



GUIDELINES

FOR

WORKING IN AND AROUND THE PTA RAIL RESERVE

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NETWORK & INFRASTRUCTURE		QUALITY SYSTEM AS/NZS ISO 9001:2008 SECTION 7	PAGE 1 of 31
APPLICABLE TO All Employees and Contractors Guidelines	COPY No.	DOCUMENT No. 8103-400-004	REV No. 3.00

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DOCUMENT HISTORY

REVISION No:	1.00	Reason For Revision Initial Document
DATE:	17 March 2010	
PREPARED By:	Acting Senior Projects Engineer M Jayabalan	
REVIEWED By:	Acting Manager Track & Structures R Davies	
AUTHORISED By:	Acting GM Network & Infrastructure K Stone	
REVISION No:	2.00	Reason For Revision Improved relativity to PTA Network and addition of further Electrical requirements
DATE:	06 February 2012	
PREPARED By:	Acting Senior Project Engineer M Jayabalan	
REVIEWED By:	Manager Track & Structures R Davies, Electrical Engineering Manager F Bahadori	
AUTHORISED By:	General Manager N & I Kim Stone	
REVISION No:	3.00	Reason For Revision Minor grammatical and formatting changes
DATE:	23 March 2012	
PREPARED By:	Acting Senior Project Engineer M Jayabalan	
REVIEWED By:	Manager Track & Structures R Davies, Electrical Engineering Manager F Bahadori	
AUTHORISED By:	General Manager N & I Kim Stone	
REVISION No:		Reason For Revision
DATE:		
PREPARED By:		
REVIEWED By:		
AUTHORISED By:		
REVISION No:		Reason For Revision
DATE:		
PREPARED By:		
REVIEWED By:		
AUTHORISED By:		
REVISION No:		Reason For Revision
DATE:		
PREPARED By:		
REVIEWED By:		
AUTHORISED By:		

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REFERENCES

- 8110-800-089 PROCEDURE FOR HIGH VOLTAGE POWER LINES CROSSING PTA
INFRASTRUCTURE IN THE PERTH URBAN AREA
8140-800-228 GUIDELINES FOR EARTHING AND BONDING IN THE 26KV AC ELECTRIFIED
AREAS
8110-800-016 SECTION 5 – SAFETY INSTRUCTIONS FOR THE ELECTRIFIED AREA

Note: copies of the above are available from PTA on request

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INTRODUCTION

Rail Safety

The Perth Metro Railway electrified environment is a very dangerous place at all times.

To ensure the safety of public and railway personnel it is imperative that all the relevant Rail Safety Act, Regulations and PTA Electrical requirements are complied with when accessing or working within the limits of the PTA's rail reserve and structures as set out in this document.

Legislation specific to railway controls working in and around the rail reserve imposes different, and in some cases higher, standards than would otherwise apply to general construction work.

Access to the rail reserve and working near PTA's infrastructure is only permitted when PTA is satisfied that adequate safety precautions are in place and PTA has approved such access and all relevant legislation and regulations are complied with.

It is an offence for individuals or organisations to access the rail reserve or interfere with PTA's assets (including gates and fences) without PTA's permission.

Do I need to follow this guide?

This guide is for anyone who wants to gain access into or work on or near PTA's railway tracks, infrastructure or property. Even work that appears small, like painting a fence backing onto the railway, may require you to obtain PTA's permission. This guide highlights what you need to address under the relevant rail safety act and legislation and PTA Electrical requirements.. It will also help you ensure safety is maintained and it describes how you can make it easier for PTA to process your application.

How is this guide arranged?

There are 5 parts to this guide and 5 appendices:

- Part 1 – This guide
- Part 2 – The application process
- Part 3 – Checklist of PTA's requirements
- Part 4 – How the railway can impact on your project
- Part 5 – Documents to be submitted

- Appendix 1 - PTA Protection Zone
- Appendix 2 - PTA Contact Details
- Appendix 3 - Technical Guidelines for Protection of PTA Tunnels and Underground Structures

How do I decide if my project is affected?

Read Part 1, then work through the checklist in Part 3. By doing this you will create a list of things you will need to address to get permission to carry out your work on or near the railway.

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What if I'm not sure if my project affects PTA?

If you are uncertain if your project requires PTA approval, please contact PTA (see Appendix 2). There is no charge for your initial enquiry. In many cases PTA staff can advise you how to carry out your works so that the application process can be simplified.

How do I get PTA to accept my project?

When you have completed the checklist in Part 3, contact PTA (see Appendix 2). Your answers to the checklist will help PTA staff decide how to best manage your project application. We will then work with you to ensure the best outcome.

PART 1 – THIS GUIDE

1.1 - About this guide

The PTA has prepared this guide to help owners, designers and builders of third party facilities to design, plan and perform work in and around the rail reserve.

The guide provides general information about PTA's requirements and processes for assessing third party work in and around rail reserves. You need to discuss all proposed work with PTA to achieve site-specific solutions.

The PTA has Network Rules and Appendix to Network Rules, procedures and guidelines that provide detailed information on its specific requirements. These Network Rules and procedures take precedence over this guide.

Be aware that local conditions or future changes to PTA infrastructure may mean that although projects comply with this guide they may not be accepted by PTA.

If your project does not meet the requirements of this guide, you may ask PTA to work with you to develop acceptable solutions. PTA may in these cases vary particular requirements at its absolute discretion.

Part 3 of this guide provides a checklist for you to assess if your project requires PTA approval. Once you have completed the checklist please contact PTA to discuss your project and obtain an application package to allow you to begin the formal PTA assessment process.

Part 4 of this guide provides information on how a railway may affect your proposals.

Where PTA accepts proposals for your works it will document its agreement with you.

Whilst PTA will not charge you a fee for processing your application, PTA will require you to provide, at your cost, any expert reports that may be prescribed in this guide or in the conditions attached to PTA's approval of your application.

If you ignore this guide or cause (or have the potential to cause) damage or affect rail operations, PTA may direct you to carry out repairs or cease work (stop work notice) and recover its costs from you. You may also be liable for prosecution under the rail safety legislation or associated regulations.

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1.2 - Definitions used in this guide

This guide uses the following definitions.

Applicant: The person or party proposing the facility or work.

Approve/al: The process by which PTA reviews your proposal and determines if the impact on Rail operations is or is not acceptable.

Building elements: Part or whole of a building or structure including roof, wall, foundation and associated structure (e.g. communications tower, lighting mast).

Council: The Local Government Authority (LGA) within whose jurisdiction the development is proposed.

Consent Authority: The council or the Department of Planning, or a public authority or permit authority having the function to determine a development application, building permit or demolition permit.

Deed: A legally binding agreement between you and the PTA in relation to your proposed works or property.

Facilities: the building elements, services or structures that you are proposing to build, demolish or modify.

