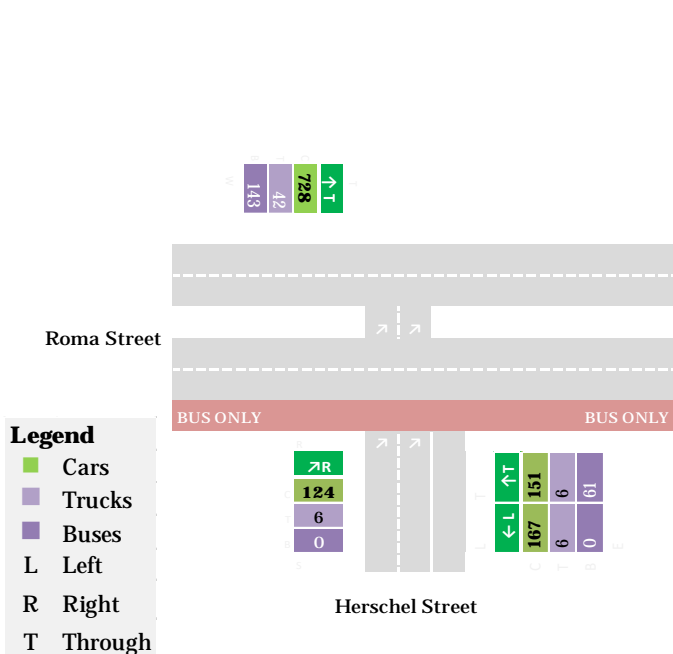
AM Peak Hour



### Roma Street and Herschel Street Intersection

Scenario: BCC Option 1b (2018)

AM Peak Hour



### Roma Street and Parkland Boulevard Intersection

Scenario: BCC Option 1b (2018)

AM Peak Hour

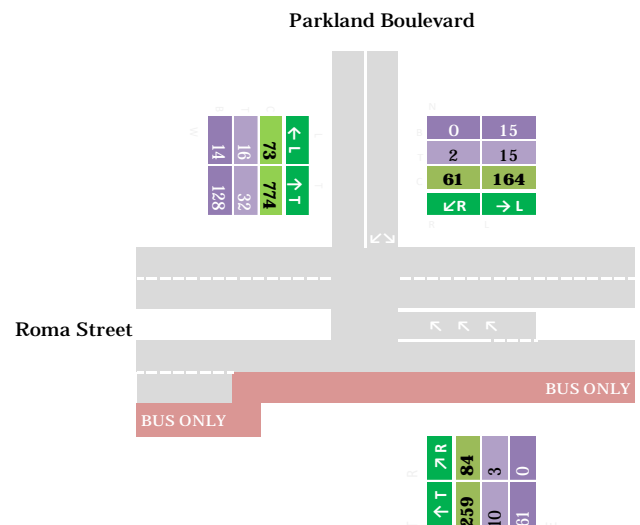


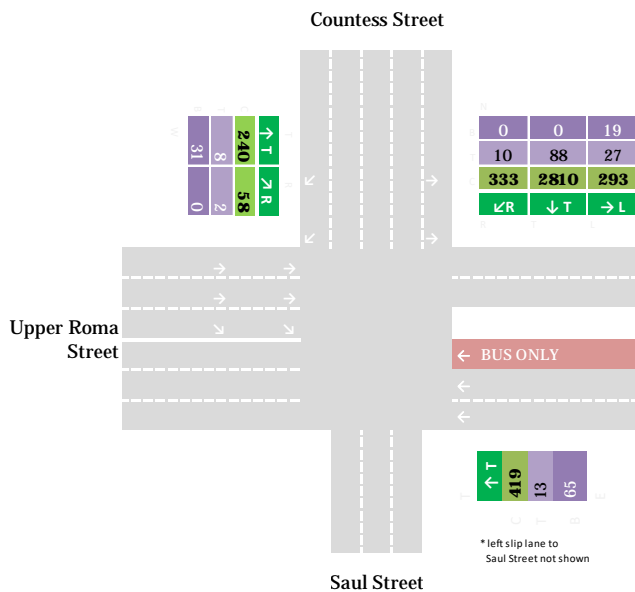
Figure 1: AM peak intersection layout and volumes

Source: BCC VISSIM Model (March 2019)

### Roma Street and Countess Street Intersection

Scenario: BCC Option 1b (2018)

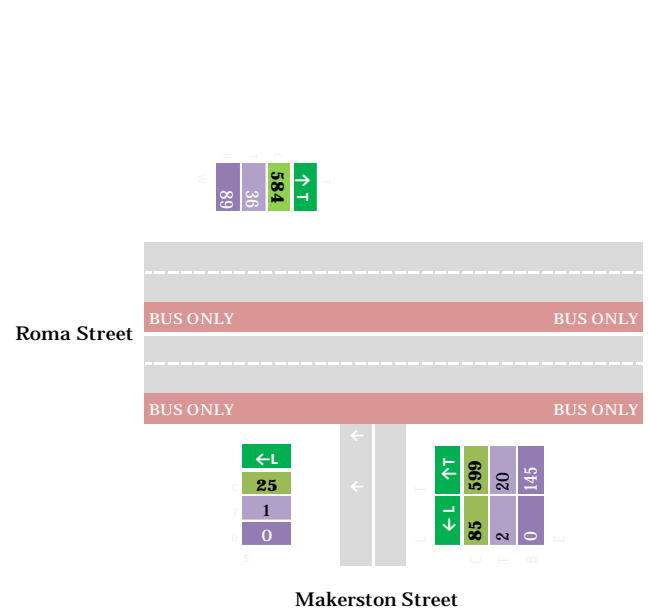
PM Peak Hour



### Roma Street and Makerston Street Intersection

Scenario: BCC Option 1b (2018)

