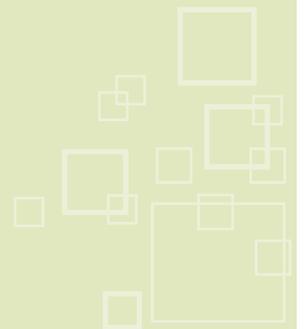




Guide for development in a railway environment



Transit oriented development: guide for development in a railway environment

Looking forward. Delivering now. The Department of Infrastructure and Planning leads a coordinated Queensland Government approach to planning, infrastructure and development across the state. The State Government, through Growth Management Queensland, is leading the way with a focused approach to growth management, to help shape tomorrow's Queensland.

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Any references to legislation are an interpretation of the law. They are to be used as a guide only. The information in this publication is general and does not take into account individual circumstances or situations. Where appropriate, independent legal advice should be sought.

ISBN: 978-0-9805449-6-1

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Preamble

This guide provides important information for those involved in the planning, design or delivery of a development in or near to a railway corridor in Queensland.

The guide is essential reading for those who are proposing to:

- develop in or near to a railway corridor, for example near a railway station, over a railway tunnel, or near a railway bridge
- provide, alter or upgrade any railway infrastructure
- excavate in or near a railway corridor
- develop in a location that is likely to experience noise and vibration from a passing train
- develop near to a railway corridor used by freight trains
- carry out a construction activity that has the potential to affect railway services.

Early consultation with the Department of Transport and Main Roads is strongly recommended to confirm how the information contained in this guide applies to a proposed development.

The list of Queensland Rail and Department of Transport and Main Roads technical requirements and standard drawings and the Queensland Rail Station design guide are current at the time of publication (Appendix 1). Future editions or amendments to the list will be available and remain current on the Queensland Rail website www.qr.com.au and the Department of Transport and Main Roads website www.tmr.qld.gov.au.

A link is also available from the Department of Infrastructure and Planning website www.dip.qld.gov.au/TOD



1 Introduction

Urban areas are comprised basically of two elements:

- the places in which people live, work and play
- the movement systems that enable people and goods to travel between these places.

By their very nature, places and movement systems are interrelated and interdependent. For places to be liveable, productive and enjoyable they need, among other things, to be easily accessed by people and vehicles. For movement systems to be functional, safe and efficient in enabling travel between places they need, among other things, to enable the convenient and unobstructed passage of people and goods.

As urban areas grow and intensify, the ability for places and movement systems to perform properly is tested. There is greater demand for the available space and more care has to be exercised in maintaining the quality of places and safeguarding the effective operation of movement systems.

The preparation of regional and metropolitan plans by the state and local governments is a reflection of the need to deal with the demands and consequences of Queensland's continuing growth to better plan for the development of places and secure the appropriate operating environments for movement networks.

In the busiest parts of the state, these plans promote a progressive move to a more compact urban form with higher density development located in the places of greatest accessibility.

Delivering transit oriented development is one of the most effective ways of achieving a desirable urban form. Transit oriented development is characterised by high quality people-focused places in which a lively mix of intensive activities is located in close proximity to a frequent and reliable public transport service.

Much has to be done well to ensure the successful delivery of a more compact urban form and transit oriented development outcomes. The choice of location has to fit with the strategic role of the place. The mix of activities has to be right. The form of development has to make for a good living environment and a favourable business setting. Using the public realm has to be welcoming and enjoyable experience. And the movement networks, especially public transport services, have to assure the accessibility of the place.

Providing this assurance of accessibility and the certainty of service is a challenge for public transport in places that are subject to increasingly intensive use and development. A particularly demanding set of circumstances arises in and around railways as the development that seeks to take advantage of the accessibility provided by the service has to be carefully planned, designed and delivered to ensure the service can continue to operate efficiently and with the expected level of reliability and safety.

A range of parameters therefore applies to the planning, design and delivery of a development near to a railway that are aimed at ensuring the operations of the railway service are maintained in an efficient, reliable and safe manner.

Queensland's urban railway network is also one of the few anywhere in the world that transports both passengers and freight on most of its lines. This introduces considerations for nearby development such as the risks associated with the transport of dangerous goods and hazardous materials and the amenity impacts associated with the transport of heavy loads and livestock.