Network Rules: The Network Rule and Appendix to the Network Rules are documents which contain all the safe working rules and instructions for the safe operation of Trains on the Public Transport Authority Network.

Piezometric pressure (pore pressure or pore water pressure): the pressure in the groundwater (kPa) in soil pores at a point in the soil profile.

PTA: Public Transport Authority of Western Australia.

PTA facilities: means those facilities that are necessary to enable a railway to operate safely and includes, but is not limited to, railway track, railway stations, associated track structures, tunnels, bridges, civil works (including drainage, earthworks and tunnels), platforms, signalling systems, train control systems, communication systems, overhead traction wiring equipment, substation, feeder stations, track sectioning cabins, conduits, ducting, cable, cable support structures, buildings (including buildings used for administrative purposes), workshops and associated plant, machinery and equipment.

PTA Protection Zone: An area within which activities have the potential to affect rail infrastructure and operations. As a general rule, the PTA Protection Zone boundary is:

- (a) in respect of a PTA tunnel or underground structure, 30 metres outside the outer surface of the PTA tunnel or underground structure, but it encompasses the whole of any lot where any part of a lot lies within the 30 metre distance;
- (b) in respect of PTA facilities at ground level, within 50 metres of a rail reserve boundary, except that where the proposed Works involve construction of a development or infrastructure over 15 storeys height or 50 metres above ground level, then the Protection Zone extends to 100 metres away from a railway boundary.

This is described in more detail in Appendix 1

Rail Reserve: The land owned or otherwise managed and controlled by PTA. It includes easements across other land that accommodates essential rail infrastructure or where a railway is located within a freeway reserve, the land within the freeway barrier used solely for operation of a railway.

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Services: Underground and above ground pipelines and cables carrying utilities such as electricity, water, gas, telecommunications and signalling.

Structures: Include the following:

- Underbridges, including culverts
- Overbridges
- Footbridges
- Overhead traction wiring equipment and signal gantries
- Tunnels, dive structures and underground stations
- Retaining walls
- Air space developments
- Platforms
- Overhead loading structures

Work/s: Any activities including mining excavation or travel within the PTA Protection Zone. This includes the demolition, construction, refurbishment, maintenance or extension of any public or private infrastructure within 50 metres of a rail reserve boundary and any infrastructure over 15 storeys or 50m height up to 100 metres away from a rail reserve boundary.

You/third party: A person or organisation that is not part of the rail industry that seeks to construct, maintain, operate or remove a Facility in or near to the rail reserve or that seeks to otherwise gain access to the rail reserve.

1.3 - What work and facilities does PTA need to review and approve?

Generally, the following Work and Facilities will require PTA's review and approval:

ALL work in the PTA Protection Zone including:

- **Above 15 storeys (50 metres)** from the ground **and within 100 metres** of the rail reserve.
- **Within 50 metres** from the rail reserve.
- **Tunnels and excavations within the PTA Protection Zone** (within 30m from outside of tunnel walls) or infrastructure (including mining).
- **Work and access within the rail reserve.**

If these do not apply to your proposal you will not need PTA's approval. For example, if you are erecting a 10 storey building 60m from the rail reserve, you do not need PTA's approval.

PTA's approval does not comprise a check of your designs or work methodology and PTA does not assume any risk or liability for your Work.

1.4 - Who in PTA should I contact with enquiries?

To find out if your activities require PTA's review and approval contact the Network and Infrastructure Division (see Appendix 2, back of this guide).

The staff there can help you with your questions and application.

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PART 2 – THE APPLICATION PROCESS

The following describes in detail the process and steps that apply to most requests PTA receives from third parties to carry out work in and around the rail reserve. Please note that the work associated with the design review and work planning varies significantly depending on the complexity of the proposal and local site conditions.

Step 1: Your initial enquiry and PTA's review of your Development Application

When you plan to undertake works you will, in many cases, be required to submit a development application (DA) to a Consent Authority. This Consent Authority may be a local council, the Department of Planning or another public authority. Depending on the nature of your work, you may need to apply for a building permit or demolition permit also, either from the Council or other permit authority provided for under the *Building Act 2011*.

If what you intend to do may impact on PTA's activities or infrastructure, the Consent Authority will normally ask PTA to review the DA or building permit/demolition permit.

PTA then informs the Consent Authority of its general requirements. These usually include a requirement for you to obtain PTA's Approval for your proposals.

It is recommended that you seek PTA's early input into the design process. This will minimise your costs and time if your DA needs to be amended to incorporate PTA's requirements.

PTA will provide you with information on location of its structures on plans it has available. Whilst every effort is made to ensure the information is correct, the PTA does not warrant its adequacy or completeness and expressly disclaims liability for any errors or omissions.

Even if your Works would not normally require you to submit a development application to a Consent Authority, you will still need to apply to PTA for prior Approval where you intend to undertake:

- (a) ground investigation works within the PTA Protection Zone;
- (b) any excavation, dewatering or recharge within the PTA Protection Zone including those for underground services, utility trenches or directionally drilled service conduit works; or
- (c) any work requiring installation of electrical conductors across the electrified railway reserve .

Step 2: Register your application with PTA

PTA's Network and Infrastructure Division will provide you with information and documents with which to register your application. In registering, you must provide the Network and Infrastructure Division with the following:

- (a) a contact person to discuss the application or project;
- (b) a completed registration form;
- (c) an address at which your project will take place along with a street map of the location;
- (d) a brief description of your proposed works; and
- (e) key dates (including desired start and finish dates).

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Step 3: Preliminary review by PTA

PTA carries out a desktop study of your application and provides you with:

- (a) "in principle" acceptance or rejection of your application; and
- (b) an indication on how long PTA needs to deal with the design and prepare an agreement contract.

Generally, this process requires 2 to 4 weeks.

Step 4: Design and works planning review by PTA

This begins when you, the applicant, accept the outcome from the preliminary review. The design and works planning review generally takes around 4 to 6 weeks.

This review is limited to those aspects of your project that may affect the rail reserve. PTA is not generally interested in work and activities which have no potential to affect rail safety, structures, overhead traction wiring equipment, traction power earthing and bonding systems or operations.

To begin this detailed review, you need to provide the design, construction plans and supporting information required by PTA.

After the design and works planning review, PTA will give you:

- (a) a final written acceptance or rejection of your proposed facility or work;
- (b) PTA's conditions and requirements for your project to proceed;
- (c) information about when and how your work is to fit in with PTA's activities;
- (d) PTA's estimated costs for supervision and installation of work in the rail reserve where PTA is required to carry these out (including your construction, use and maintenance of the site and ensuring you apply appropriate work site protection procedures where these affect rail);
- (e) the estimated costs to you of any (PTA required) changes to the PTA facilities to accommodate your project;
- (f) if required by PTA, a deed confirming your rights and associated terms (negotiated and signed by your authorised representative) including details of the indemnities, bonds and insurances you need to provide; and
- (g) ongoing inspection, maintenance and removal arrangements for your facility or work (to be agreed with you).