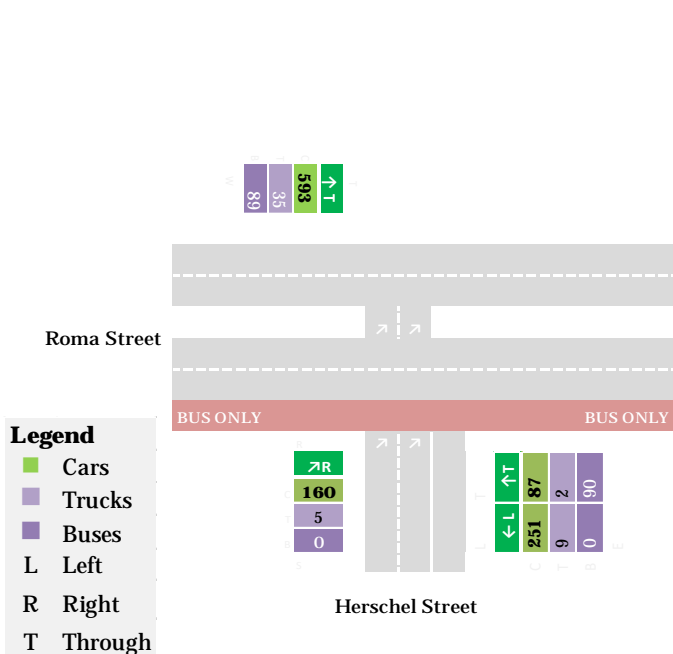
PM Peak Hour



### Roma Street and Herschel Street Intersection

Scenario: BCC Option 1b (2018)

PM Peak Hour



### Roma Street and Parkland Boulevard Intersection

Scenario: BCC Option 1b (2018)

PM Peak Hour

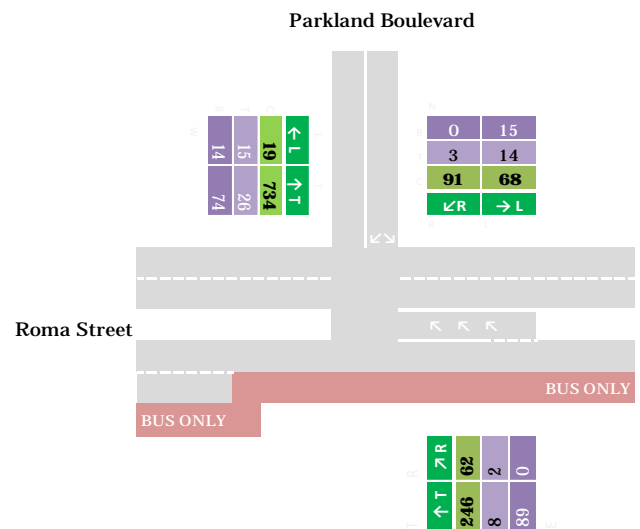


Figure 2: PM peak intersection layout and volumes

Source: BCC VISSIM Model (March 2019)

## **Appendix 2**




CRR-0003-AL-GA-100	DRAWING INDEX AND LOCALITY PLAN - SHEET 1
CRR-0003-AL-GA-101	DRAWING INDEX AND LOCALITY PLAN - SHEET 2