For development to satisfactorily coexist with an operating railway the parameters associated with railway operations and the risk and amenity considerations associated with freight transport have to be appropriately addressed during the planning, design and delivery of the development. This guide will assist those involved in this process to be informed of what has to be addressed when dealing with a development in a railway environment.

1.1 What is the purpose of this guide?

This guide provides information about the matters that should be taken into account in undertaking development in a railway environment. It explains why this is necessary, who and where it applies to, which government agencies are involved, what processes have effect, how parameters are to be used and when to seek advice.

The guide provides a checklist approach to determining whether the appropriate steps have been taken to address the matters that affect development in a railway environment. It also sets out what is involved in gaining access to railway land, how to deal with a number of operational constraints and what must be done to ensure that the construction of a development proceeds safely and smoothly. A risk assessment process is appended to assist with the evaluation and refinement of development proposals in a railway environment.

1.2 Who is this guide for?

This guide is for those involved in the planning, design or delivery of a development in a railway environment in Queensland, including developers, development managers, project managers, urban planners, architects, engineers, landscape architects and construction managers. It is also for those who are responsible for assessing and responding to development applications made under the *Sustainable Planning Act 2009*.

All of those involved in a development in a railway environment, either as a proponent, applicant or assessor, should be familiar with the contents of this guide. They should understand the framework for dealing with development in a railway environment as illustrated in Figure 1. They should also be aware of the importance of early consultation in relation to a proposed development to ensure that all the information needed to successfully progress the development is sought and provided in advance, to minimize the potential for wasted effort, rework and delay.

Figure 1: The framework for development in a railway environment



1.3 What is the railway environment?

The railway environment comprises the combination of the following:

- the area located in, below and above a railway corridor
- the area located on, below and above the 25 metre wide strip of land running along each side of a railway corridor.

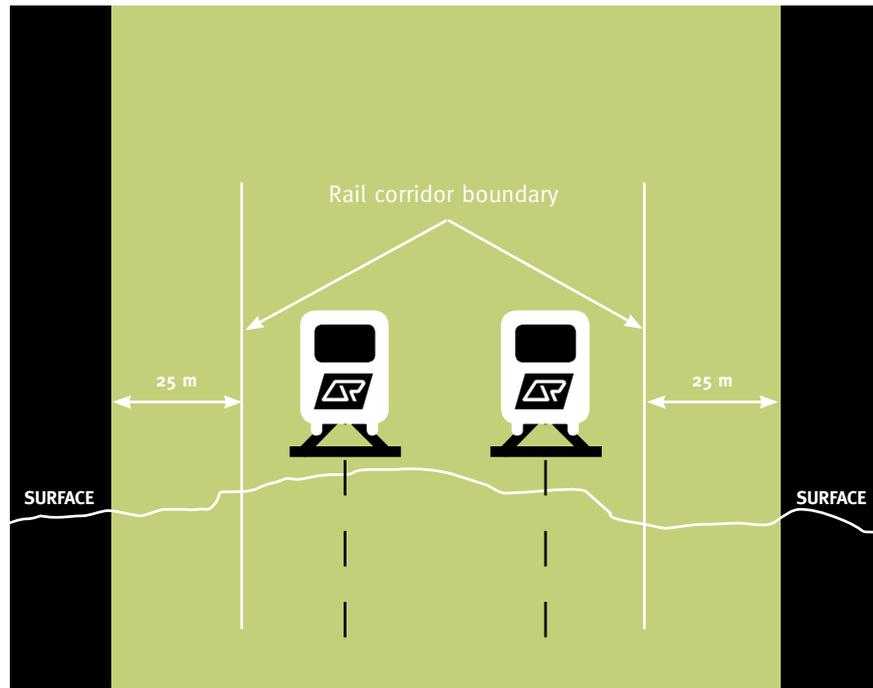
The extent of the railway environment is illustrated in Figure 2.

Maps of existing railway corridors are available on the Department of Transport and Main Roads' website. These maps typically depict the corridors as 'railway corridor land'. Railway corridor land includes the area containing the railway tracks as well as railway stations, park 'n' ride facilities and other sundry land holdings.