PTA will assess each application to determine its impact on existing PTA facilities and to ensure PTA's technical requirements including those relating to tunnels and underground structures in Appendix 4 are met. PTA may refuse your application, or may approve it, with or without conditions (which may include a requirement for indemnities and bonds/guarantees).

Where PTA approves an application, it will always be conditional on the applicant or developer, as the case may be, allowing authorised PTA persons to enter your building site within the PTA Protection Zone to monitor the works for compliance with these guidelines, the documents you submitted and the conditions of PTA's approval.

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Step 5: Site works

This begins after the design and works planning review and when the work in the rail reserve is required. Once again PTA is only interested in those aspects of your project that may affect rail safety, structures or operations.

To start this step you need to:

- (a) sign and return any deed required by PTA at Step 4 above, confirming the details, such as access rights, agreed with PTA (required before work can start);
- (b) pay PTA's estimated costs in advance (if applicable) for any change to PTA facilities affected by your Works, including any bonds or bank guarantees;
- (c) provide details of construction proposals for review and approval by PTA, details would typically include:
 - i. a program of works to be undertaken;
 - ii. project safety management plan (as required by OH&S legislation);
 - iii. a site specific safety plan (SSSP);
 - iv. safe work method statements (SWMS);
 - v. an emergency event plan;
 - vi. a plan of any temporary works you are undertaking;
 - vii. details of scaffolding, temporary access, vehicles, plant and equipment including cranes operating in and close to the rail reserve;
 - viii. a condition survey of existing buildings, structures, infrastructure and services (if required);
 - ix. a boundary/site survey (if required);
- (d) develop a plan, in consultation with PTA, that explains how you will maintain the product of your Work into the future;

Before work can begin you must obtain from PTA:

- (a) a written acceptance or rejection of your proposed activity;
- (b) details of PTA's conditions and requirements for your site work to proceed;
- (c) information on when and how your work is to fit in with PTA's activities; and
- (d) worksite supervision where Work is required in the rail reserve.

Step 6: Completion of your work

On completing your work you must allow PTA to inspect the completed work. PTA can then give you formal acceptance of your work. The inspection is to take place at both practical completion and before any construction warranties expire (or before the end of any defects liability period).

You must provide "as-built" information to PTA and deal with any issues arising during construction.

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PART 3 – CHECKLIST OF PTA’S REQUIREMENTS

The following describes the process used by PTA to decide if it can accept your proposal.

The following work and facilities MAY affect PTA facilities, namely all work in the PTA Protection Zone including work:

- above 15 storeys (50m) from the ground and within 100m of the rail reserve;
- within 50m from the rail reserve;
- tunnels, dewatering, recharge and excavations; or
- work and access within the rail reserve.

If these do not apply to your proposal you will NOT need PTA’s approval.

For example, if you are erecting a 10 storey building 60m from the rail reserve you do not need PTA’s Approval.

If your proposals MAY affect PTA facilities

If the tests noted above indicate that your proposal MAY affect PTA facilities then the checklist below helps you identify those aspects of your proposals that you will need to **discuss and agree with PTA**.

Does your proposed work meet PTA’s requirements?

If the tests noted above indicate that your proposal MAY affect the PTA facilities the following checklist helps you identify those aspects of your proposal that you will need to discuss and agree with PTA.

Work through the checklist and tick the appropriate “YES” or “NO” boxes in the right hand column.

Generally:

YES	This aspect of your project MAY affect the railway. The checklist provides details of what will generally be required to satisfy PTA. You are required to agree an acceptable solution with PTA for your specific project.
NO	This aspect of your project should not affect the railway and you will not be required to agree this with PTA.

When general solution from checklist is NOT acceptable to PTA

Sometimes PTA cannot accept the general solutions identified within the checklist. This may be because the proposed project is unusual or because local conditions prevent the general solution being adopted. In these cases PTA can work with you to develop a solution that meets your requirements and is acceptable to PTA.

Occasionally PTA receives requests from 3rd parties that it cannot accept and for which alternatives are not available. They may be technically impossible (PTA’s decision) or simply uneconomic (generally an applicant’s decision).

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3.1 Do you need PTA approval for your project?	YES	NO
All work in the PTA Protection Zone		
<input type="radio"/> Will you be working or installing facilities or carrying out maintenance work within the rail reserve? OR		
<input type="radio"/> Is your work above 15 storeys (50m) from the ground AND within 100m of the rail reserve? OR		
<input type="radio"/> Is your work within 50m of the rail reserve? OR		
<input type="radio"/> Are you working within the PTA Protection Zone (refer Appendix 1)?		

YES Complete the checklist below and contact PTA (Appendix 2) to discuss registering your proposals and beginning the PTA approval process.

NO Your project does not require PTA assessment and you do not need to address the checklist below.

If ALL questions in 3.1 produce a “NO” your project will not affect rail and you do not need to complete the remainder of this checklist. If ANY questions in 3.1 produce a “YES” then you should complete ALL the remainder of this checklist to identify those particular aspects of your work that will need to be agreed with PTA.

3.2 Are you working within or near a rail reserve boundary?	YES	NO
<input type="radio"/> Is your work inside the rail reserve? OR		
<input type="radio"/> Is your work within 2m of the rail reserve fence/boundary?		

YES Provide PTA with an identification survey. This is a precise survey of the area in which you propose to work. It gives the location of your work in relation to the rail reserve boundary and rail infrastructure. The survey is to be undertaken by a registered surveyor and be conducted to PTA’s requirements.

NO This aspect of your project does not require PTA assessment.

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3.3 Are you working or building over and near rail tunnels?	YES	NO
<input type="checkbox"/> Is your work inside the PTA Protection Zone (Refer Appendix 1)?		
YES	You need to ensure your construction work methods are included in the design process. Your work methods must also be designed, staged and monitored to avoid damage to the railway. PTA must review and accept your work method statements. Before commencing work within 30m of a tunnel, a monitoring system acceptable to PTA must be in place. Any damage to PTA facilities during execution of your work is to be repaired to PTA's requirements (at your cost). A joint condition survey with PTA is to be carried out before you start work. Please also refer to Appendix 3– Technical Guidelines.	
NO	This aspect of your project does not require PTA assessment.	

3.4 Are you developing the air space in and around the rail reserve?	YES	NO
<input type="checkbox"/> Are you developing airspace in and around the rail reserve?		
YES	Airspace developments (high rise) over and near the rail reserve create significant operational and safety issues for the railway. You must discuss your proposals with PTA on a case by case basis as local conditions will determine PTA's requirements.	
NO	This aspect of your project does not require PTA assessment.	