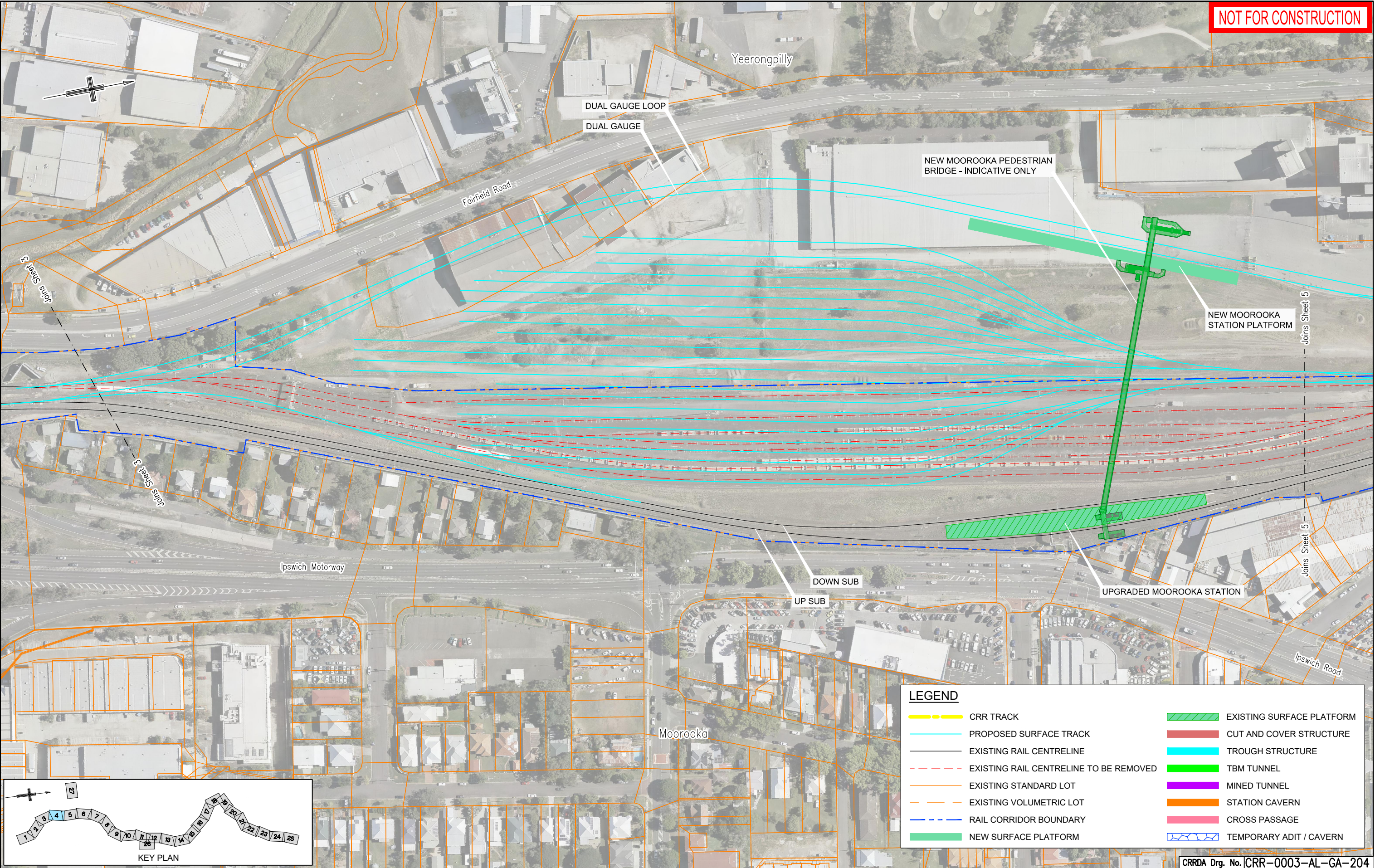
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CRR-0003-AL-GA-203	GENERAL ARRANGEMENT SHEET 3
CRR-0003-AL-GA-204	GENERAL ARRANGEMENT SHEET 4
CRR-0003-AL-GA-205	GENERAL ARRANGEMENT SHEET 5
CRR-0003-AL-GA-206	GENERAL ARRANGEMENT SHEET 6
CRR-0003-AL-GA-207	GENERAL ARRANGEMENT SHEET 7
CRR-0003-AL-GA-208	GENERAL ARRANGEMENT SHEET 8
CRR-0003-AL-GA-209	GENERAL ARRANGEMENT SHEET 9
CRR-0003-AL-GA-210	GENERAL ARRANGEMENT SHEET 10
CRR-0003-AL-GA-211	GENERAL ARRANGEMENT SHEET 11
CRR-0003-AL-GA-212	GENERAL ARRANGEMENT SHEET 12
CRR-0003-AL-GA-213	GENERAL ARRANGEMENT SHEET 13
CRR-0003-AL-GA-214	GENERAL ARRANGEMENT SHEET 14
CRR-0003-AL-GA-215	GENERAL ARRANGEMENT SHEET 15
CRR-0003-AL-GA-216	GENERAL ARRANGEMENT SHEET 16
CRR-0003-AL-GA-217	GENERAL ARRANGEMENT SHEET 17
CRR-0003-AL-GA-218	GENERAL ARRANGEMENT SHEET 18
CRR-0003-AL-GA-219	GENERAL ARRANGEMENT SHEET 19
CRR-0003-AL-GA-220	GENERAL ARRANGEMENT SHEET 20
CRR-0003-AL-GA-221	GENERAL ARRANGEMENT SHEET 21
CRR-0003-AL-GA-222	GENERAL ARRANGEMENT SHEET 22
CRR-0003-AL-GA-223	GENERAL ARRANGEMENT SHEET 23
CRR-0003-AL-GA-224	GENERAL ARRANGEMENT SHEET 24
CRR-0003-AL-GA-225	GENERAL ARRANGEMENT SHEET 25