Where a railway is located in a tunnel and any part of that tunnel is less than 25 metres below natural ground level, the width of the strip of land included in the railway environment increases to 50 metres along each side of the tunnel.



Figure 2: The extent of the railway environment



The area represented in this colour comprises the extent of the railway environment at any given point along the length of a railway corridor. The area extends indefinitely above and below a railway corridor. A development located in this area is the subject of the information contained in this guide.

1.4 What regulatory provisions apply?

Those involved in the planning, design or delivery of a development in a railway environment should be familiar with all of the regulatory provisions that have the potential to affect such development. The following is a list of the legislation and regulatory documents applicable to developing in a railway environment.

- *Building Act 1975*
- *Electrical Safety Act 2002*
- *Environmental Protection Act 1994*
- *Disability Discrimination Act 1992* (Australian Government)
- *Land Act 1994*
- *Sustainable Planning Act 2009*
- *Transport Infrastructure Act 1994*
- *Transport Operations (TransLink Transit Authority) Act 2008*
- *Transport Planning and Coordination Act 1994*
- *Workplace Health and Safety Act 1995*
- *Disability Standards for Accessible Public Transport 2002* (Australian Government)
- *Environmental Protection (Noise) Policy 2008*
- *Sustainable Planning Regulation 2009*
- *South East Queensland Regional Plan 2009–2031*
- *Far North Queensland Regional Plan 2009–2031*
- *Transport Infrastructure (Dangerous Goods by Rail) Regulation 2008*



2 State agency roles and responsibilities

Whenever development is proposed in a railway environment in Queensland, various state agencies become involved including several government departments and certain state owned entities.

Some of these are involved in a decision making capacity; others provide advice on the development proposal. Each has particular objectives and responsibilities that shape their input to the process.

This section provides an overview of the agencies that may be involved in a development, including the roles and responsibilities of those agencies. It should be noted that the extent of involvement of each agency will depend on the nature and scale of the development, and on factors such as whether the development is proposed to:

- use or encroach on the railway environment
- affect transport infrastructure
- trigger a referral under the IDAS process.

2.1 Department of Transport and Main Roads

The Department of Transport and Main Roads (TMR) is the owner of the railway corridor on behalf of the State of Queensland. In this regard, TMR's role is to protect the long-term integrity of the railway corridor. A number of divisions of TMR are involved, each performing a different, but related role.

TMR is a concurrence agency under the *Sustainable Planning Act 2009*. TMR is responsible for ensuring the safety and operational integrity of railways and for assessing the affect of proposed development on existing and future public passenger transport. Through the IDAS process (refer to Section 3 of this guide), TMR has the authority to direct the outcome of a development application.

TMR staff will typically be involved in pre-lodgment discussions about a development proposal in a railway environment, either with or without the relevant local government. TMR does not charge a fee for participating in pre-lodgement discussions or conducting its assessment processes.

TMR consults with stakeholders such as Queensland Rail (the railway manager) and the TransLink Transit Authority (an adviser on specialist matters). The advice of these stakeholders is incorporated in TMR's IDAS response. TMR staff also collaborate with the Department of Infrastructure and Planning, local councils and development proponents about the delivery of land use transport integration in appropriate locations.

TMR is also responsible for:

- providing resource entitlements for development applications in a railway environment
- negotiating and facilitating private sector purchase and development of railway corridor land.

The latter responsibility entails:

- identifying and assessing the risks associated with a proposed development and determining the opportunities to upgrade railway station infrastructure
- working with Queensland Rail to facilitate development in a railway environment, including resolving the applicable commercial arrangements.

These commercial arrangements may include, for example:

- the sale or lease of railway corridor land or the volumetric title needed for a proposed development
- an infrastructure agreement in relation to the provision of new or upgraded transport infrastructure needed to support a development.



2.2 Queensland Rail

Queensland Rail (QR) is a government-owned corporation with two subsidiary companies - QR Passenger Pty Ltd and QR Network Pty Ltd.

