



ECRL Underground Infrastructure Protection Guidelines

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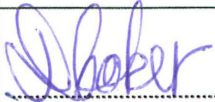
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1	21/12/07	Draft issue	Adam Lander Project Manager (Maunsell)	Michael Kartsounis Project Reviewer (Maunsell)	(Original Signed) Adam Lander Project Manager (Maunsell)
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TABLE OF CONTENTS

1.1 Introduction	1
1.2 General	1
2.1 Existing Planning Process	2
2.2 Statutory Protections	2
2.3 Acquired Stratum	2
3.1 Rail Protection Reserves	3
3.1.1 First Reserve	3
3.1.2 Second Reserve	3
3.1.3 Additional	3
3.2 Potential Impacts on Proposed Development on Underground Infrastructure	4
3.3 Potential Impacts of Underground Infrastructure on Proposed Development	4
3.4 Development Guidelines	4
3.4.1 Excavations	5
3.4.2 Shallow Footings	5
3.4.3 Deep Foundations	5
3.4.4 Ground Anchors	6
3.4.5 Tunnels and Underground Excavations	6
3.4.6 Demolition of Existing Subsurface Structures	7
3.4.7 Penetrative Subsurface Investigation (Including Directional Drilling)	7
3.5 Development Guidelines	7
3.5.1 Storage of Explosive / Flammable Materials	7
3.5.2 Storage of Potential Contaminations and Hazardous Materials	7
3.5.3 Installations Containing Machinery Causing Heavy Vibrations	8
3.5.4 Installations Containing Machinery Causing Heaving Vibrations	8
3.6 Requirements for Engineering Assessments	8
4.1 Information to be Made Available to the Developer	10
4.2 Information to be Provided by the Developer	11
5.1 List of Drawings	12



1.1 Introduction

This document provides guidelines for assessing the impact of proposed developments on the underground infrastructure of the Epping to Chatswood Rail Line (ECRL formerly known as the Parramatta Rail Link Project (PRL)). In particular, the guidelines provide:

- Extents of reserve zones in which proposed developments may impact on the underground infrastructure.
- Restrictions and requirements for proposed developments in each of the reserve zones.
- Information to be made available to developers to enable assessments of impact on the underground infrastructure to be undertaken
- Information to be provided by developers in support of proposed developments to enable Transport Infrastructure Development Corporation (TIDC) to make an assessment of the potential impact on the underground infrastructure
- Qualification requirements for professionals undertaking assessments of the impact of the proposed development on the underground infrastructure.

The intention is to provide sufficient guidance to Councils, developers and property owners to identify those future developments that are likely to be restricted or subject to engineering assessment.

1.2 General

The underground infrastructure of the ECRL comprises twin single track tunnels about 7m in diameter at a centre to centre spacing generally of about 11.5m. The two tunnels are located within the project's approved 60m corridor. The depth to rail level varies from about 15m at the portals to in excess of 60m in other sections.

The underground station structures at North Ryde, Macquarie Park and Macquarie University consist of large span platform caverns typically of about 19m span and 13m high, together with concourse caverns, access tunnel, adits and shafts and associated plant and equipment rooms. The underground station structures at Epping consist of two platform tunnels of about 12m span together with associated concourses, adits and shafts. It is expected that any restrictions to property developments are more likely to be in and around station structures rather than the tunnelled sections of the project.

The potential impact of a proposed building development, particularly commercial development, in the vicinity of the ECRL underground infrastructure fundamentally depends on the details of the proposed development including founding level and foundation loads, excavation dimensions and support, the particular geology of the site and the proximity of the proposed development to the underground infrastructure.

2.1 Existing Planning Process

State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) came into force on 1 January 2008 and includes the following aims:

- to identify matters to be considered in the assessment of development adjacent to particular types of infrastructure; and
- to provide for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.

The Infrastructure SEPP includes provisions within Division 15 Subdivision 2 requiring future development applications (DAs) with the potential to impact on development in or adjacent to rail corridors to be referred to RailCorp for review and comments. This includes the following types of development:

- Development involving access via level crossings (Clause 84)
- Development immediately adjacent to railway corridors (Clause 85)
- Excavation in, above or adjacent to rail corridors (Clause 86)

Further details in respect of referral requirements are outlined in Clauses 84 to 89 of the Infrastructure SEPP. Given the provisions of the Infrastructure SEPP, all referrals will be made directly to RailCorp, with subsequent input sought (where required) from TIDC.

2.2 Statutory Protections

In addition to the Infrastructure SEPP, Schedule 6B of the Transport Administration Act 1991 provides statutory protections in respect of underground rail facilities such as those constructed for the purposes of the ECRL. These protections include a right of support and an implied covenant for protection of underground rail facilities over land above, under or adjacent to the subsurface stratum. The relevant rail authority also has a right to claim compensation from a person who, without consent, carries out an activity, which damages or interferes with any underground rail facility.

2.3 Acquired Stratum

Portions of land below the surface (stratum) of properties between Epping and Chatswood have been acquired to accommodate underground rail facilities for the ECRL. The acquired land was defined by the rail corridor and a horizontal stratum below the surface, with the entire underground works being located below this level. The stratum level varies with the depth of the tunnels and station caverns and with variations in the ground surface level. The acquired level varies from 3m to 60m below the surface of residential and commercial properties.

3.1 Rail Protection Reserves

Two Rail Protection Reserves are provided for protection of the ECRL underground infrastructure. The Reserves have been selected on the basis that different types of works at different proximities will have varying potential for impacts on the underground infrastructure. The Reserves also vary with the type of underground infrastructure. Plans showing the extent of the Reserves are provided in Appendix A.

The Reserves are defined by vertical boundaries to simplify the initial process of assessing whether a proposed development falls within the Reserves. Each Reserve is further separated into Support or Influence Zones based on the potential for impact on the underground infrastructure. Cross sections indicating the Reserves and the Support and Influence Zones for the different types of underground infrastructure are provided in Appendix B.

3.1.1 First Reserve

The First Reserve includes the Support Zone, which comprises the installed support elements, including rock bolts, ground anchors and forward reinforcement, for the underground infrastructure and the zone directly above the crown of the underground infrastructure where most works are expected to either intersect or have a significant direct influence on the performance of the support elements or the tunnel lining. The development guidelines for the Support Zone are generally prescriptive and would only be relaxed where a comprehensive investigation and assessment explicitly demonstrates the impact of the proposed development on the underground infrastructure to be insignificant.

Proposed developments within the First Reserve, but outside of the Support Zone are typically required to have an engineering assessment of the impact of the works.

3.1.2 Second Reserve

The Second Reserve zone covers the areas where some development works have the potential to impact on the performance of the support elements or the tunnel lining although many works would be unlikely to have a significant impact. The development guidelines for the Second Reserve zone typically comprise an engineering assessment only for those particular works that have potential for impact on the underground infrastructure.

The Second Reserve includes the Influence Zone, which delineates where some development works may potentially impact on the underground infrastructure

3.1.3 Additional Requirements for Operational Use of Developments

An additional series of development guidelines relevant to the operational use of the proposed development are also presented and are common to both Reserves.

3.2 Potential Impacts of Proposed Development on Underground Infrastructure

Some typical impacts of development works on underground infrastructure are described in the following paragraphs. This is not intended to be a comprehensive list, but to provide a general indication of the types of issues that can arise and to provide some background understanding to the rationale for the development guidelines.

Excavations of significant size and depth have the potential to alter the stress regime in the ground. This can lead to stress concentrations or stress relief in the surrounding ground and can lead to movement within the ground, particularly along existing discontinuities in a rock mass. These effects can directly impact on a tunnel lining or support element.

Foundation loads have the potential to increase the direct load on the tunnel lining or alter the stress regime in the ground surrounding the tunnel and its support elements. Depending on the foundation configuration, loads may be transferred to the ground at different parts of the foundation element.

Ground anchors can cause high concentrated loadings at their fixed ends and significantly alter the local stress regime in the ground, particularly local horizontal stresses. Existing temporary ground anchors may still be stressed.

Tunnels and underground excavation significantly alter the stress regime in the surrounding ground. This leads to stress concentrations or stress relief and movements within the ground. These changes in stresses and ground movements can cause considerable impact on nearby tunnel linings and support elements.

Some construction methods can have an adverse impact on the underground infrastructure. Percussive or explosive excavation methods, such as rock-chiselling, pile driving and blasting, can cause excessive vibrations, resulting in damage to the underground infrastructure. The use of grouts or slurries in close proximity to underground infrastructure can impact on drainage and linings.

3.3 Potential Impacts of Underground Infrastructure on Proposed Development

It is possible that proposed developments in proximity to the ECRL may be adversely affected by airborne noise, ground borne noise, vibration, electromagnetic radiation and/or stray electrical currents arising from railway operations. TIDC therefore recommends that Councils require the developer to satisfy the Council that the development will not be adversely affected by railway operations or, to the extent that any adverse impacts are identified, that appropriate mitigation measures are incorporated into the development, and that these measures are supported by appropriate conditions of consent.

3.4 Development Guidelines

The development guidelines for proposed developments are listed by type of works below:

3.4.1 Excavations

First Reserve – inside Support Zone

Any excavations within the Support Zone in the First Reserve are not allowed.

First Reserve – outside Support Zone

Shallow excavations (less than 3m depth) within the First Reserve but outside of the Support Zone are not required to be assessed.

Excavations of 3m depth or more within the First Reserve but outside of the Support Zone should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

Second Reserve

Shallow excavations (less than 3m depth) within the Second Reserve are not required to be assessed.

Excavations of 3m depth or more within the Second Reserve should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

3.4.2 Shallow Footings

First Reserve – inside Support Zone

Any shallow footings within the Support Zone in the First Reserve are not allowed.

First Reserve – outside Support Zone

Shallow footings with relatively light loadings (allowable bearing pressure of less than 150kPa on small pad or strip footings) within the First Reserve but outside of the Support Zone are not required to be assessed.

Other shallow footings within the First Reserve but outside of the Support Zone should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

Second Reserve

Shallow footings with relatively light loadings (allowable bearing pressure of less than 150kPa on small pad or strip footings) within the Second Reserve are not required to be assessed.

Other shallow footings within the Second Reserve should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

3.4.3 Deep Foundations

First Reserve – inside Support Zone

Deep foundations within the Support Zone in the First Reserve are not allowed.



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First Reserve – outside Support Zone

Deep foundations within the First Reserve but outside of the Support Zone should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

Second Reserve – inside Influence Zone

Deep foundations located within the Second Reserve and founded within the Influence Zone, including shaft friction developed within the Influence Zone, should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

Second Reserve – outside Influence Zone

Deep foundations located within the Second Reserve but founded below and de-bonded through the Influence Zone are not required to be assessed.

3.4.4 Ground Anchors

First Reserve – inside Support Zone

Ground anchors within the Support Zone in the First Reserve are generally allowed.

not

First Reserve – outside Support Zone

Ground anchors within the First Reserve but outside of the Support Zone should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

Station 11/11/16

Second Reserve

Ground anchors within the Second Reserve should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

3.4.5 Tunnels and Underground Excavations

First Reserve – inside Support Zone

Tunnels and underground excavations within the Support Zone in the First Reserve are not allowed.

First Reserve – outside Support Zone

Tunnels and underground excavations in the First Reserve but outside of the Support Zone should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

Second Reserve

Tunnels and underground excavations within the Second Reserve should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

3.4.6 Demolition of Existing Subsurface Structures

First Reserve – inside Support Zone

Demolition of existing subsurface structures within the Support Zone in the First Reserve is not allowed.

First Reserve – outside Support Zone

Demolition of existing subsurface structures within the First Reserve but outside of the Support Zone should be assessed for the impact on the underground infrastructure, including the impact of the demolition method.

Second Reserve

Demolition of existing subsurface structures within the Second Reserve should be assessed for their impact on the underground infrastructure, including the impact of their construction method.

3.4.7 Penetrative Subsurface Investigations (including Directional Drilling)

First Reserve – inside Support Zone

Penetrative subsurface investigations, such as boreholes and directional drilling, within the Support Zone in the First Reserve are not allowed.

First Reserve – outside Support Zone

Penetrative subsurface investigations, such as boreholes and directional drilling, within the First Reserve but outside of the Support Zone should be assessed for their impact on the underground infrastructure, including the impact of their proposed method.

Second Reserve

Penetrative subsurface investigations in the Second Reserve are not required to be assessed.

3.5 Development Guidelines common to all Reserves

The development guidelines based on the operational use of proposed developments that may also impact on the underground infrastructure and are common to all of the Reserves are listed by type of works below:

3.5.1 Storage of Explosive / Flammable Materials

A risk assessment and appropriate safety precautions should be provided for storage of explosive/flammable materials within any of the Reserves.

Storage of explosive/flammable materials in any of the Reserves may be approved where a risk assessment demonstrates the risk to the underground infrastructure to be appropriately managed.

3.5.2 Storage of Potential Contaminants and Hazardous Materials

A risk assessment and appropriate safety precautions should be provided for storage of potential contaminants within any of the Reserves, where there is potential for the contaminants to migrate to or come in contact with the underground infrastructure.

This shall include an assessment of the impact on the durability of concrete, grout, resin, steel, waterproofing gaskets and membranes and any other material forming the permanent works of the underground infrastructure.

Storage of potential contaminants and hazardous materials in any of the Reserves may be approved where the risk assessment demonstrates the risk to the underground infrastructure to be appropriately managed.

3.5.3 Installations Containing Machinery Causing Heavy Vibrations

Installations containing machinery that may produce heavy vibrations in any of the Reserves may be approved where an engineering assessment demonstrates the impact of the vibrations on the underground infrastructure to be insignificant.

3.5.4 Installations Containing Machinery Causing Heavy Vibrations

Installations in any of the Reserves containing machinery that may cause stray electrical/magnetic current may be approved where an engineering assessment demonstrates the impact of the stray current on the underground infrastructure to be insignificant.

3.6 Requirements for Engineering Assessments

A typical engineering assessment of the impact of the proposed development on the underground infrastructure should include, but not be limited to, the following items:

- stress distribution in the ground surrounding the underground infrastructure, in particular, increases in shear stress on existing bedding planes, concentrations of horizontal stresses beneath excavations and stresses beneath foundation elements
- stresses in the support elements and linings of the underground infrastructure
- deformation of the ground surrounding the underground infrastructure, such as movement on existing bedding planes and their consequent effect on the support elements of the underground infrastructure
- deformation of the support elements and linings of the underground infrastructure, in particular, any incursions into the rail envelope and any deformations that may affect the long term durability of the underground infrastructure
- interaction between combinations of different works that may be part of a proposed development
- proposed construction sequences
- proposed work methods, particularly where blasting, rock-chiselling, percussive pile driving or similar methods are proposed
- changes to the groundwater regime, including dewatering works or installation of barriers to groundwater flow that may dam groundwater above the underground infrastructure

Where an engineering assessment is required simply to demonstrate that the impact of the proposed development on the underground infrastructure is insignificant, this may be inferred from such indicators as insignificant increases in ground stresses or deformations.



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Where a comprehensive investigation and assessment is required, such as for approval of those works in the First Reserve that are generally not allowed, it is expected that the engineering assessment would involve detailed and sophisticated modelling of the impact on the actual underground infrastructure elements, demonstrating explicitly that the impact is insignificant.

The engineering assessment should be carried out by a suitably experienced geotechnical engineer with a minimum of 10 years experience in tunnel design and analysis.

4.1 Information to be Made Available to the Developer

The developer undertaking an engineering assessment should review the full list of reports and drawings available for the underground infrastructure and extract the relevant information as required for their analysis.

The reports and drawings to be reviewed should include, but not be limited to, the following:

- alignment drawings
- geotechnical investigation reports
- geotechnical interpretative reports
- design input reports
- design reports
- initial support drawings
- permanent lining drawings
- waterproofing and drainage drawings

The reports reviewed should be the final version and the drawings should be the as-built revision.

4.2 Information to be Provided by the Developer

The developer should provide the following information in support of their proposed development:

- The assessment carried out by a suitably qualified geotechnical engineer, as required by Section 3.5 above.
- Drawings showing the type of works and general arrangement in relation to the underground infrastructure and the Reserve zones.
- Setting out details of all aspects of the proposed development, including survey reference marks coordinated in MGA coordinates and all founding levels in AHD.
- All dimensions of the foundation and support elements including anchor fixed and free lengths, pile diameters, bore diameters, retaining wall thicknesses and tunnel diameters and lining thicknesses.
- Schedule of loads for all foundation and support elements, including pile loads, anchor lock off loads and shoring preloads.
- Details of any proposed testing of foundation and support elements, especially where proposed test loads are greater than the design working loadings.
- Construction staging and foundation and support installation sequences, including any proposed dewatering or cut-off works.
- Underground infrastructure protection plans, where required.
- Predictions of loads and deformations induced by the proposed development in the underground infrastructure and in the surrounding ground.
- Method statements for construction activities that have potential to impact on the underground infrastructure.
- Instrumentation and monitoring plans for the works, including the proposed instrumentation and monitoring programme for monitoring of the underground infrastructure.
- Contingency plans for safe guarding the underground infrastructure in the event that monitoring results exceed predicted levels.
- Pre-construction dilapidation survey.

For the purpose of assessing planning approval, the documents to be provided may be limited to general arrangements and a preliminary engineering assessment of the impact on the underground infrastructure. In some cases, the approving authority may request further information to be provided to enable planning approval to be granted.