CRR-0003-LS-GA-100	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 1
CRR-0003-LS-GA-101	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 2
CRR-0003-LS-GA-102	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 3
CRR-0003-LS-GA-103	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 4
CRR-0003-LS-GA-104	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 5
CRR-0003-LS-GA-105	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 6
CRR-0003-LS-GA-106	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 7
CRR-0003-LS-GA-107	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 8
CRR-0003-LS-GA-108	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 9
CRR-0003-LS-GA-109	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 10
CRR-0003-LS-GA-110	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 11
CRR-0003-LS-GA-111	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 12
CRR-0003-LS-GA-112	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 13
CRR-0003-LS-GA-113	RAIL ALIGNMENT LONG SECTION DOWN CRR TRACK SHEET 14
CRR-0003-LS-GA-150	RAIL ALIGNMENT LONG SECTION UP CRR TRACK SHEET 1
CRR-0003-LS-GA-151	RAIL ALIGNMENT LONG SECTION UP CRR TRACK SHEET 2
CRR-0003-LS-GA-152	RAIL ALIGNMENT LONG SECTION UP CRR TRACK SHEET 3
CRR-0003-LS-GA-153	RAIL ALIGNMENT LONG SECTION UP CRR TRACK SHEET 4
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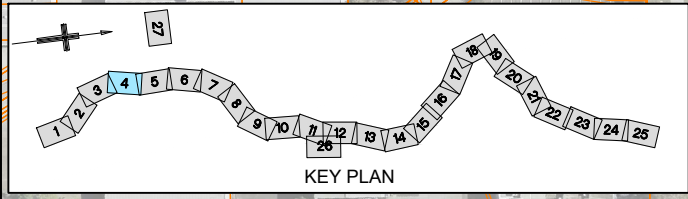
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CRR-0003-BOG-GA-102 BOGGO ROAD STATION PLATFORM PLAN  
CRR-0003-BOG-GA-103 BOGGO ROAD STATION SECTIONS  
CRR-0003-WOL-GA-101 WOOLLOONGABBA STATION SITE PLAN  
CRR-0003-WOL-GA-102 WOOLLOONGABBA STATION PLATFORM PLAN  
CRR-0003-WOL-GA-103 WOOLLOONGABBA STATION SECTIONS  
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CRR-0003-ALB-GA-102 ALBERT ST STATION PLATFORM PLAN  
CRR-0003-ALB-GA-103 ALBERT ST STATION SECTIONS  
CRR-0003-ROM-GA-101 ROMA ST STATION STATION SITE PLAN  
CRR-0003-ROM-GA-102 ROMA ST STATION STATION PLATFORM PLAN  
CRR-0003-ROM-GA-103 ROMA ST STATION STATION SECTIONS  
CRR-0003-EXH-GA-101 EXHIBITION STATION SITE PLAN

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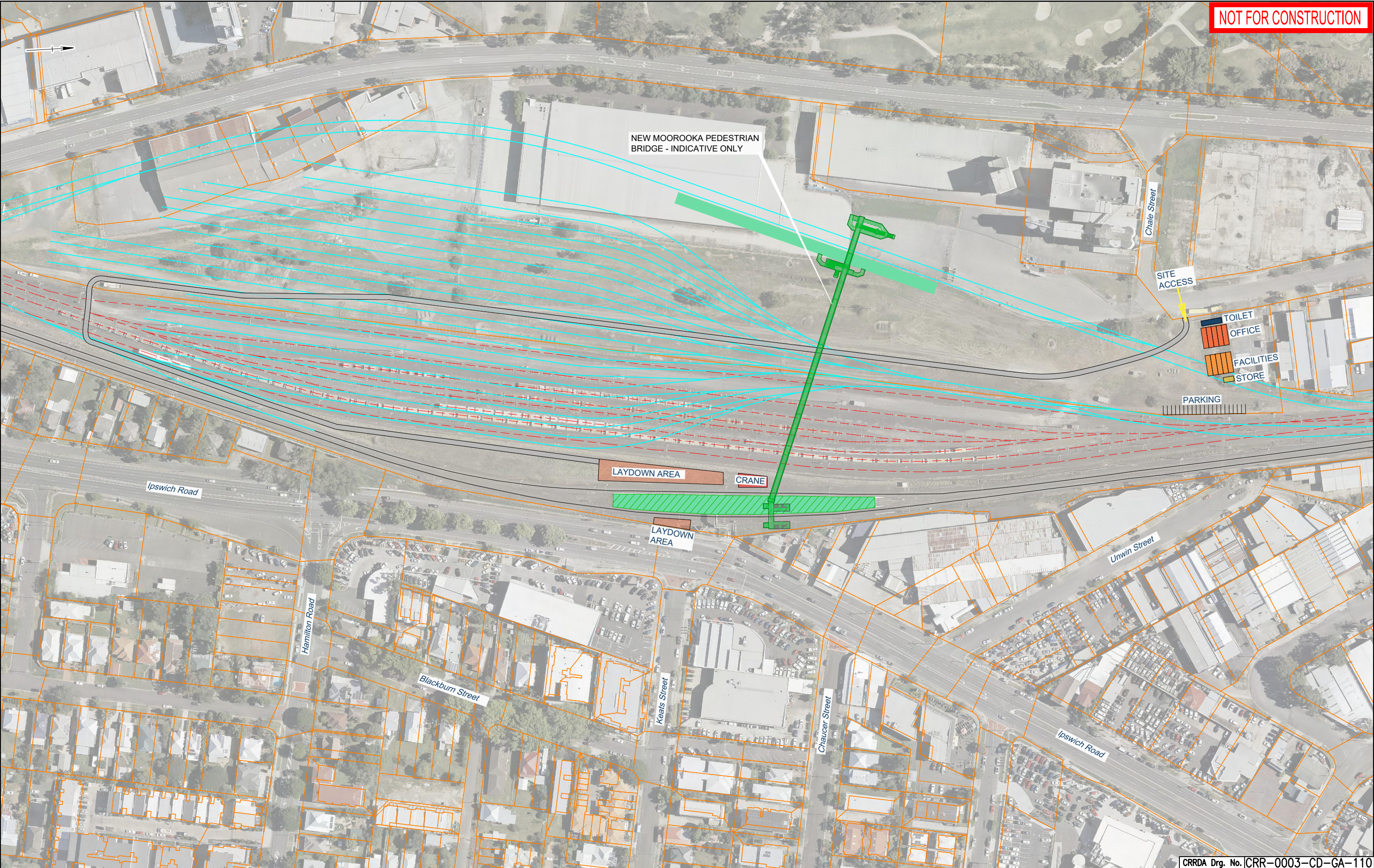
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	EXISTING RAIL CENTRELINE TO BE REMOVED
	EXISTING STANDARD LOT
	EXISTING VOLUMETRIC LOT
	RAIL CORRIDOR BOUNDARY
	NEW SURFACE PLATFORM
	EXISTING SURFACE PLATFORM
	CUT AND COVER STRUCTURE
	TROUGH STRUCTURE
	TBM TUNNEL
	MINED TUNNEL
	STATION CAVERN
	CROSS PASSAGE
	TEMPORARY ADIT / CAVERN