QR Passenger Pty Ltd provides services under contract to TransLink Transit Authority and TMR. QR Network Pty Ltd is the railway manager for most of Queensland's railway corridors. QR Network Pty Ltd is responsible for railway operations involving passengers and the majority of freight transport and for managing the railway infrastructure. Both subsidiary companies may be involved in discussions about a proposed development in a railway environment.

2.2.1 Section 255 of the *Transport Infrastructure Act 1994*

QR regulates activities that may affect the operations of a railway in accordance with the provisions of Section 255 of the *Transport Infrastructure Act 1994* (Section 255). Under Section 255 the approval of the railway manager (QR) is required for activities that could “interfere with a railway”. QR is therefore required to assess proposals for development in a railway environment to ensure that railway services will not be interrupted, safety risks are minimised, maintenance arrangements are not compromised and development activities such as building construction in, over or under the railway environment proceed in an orderly manner.

An applicant lodging an IDAS application is advised in the concurrence agency approval from TMR whether an application will need to be lodged under Section 255. QR requires detailed construction plans and a description of the construction process to be lodged with a Section 255 application. The Section 255 application is therefore typically lodged after the local government's decision notice has been issued and following the execution of a development agreement.

An approval under Section 255 is required notwithstanding the existence of access rights or rights to develop conferred by a development agreement, development lease or access licence.

QR will typically impose a condition on a Section 255 approval that enables QR to oversee the construction of the aspects of a development that QR considers have the potential to affect railway operations.

A Section 255 approval for proposed development activities may also be necessary apply in the following circumstances:

- where work is proceeding in a railway environment that does not need a development approval from a local government or TMR (for example, tree lopping or fence construction)
- where QR identifies work in a railway environment that has the potential to interfere with railway operations (for example, an unauthorised excavation).

QR charges a fee to make an application under Section 255. QR will advise the applicable fee at the time of lodgment.

2.3 TransLink Transit Authority

TransLink Transit Authority (TTA) is the statutory body responsible for:

- purchasing and scheduling government-funded services on the passenger network
- administering the funding for Citytrain services, new stations, station upgrades and rolling stock
- designing new stations and station upgrades.

TTA advises TMR about the affect of development on railway stations and passenger services and the requirements for access to stations and intermodal facilities.

TTA manages the delivery of new and upgraded public transport station facilities in South East Queensland (SEQ) through the TTA Station Upgrade Program, which is funded through the SEQ Infrastructure Plan and Program. TTA also manages the upgrade of stations on the railway network in SEQ as part of the Citytrain Station Upgrade Program, funded through the transport services contract between the state government and QR. This contract is administered by TTA.



2.4 Department of Infrastructure and Planning

The Department of Infrastructure and Planning (DIP) is the lead agency for coordinating the state's transit oriented development (TOD) implementation activities, including:

- developing whole-of-government TOD policy
- determining TOD priorities
- coordinating the state government's interests and involvement in TOD delivery
- identifying and determining the planning and delivery mechanisms for, and sequencing of, TOD projects.

DIP works with other state government agencies and local government and industry stakeholders to facilitate TOD outcomes. DIP also provides input to the assessment of development applications in TOD locations and may coordinate state and local government interests in these locations.

2.5 Department of Environment and Resource Management

The Department of Environment and Resource Management (DERM) maintains the state government's land policies and manages state land disposal processes through the Property Management Committee. If a development is proposed on state land, the PMC will consider the case for allowing access to state land via private treaty or tender.

In addition, if a project involves the private use of a public road, necessitating, for example, the issuing of a permit to occupy or a temporary or permanent road closure, the development application for the project will need to be referred to the local DERM office for resource evidence required under the *Sustainable Planning Act 2009* and the *Sustainable Planning Regulation 2009*.

2.6 Queensland Government Architect, Department of Public Works

The Queensland Government Architect advises the state government on design and heritage matters. From time to time, the Queensland Government Architect may seek or be requested to provide advice in relation to a TOD proposal or a transport infrastructure proposal, for example, the design of a railway station precinct. This advice may have an influence on, among other things, the TTA design of a station or a station upgrade.