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5.1 List of Drawings

Drawing No.	Revision	Title
PRL GD 02467	B	RAIL PROTECTION RESERVES – PLAN – SHEET 1 OF 20
PRL GD 02468	B	RAIL PROTECTION RESERVES – PLAN – SHEET 2 OF 20
PRL GD 02469	B	RAIL PROTECTION RESERVES – PLAN – SHEET 3 OF 20
PRL GD 02470	B	RAIL PROTECTION RESERVES – PLAN – SHEET 4 OF 20
PRL GD 02471	B	RAIL PROTECTION RESERVES – PLAN – SHEET 5 OF 20
PRL GD 02472	B	RAIL PROTECTION RESERVES – PLAN – SHEET 6 OF 20
PRL GD 02473	B	RAIL PROTECTION RESERVES – PLAN – SHEET 7 OF 20
PRL GD 02474	B	RAIL PROTECTION RESERVES – PLAN – SHEET 8 OF 20
PRL GD 02475	B	RAIL PROTECTION RESERVES – PLAN – SHEET 9 OF 20
PRL GD 02476	B	RAIL PROTECTION RESERVES – PLAN – SHEET 10 OF 20
PRL GD 02477	B	RAIL PROTECTION RESERVES – PLAN – SHEET 11 OF 20
PRL GD 02478	B	RAIL PROTECTION RESERVES – PLAN – SHEET 12 OF 20
PRL GD 02479	B	RAIL PROTECTION RESERVES – PLAN – SHEET 13 OF 20
PRL GD 02480	B	RAIL PROTECTION RESERVES – PLAN – SHEET 14 OF 20
PRL GD 02481	B	RAIL PROTECTION RESERVES – PLAN – SHEET 15 OF 20
PRL GD 02482	B	RAIL PROTECTION RESERVES – PLAN – SHEET 16 OF 20
PRL GD 02483	B	RAIL PROTECTION RESERVES – PLAN – SHEET 17 OF 20
PRL GD 02484	B	RAIL PROTECTION RESERVES – PLAN – SHEET 18 OF 20
PRL GD 02485	B	RAIL PROTECTION RESERVES – PLAN – SHEET 19 OF 20
PRL GD 02486	B	RAIL PROTECTION RESERVES – PLAN – SHEET 20 OF 20
PRL GD 02487	B	RAIL PROTECTION RESERVES – NORTH RYDE STATION PLAN
PRL GD 02488	B	RAIL PROTECTION RESERVES – MACQUARIE PARK STATION PLAN
PRL GD 02489	B	RAIL PROTECTION RESERVES – MACQUARIE UNIVERSITY STATION PLAN
PRL GD 02490	B	RAIL PROTECTION RESERVES – EPPING STATION PLAN



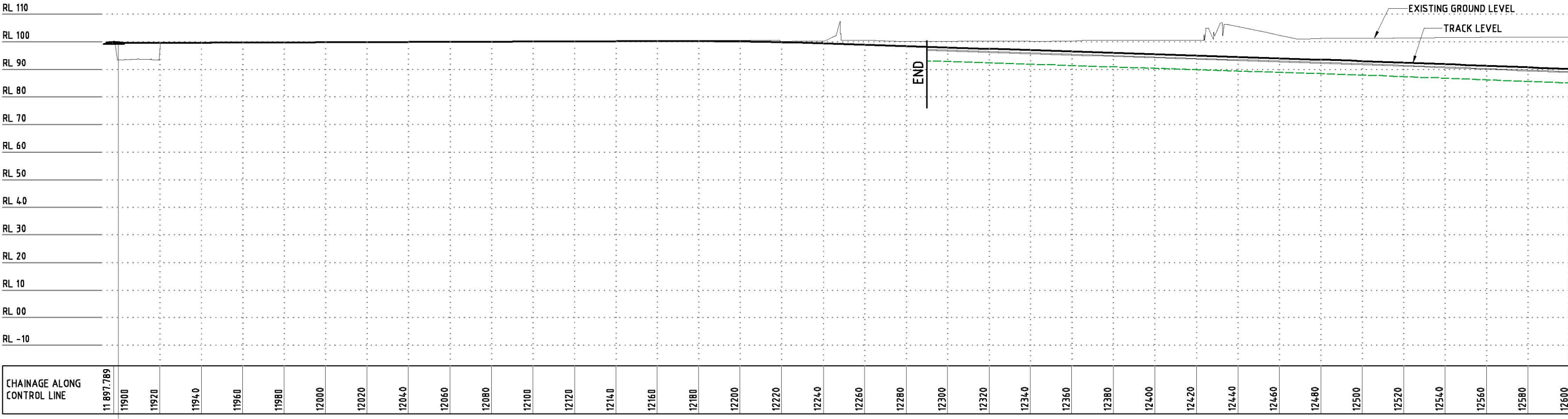
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Drawing No.	Revision	Title
PRL GD 02600	B	RAIL PROTECTION RESERVES – CROSS SECTION – RUNNING TUNNELS
PRL GD 02601	B	RAIL PROTECTION RESERVES – CROSS SECTION – CROSSOVER STRUCTURES
PRL GD 02602	B	RAIL PROTECTION RESERVES – CROSS SECTION – PLATFORM CAVERNS
PRL GD 02603	B	RAIL PROTECTION RESERVES – CROSS SECTION – STATION CAVERNS
PRL GD 02604	B	RAIL PROTECTION RESERVES – CROSS SECTION – CUT AND COVER AND DIVE STRUCTURES

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604

LEGEND

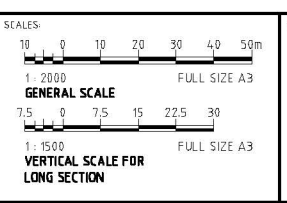
- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

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APPROVED	AJL	DATE	



CONTRACTOR:

DESIGNER: **MAUNSELL | AECOM**

CLIENT: **Transport Infrastructure Development Corporation**

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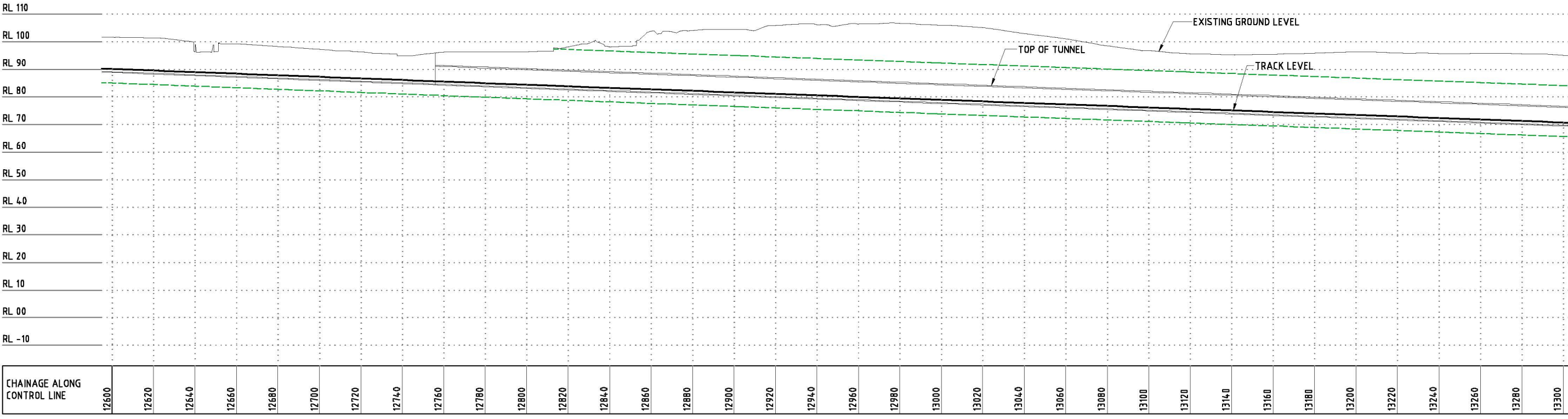
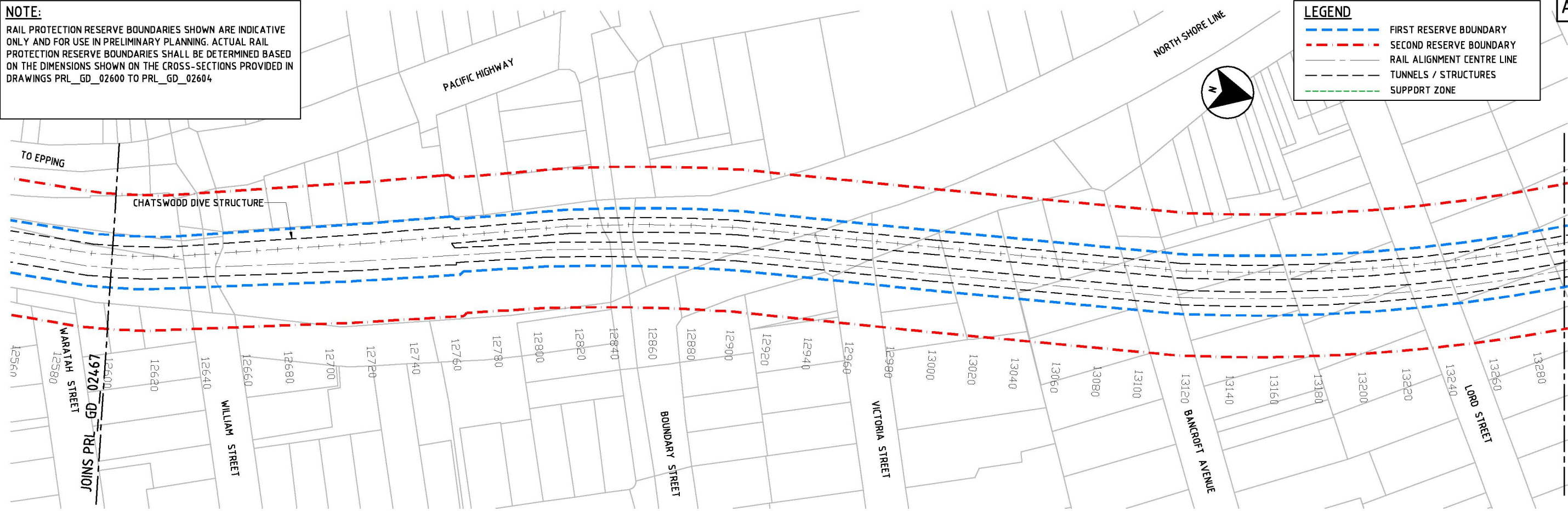
RAIL PROTECTION RESERVES PLAN SHEET 1 OF 20

STATUS: **FINAL** DRAWING NO: **PRL GD 02467** REV: **B**

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- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

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B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

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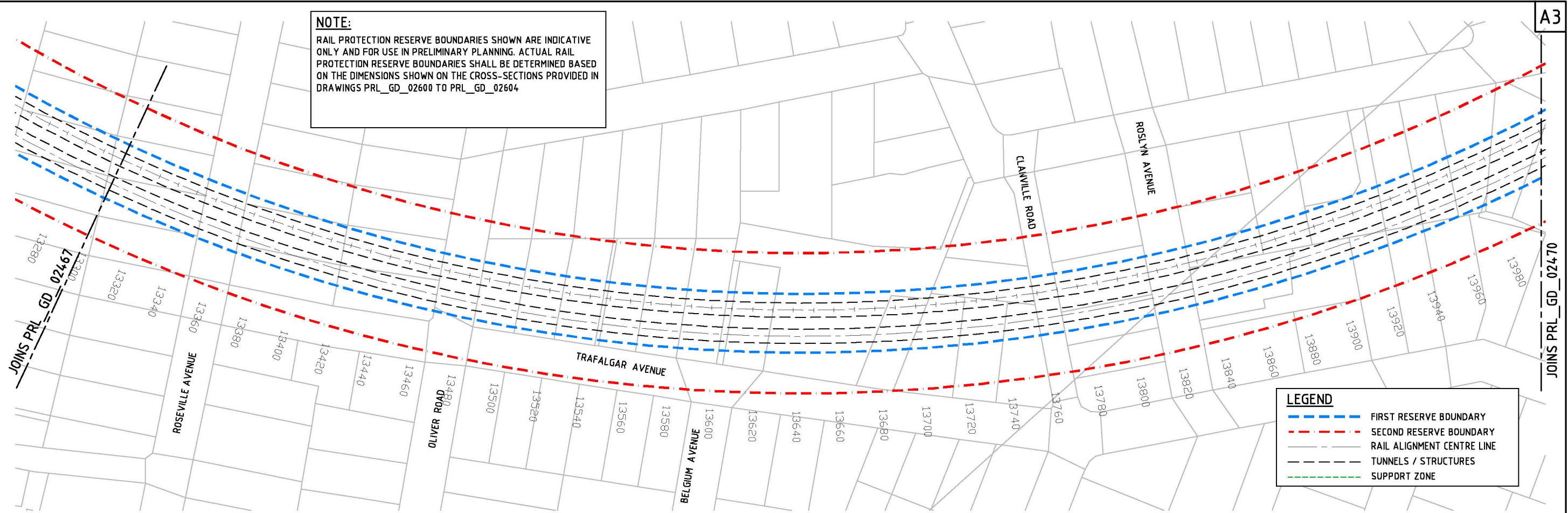
RAIL PROTECTION RESERVES
PLAN
SHEET 2 OF 20

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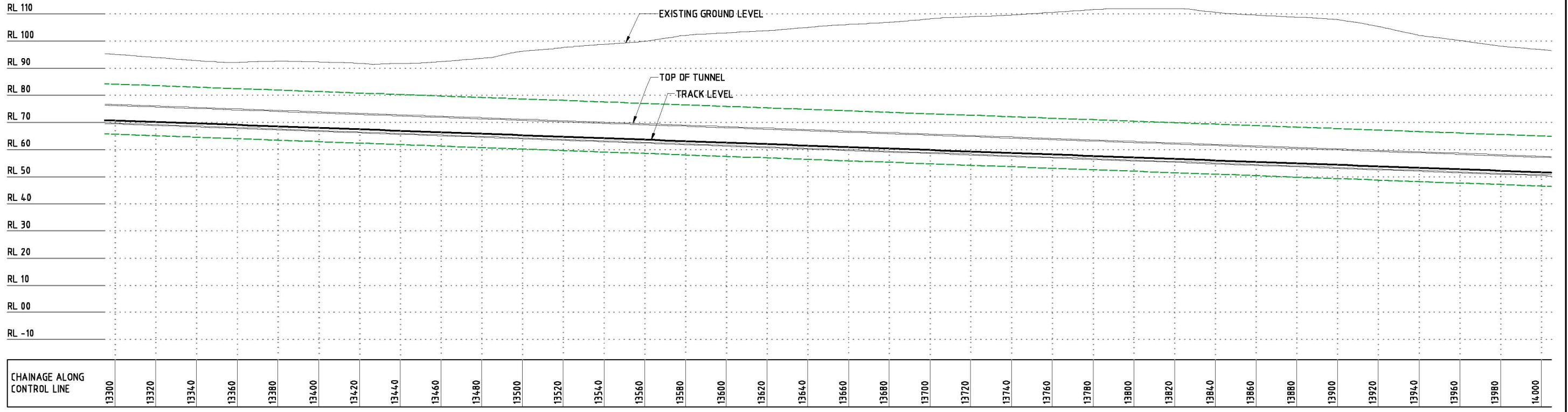
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- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPDRT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

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B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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AJL	JJA
PVM	AJL
AJL	DATE

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

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RAIL PROTECTION RESERVES PLAN SHEET 3 OF 20

STATUS: FINAL

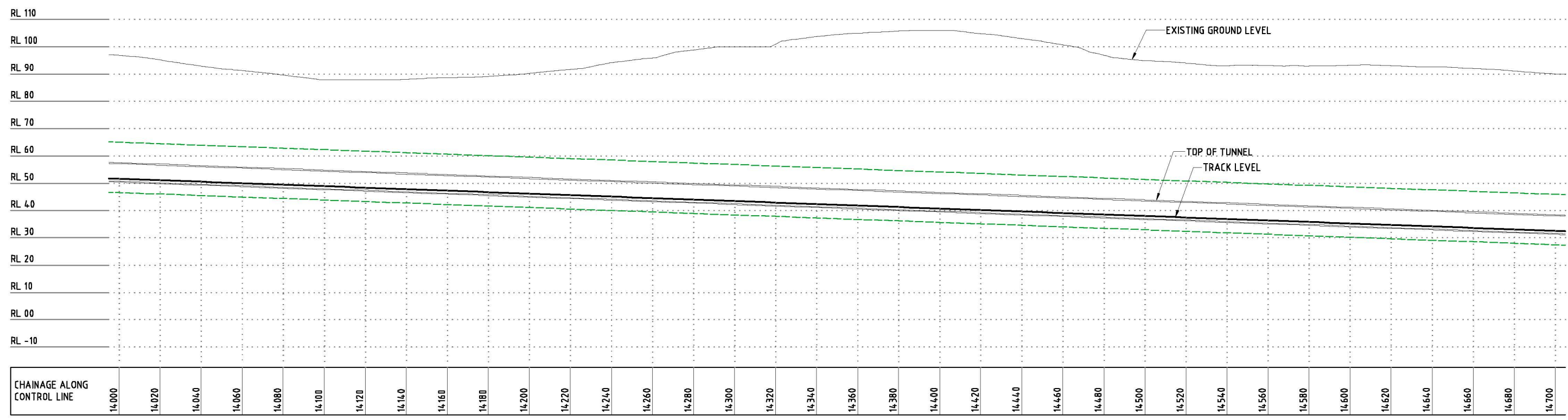
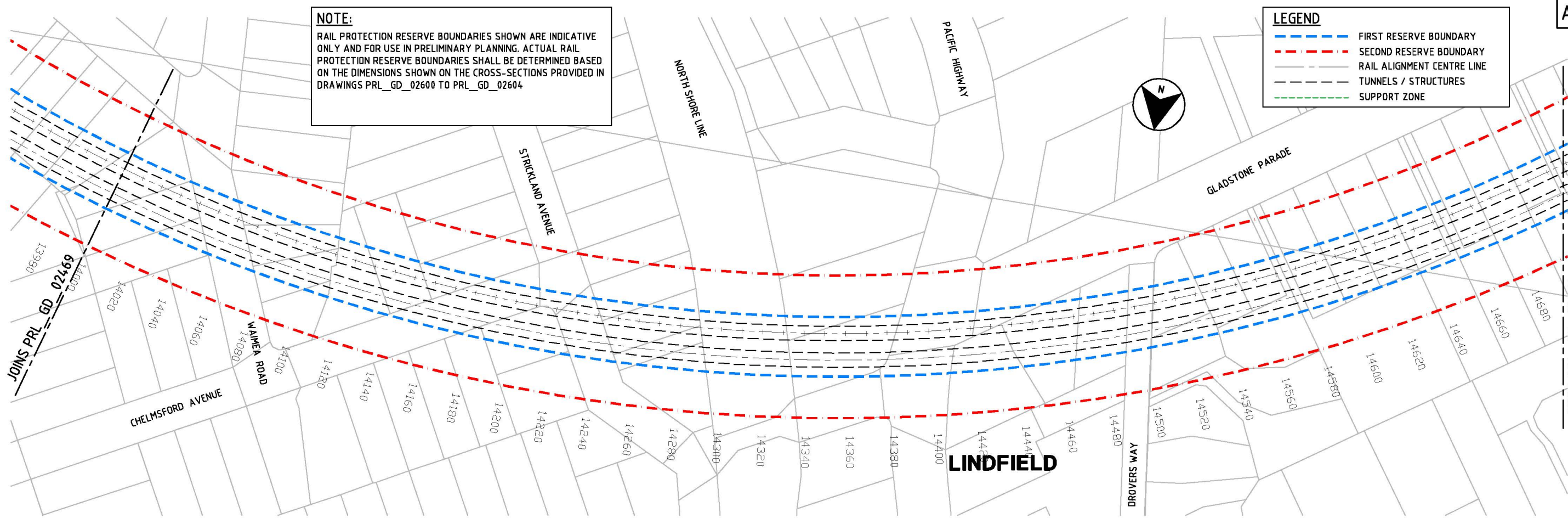
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LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPORT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

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B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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A.J.L.		DATE					