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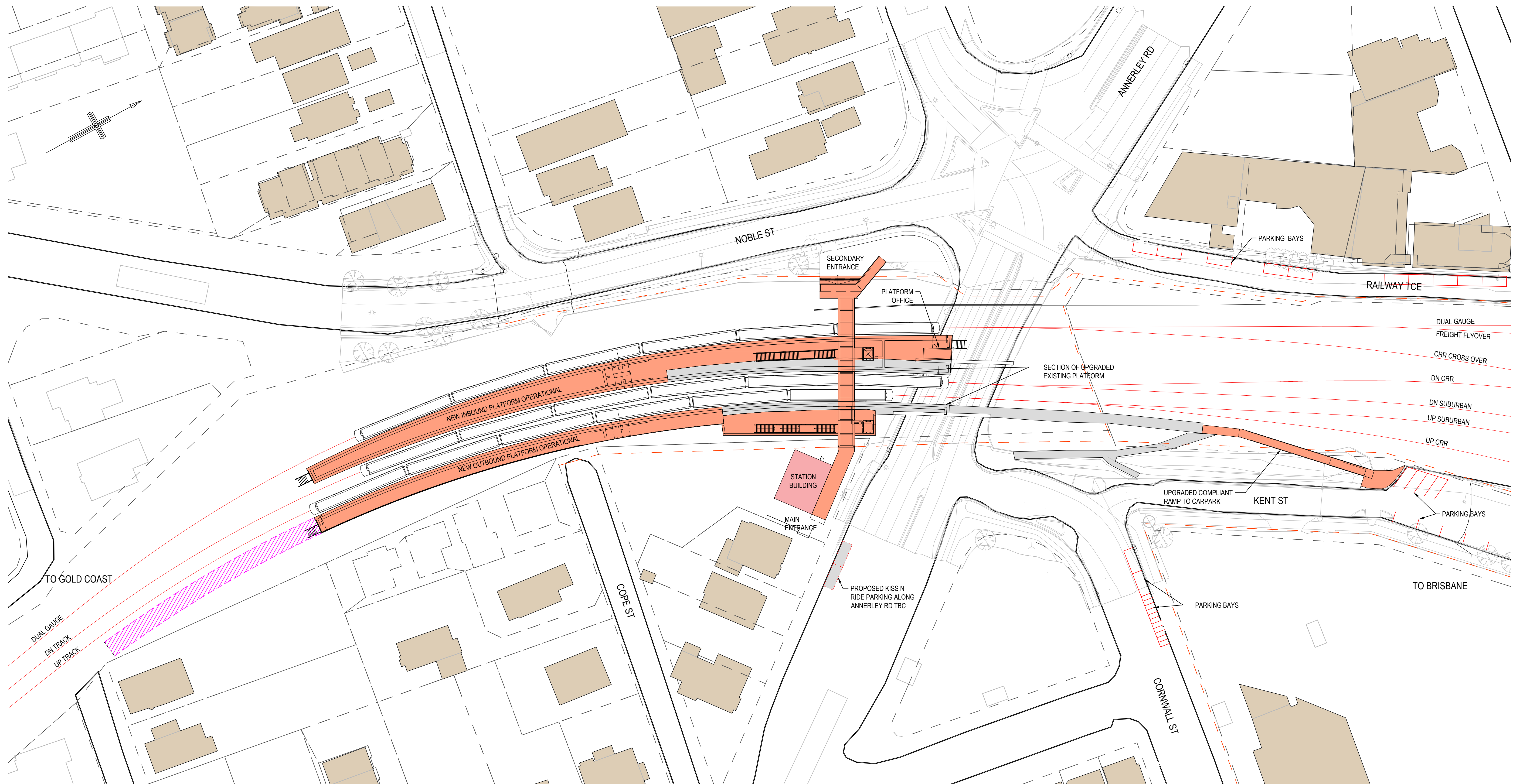