3.5 Under bores and services in the rail reserve?	YES	NO
<input type="checkbox"/> Are you seeking to install ducts or services over, under or within the rail reserve?		
YES	Contact PTA with details of your proposals. PTA addresses under bores and services in the rail reserve on a case by case basis but taking into account the Technical Guidelines attached at Appendix 34. In addition to Appendix 3, the following will help you understand PTA's general approach to this kind of work. Crossing Direction: - PTA prefers right-angle crossings to the track. Track Clearances: - No services are permitted within 1.6 metres of the underside	

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of tracks. This is to avoid loading service ducts or creating soft spots below the track. PTA generally installs its own services within a one-metre band between 1.6 and 2.6 metres. PTA generally seeks a minimum 1m clearance between its services and others' services plus a margin of error to avoid conflicts and damage when services are installed or repaired. PTA prefers your services to be below 4m and normal to the track.

OHTWE Clearance: - No services or boring within 5 metres from either side of a mast, portal or a pad mounted Booster transformer and 3 metres from back of a mast or portal. Any wiring above the OHTWE must comply with procedure referred to in Appendix 6[w1]

Rail reserve access: - Most under crossings require access pits for drilling or jacking equipment. PTA recommends these be located outside the rail reserve. If your work is outside the rail reserve, and staff are not required to access the reserve, it is usually possible to avoid strict compliance with PTA's safe-working rules (which is generally costly and causes delay). Locating pits outside the rail reserve also facilitates easier future inspections and maintenance.

Clearances to rail cables, pipes and structures: - These are dealt generally elsewhere in this document.

NO This aspect of your project does not require PTA assessment.

3.6 Do you need to meet PTA's geotechnical (ground) conditions?	YES	NO
o Is your work inside the PTA Protection Zone (Refer Appendix 1)?		

YES	<p>You must discuss and agree your proposals with PTA. Please note the following general requirements:</p> <p>A (General) Before starting work, you need to provide PTA with a geotechnical engineering report. PTA will review this. If it is to satisfy the PTA, it needs to:</p> <ul style="list-style-type: none"> o demonstrate your proposed work will not adversely impact on the rail reserve or the integrity of PTA facilities; o contain structural design details and analysis for PTA to review; o detail the potential impact any demolition or excavation might have on PTA facilities (including the impact from vibrations your activities may induce); and o detail the impact of loadings on PTA facilities (especially any rail tunnels or underground structures) as a result of your work. <p>B (For embankments or cuttings) Where the rail reserve is inside a cutting with an embankment bordering the proposed work site or where the rail reserve is on an embankment bordering the work you need to have a geotechnical report prepared. This report is to evaluate the stability of the cutting or embankment in the face of any excavation or vibration your work may cause to the rail reserve. Submit this report to PTA for</p>
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review. You may also need to adopt appropriate measures, such as using anchors to protect the safety of the rail reserve.

C (For rail tunnels)
You need to submit to PTA a geotechnical report that evaluates the impact of your proposed work on the tunnel below or close by, refer to Appendix 3. PTA will review the report to ensure your proposed development is structurally sound and will not jeopardise the structural integrity of the existing rail tunnel.

Where no ground movement is expected
Proposed works are acceptable if the geotechnical report indicates there is no risk of track movement or damage to PTA facilities.

Where ground movement is possible
Sometimes a geotechnical report indicates ground movement is possible or expected as a result of your work. Significant ground movement is a shifting of 5mm or more in the PTA Protection Zone. If there is any possibility of movement, you will be required to:

- agree with PTA on arrangements for ongoing monitoring of PTA facilities; and
- provide indemnities, bonds and/or insurances to cover PTA's actual and potential costs.

The extent and frequency of monitoring will be determined by the amount of expected movement and the duration of your project.

NO This aspect of your project does not require PTA assessment.

3.7 Does your work affect rail reserve boundary fences?	YES	NO
○ Does your work require taking down or repairing existing rail reserve boundary fencing? OR		
○ Does your work require a fence near a rail reserve boundary to be replaced?		

YES Where your work requires existing fences to be removed or repaired, you must discuss this with PTA and negotiate arrangements with us in advance. This can be done by contacting PTA (Refer Appendix 2).

NO This aspect of your project does not require PTA assessment.

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3.8 Are you working near PTA Services?		YES	NO
<input type="radio"/> Is your work within 5m of a PTA above or below ground Service?			
YES	You must lodge a request with PTA for a service search. If PTA Services are identified you must reach agreement with PTA about how these Services are to be accommodated in your activities.		
NO	This aspect of your project does not require PTA assessment.		

3.9 Are you clear of rail cables and conductors (electrical clearances)?		YES	NO
<input type="radio"/> Is your work within 5m of live rail cables or conductors?			
YES	<p>You will need to agree with PTA how work may be carried out safely. This may include arranging alternative access or carrying out work during PTA's planned shut downs and planned maintenance works (possessions).</p> <p>Working Instructions All persons are required to work in accordance with PTA's "Safety Instructions for the Electrified Area" available from PTA on request).</p> <p>Excavation in the railway reserve No excavation or boring is permitted within 2m (measured horizontally) of high voltage underground cables and 1m (measured horizontally) for low voltage cables.</p> <p>Excavation includes boring, grading or post driving. You cannot begin any excavations in the railway reserve unless an underground Services search report has been obtained in writing. The position of any Service expected to be in the vicinity must also be marked in the field before excavation starts.</p> <p>Pot holing and Service detection devices must be used to verify the Services search before excavation commences.</p> <p>Rail poles masts and signals No excavation or boring is permitted within 5m from either side of a mast or portal and within 3m from the back of a mast or portal. No excavation is permitted within 3m of signals poles.</p> <p>Please refer to section 4.2 for additional requirements.</p>		
NO	This aspect of your project does not require PTA assessment.		

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3.10 Will your project drain into the rail reserve?		YES	NO
<input type="checkbox"/>	Does your project require drainage to the rail reserve?		
<input type="checkbox"/>	Are you changing existing watercourses or run off near the rail reserve?		

YES PTA requires all projects to drain away from the rail reserve. Where drainage is not possible away from the rail reserve, you will be required to contain it and deal with it on your property. If the works are wholly within the rail reserve a hydraulic design report must be submitted demonstrating that proposed outflows will not overload PTA's drainage system.

NO This aspect of your project does not require PTA assessment.

3.11 Do you need to consider derailment protection measures?		YES	NO
<input type="checkbox"/>	Your work is inside the rail reserve OR		
<input type="checkbox"/>	Your work is less than 20m from the rail track (side of nearest rail).		

YES EITHER

Structures and building elements located up to 10m from the centre line of a track must be designed to the Australian Standard AS 5100 - Bridge Design.

Structures and building elements between 10m and 20m from the centre line of a track must be designed to withstand a 1000KN ultimate horizontal load applied from any direction at a height of 2m above rail level.