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 A.B.N. 20 093 846 925

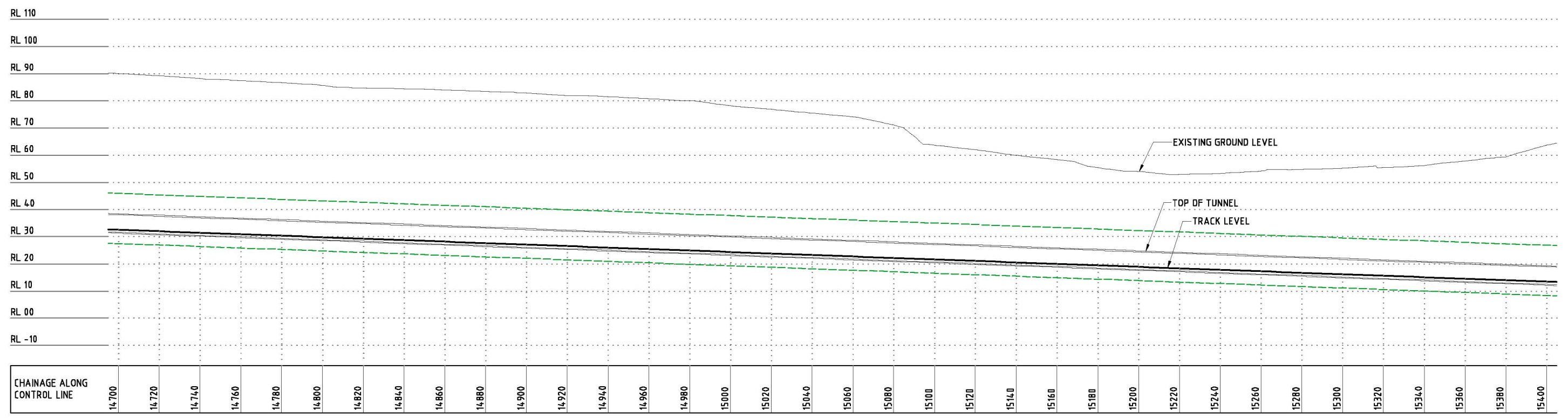
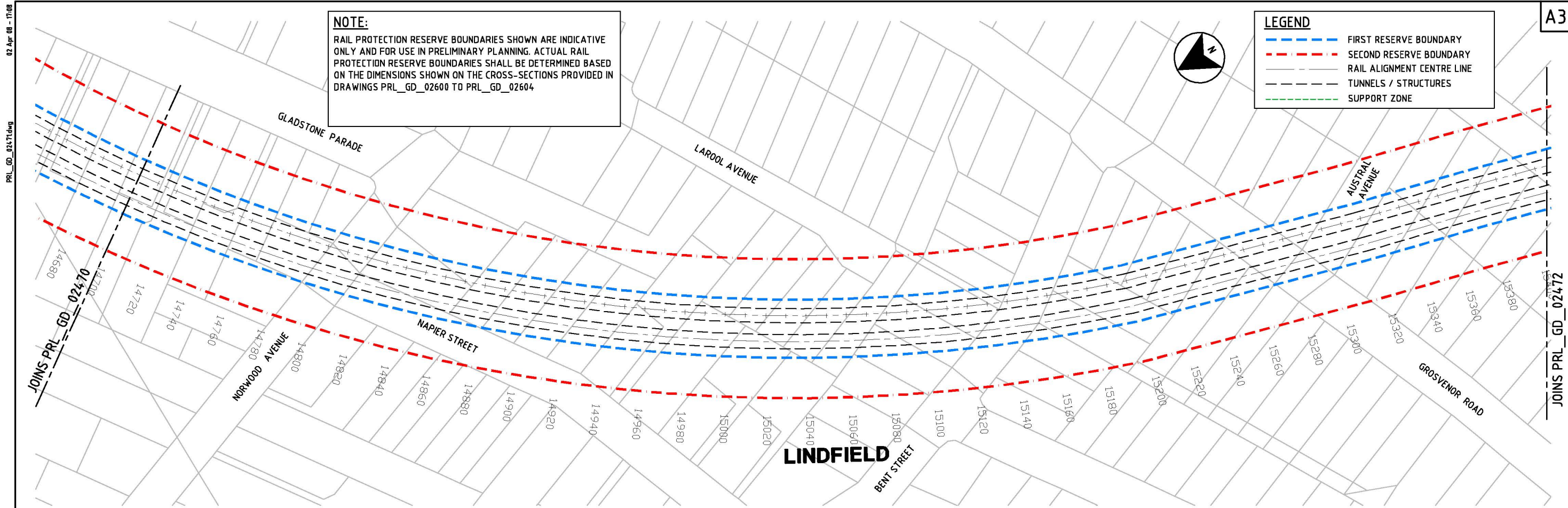
CLIENT: Transport Infrastructure Development Corporation

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 4 OF 20

STATUS: FINAL
 DRAWING NO: PRL GD 02470
 REV: B



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

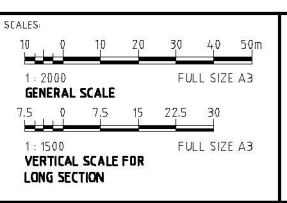
- FIRST RESERVE BOUNDARY
- - - SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- - - TUNNELS / STRUCTURES
- - - SUPPORT ZONE

PRL_GD_02471.dwg 02 Apr 08 - 17:08

A3

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

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DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



CONTRACTOR:
MAUNSELL | AECOM
Munshell Australia Pty Ltd
A.B.N. 20 093 846 925

DESIGNER:
MAUNSELL | AECOM

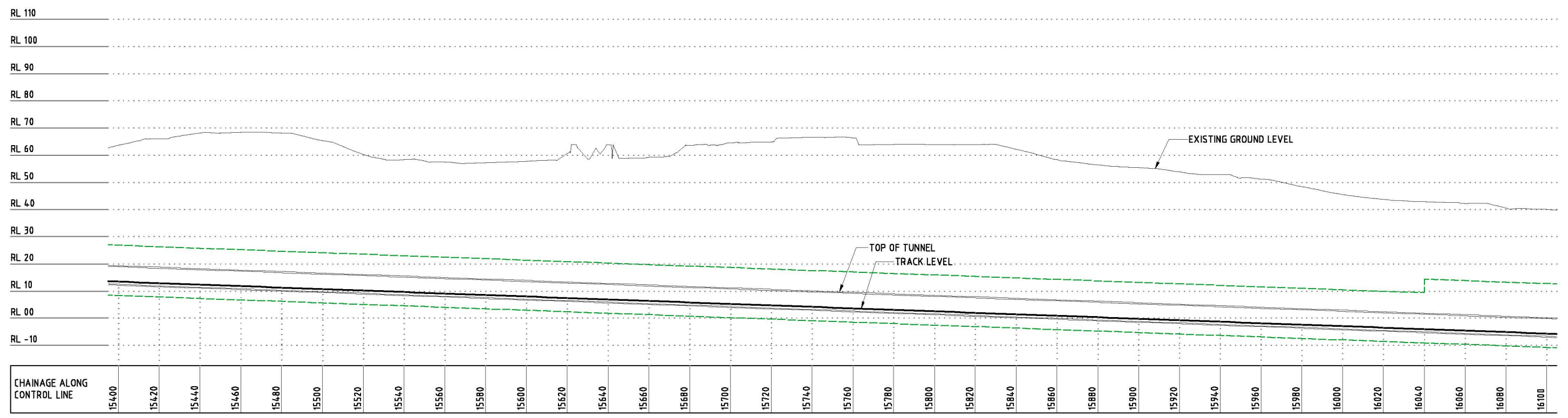
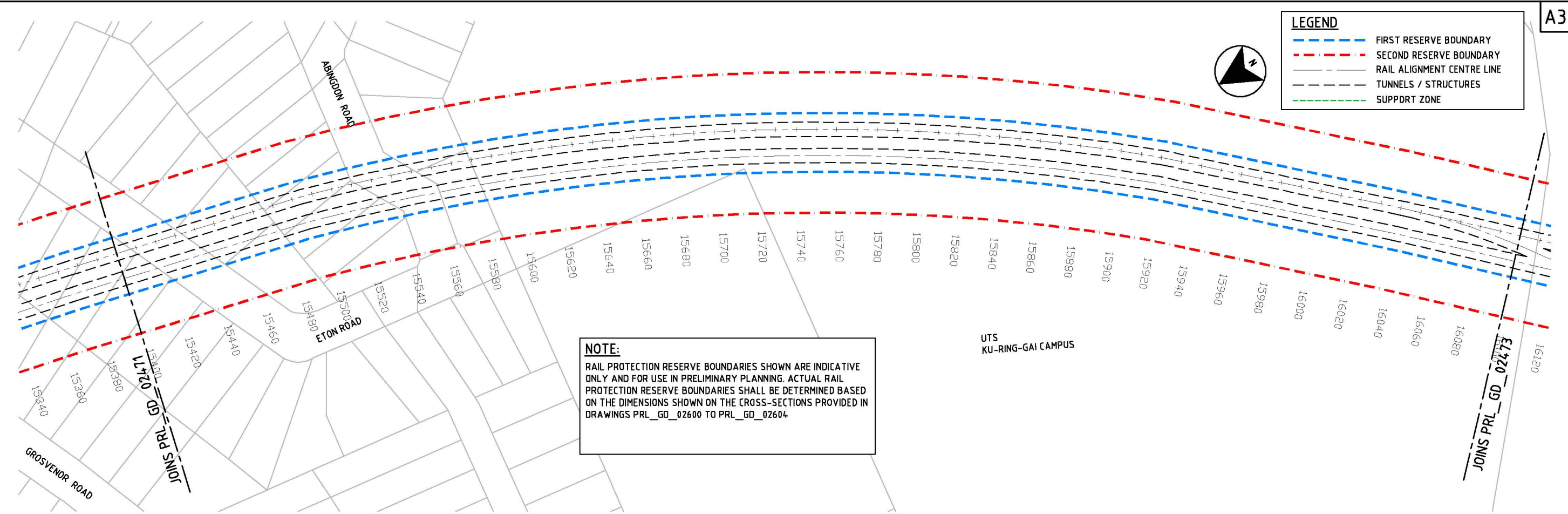
CLIENT:
Transport Infrastructure Development Corporation

RAILCORP EDMS ID --
ECRL DEVELOPMENT GUIDE LINES
RAIL PROTECTION RESERVES PLAN SHEET 5 OF 20

STATUS: FINAL	DRAWING NO: PRL GD 02471	REV: B
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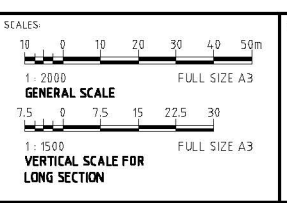
PRL_GD_02472.dwg 02 Apr 08 - 11:09

A3



No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



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CLIENT: Transport Infrastructure Development Corporation

RAILCORP EDMS ID --		
ECRL DEVELOPMENT GUIDE LINES		
RAIL PROTECTION RESERVES PLAN SHEET 6 OF 20		
STATUS: FINAL	DRAWING NO: PRL GD 02472	REV: B

Reference material - for information only

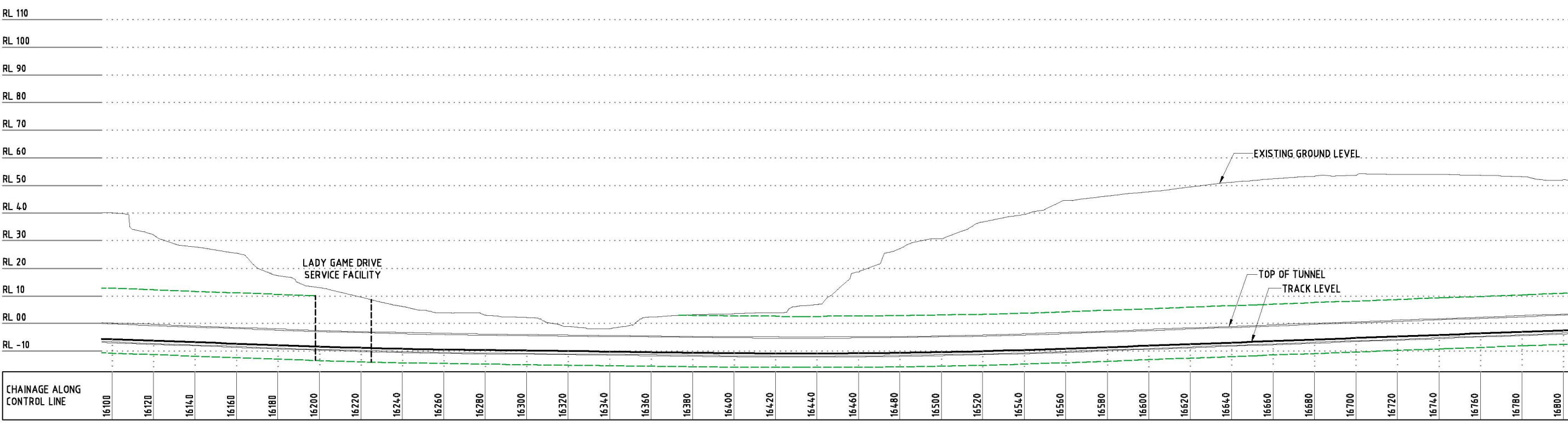
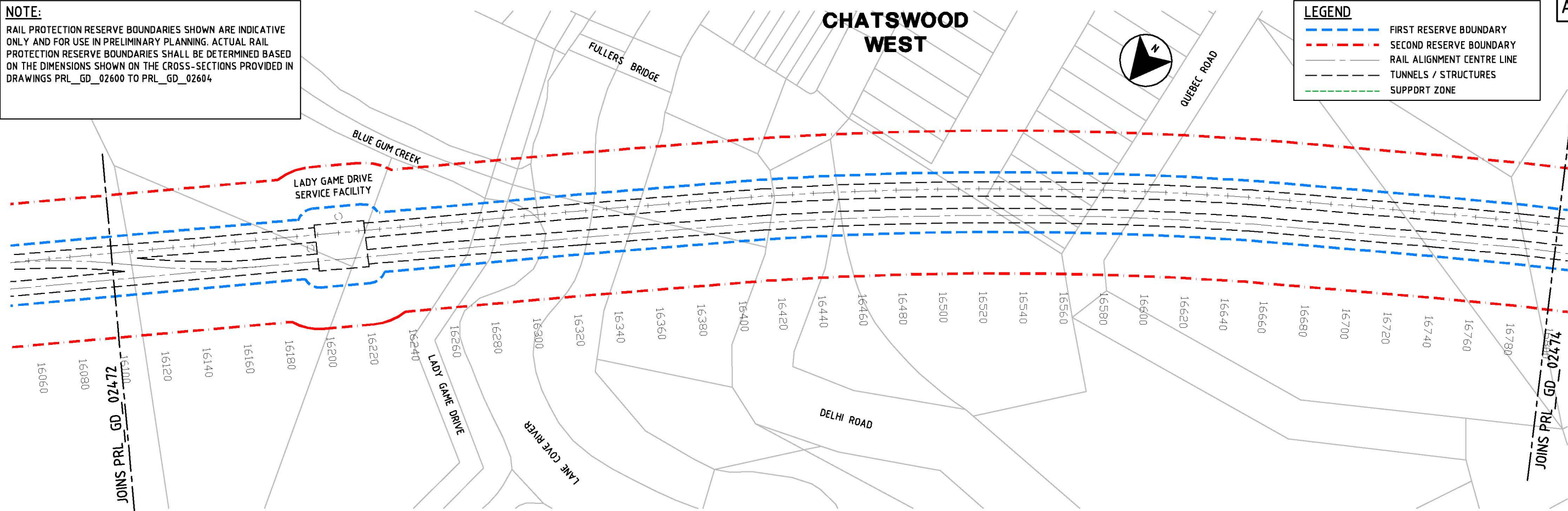
02 Apr 08 - 11:09
PRL_GD_02473.dwg

A3

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE



No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	CHECKED	APPROVED
A.J.L.	J.J.A.	A.J.L.
P.V.M.		DATE

THE INFORMATION SHOWN ON THIS DRAWING IS FOR THE PURPOSES OF THE NORTH SYDNEY STATION UPGRADE PROJECT ONLY. NO WARRANTY IS GIVEN OR IMPLIED AS TO ITS SUITABILITY FOR ANY OTHER PURPOSE.

SCALES:
 1:2000 GENERAL SCALE FULL SIZE A3
 1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

CONTRACTOR:

DESIGNER:
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 Mounsell Australia Pty Ltd
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CLIENT:
Transport Infrastructure Development Corporation

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 7 OF 20

STATUS: **FINAL** DRAWING NO: **PRL GD 02473** REV: **B**

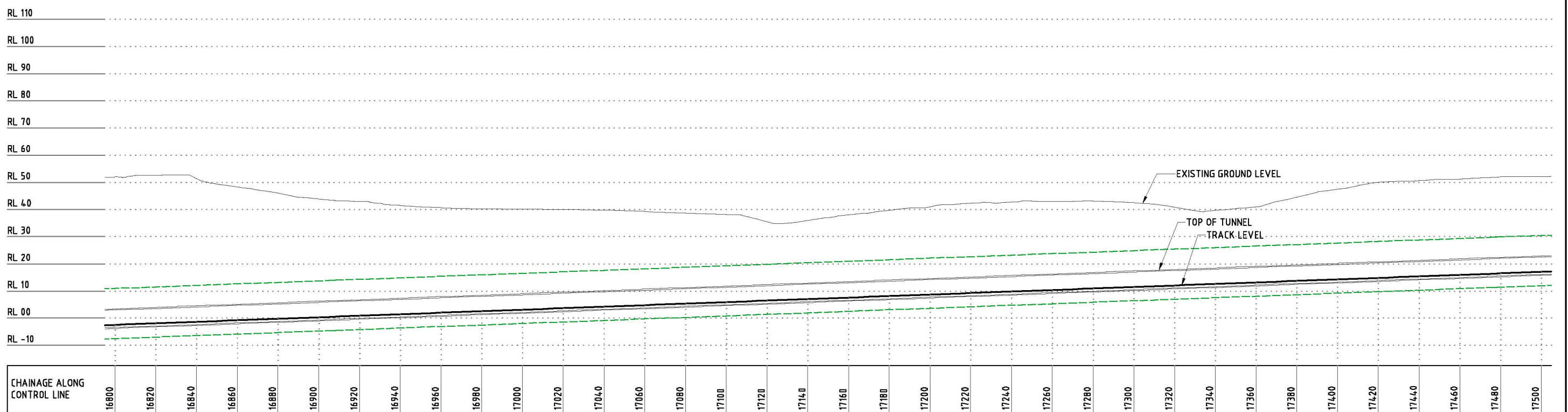
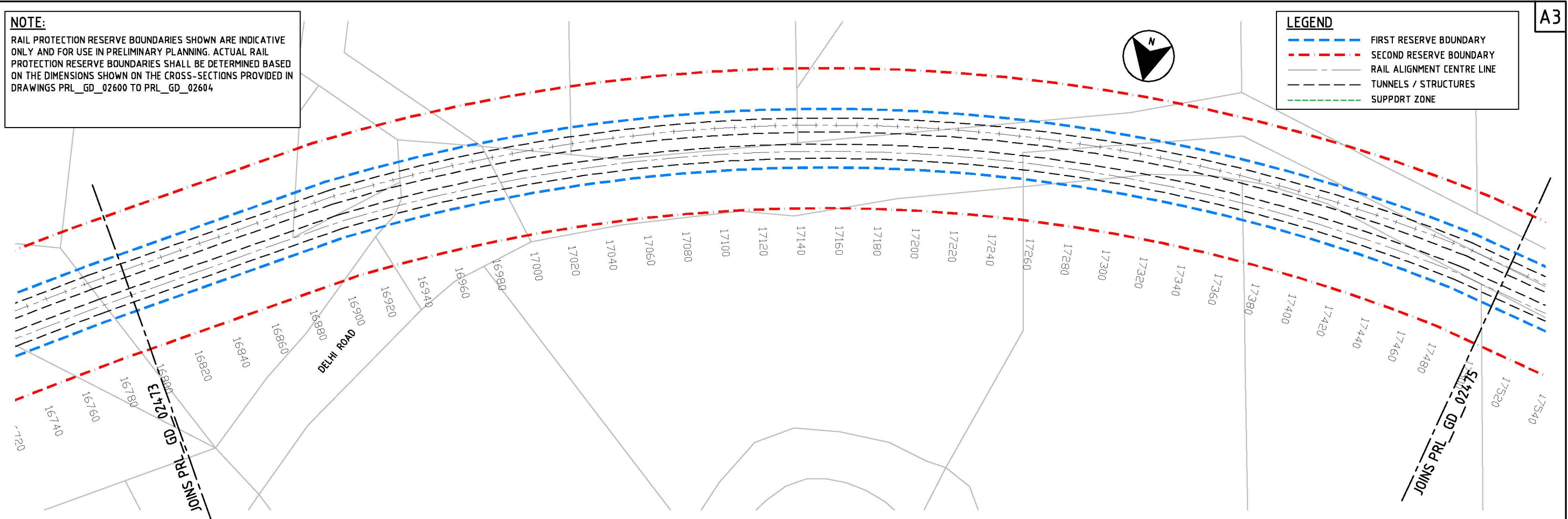
PRL_GD_02474.dwg 02 Apr 08 - 11:09