2.7 Queensland Fire and Rescue

The Queensland Fire and Rescue Service (QFRS) provides specialist advice regarding the handling of emergency events and the protection of community safety. The input of QFRS is sought by TMR when a development is proposed in a railway environment on the basis that such a development may be subject to an increased risk associated with a serious accident, particularly where the railway is known to carry dangerous goods. A concurrence referral received by TMR involving development in a railway environment will therefore be referred to QFRS, State Community Safety Unit, Major Infrastructure Developments for third party advice under section 256 of the *Sustainable Planning Act 2009*.



3 Integrated Development Assessment System

The Integrated Development Assessment System (IDAS) is the process under the *Sustainable Planning Act 2009* for assessing and determining development applications in Queensland. This section describes the IDAS process, TMR's concurrence agency powers and the matters that TMR takes into account in dealing with an application.

3.1 IDAS process

TMR is a concurrence agency under the Sustainable Planning Act, which means that, in addition to providing advice to the assessment manager (typically the local government), TMR may:

- impose conditions on the approval of a development application
- approve only part of an application
- request more information about an application.

Schedule 7 of the *Sustainable Planning Regulation 2009* specifies the types of applications for which TMR is a referral agency. In addition, the *Guide to referrals in relation to public transport, rail and airports* (IDAS guide 2) assists applicants and local governments to determine if TMR needs to assess a development application as a concurrence agency under IDAS.

TMR's website provides checklists to assist with the preparation of information for a development application.

3.2 Stages of IDAS

The following sets out the stages involved in the IDA process.

Stage 1 – Lodgement of development application

The applicant lodges the development application with the assessment manager (typically the local government).

Stage 2 – Referral and information request

The assessment manager reviews the development application. The applicant refers the application to the relevant IDAS referral agencies (usually state government agencies) which assess the application. Concurrence agencies (for example, TMR), may request more information about the proposed development.

Stage 3 – Notification

If the development application requires public notification, the applicant advertises the application. Public notification is required for impact assessable development and applications for preliminary approval under Section 242 of the *Sustainable Planning Act 2009*.

Stage 4 – Decision

The assessment manager determines the application by way of either an approval or a refusal. In approving the application, the assessment manager may make the approval subject to conditions, including any conditions provided by concurrence agencies. The applicant and any submitters are advised of the decision.



Where development is proposed in a railway environment TMR should be contacted as soon as possible (and preferably well before an application is lodged). Following this initial contact a request for a pre-lodgment meeting should be made in writing to TMR. The request should specify the location of the proposed development (by way of lot and plan numbers and the street address) and include indicative concept plans. TMR will endeavour to provide a written response to the concept plans within 10 working days of the pre-lodgement meeting. The response will incorporate the advice of all TMR stakeholders, including QR and TTA.

A pre-lodgment meeting can assist in the early determination of:

- the state government's level of support for the development proposal
- whether a resource entitlement needs to be obtained in the form of either the railway owner's consent to lodge a development application that affects a railway corridor, or DERM's consent to occupy state land
- whether a commercial agreement needs to be entered into with TMR or QR
- the level of information TMR or QR will require to assess the development application (for example, a geotechnical report and a risk assessment if structures are proposed to be located over a railway line).

Where a proposed development involves multiple processes (such an IDAS referral, a Section 255 application and the resolution of commercial dealings with TMR or QR), the processes associated with each of these can be run in parallel under the coordination of TMR.

3.3 Assessment of minor development

Applications for minor development in a railway environment are typically assessed by TMR within five days of lodgement and are subject to few or no conditions. Examples of minor development include:

- the subdivision of an existing house block or the extension of an existing house
- an extension to the gross floor area of an established business by less than 10 percent or an increase in the number of dwellings in an apartment building of less than ten percent
- the addition of a new use in an existing building that does not involve the modification of the building
- the volumetric subdivision of an existing or approved building where no modification of the structure is proposed
- a development in compliance with an approval already issued by TMR, for example, for the implementation of part of an approved master plan or preliminary approval.
- a proposal for a building on a site that is partially within the railway environment, but the building's footprint is located entirely outside the railway environment.

3.4 Checklist for development in a railway environment

Introduction

This checklist covers the matters that will need to be addressed in an application for a proposed development that will be referred to TMR on the basis of its potential to have an affect on a railway environment.