OR

Undertake a risk assessment

This is an alternative to testing your work against the load requirements above. Your proposal may be assessed after you have done a risk assessment in accordance with PTA's safety risk management framework. This will determine whether any relaxation can be made to the derailment protection requirements.

The risk assessment should consider:

- the site condition, cutting, embankment and other characteristics of the site;
- derailment history of the site;
- the type of structure you are erecting, especially considering its potential for collapse and consequent damage to trains and other infrastructure;
- how your work may be affected by the track geometry;
- track speed and whether this represents a risk to the integrity of your structure; and

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	<ul style="list-style-type: none"> ○ type of rolling stock and how this might affect the integrity of your structure. <p>The results of the risk analysis may mean that simpler (and less costly) devices such as earth mounds, gabions, guard railing, etc. may be permitted to provide protection.</p> <p>Even if the analysis reveals a low probability of risk, PTA may require provisions to include in-built deflection resistance to your structure.</p>
NO	This aspect of your project does not require PTA assessment.

3.12 Are you complying with environmental requirements?	
You must comply with all relevant legislation.	

3.13 Are your lighting and external finishes visible from the railway?	YES	NO
○ Does your work include lighting or bright finishes that will be visible from the railway? OR		
○ Does your work include red or green lights or coloured surfaces facing the rail reserve?		
YES	<p>You must ensure railway workers, including train drivers, are not blinded or distracted by your lighting, signage or reflective materials facing the rail reserve. Reds and Greens are associated with our signalling systems and are not generally acceptable.</p> <p>All lighting circuits' earths must be at least 10m from any railway traction power earth electrodes.</p>	
NO	This aspect of your project does not require PTA assessment.	

3.14 Do you need to undertake a condition survey?	YES	NO
○ Are you working in the PTA Protection Zone?		
YES	<p>You or your representative, along with a PTA representative, may need to carry out a joint condition survey of PTA facilities and property in the zone of influence of your project. This must be done before you start work. The survey will establish the existence of any defects, monitoring that may be required and enable any deterioration during construction to be identified.</p>	

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	Upon completion of your work a further survey will be required, to identify any additional defects caused by your work, which PTA will require to be made good at your cost.
NO	This aspect of your project does not require PTA assessment.

3.15 Do you need to satisfy PTA of your OH&S management?	YES	NO
<input type="radio"/> Does your project require you to work within the rail reserve?		
YES	You must prepare and submit for PTA review site specific safety plans, risk assessments and safe work method statements. They are to address all OH&S and safety issues, including all PTA's safe-working requirements at the rail interface of your project.	
NO	This aspect of your project does not require PTA assessment.	

3.16 Do you require a deed (agreement) with PTA?	YES	NO
<input type="radio"/> Does your project require you to work within the PTA Protection Zone?		
YES	You will be required to enter into a deed that is acceptable to PTA which may include requirements for indemnities, bonds and insurances.	
NO	This aspect of your project does not require PTA assessment.	

3.17 Will you need the railway to close during your work?	YES	NO
<p>Some work may only be carried out when PTA has stopped all trains. This shutting down is called a "Track Closure". If the work also requires the traction power to be turned off to that part of the rail network this is known as an "Isolation" and the Request for Isolation must be made 2 weeks in advance. The cost of an Isolation is \$1500 and must be paid in advance.</p> <p>Such work (Track Closures and Isolations) can only occur by prior arrangement with PTA. PTA plans a Track Closure programme for essential rail maintenance. You will usually need to schedule work to coincide with this program, which is generally locked in 8 weeks earlier. PTA will advise you if you need to carry out your work during a Track Closure.</p>		

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<input type="radio"/>	Will your project require the railway to close during your work?		
YES	You need to schedule your works around PTA's planned shutdowns, which are finalised 8 weeks in advance and pay PTA's charges.		
NO	This aspect of your project does not require PTA assessment.		

3.18	Does your work involve demolition?	YES	NO
<input type="radio"/>	Does your project require you to carry out demolition within the PTA Protection Zone?		
YES	You must agree with PTA a demolition plan, emergency event plan and indemnities and bonds as required by PTA.		
NO	This aspect of your project does not require PTA assessment.		

3.19	Will you be using soil or rock anchors, rock bolts or soil nails?	YES	NO
	Where soil or rock anchors, rock bolts, soil nails and the like are proposed the same PTA guidelines apply as to any other works (as set out elsewhere in this guide and Appendices). In particular, where development occurs close to the boundary with PTA's land you SHOULD NOT assume PTA will automatically accept the installation of soil and rock anchors, rock bolts or soil nails on PTA land. Where these items are permitted by PTA, PTA may require a deed, indemnities and bonds.		
<input type="radio"/>	Does your project require you to install soil or rock anchors, rock bolts or soil nails wholly or partly within the rail reserve or within 3m of a PTA tunnel or underground structure		
YES	PTA must review and accept the methodology and materials used. The design and proposed works will require indemnities, a deed and bonds.		
NO	This aspect of your project does not require PTA assessment.		

3.20	Do you have windows, balconies and building openings that overlook the rail reserve?	YES	NO

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<input type="checkbox"/> Does your project have windows, balconies and building openings that are within 20m of the rail reserve?		
<p>YES No openings that could allow objects to be thrown or fall onto passing trains or infrastructure will be accepted. Generally this is achieved by keeping balconies and windows at least 20m clear of the rail reserve.</p> <p>Where balconies and windows are closer than 20m AND face the rail reserve they should be fully enclosed. Where opening windows cannot be avoided, the opening should be restricted to a maximum of 80mm.</p>		
<p>NO This aspect of your project does not require PTA assessment.</p>		

3.21 Could your project discharge water onto the rail reserve?	YES	NO
<input type="checkbox"/> Does your project have overflow pipes, gutter channels and watering points that could discharge into the rail reserve?		
<p>YES PTA operates electrical and signalling systems that are not compatible with water. The discharge of water from overflow pipes, gutter channels and watering points into the rail reserve or onto infrastructure is not acceptable. In particular buildings and balconies should not have overflow pipes or watering points within 20m of the rail reserve.</p>		
<p>NO This aspect of your project does not require PTA assessment.</p>		

3.22 Noise, vibration and induction in design	YES	NO
If your project is within 50m of the railway your design should consider the effects of noise, vibration and induction from rail operations.		
<input type="checkbox"/> Is your project within 50m of the railway?		
<p>YES Your design should consider the effects of noise, vibration and induction from rail operations. PTA may require a notification on titles created that are partly or wholly within 50m of the railway to protect against claims by future owners in this regard.</p>		
<p>NO This aspect of your project does not require PTA assessment.</p>		

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PART 4 – HOW THE RAILWAY CAN IMPACT ON YOUR PROJECT

4.1 Noise and vibration

NSW StateRail’s document “Guidelines for Applicants – Consideration of rail noise and vibration in the planning process” dated November 2003 and WAPC State Planning Policy 5.4 “Road and Rail Transport Noise and Freight Considerations in Land Use Planning” will help you understand and prepare for the effect of rail noise and vibration on your project.