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE

A3



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	CHECKED	DATE
A.J.L.	J.J.A.	
P.V.M.	A.J.L.	
A.J.L.	DATE	

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

DESIGNER: MAUNSELL | AECOM

CLIENT: Transport Infrastructure Development Corporation

CONTRACTOR: Mounsell Australia Pty Ltd A.B.N. 20 093 846 925

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 8 OF 20

STATUS: FINAL

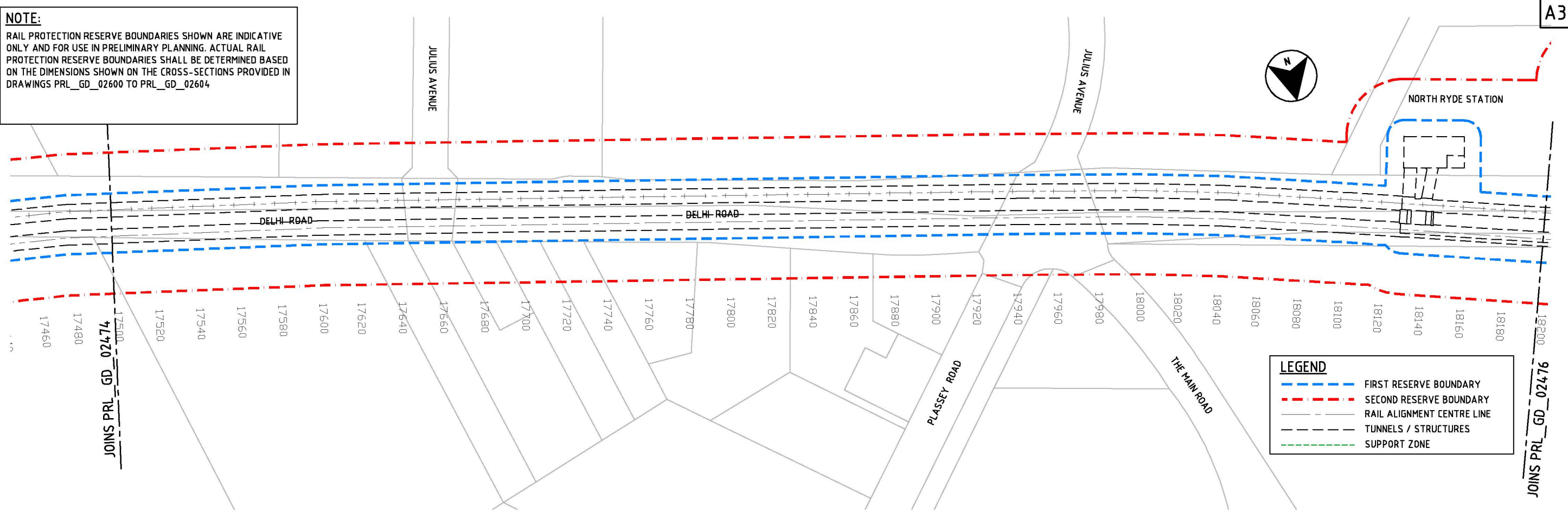
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REV: B

Reference material - for information only

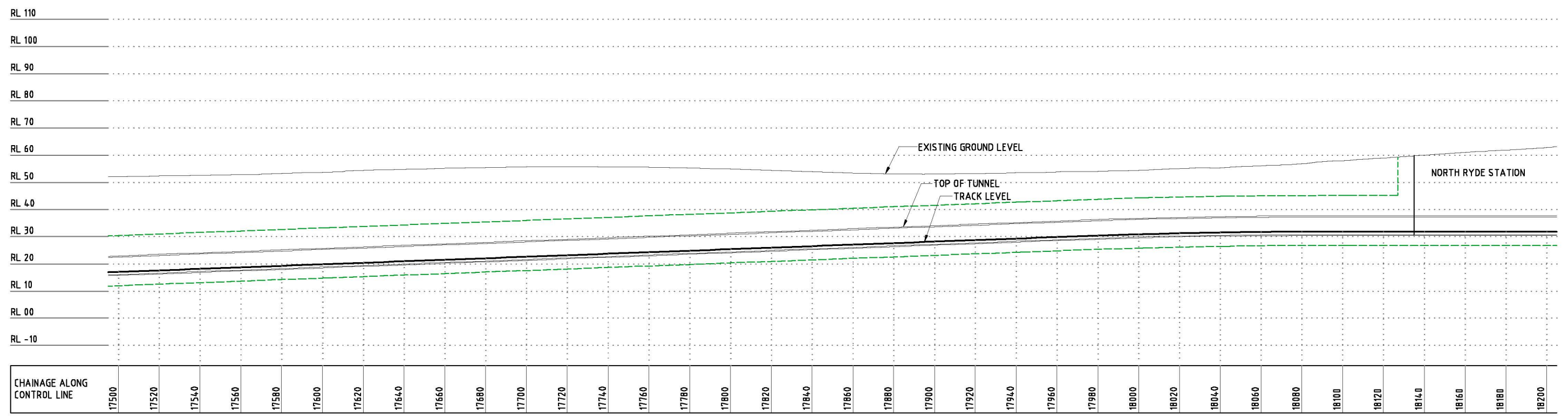
02 Apr 08 - 17:09
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NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.



LEGEND

- FIRST RESERVE BOUNDARY
- - - SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- - - TUNNELS / STRUCTURES
- SUPPORT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	A.J.L.	CHECKED	J.J.A.
DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	

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SCALES:
 1:2000 GENERAL SCALE FULL SIZE A3
 1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

CONTRACTOR:

DESIGNER:
MAUNSELL | AECOM
 Mounsell Australia Pty Ltd
 A.B.N. 20 093 846 925

CLIENT:
Transport Infrastructure Development Corporation

RAILCORP EDMS ID --

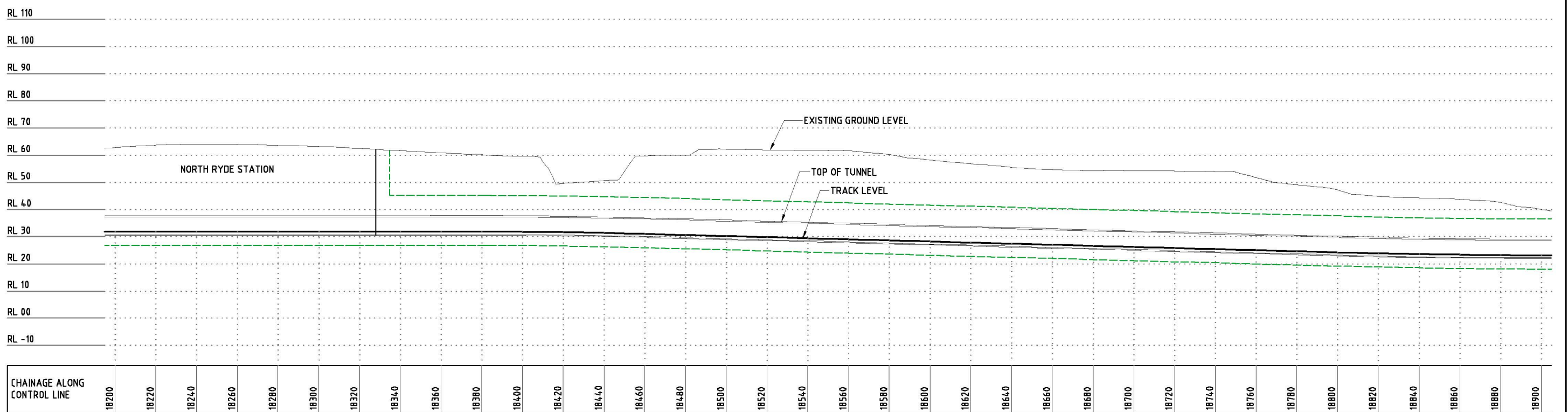
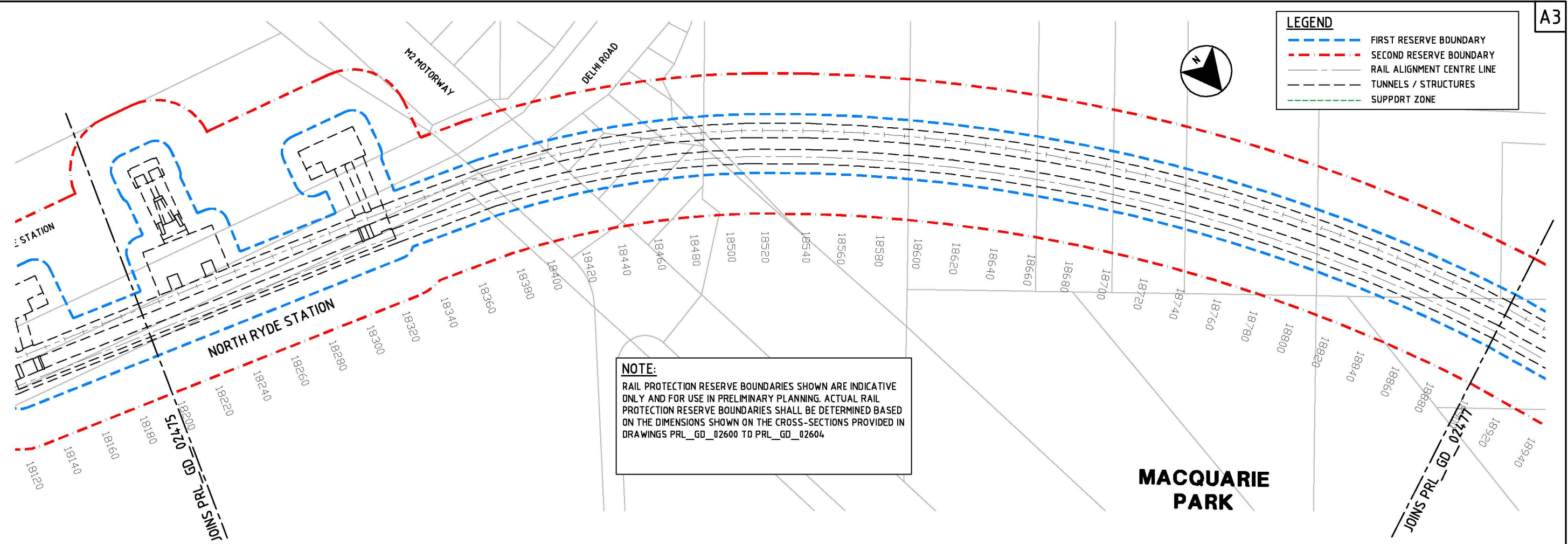
ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 9 OF 20

STATUS: FINAL
 DRAWING NO: PRL GD 02475
 REV: B

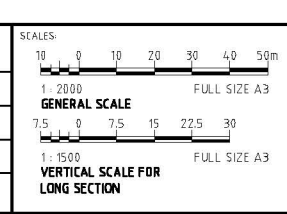
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JOINS PRL_GD_02476



DESIGNED	A.J.L.	CHECKED	J.J.A.
DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	
No.	BY	DATE	DESCRIPTION
B	DS	02.04.08	FINAL ISSUE
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT

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DESIGNED	A.J.L.	CHECKED	J.J.A.
DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	



CONTRACTOR:

DESIGNER: MAUNSELL | AECOM

CLIENT: Transport Infrastructure Development Corporation

Maunsel Australia Pty Ltd
A.B.N. 20 093 846 925

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 10 OF 20

STATUS: FINAL

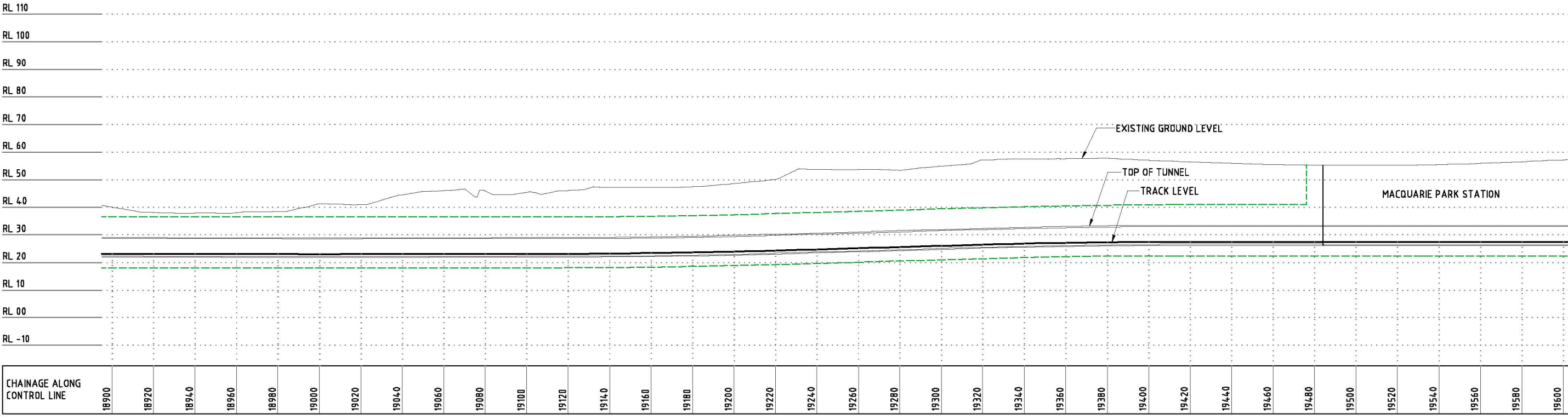
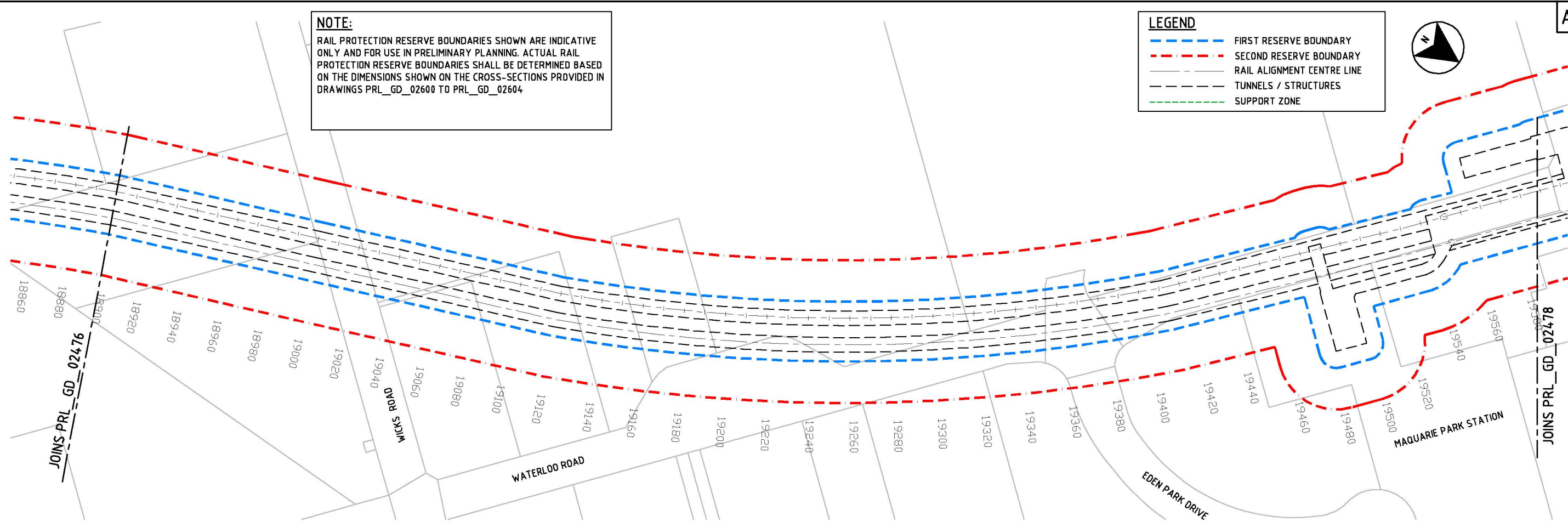
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REV: B

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

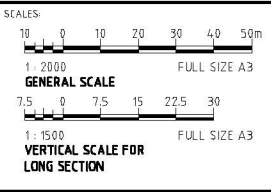
- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPORT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



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CLIENT: Transport Infrastructure Development Corporation

Mounsell Australia Pty Ltd
A.B.N. 20 093 846 925

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 11 OF 20

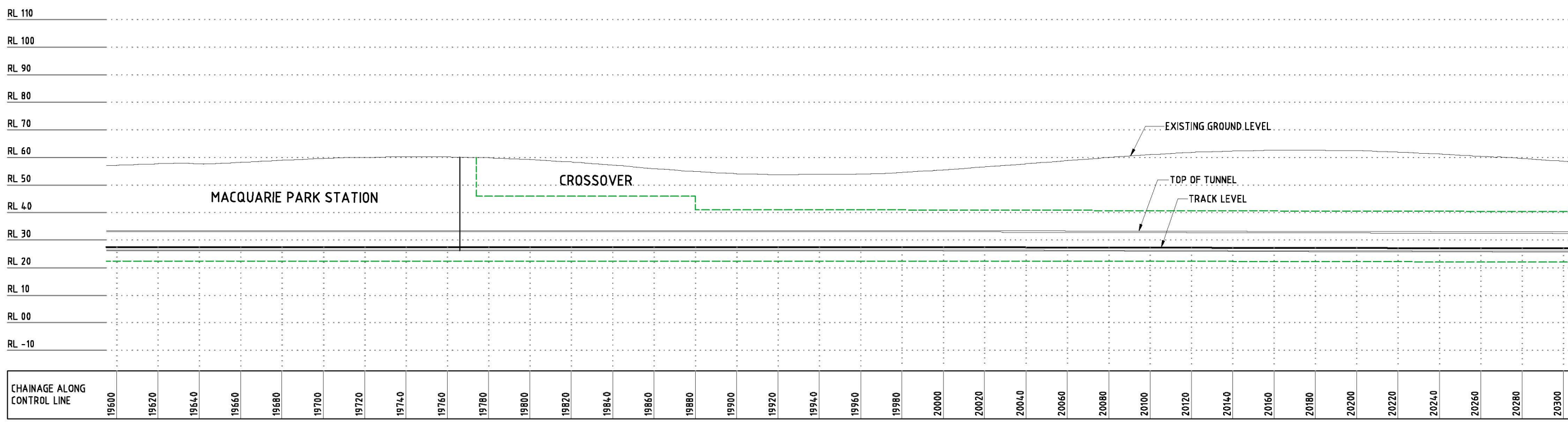
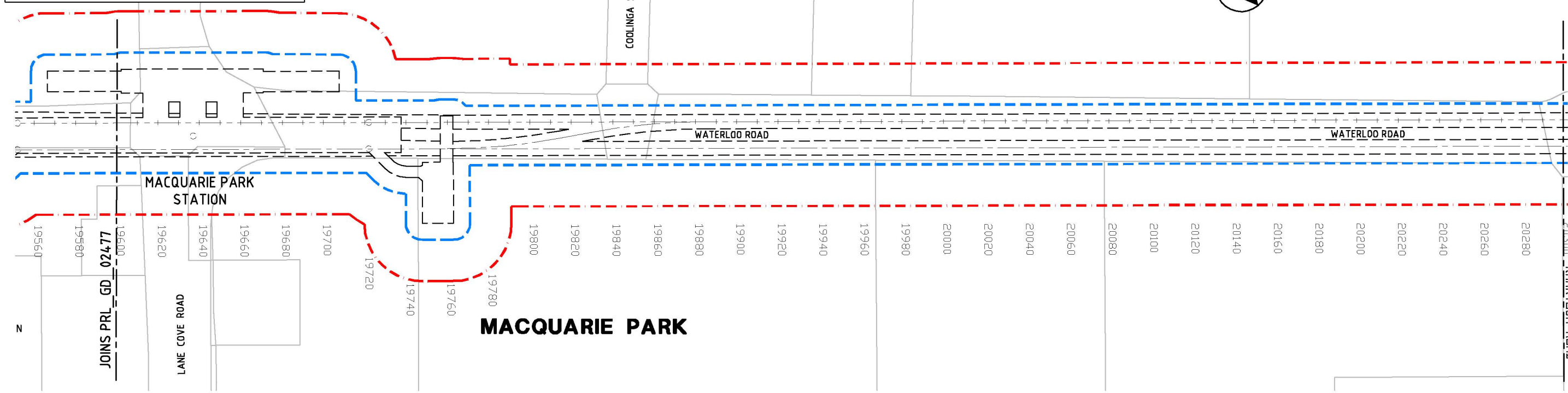
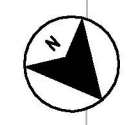
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02 Apr 08 - 1710
PRL_GD_02478.dwg