Using the checklist

The checklist is presented in two parts:

- **Part A: For development in, below or above a railway corridor.**
- **Part B: For development on a site abutting a railway corridor.**

Each part of the checklist sets out the matters that will need to be addressed in a development application. Each matter is described to prompt consideration of the matter's relevance to a proposed development. With the desired development outcome in mind, the checklist should be used to ensure the application responds appropriately to all of the relevant matters.

It is recommended that an applicant review the checklist prior to the pre-lodgement meeting to help frame any questions or raise any concerns.



Australian standards, QR and TMR technical requirements and standard drawings

Where reference is made to an Australian Standard, a QR and TMR technical requirement, or standard drawing, all referenced requirements and standards are taken to mean the version current at the time of lodgement of a development application.

A proposed development is to comply, where relevant, with the QR and TMR technical requirements and standard drawings outlined below.

Note – The following list of QR and TMR technical requirements and standard drawings is current at the time of publication (Appendix 1). Future editions or amendments to this list will be available and remain current on QR and TMR's websites.

- *MCE-SR-001 - Design of road overbridges (Revision F dated 30-09-2010)*
- *MCE-SR-002 - Work in or about QR property (Revision F dated 27-09-2010)*
- *MCE-SR-003 - Work adjacent to overhead line equipment (Revision E dated 30-09-2010)*
- *MCE-SR-005 - Design of buildings over or near railways (Revision C dated 30-09-2010)*
- *MCE-SR-006 - Design of footbridges (Revision G dated 30-09-2010)*
- *MCE-SR-007 – Design and selection criteria for road/rail interface barriers (Revision A dated 30-09-2010)*
- *MCE-SR-008 – Protection screens (Revision A dated 30-09-2010)*
- *MCE-SR-012 – Collision protection of supporting elements adjacent to railways (Revision B dated 30-09-2010)*
- *MCE-SR-014– Design of noise barriers adjacent to railways (Revision A dated 30-09-2010)*
- *MCE-SR-016 - Requirements for services under the railway corridor (non-QR services) (Revision A dated 30-09-2010)*
- *Standard Drawing 1474 - Steel beam guardrail installation and set out*
- *Standard Drawing 2544 - Standard security fence (50 mm chain link fabric)*
- *Standard Drawing 2545 - Standard timber fence (1800 mm high timber paling fence)*
- *Standard Drawing 2550 - Standard rural fences (miscellaneous site layout details)*
- *Standard Drawing 2754 - Standard clearances for new structures*
- *Standard Drawing 2614 - Standard rural fences (fencing with rail posts)*

Compliance with QR's standards is generally deemed to satisfy the railway manager's requirements. Development proposals that deviate from these standards will need to be supported by sound argument and proof that the railway manager's core requirements and objectives are not compromised.

To avoid frustrations or delays, it is strongly recommended that any proposal to modify or waive requirements contained in the standards be discussed with TMR and QR at the earliest opportunity. It may be necessary to undertake a risk assessment in conjunction with QR, to validate the proposal.

Notes

1. The Queensland Fire and Rescue Service plays a significant role in ensuring the safety of development. Therefore, safety considerations should be discussed with the Queensland Fire and Rescue Service prior to the lodgement of a development application.
2. Where a proposed development necessitates the crossing of a railway corridor by utility services or other infrastructure, resource evidence is required under Section 264 of the *Sustainable Planning Act 2009*. This should be obtained from TMR prior to the lodgement of a development application.



Part A – Development in, below or above a railway corridor

Matters identified in Part A:

The following matters are likely to apply to all development proposals.

Generic matter

Part A.1 Dangerous goods and fire safety

Part A.2 Future railway corridors and upgrades

Part A.3 Stormwater and drainage

Part A.4 Services and utilities

Part A.5 Design and construction

Part A.6 Maintenance

Part A.7 Amenity

Part A.8 Protection of the railway corridor from unauthorised access

The extent to which the following matters are relevant to a proposed development will depend on the nature of the development, the attributes of the railway corridor and the characteristics of the site.