It will be useful background to those involved in planning and designing developments near the rail reserve.

4.2 Induction/coupling from rail operations in electrified railway areas

a) Coupling/induction/interference of 25kVac traction power on any electrical circuit in the proximity of PTA’s traction power distribution network or vice-versa.

The applicant is required to submit a study of the above with a proposed mitigation at its own cost. The applicant must pay the cost for any mitigation required for PTA circuits and its own circuits.

b) Coupling/induction of 25kVac traction power on any metallic pipe or structures.

This can affect pipes, structures and any exposed metal on or in the ground or in close proximity to overhead wiring equipment.

Provided this is addressed at the design stage for objects in close proximity to overhead traction wiring equipment, it can generally be solved by avoiding the use of metal and by protecting metal parts by suitable earthing and bonding system. PTA’s standard, “Guidelines for earthing and bonding in the 25kV AC Electrified Areas” offers guidance and information (copies available on request).

4.3 Maintenance

Building maintenance, including painting, window cleaning and repairs should be able to be carried out without access being required over or under the rail reserve.

If access into the rail reserve is required for inspections and maintenance of facilities, PTA will require from you for each occasion of access:

- a deed or letter agreement setting out ongoing access arrangements;
- safe work method statements;
- site specific safety plans; and
- payment of all PTA fees costs and charges that apply at that time (if any).

4.4 Level crossings

Level crossings are no longer considered an acceptable solution to providing access across the rail reserve. PTA, in accordance with our safety plan, will not be increasing the number of at-grade (level) crossings on its metropolitan electrified passenger railway.

Your work must not require a new level crossing and should not increase traffic on existing level crossings.

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4.5 Future PTA works

PTA can advise you on PTA's future work in your local area. Generally you are required to keep your building works outside the PTA Protection Zone and 20m clear of the nearest track.

PART 5 – DOCUMENTS TO BE SUBMITTED

5.1 Documents required

When applying for permission to undertake any of the works described in section 3 above, within the PTA Protection Zone, you must submit as many of the following documents to the Consent Authority, for review by the PTA, or to the PTA directly, as the case may be, as the PTA considers necessary or appropriate:

- (a) plans of engineering works;
- (b) engineering evaluation report;
- (c) instrumentation proposal;
- (d) method statement for works;
- (e) emergency procedures; and
- (f) condition survey report.

The requirements for the above items are described below.

PTA acknowledges that all the above may not be relevant to certain proposed Works, and that they relate particularly to Works that may affect PTA facilities located underground.

PTA refers applicants also to information in Section 3 that may outline what documents may be required for specific types of Works.

5.2 Plans of engineering works

Plans must show layout and cross-sectional details of the proposed works, including vertical and horizontal distances of the proposed works relative to the existing PTA facilities, and the PTA Protection Zone boundaries in the area of interest.

5.3 Engineering Evaluation Report

An engineering evaluation report must be prepared and endorsed by a Chartered Professional Engineer.

The report is to be independently verified by another Chartered Professional Engineer before being submitted to the PTA.

The report must address:

- (a) predicted movements of the PTA facilities at each stage of construction and at completion of the development works, including:
 - i. examination of ground and groundwater conditions;
 - ii. calculations for deriving the predicted movements;

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- iii. appropriate sensitivity analysis to check the effects of variations in assumptions on results;
- (b) assessment of the likely effects of movements on existing PTA facilities, including without limitation, effects on structural integrity, track beds, structural gauge clearances, drainage, groundwater seepage/leakage into tunnels and underground structures;
- (c) proposals for any special measures for advance works required to minimise risk of damage to existing PTA facilities and to ensure continuation of safe public transport operations;
- (d) proposals for rectification works to existing PTA facilities, which may include, without limitation, specifications for remedial grouting, underpinning or structural repair, requirements for adjusting track during or subsequent to construction, need for drain realignment, etc.

The report should clearly demonstrate that the performance requirements of Appendix 4 are fully met for existing PTA tunnels and underground structures after all works have been completed.

The PTA reserves the right to make further requirements on the engineering evaluation report which may be necessary for safeguarding existing PTA facilities.

5.4 Instrumentation Proposal

The instrumentation proposal must be prepared and endorsed by a Chartered Professional Geotechnical Engineer (GE) independent of, but retained by you and must be verified by a second independent GE retained by you. The proposal shall include the following items:

- (a) comprehensive monitoring system to monitor behaviour of the existing PTA facilities and adjacent ground and groundwater;
- (b) layout plans and relevant cross-sections indicating locations of proposed instruments relative to existing PTA facilities;
- (c) details of instruments or equipment, including types, function, depth of installation;
- (d) frequency of monitoring;
- (e) valid calibration certificates for proposed instruments, where applicable; and
- (f) schedule for instrument installation and removal works on or within existing PTA facilities indicating number and frequency of access required.

GEs must monitor any movement and vibration on PTA facilities when required by PTA. If PTA requests, the GE must submit a copy of the monitoring records to PTA. The GE must inform PTA directly of the commencement of any building works within the PTA Protection Zone to enable PTA and the GE to observe the implementation of the monitoring program. If PTA observes any adverse operational condition on PTA facilities, PTA will alert the relevant parties.

Any other necessary monitoring within the building or work site (e.g. monitoring of piezometric pressure changes in groundwater) must be carried out by the GE who should maintain regular contact with the PTA and keep PTA informed of the monitoring records as necessary.

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5.5 Method statement for works

A method statement for the proposed works must be prepared, accompanied by the following items:

- (a) layout plan showing location of works relative to existing PTA facilities;
- (b) writeup and/or plans indicating step-by-step sequence of conducting each phase of works or activities;
- (c) list of principal plant to be used; and
- (d) hazard analysis identifying all possible risks that may be posed to existing PTA facilities and a description of the safety and precautionary measures to mitigate these risks.

5.6 Contingency plans/emergency procedure

Contingency plans and emergency procedures must be submitted by you to PTA addressing the risks identified in the method statement hazard analysis.

5.7 Condition Survey

A condition survey (including a photographic record) of the potentially affected PTA facilities must be carried out before you start work. The condition survey must be conducted by an independent Chartered Professional Engineer suitably qualified, specialised in this type of work and who is acceptable to the PTA.

The condition survey must be conducted jointly with PTA involvement.

The survey must establish the existence of any defects and enable any deterioration during construction to be identified. Upon completion of your work, you must arrange a further survey to identify any additional defects caused by your work.

You must make good any additional defects identified in the post-completion condition survey, at your cost.