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	CHECKED	APPROVED
A.J.L.	J.J.A.	A.J.L.
P.V.M.		DATE

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

DESIGNER: MAUNSELL | AECOM

CLIENT: Transport Infrastructure Development Corporation

Mounsell Australia Pty Ltd
A.B.N. 20 093 846 925

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES
PLAN
SHEET 12 OF 20

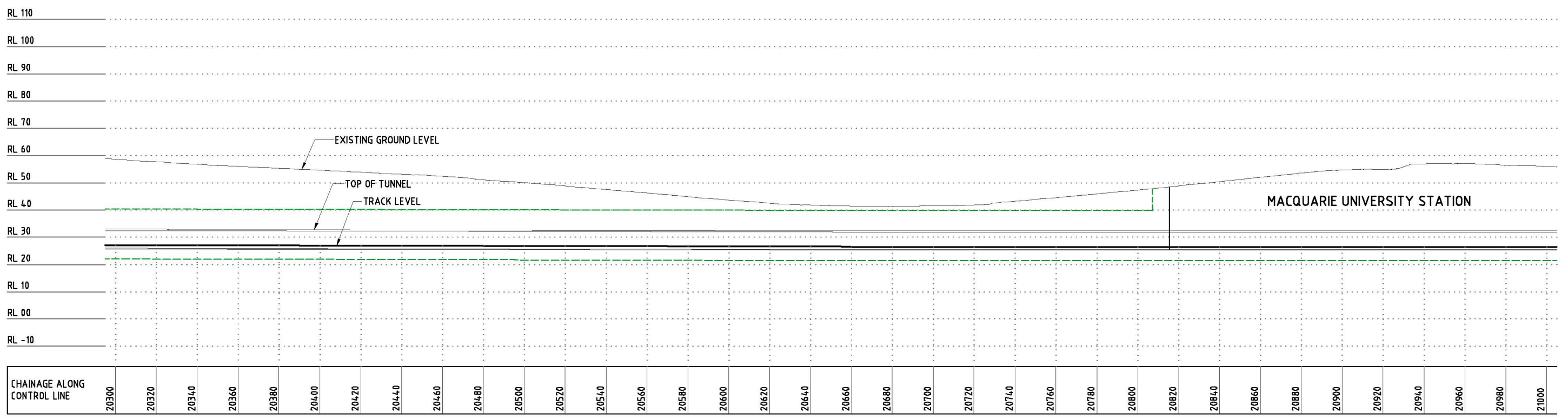
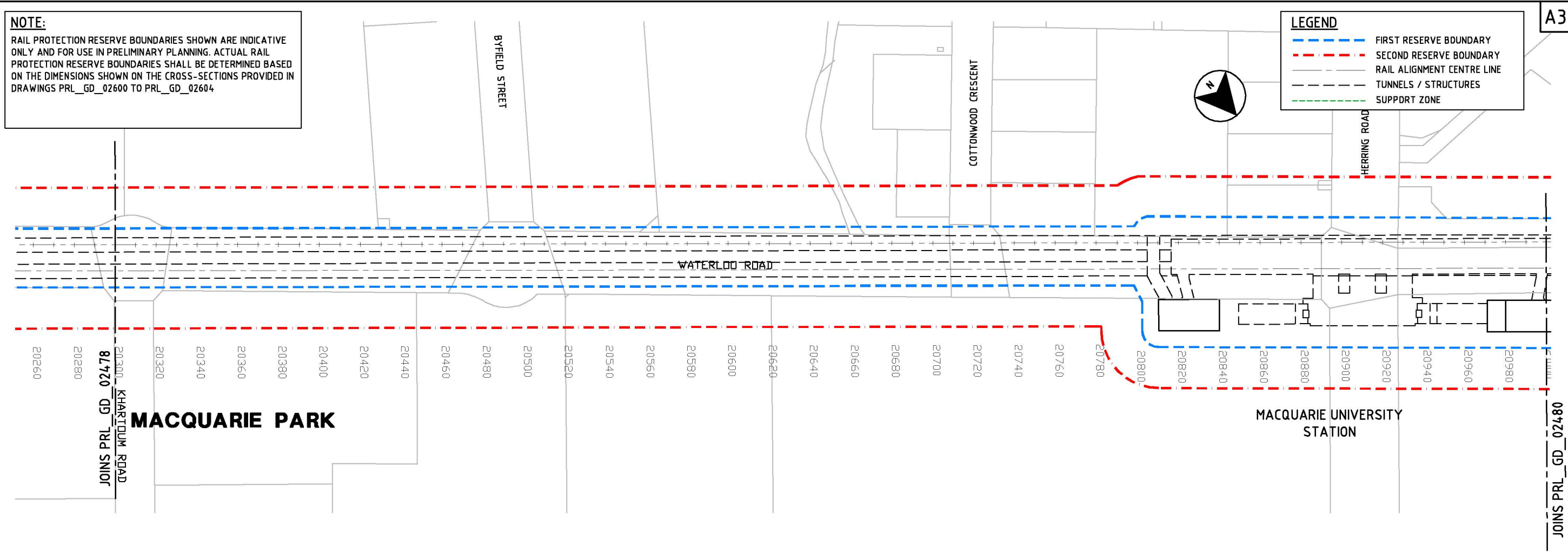
STATUS: FINAL

DRAWING NO: PRL GD 02478

REV: B

Reference material - for information only

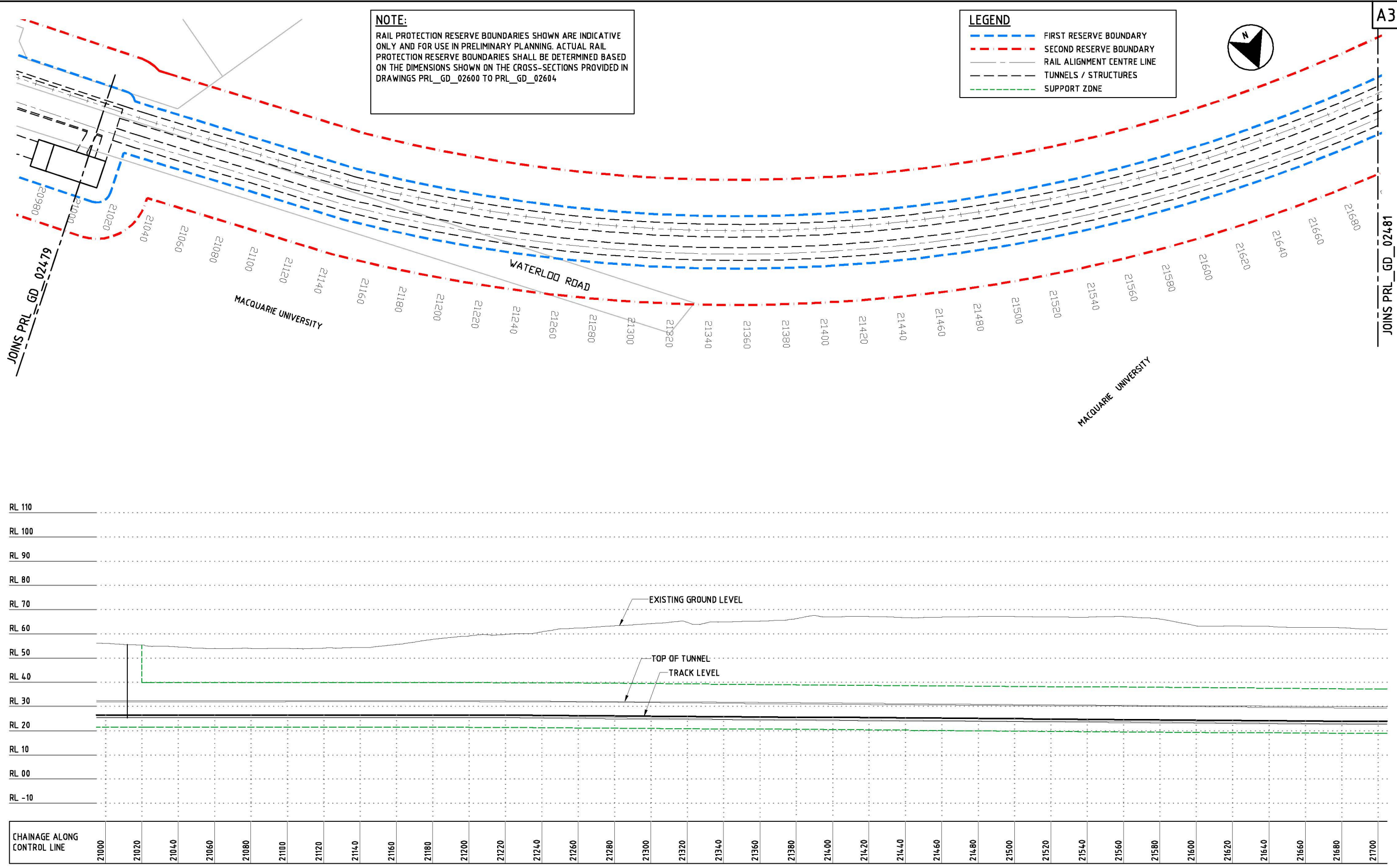
PRL_GD_02479.dwg 02 Apr 08 - 17:11



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

				THE INFORMATION SHOWN ON THIS DRAWING IS FOR THE PURPOSES OF THE NORTH SYDNEY STATION UPGRADE PROJECT ONLY. NO WARRANTY IS GIVEN OR IMPLIED AS TO ITS SUITABILITY FOR ANY OTHER PURPOSE.				SCALES: 		CONTRACTOR:		DESIGNER: MAUNSELL AECOM Mounsell Australia Pty Ltd A.B.N. 20 093 846 925		CLIENT: Transport Infrastructure Development Corporation		RAILCORP EDMS ID -- ECRL DEVELOPMENT GUIDE LINES	
B	DS	02.04.08	FINAL ISSUE	DESIGNED	AJL	CHECKED	JJA					RAIL PROTECTION RESERVES PLAN SHEET 13 OF 20					
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	DRAWN	PVM	CHECKED	AJL					STATUS: FINAL					
No	BY	DATE	DESCRIPTION	APPROVED	AJL	DATE						DRAWING NO: PRL GD 02479					
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PRL_GD_02480.dwg 02 Apr 08 - 17:11



NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604

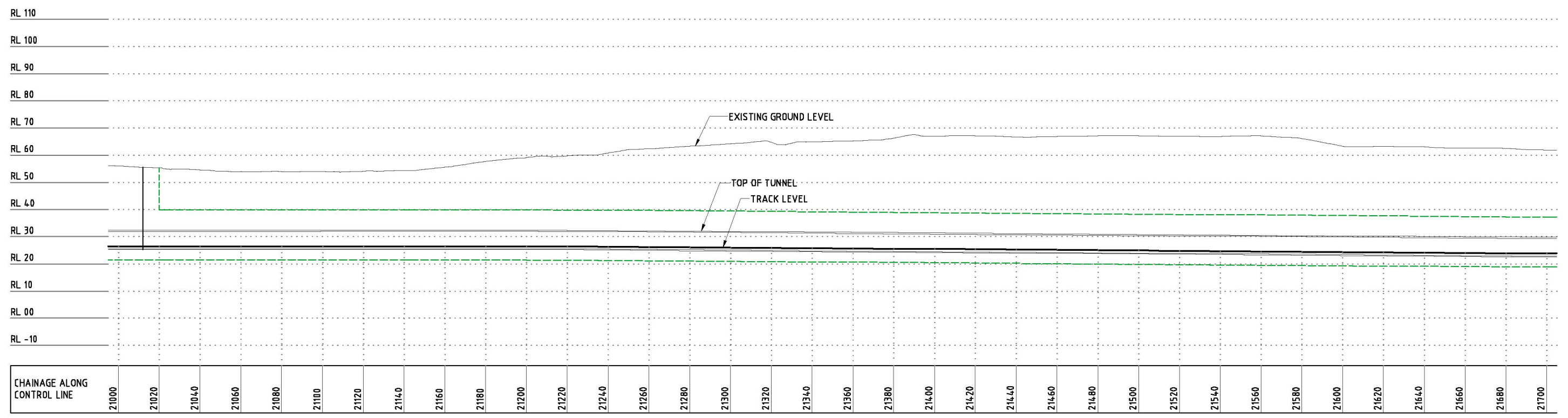
LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPORT ZONE



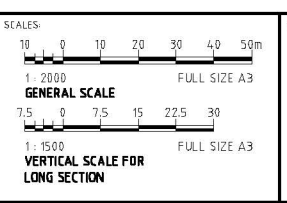
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18170_PRL_GD_02480



No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



CONTRACTOR:

DESIGNER:

MAUNSELL | AECOM

Mounsell Australia Pty Ltd
A.B.N. 20 093 846 925

CLIENT:

Transport Infrastructure Development Corporation

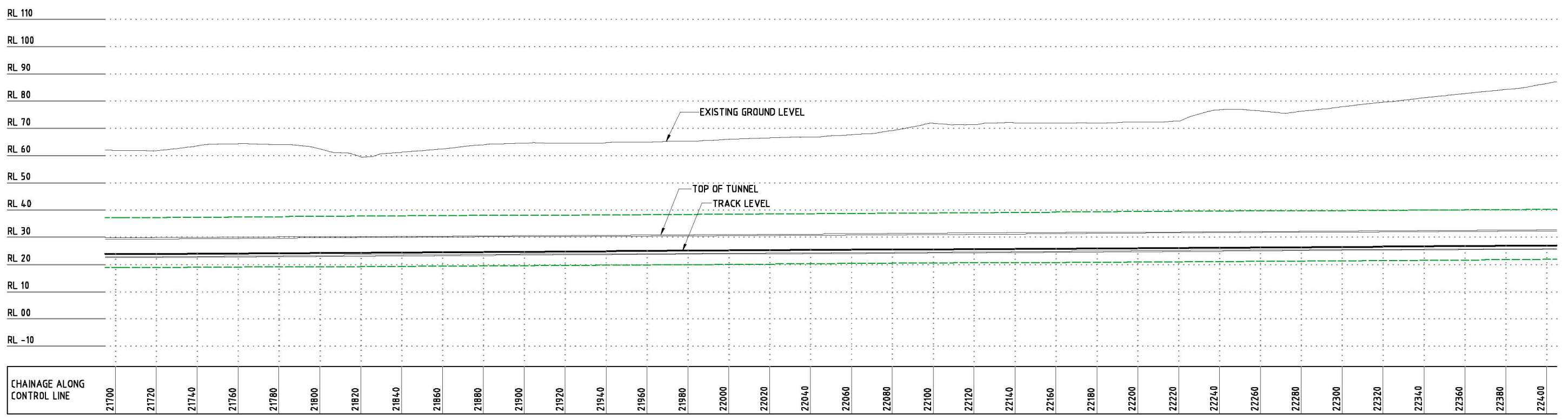
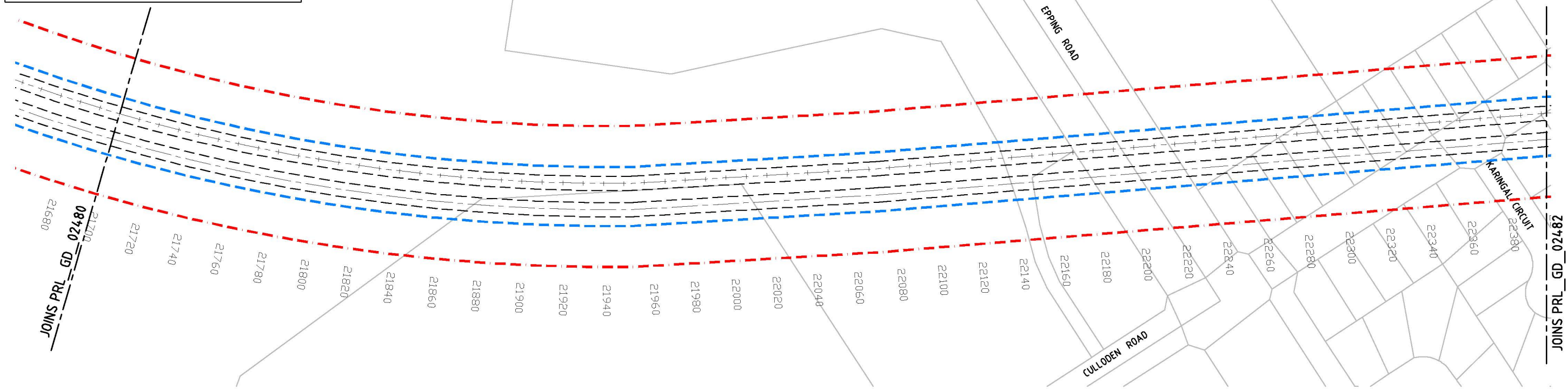
RAILCORP EDMS ID --		
ECRL DEVELOPMENT GUIDE LINES		
RAIL PROTECTION RESERVES PLAN SHEET 14 OF 20		
STATUS:	DRAWING NO:	REV:
FINAL	PRL GD 02480	B

02 Apr 08 - 17:11
PRL_GD_02481.dwg

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPDRT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	A.J.L.	CHECKED	J.J.A.
DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

CONTRACTOR:

DESIGNER:

MAUNSELL | AECOM

Mounsell Australia Pty Ltd
A.B.N. 20 093 846 925

CLIENT:

Transport Infrastructure Development Corporation

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 15 OF 20

STATUS: FINAL

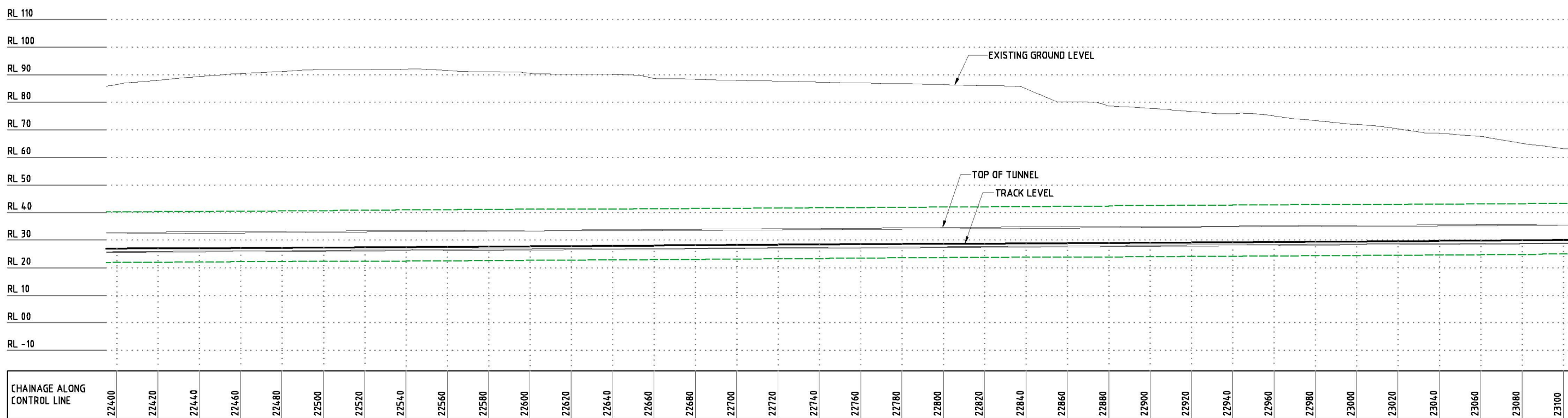
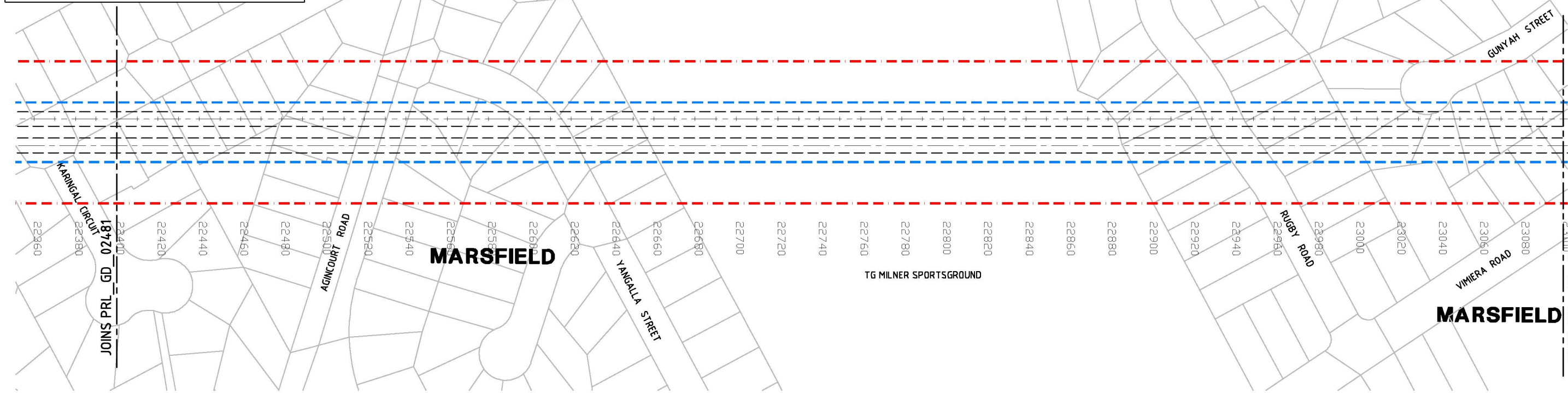
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REV: B

NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.

LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

CONTRACTOR:

DESIGNER: MAUNSELL | AECOM

Mounsell Australia Pty Ltd
A.B.N. 20 093 846 925

CLIENT: Transport Infrastructure Development Corporation

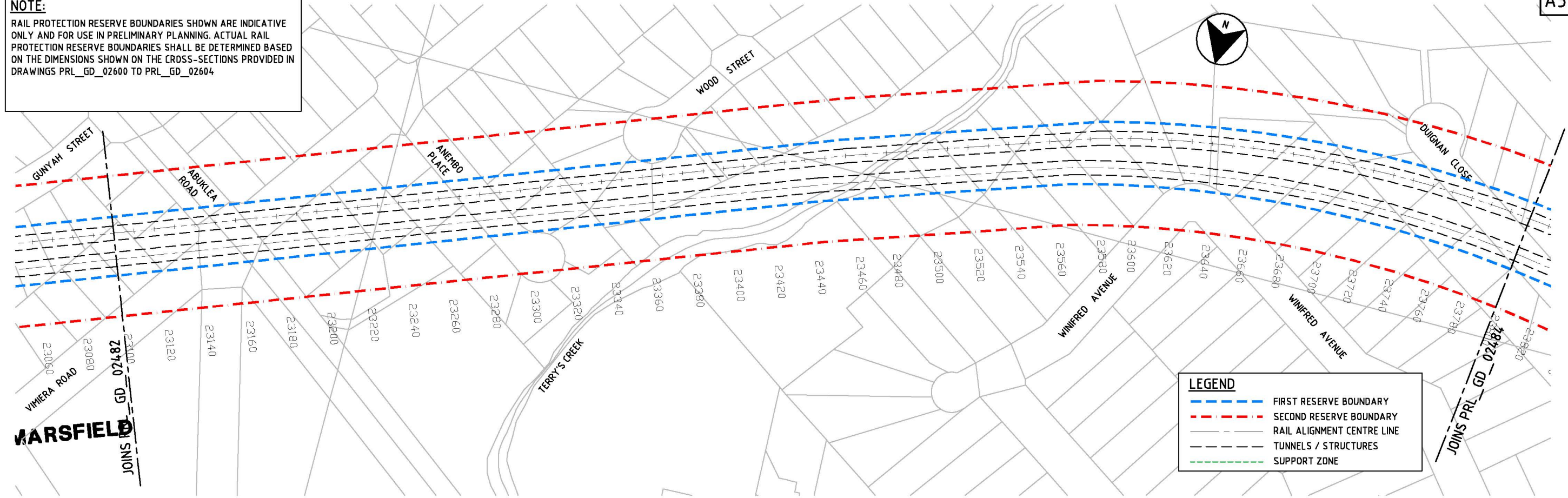
RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES PLAN SHEET 16 OF 20

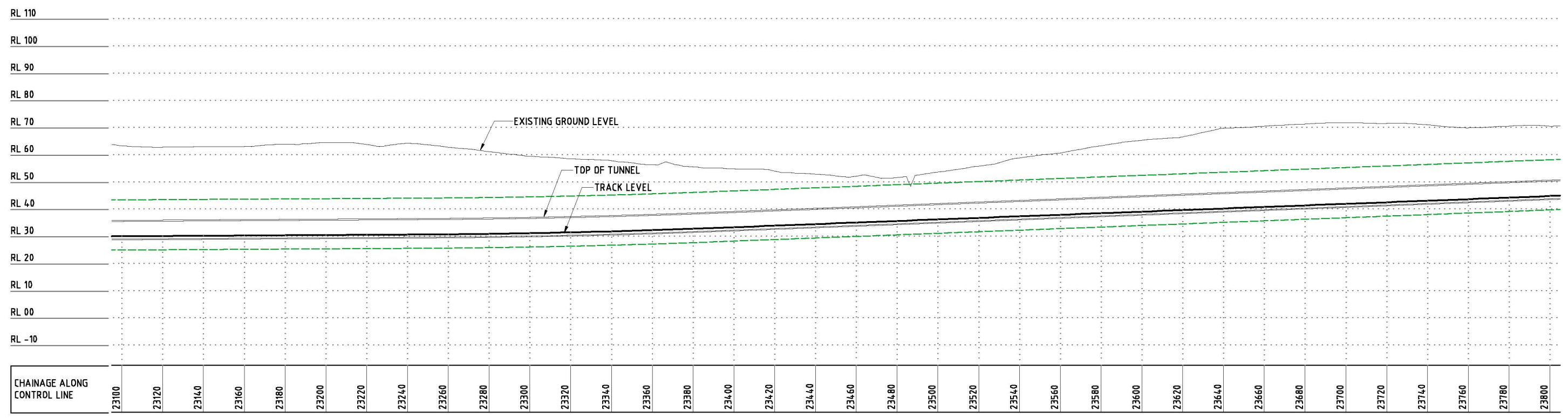
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NOTE:
RAIL PROTECTION RESERVE BOUNDARIES SHOWN ARE INDICATIVE ONLY AND FOR USE IN PRELIMINARY PLANNING. ACTUAL RAIL PROTECTION RESERVE BOUNDARIES SHALL BE DETERMINED BASED ON THE DIMENSIONS SHOWN ON THE CROSS-SECTIONS PROVIDED IN DRAWINGS PRL_GD_02600 TO PRL_GD_02604.



LEGEND

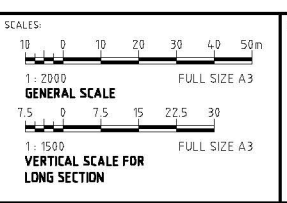
- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPORT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No.	BY	DATE	DESCRIPTION	APPD.
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED				CHECKED			
A.J.L.		J.J.A.		P.V.M.		A.J.L.	
APPROVED		DATE					
A.J.L.		DATE					



CONTRACTOR:

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CLIENT: Transport Infrastructure Development Corporation

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

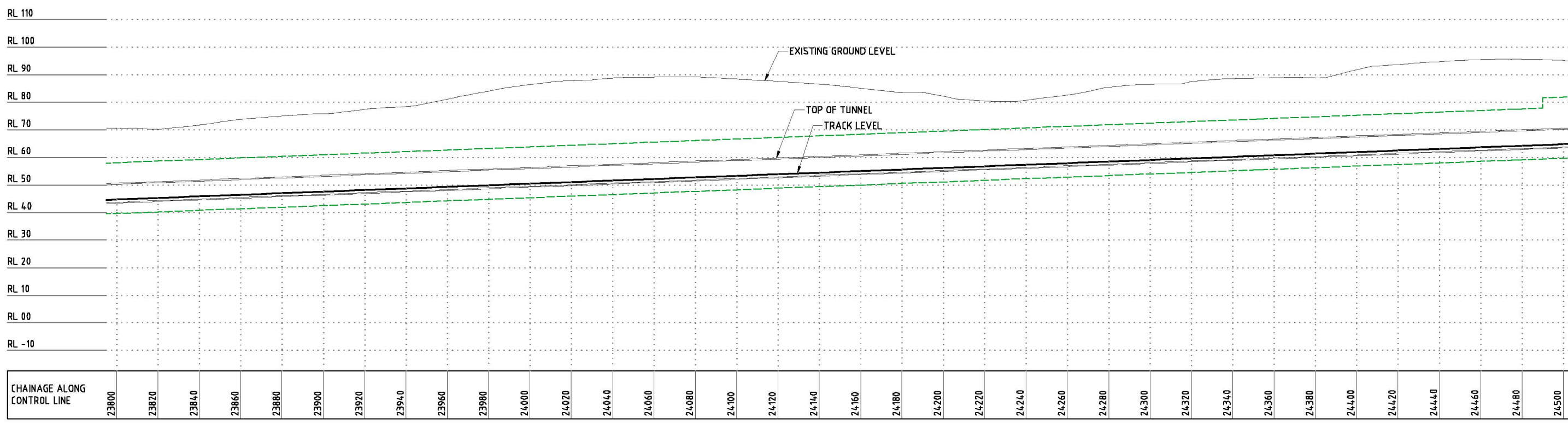
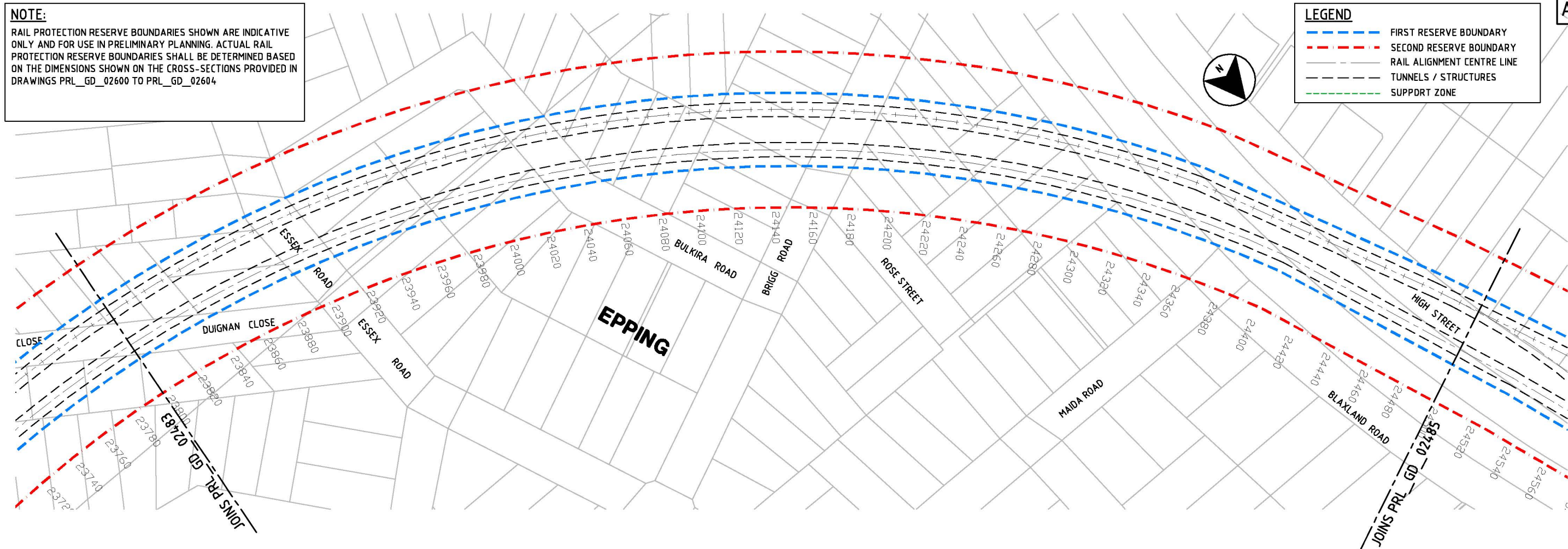
RAIL PROTECTION RESERVES PLAN SHEET 17 OF 20

STATUS: FINAL
 DRAWING NO: PRL GD 02483
 REV: B

NOTE:
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LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPRT ZONE

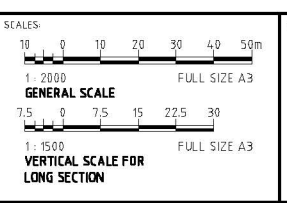


LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

B	DS	02.04.08	FINAL ISSUE
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT
No	BY	DATE	DESCRIPTION
			APPD

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DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	



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RAILCORP EDMS ID --

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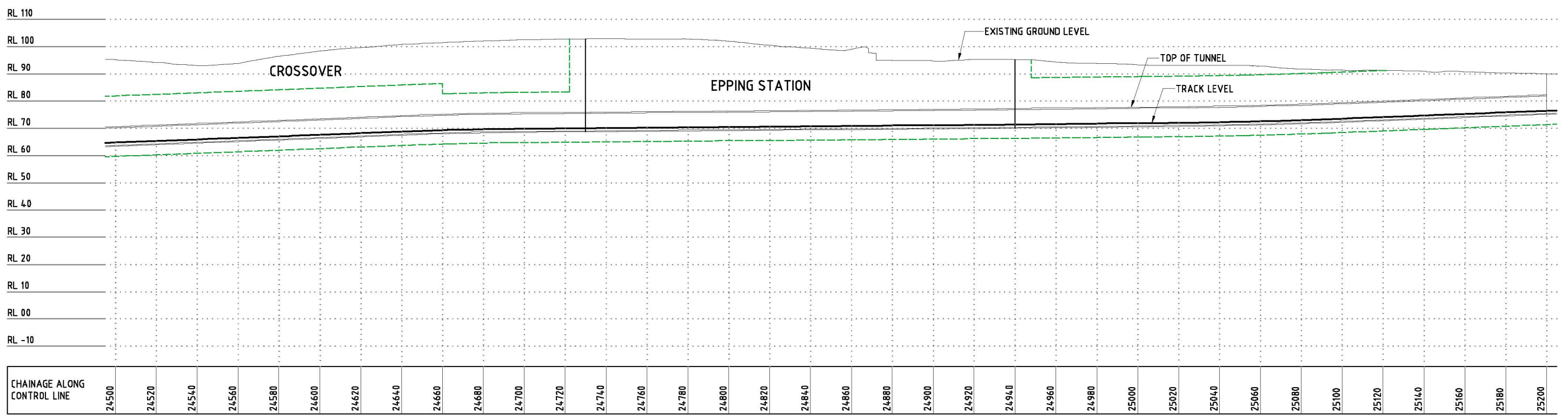
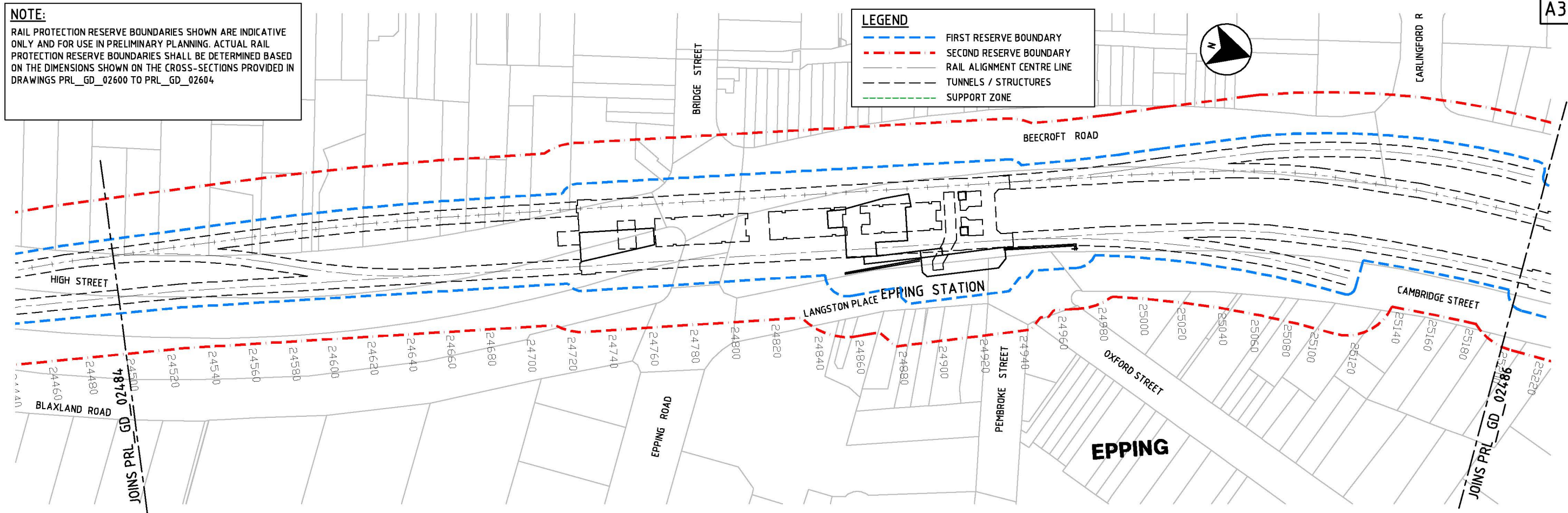
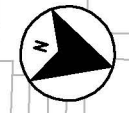
**RAIL PROTECTION RESERVES
PLAN
SHEET 18 OF 20**