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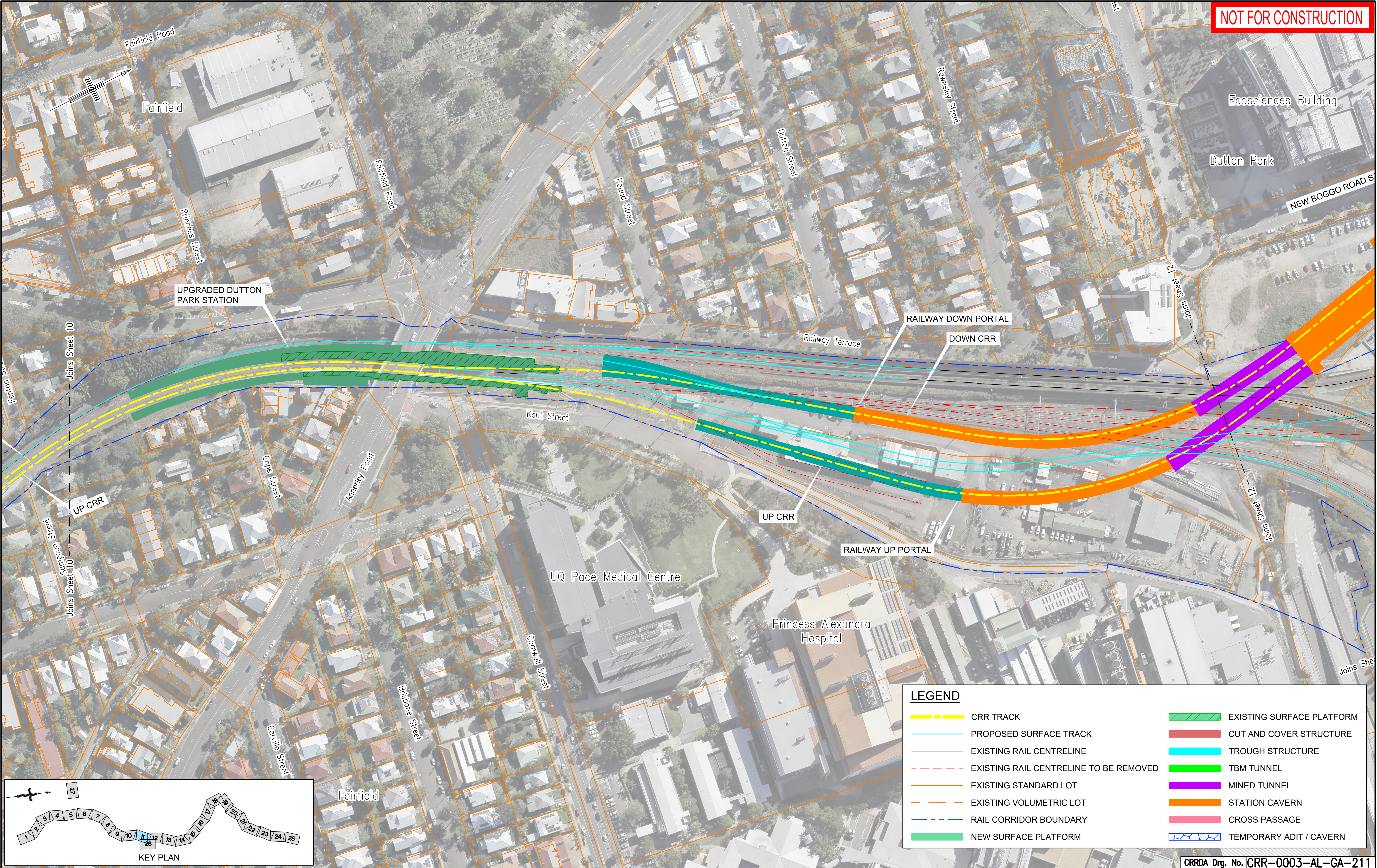
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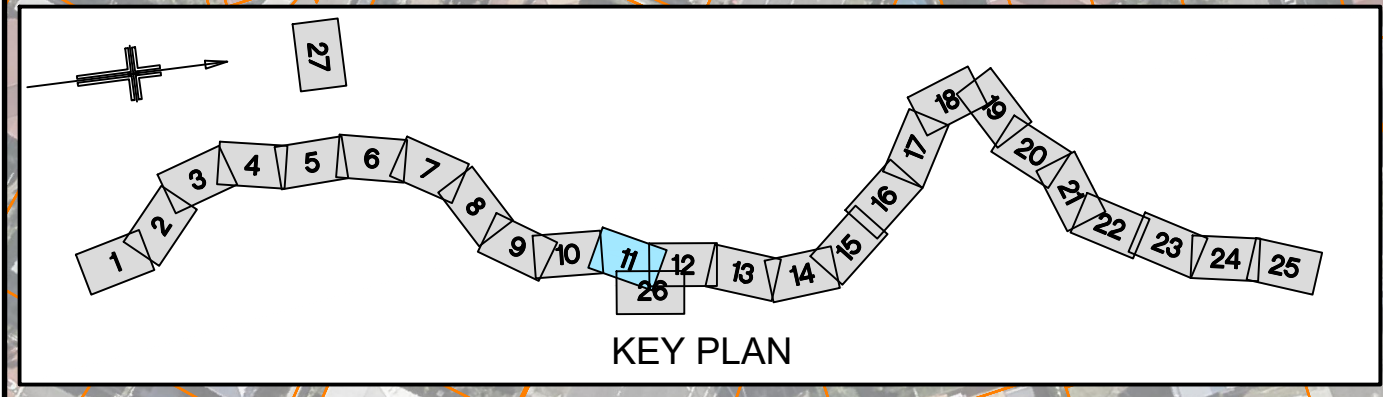