[w2]

----- **END OF GUIDELINES** -----

APPENDIX 1 – PTA PROTECTION ZONE

The following diagrams define the PTA Protection Zone. Above ground this is the area within which objects and equipment can fall into the Rail Reserve. Below ground this is the zone within which excavation, dewatering and tunnelling could affect Rail infrastructure.

If the proposed Work is within the PTA Protection Zone you should obtain PTA's approval BEFORE starting this aspect of your project.

In addition to the proposed development being constructed or installed the following matters must be taken into account in the course of the consultation process of any Work/s that comes within the PTA Protection Zone:

- 1 The siting, size and depth of any proposed building or work, including any proposed excavation, in relation to their effects on PTA facilities.
- 2 The proposed access for maintenance of existing or proposed work.
- 3 The potential for impact on any PTA facility as a result of any construction and development activity.
- 4 Any potential cumulative impact from other developments in the vicinity of the site.
- 5 Scaffolding, demolition, aerial operations (cranes, concrete pumps etc) construction aids, temporary works, sound walls, planting/landscaping schemes (including potential height of trees), open cut mining etc.
- 6 The possibility that the Work/s could affect the ground water conditions within the rail reserve.
- 7 Electrical coupling/induction study

Note: The PTA Protection Zone is not restricted in height or depth.

Any development or activity occurring within the PTA Protection Zone is to be referred to PTA for formal acceptance prior to development/activity - this includes survey, demolition, temporary works and construction aids.

Developments in the vicinity of surface rail

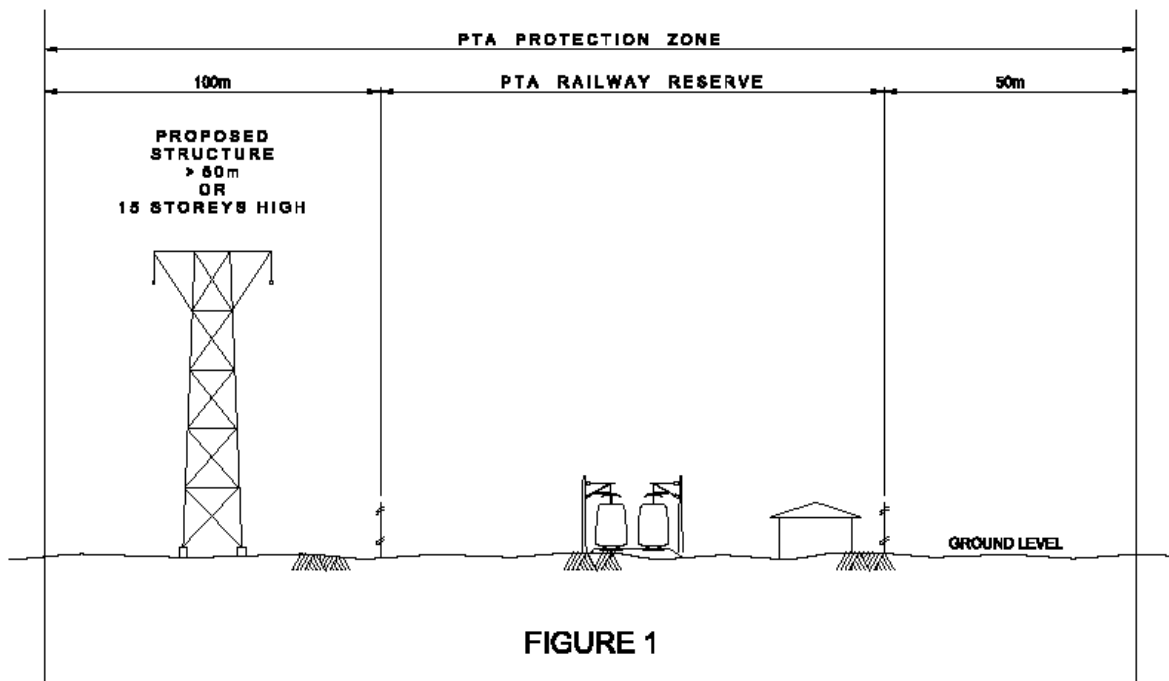


FIGURE 1

DEVELOPMENT IN THE VICINITY OF PTA ABOVE GROUND FACILITIES

NOTE: PTA PROTECTION ZONE BOUNDARIES ARE NOT RESTRICTED IN HEIGHT OR DEPTH



Crane overturned across rail reserve.