STATUS: FINAL	DRAWING NO: PRL GD 02484	REV: B
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LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPORT ZONE



LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

DESIGNED	AJL	CHECKED	JJA
DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

SCALES:

1:2000 GENERAL SCALE FULL SIZE A3

1:1500 VERTICAL SCALE FOR LONG SECTION FULL SIZE A3

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DESIGNER:

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RAIL PROTECTION RESERVES PLAN SHEET 19 OF 20

STATUS:	FINAL	DRAWING NO:	PRL GD 02485	REV:	B
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Reference material - for information only

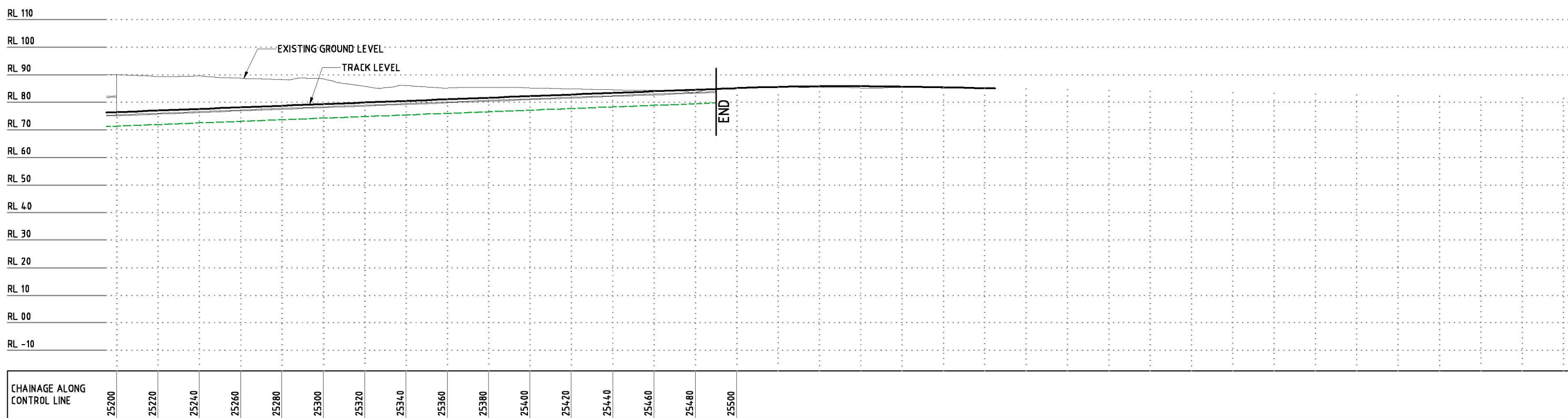
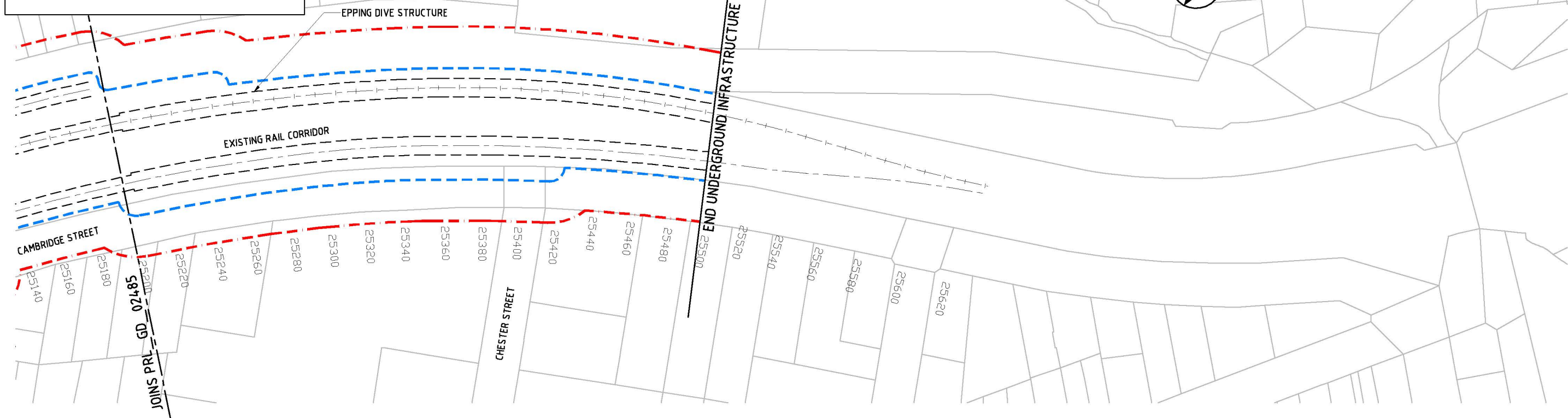
02 Apr 18 - 1713
PRL_GD_02486.dwg

NOTE:
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LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS / STRUCTURES
- SUPPORT ZONE

A3

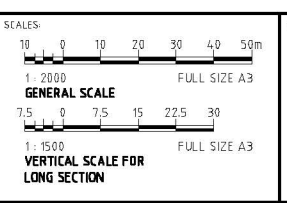


LONGITUDINAL SECTION DOWN TRACK DESIGN CENTRELINE

No	BY	DATE	DESCRIPTION	APPD
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A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



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RAILCORP EDMS ID --

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RAIL PROTECTION RESERVES PLAN SHEET 20 of 20

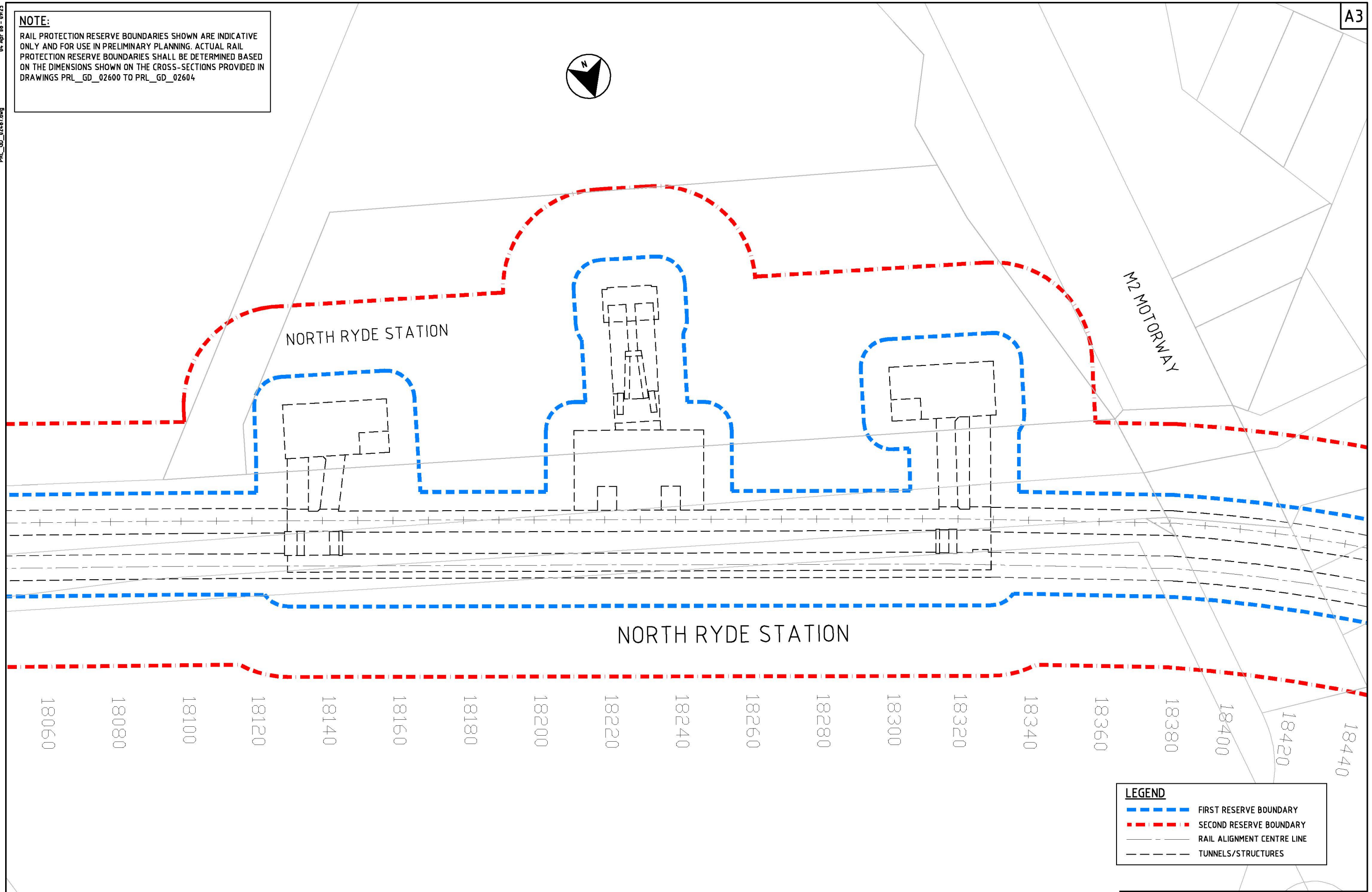
STATUS: FINAL	DRAWING NO: PRL GD 02486	REV: B
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PRL_GD_02487.dwg 04 Apr 18 - 09:25

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A3



LEGEND

- - - - - FIRST RESERVE BOUNDARY
- - - - - SECOND RESERVE BOUNDARY
- - - - - RAIL ALIGNMENT CENTRE LINE
- - - - - TUNNELS/STRUCTURES

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	

SCALES:
1:1000 FULL SIZE A3

CONTRACTOR:

DESIGNER:

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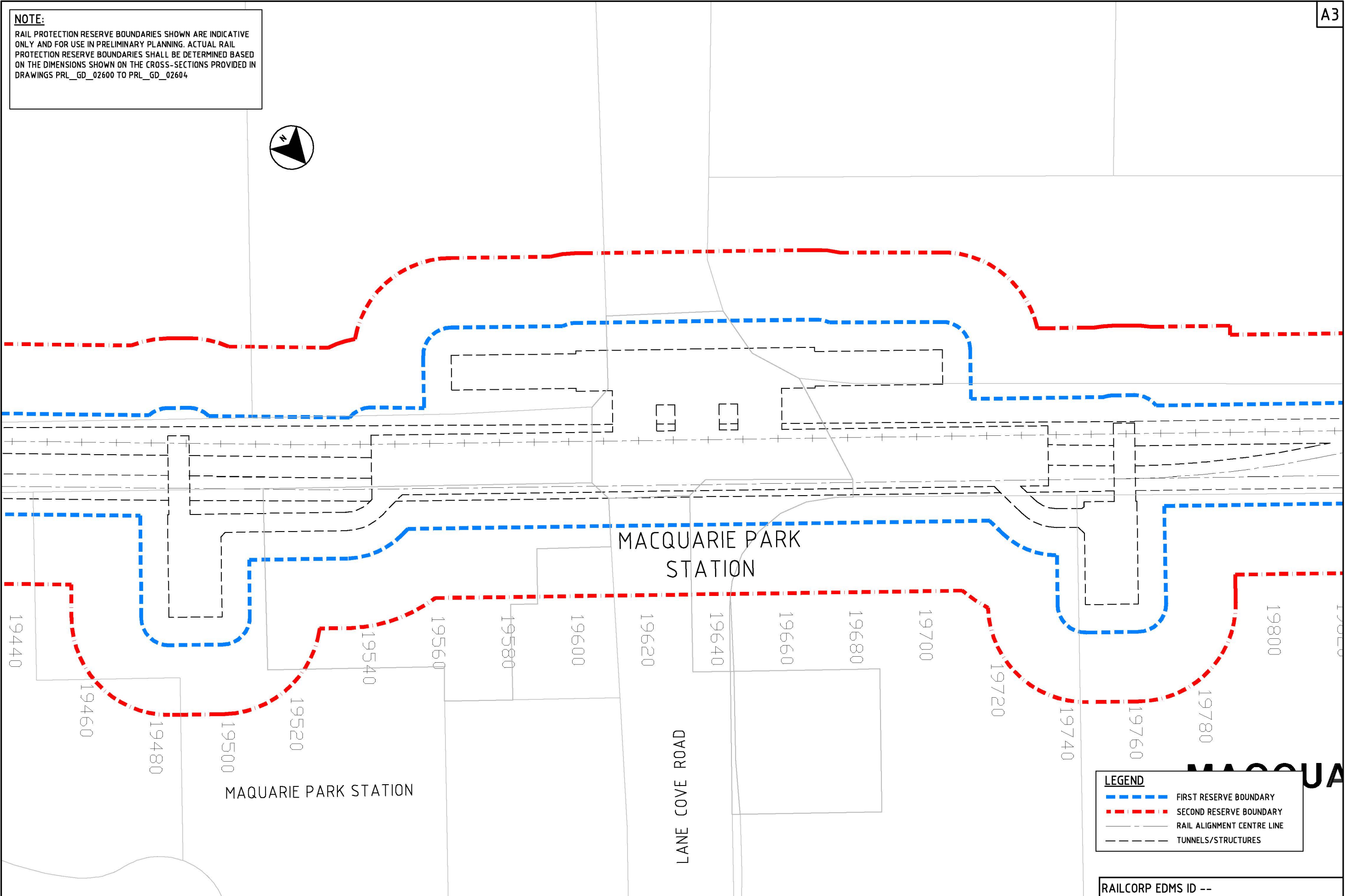
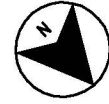
RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES NORTH RYDE STATION PLAN

STATUS:	DRAWING NO:	REV:
FINAL	PRL GD 02487	B

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LEGEND

- FIRST RESERVE BOUNDARY
- SECOND RESERVE BOUNDARY
- RAIL ALIGNMENT CENTRE LINE
- TUNNELS/STRUCTURES

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

**RAIL PROTECTION RESERVES
MACQUARIE PARK STATION PLAN**

STATUS: **FINAL** DRAWING NO: **PRL GD 02488** REV: **B**

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

SCALES:

1:1000 FULL SIZE A3

CONTRACTOR:

DESIGNER:

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HERRING ROAD

MACQUARIE UNIVERSITY STATION

MACQU

LEGEND

- - - - FIRST RESERVE BOUNDARY
- - - - SECOND RESERVE BOUNDARY
- - - - RAIL ALIGNMENT CENTRE LINE
- - - - TUNNELS/STRUCTURES

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

**RAIL PROTECTION RESERVES
MACQUARIE UNIVERSITY STATION PLAN**

STATUS: **FINAL** DRAWING NO: **PRL GD 02489** REV: **B**

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	

SCALES:

1:1000 FULL SIZE A3

CONTRACTOR:

DESIGNER:

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CLIENT:

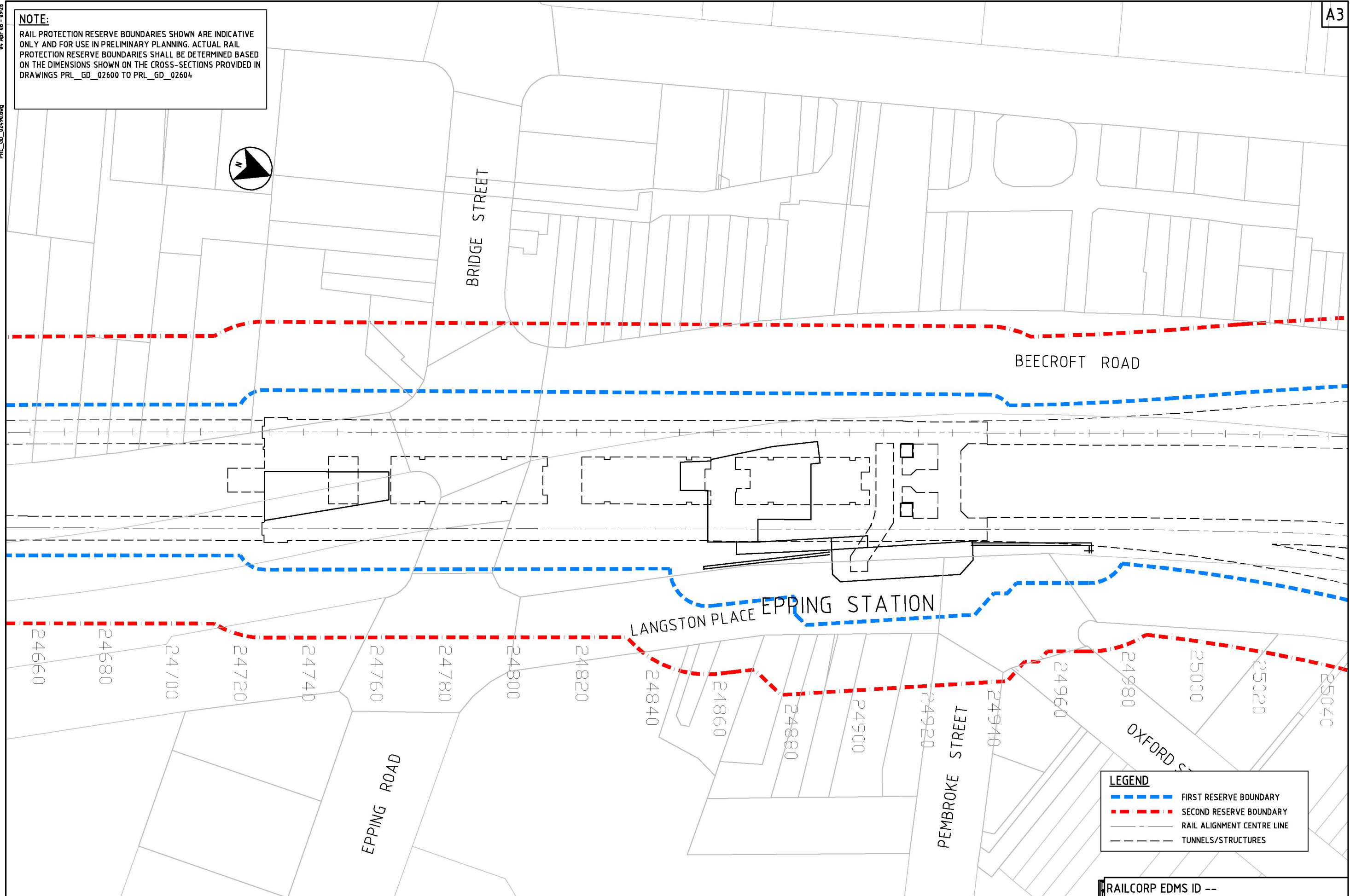
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PRL_GD_02490.dwg 04 Apr 08 - 0926

A3

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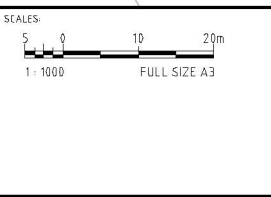


LEGEND	
	FIRST RESERVE BOUNDARY
	SECOND RESERVE BOUNDARY
	RAIL ALIGNMENT CENTRE LINE
	TUNNELS/STRUCTURES

No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
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DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