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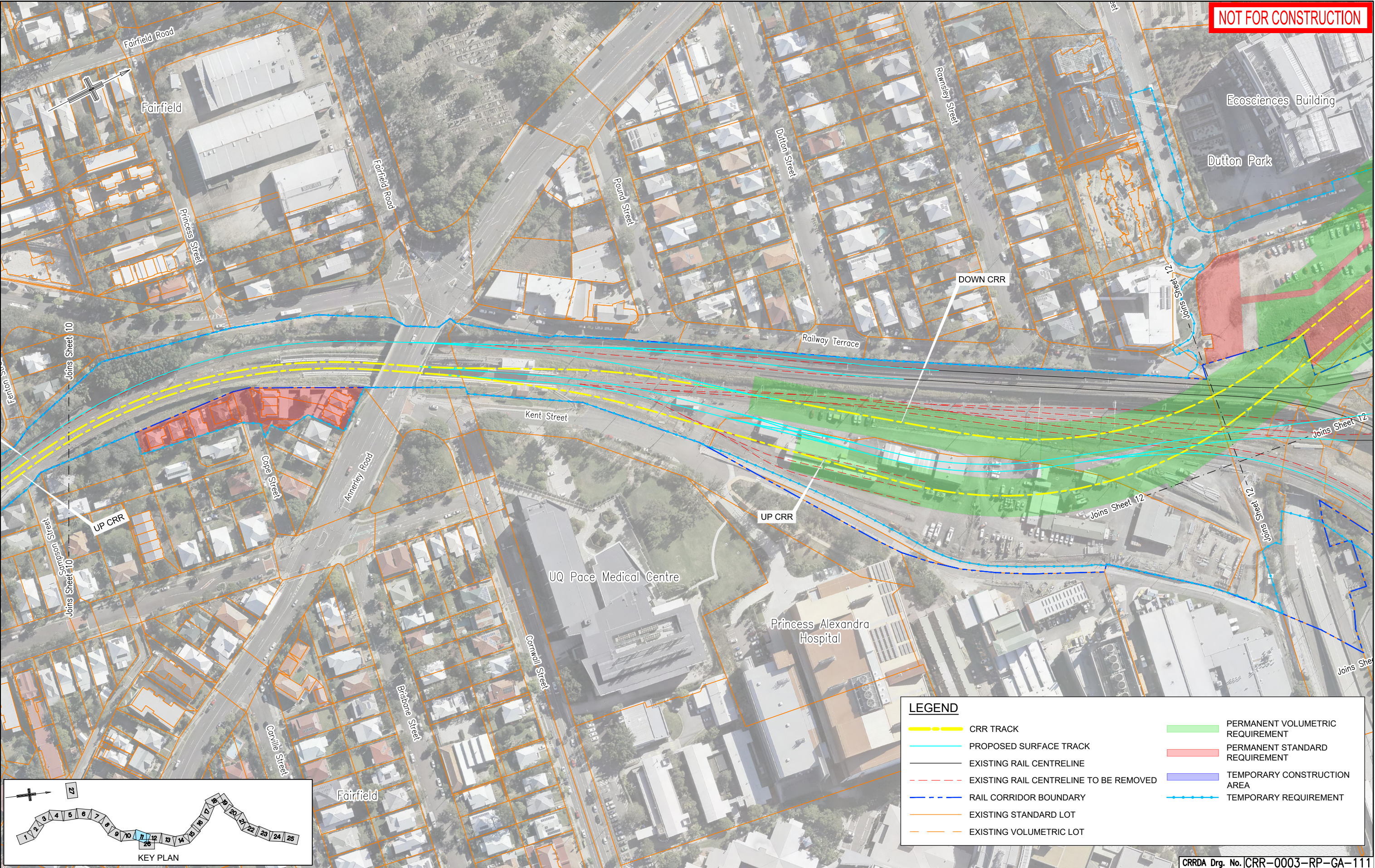