Developments in the vicinity of rail tunnels/structures below ground

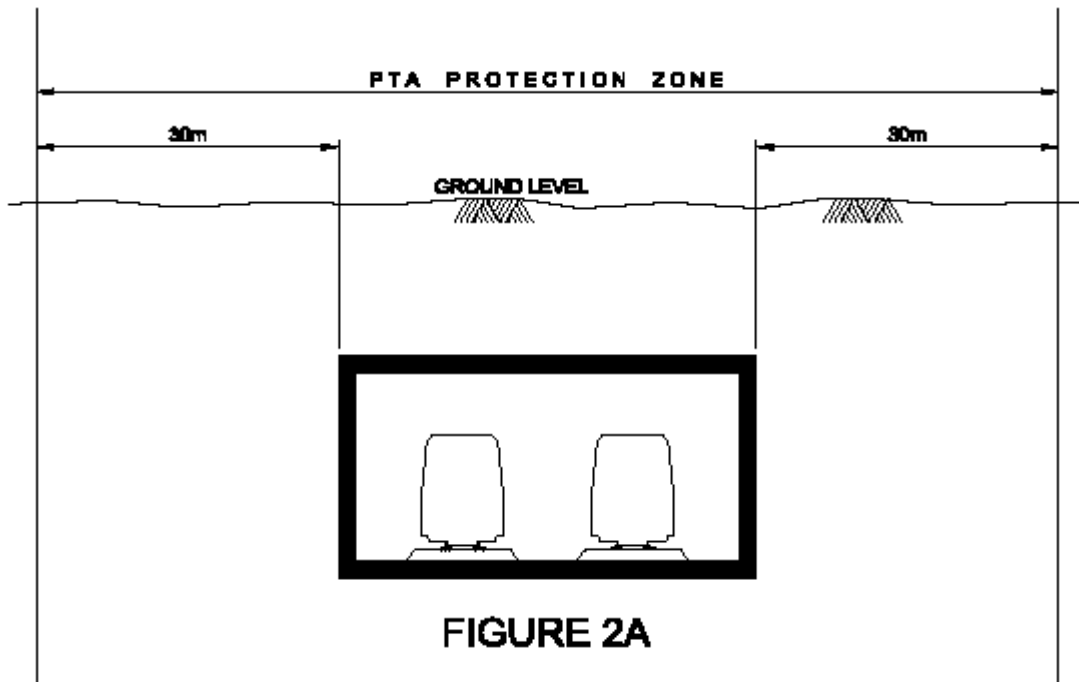


FIGURE 2A

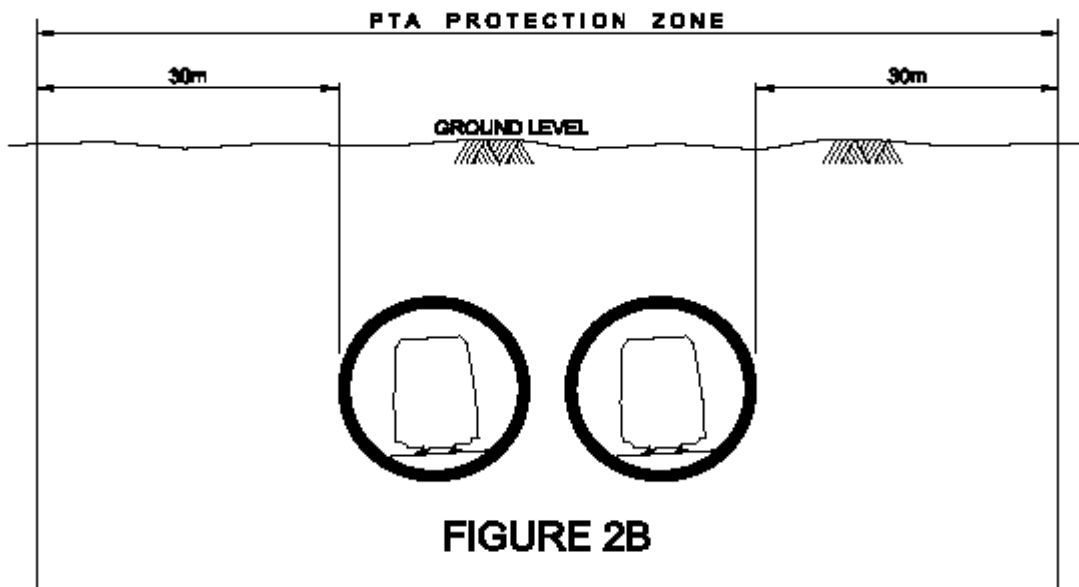


FIGURE 2B

**DEVELOPMENT IN THE VICINITY OF PTA
TUNNELS AND UNDERGROUND STRUCTURES**

NOTE: PTA PROTECTION ZONE BOUNDARIES ARE NOT RESTRICTED IN HEIGHT OR DEPTH

APPENDIX 2 – PTA CONTACT DETAILS

Track Access Officer Ph 9326 2365 Fax 9326 2016

For all access and work in suburban electrified territory network requests.

PTA Emergency Number Ph 9326 2345

Freight Corridor Reserve Manager Ph 9326 2510

For all Freight Railway network enquiries

Manager Track & Structures Office Ph 9326 2185

Track Structures Supervisor Ph 9326 3942

For fencing details and repair information

Electrical Engineering Manager Ph 9326 2937

For approval of any issue related to electrical systems, OHTWE, electrical earthing separation and earthing & bonding of structures

Electrical Control Officer (ECO) Ph 9326 2722

For any concerns with working near electrical overhead wiring equipment

APPENDIX 3 - TECHNICAL GUIDELINES FOR PROTECTION OF PTA TUNNELS AND UNDERGROUND STRUCTURES

1. Site formation/foundation/excavation works

Where site formation, demolition, foundation works or excavations for basements, services, etc are proposed above or adjacent to PTA underground structures the effects of such works shall not exceed the following limits:

- a) The vertical or horizontal pressure change on any underground structure due to the above works, including filling, dewatering etc and due to additional loads transmitted from foundations (including loads arising during construction from stockpiles, cranes, etc) shall not exceed 20 kPa.
- b) Differential movement resulting from the works shall not produce final distortion in any underground PTA structure, including the plinth or track, more than 1:1000 in any plane or a total movement in any element of any PTA structure, including the plinth or track, exceeding 15 mm in any plane.
- c) The peak particle velocities induced to any underground structure resulting from:
 - i) blasting (where permitted) shall not exceed 25 mm/s; and
 - ii) demolition, driving or withdrawing of piles or any similar operation which can induce prolonged vibrations shall not exceed 15 mm/s, when measured with a vibrometer.
- d) No pile, foundation, borehole, well, anchor, soil nail, horizontal drain or any other geotechnical installation shall be driven or constructed within a distance of 3 m from any point of the PTA underground structure.
- e) Any part of an anchor, if allowed, shall be more than 3 m away from any part of a PTA structure/installation and the centroid of the fixed length of the anchor shall be more than twice the fixed length away from any PTA structure/installation
- f) Groundwater dewatering or recharge in the vicinity of a PTA tunnel or underground structure shall not reduce or increase groundwater piezometric pressures by more than 10kPa in any aquifer within the PTA Protection Zone when compared to seasonal lows or highs in that aquifer

2. Ground investigation works

2.1 Ground investigation proposals must identify:

- a) details of the explorations and locations of the proposed exploration holes, trial pits, trenches, penetrometers, field testing including groundwater pump tests or instrumentations relative to the PTA structures whether inside or outside the lot;
- b) proposed depth of boreholes, pits, probes, trenches etc.;
- c) a method statement for sinking of boreholes, excavating trial pits and trenches including backfilling, conducting penetrometer tests, field testing including groundwater pump tests or installing instrumentation;
- d) a method statement for checking verticality of boreholes or probes within a distance of 10 metres in plan of any point of the PTA underground structure, should boreholes or probes be sunk to a depth of 3 m from the highest point of the PTA underground structure; and
- e) a method statement for controlling depth of ground hole sinking within a distance of 3 metres in plan of any point of the PTA underground structure.

2.2 Each proposal will also be judged against the following technical guidelines:

- a) The vertical and horizontal pressure change on any PTA structure due to ground investigation works including field testing such as plate load testing, pressuremeter tests, packer tests or any operation shall not exceed 20 kPa.
- b) Differential movement resulting due to ground investigation works shall not produce final distortion in any underground PTA structure, including the plinth or track, more than 1:1000 in any plane or a total movement in any element of any PTA structure, including the plinth or track, exceeding 15 mm in any plane.
- c) The peak particle velocities induced to any PTA structure resulting from artificial shocks generated either by the detonation of explosives or a mechanical blow at ground surface or at depth within a hole shall not exceed 25 mm/s.
- d) The peak particle velocities induced to any PTA structure resulting from percussion drilling, hammer drilling or any other site operation which can induce prolonged vibration shall not exceed 15 mm/s.
- e) No boreholes, trial pits or trenches shall be sunk or excavated within a distance of 3 metres from any point of a PTA structure.
- f) Groundwater dewatering or recharge in the vicinity of a PTA tunnel or underground structure shall not reduce or increase groundwater piezometric pressures by more than 10kPa in any aquifer within the PTA Protection Zone when compared to seasonal lows or highs in that aquifer.