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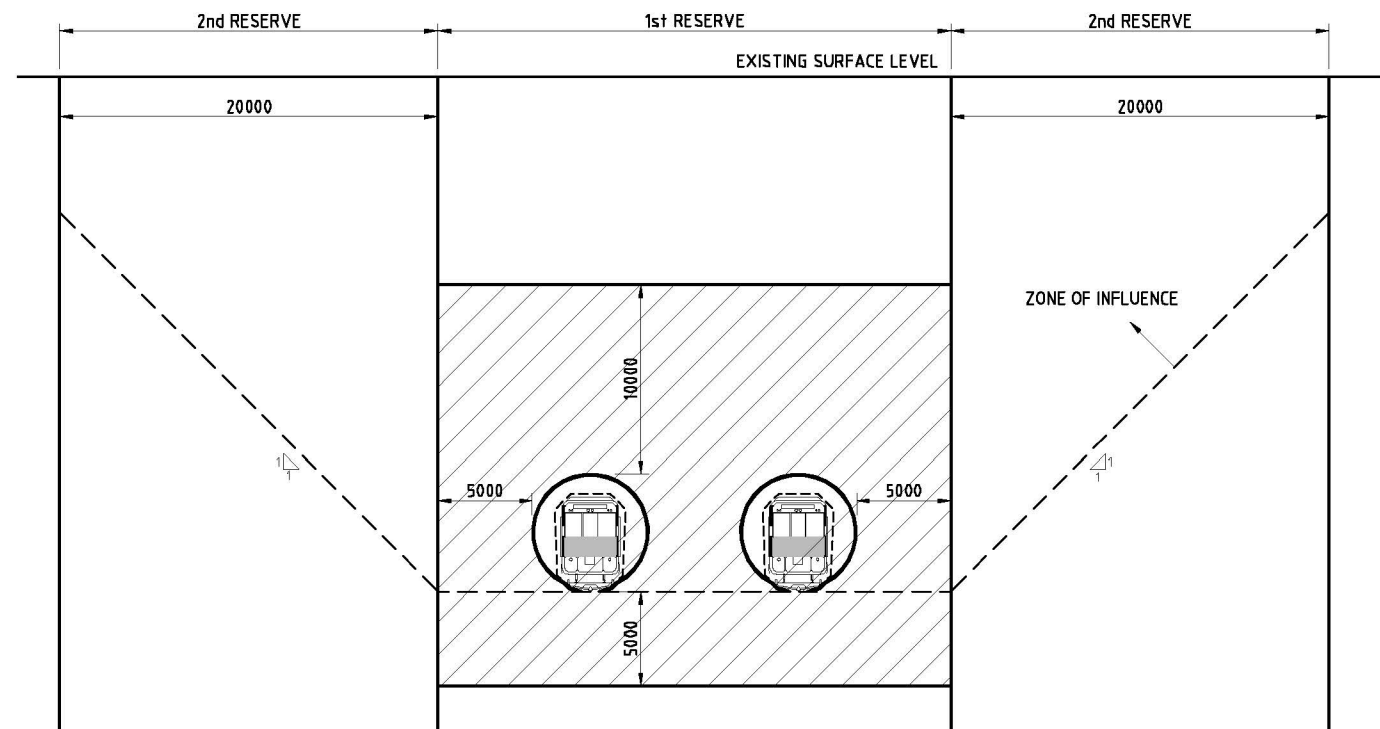
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RAIL PROTECTION RESERVES EPPING STATION PLAN		
STATUS:	DRAWING NO:	REV:
FINAL	PRL GD 02490	B




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 SUPPORT ZONE

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APPROVED	AJL	DATE	

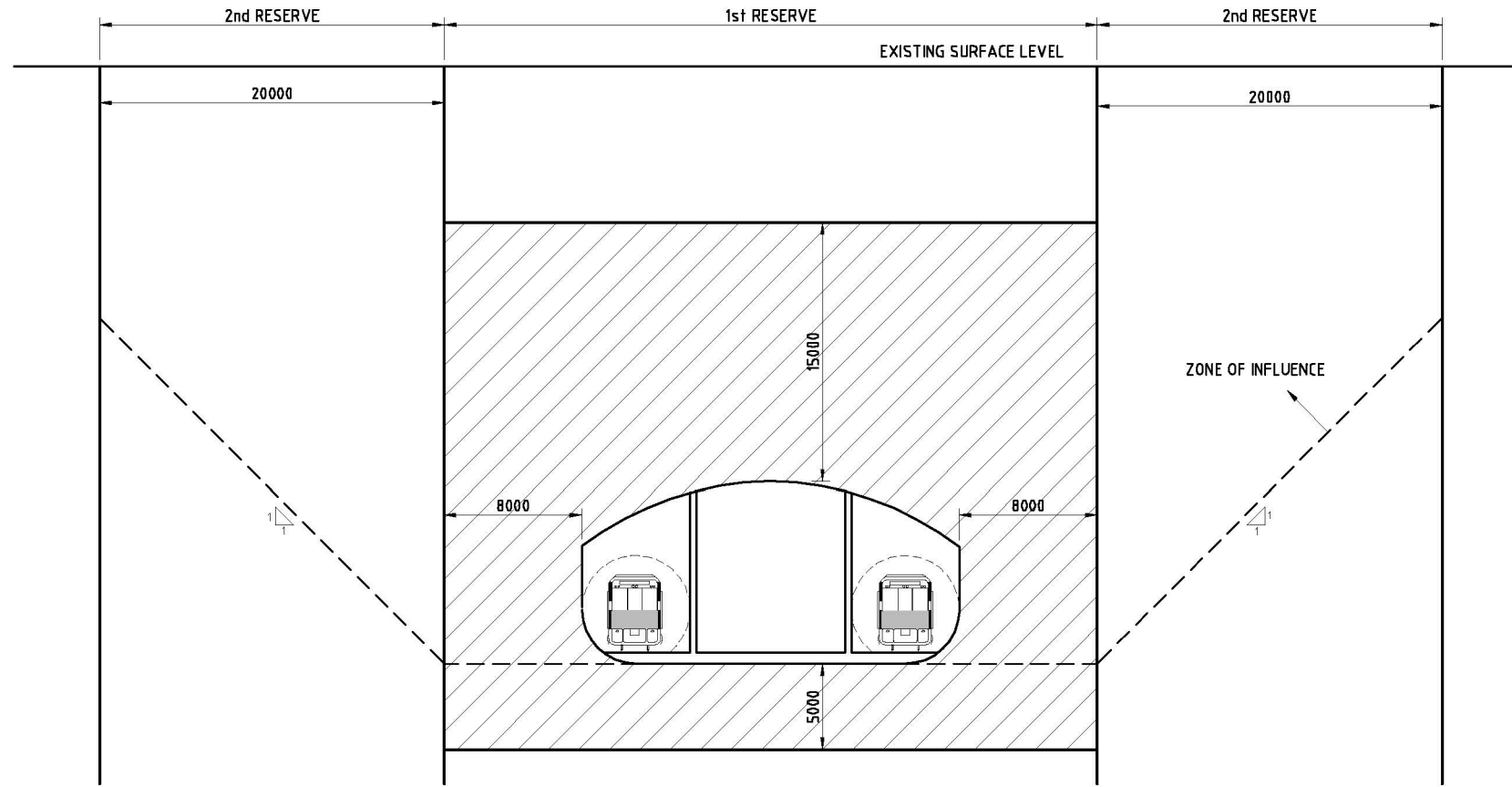
SCALES:

 1 : 4.00 FULL SIZE A3

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 ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES CROSS SECTION RUNNING TUNNELS		
STATUS: FINAL	DRAWING NO: PRL GD 02600	REV: B



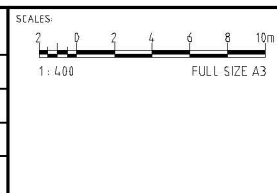
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No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	



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CLIENT:

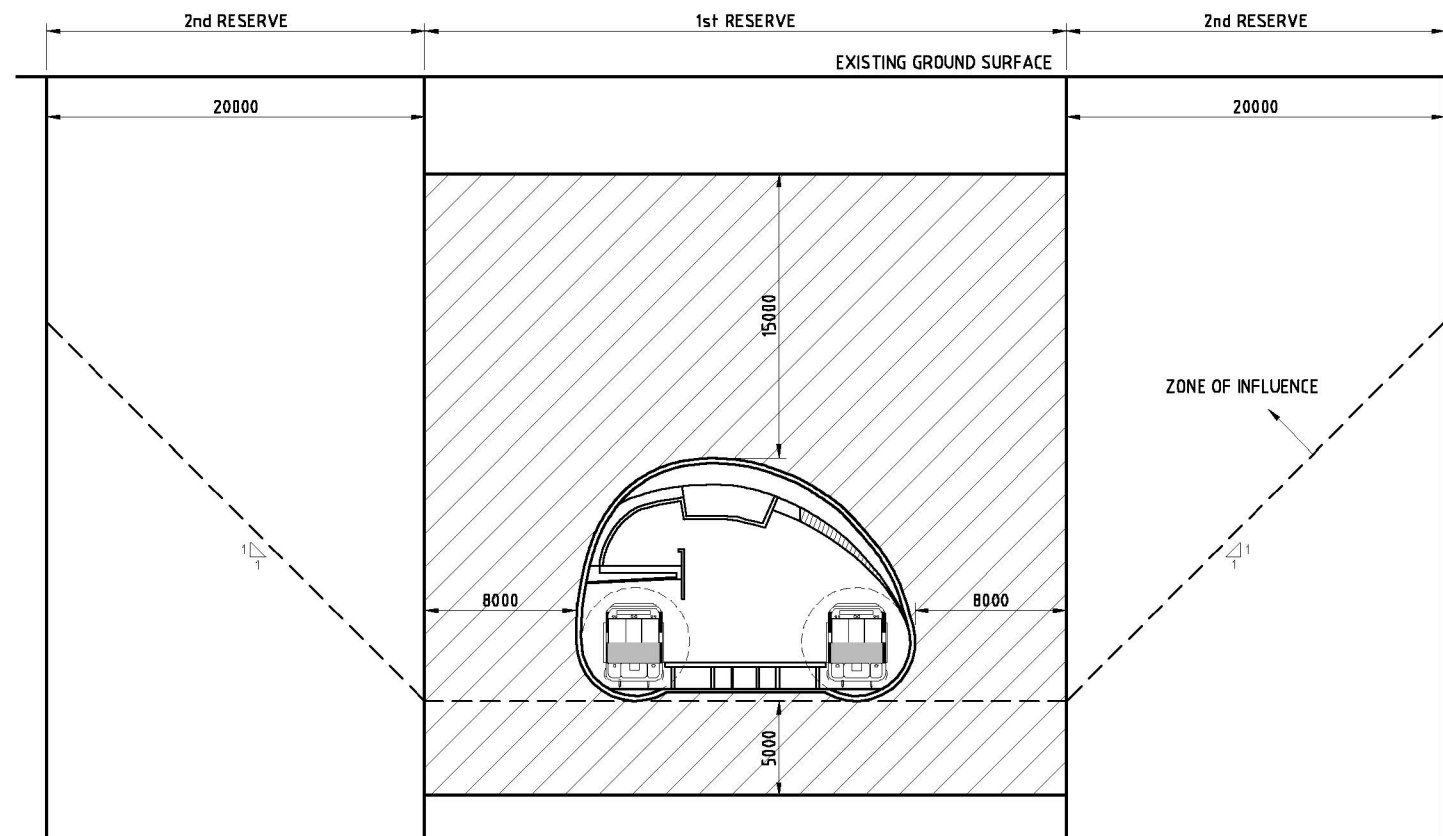
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Development Corporation

RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

**RAIL PROTECTION RESERVES
CROSS SECTION
CROSS OVER STRUCTURES**

STATUS:	FINAL	DRAWING NO:	PRL GD 02601	REV:	B
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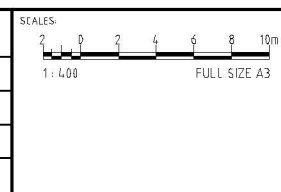
LEGEND



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B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	P.V.M.	CHECKED	A.J.L.
APPROVED	A.J.L.	DATE	



CONTRACTOR:

DESIGNER:

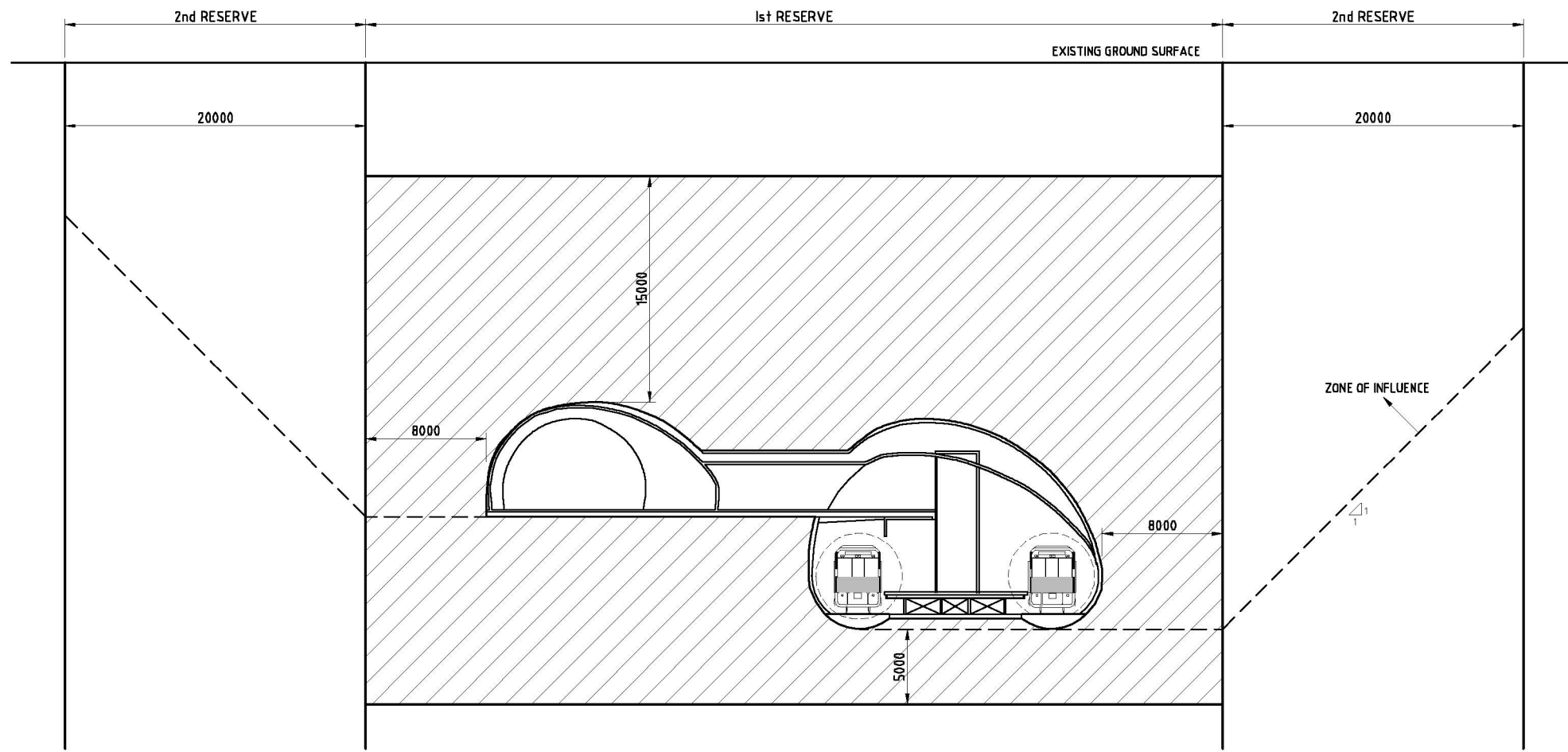
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ECRL DEVELOPMENT GUIDE LINES		
RAIL PROTECTION RESERVES CROSS SECTION PLATFORM CAVERNS		
STATUS:	DRAWING NO:	REV:
FINAL	PRL GD 02602	B



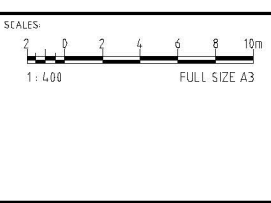
LEGEND



No	BY	DATE	DESCRIPTION	APPD
B	DS	02.04.08	FINAL ISSUE	
A	PVM	21.12.07	DRAFT ISSUE FOR REPORT	

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DRAWN	PVM	CHECKED	AJL
APPROVED	AJL	DATE	



CONTRACTOR:

DESIGNER:

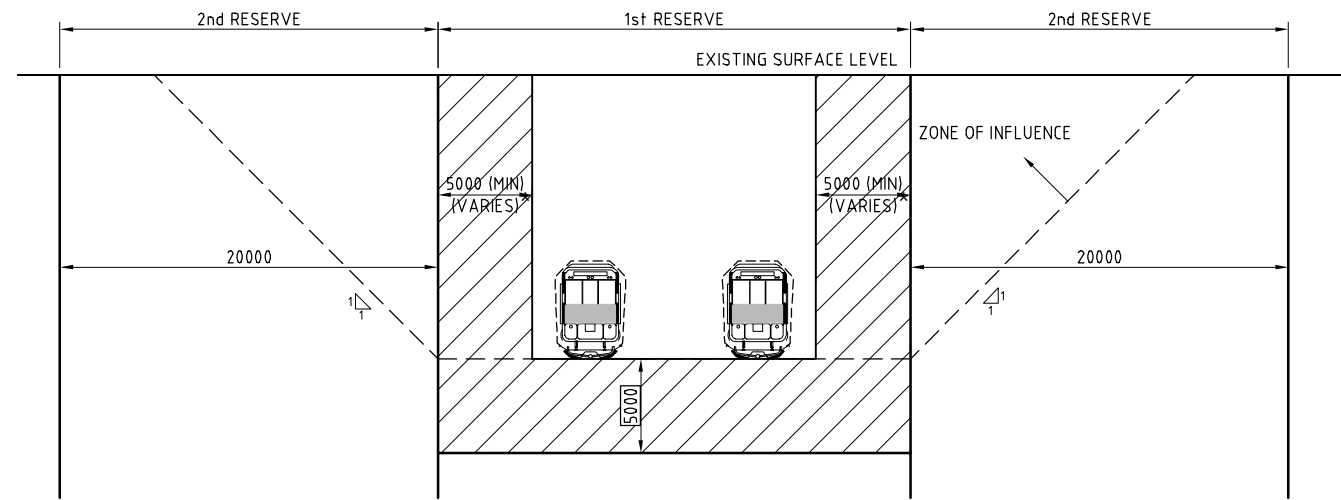
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ECRL DEVELOPMENT GUIDE LINES		
RAIL PROTECTION RESERVES CROSS SECTION STATION CAVERNS		
STATUS:	DRAWING NO:	REV:
FINAL	PRL GD 02603	B



* ANCHORS RANGE IN LENGTH FROM 3000 to 16000 AND THE VARIATION TO THE EXTENT OF THE 1ST RESERVE IS SHOWN ON THE PLAN WHERE RELEVANT

LEGEND



RAILCORP EDMS ID --

ECRL DEVELOPMENT GUIDE LINES

RAIL PROTECTION RESERVES
CROSS SECTION
CUT AND COVER AND DIVE STRUCTURES

STATUS:	FINAL	DRAWING NO:	PRL GD 02604	REV:	B
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B	DS	02.04.08	FINAL ISSUE	
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DESIGNED	A JL	CHECKED	J JA
DRAWN	P VM	CHECKED	A JL
APPROVED	A JL	DATE	



CONTRACTOR:

DESIGNER:

MAUNSELL | AECOM

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