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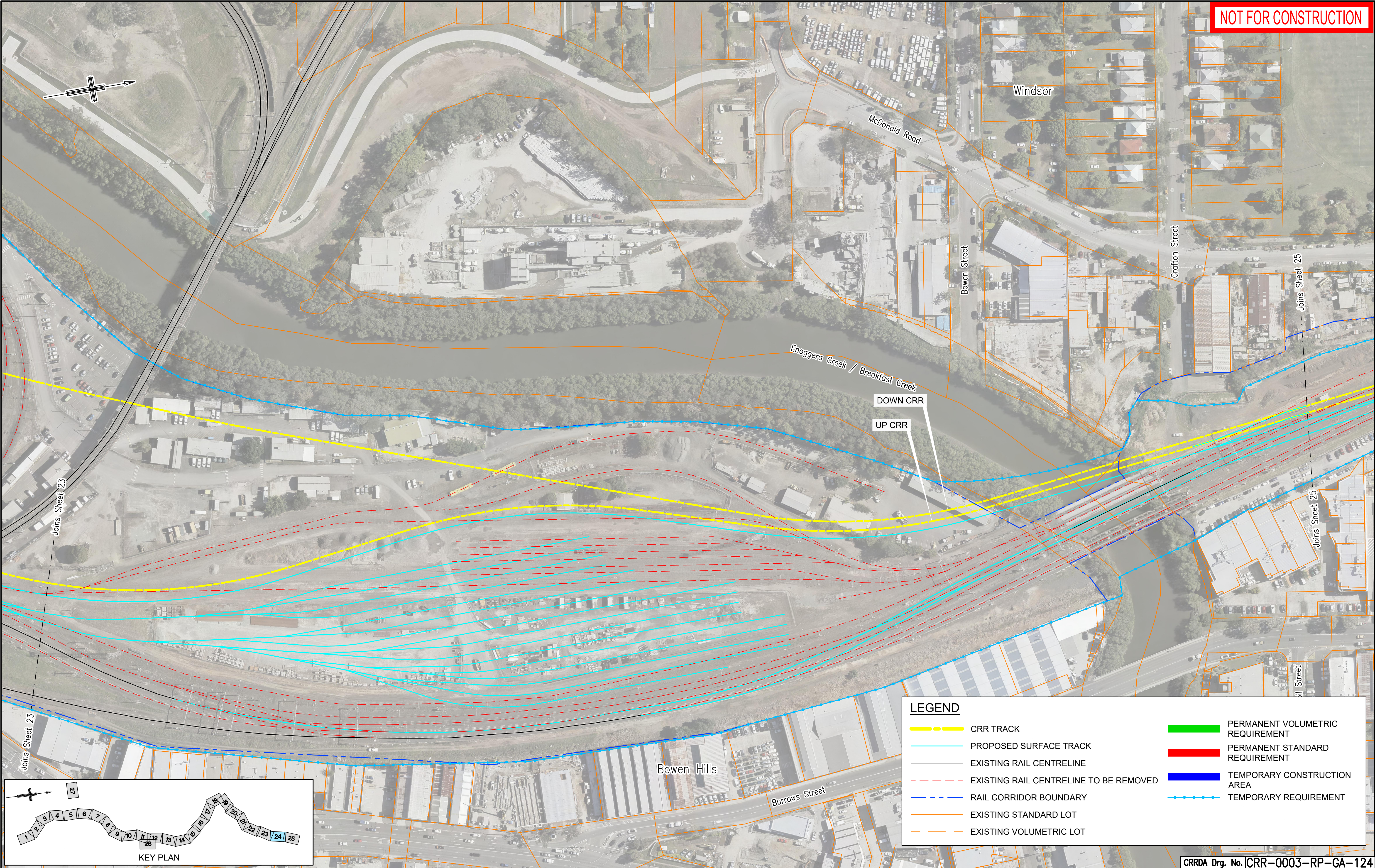
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Dimensions shown in Metres except where shown otherwise

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Through Chainage from				

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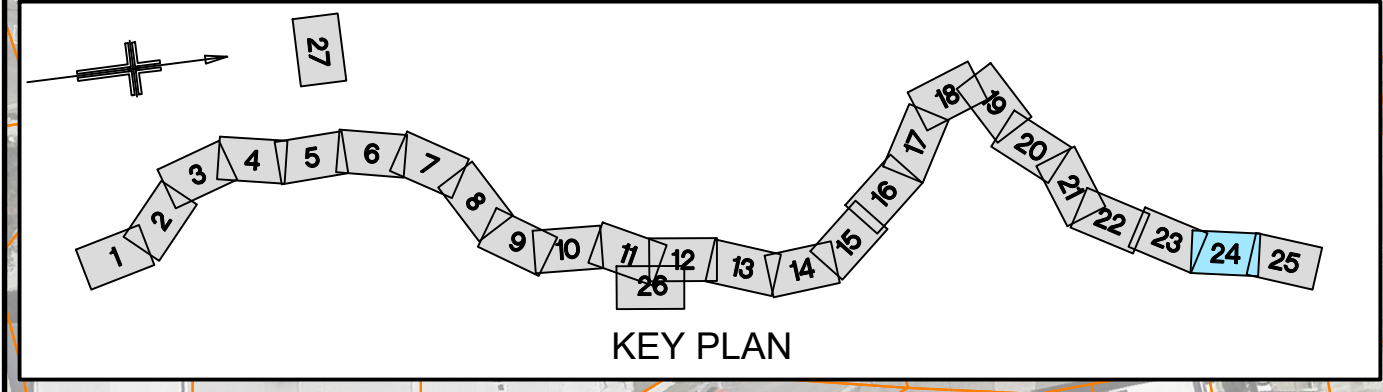





NOT FOR CONSTRUCTION

**LEGEND**

- CRR TRACK
- PROPOSED SURFACE TRACK
- EXISTING RAIL CENTRELINE
- EXISTING RAIL CENTRELINE TO BE REMOVED
- RAIL CORRIDOR BOUNDARY
- EXISTING STANDARD LOT
- EXISTING VOLUMETRIC LOT
- PERMANENT VOLUMETRIC REQUIREMENT
- PERMANENT STANDARD REQUIREMENT
- TEMPORARY CONSTRUCTION AREA
- TEMPORARY REQUIREMENT



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