Specific matters:

Part A.9 Collision protection

Part A.10 Clearances

Part A.11 Integrating with stations and park 'n' ride facilities

Part A.12 Ventilation and lighting

Part A.13 Tunnels

Part A.14 Viaducts

Part A.15 Excavation, retaining and ground disturbance

Part A.16 Rock anchors and soil nails



Generic matters

Part A.1 Dangerous goods and fire safety

Description

The cost of developing in, below or above a railway corridor may be prohibitive because of the need to ensure the impacts of an incident involving dangerous goods and fire can be appropriately mitigated.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor in which dangerous goods will be transported?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.2

Desired development outcome

Development located in, below or above a railway corridor is designed and constructed to ensure the impacts of a fire, explosion, spill, gas emission or dangerous goods incident that occurs in the railway corridor can be appropriately mitigated.

Checklist

- a. A pre-lodgement meeting has been held with TMR to enable the early assessment of risk and TMR has sought the input of the Railway Manager and the Queensland Fire and Rescue Service.
- b. A risk assessment has been undertaken to evaluate all relevant considerations relating to fire safety and the transport of dangerous goods in the railway corridor. (A risk assessment guide is provided in Appendix 1).
- c. The proposed development has been designed to minimise the impacts of fire, explosion, chemical spill, liquid fuel spill or gas emission. Measures have been incorporated in the design to:
- i. minimise or control the outbreak of fire
 - ii. control smoke and/or gas release and dispersion
 - iii. minimise heat build-up in structures
 - iv. limit the possibility of structural components being blast damaged
 - v. provide stability or contingency measures in the proposed development
 - vi. provide safe emergency access and egress to and from the railway corridor and the development
 - vii. ensure effective containment and cleanup of dangerous goods incidents.



- d. The proposed development has been designed to withstand a minimum heat load of 60 MW. Consideration has been given, in discussion with TMR, to the prospect that the proposed development, its location in the railway corridor and the risk profile of the dangerous goods transported in the corridor may mean the development will have to withstand a greater heat load.
- The design for the appropriate heat load has considered the following:
- i. the appropriate thickness of the enclosure soffit
 - ii. the coating of the enclosure soffit with passive fire protection material
 - iii. the provision of sprinklers on the enclosure soffit above the tracks to reduce the heat generation rate and suppress fire by preventing air flow to the fuel.
- e. Appropriate fire protection and alarm systems are proposed to be provided in the enclosed parts of the railway corridor.

Other advice

TMR may refer a development application to the Queensland Fire and Rescue Service for advice to ensure the relevant safety requirements have been incorporated in the design of the proposed development.

Part A.2 Future railway corridors

Description

Railway corridors are continuously being upgraded to increase the capacity of the network, minimise maintenance and respond to legislative changes aimed at improving safety, sustainability and amenity. TMR's website contains plans of future railway corridors and shows the extent of these corridors as 'future railway land'. If development is proposed in, below or above a future railway corridor, a pre-lodgement meeting should be held with TMR to determine the applicable development requirements.

Is this relevant?

Will the proposed development be located in, below or above a future railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.3

Desired development outcome

Development accommodates proposed railway corridor upgrades and future railway corridor plans.

Checklist

- a. A pre-lodgement meeting has been held with TMR to discuss the potential impact that any upgraded or future railway corridor may have on the proposed development.
- b. The proposed development is designed to accommodate a proposed upgrade to the railway corridor and/or future railway corridors.



Part A.3 Stormwater and drainage

Description

Railway corridors should have a high level of flood immunity. Development should generally not discharge or direct stormwater, roof water or floodwater onto a railway corridor. Where circumstances necessitate the crossing of a railway corridor by stormwater and drainage infrastructure associated with a development, TMR may require resource evidence prior to the lodgement of a development application.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.4

Desired development outcome

The stormwater and drainage infrastructure associated with a development does not adversely impact on the function, operation or maintenance of a railway corridor.

Checklist

- a.** The development will not cause the following to be directed to or increased or concentrated in a railway corridor:
 - i. stormwater
 - ii. roof water
 - iii. ponding
 - iv. floodwater
 - v. any other drainage.
- b.** The development will not impede any drainage, stormwater or floodwater flows from a railway corridor.
- c.** Stormwater or floodwater flows have been designed to:
 - i. maintain the structural integrity of the railway corridor infrastructure
 - ii. avoid scour or deposition
 - iii. prevent obstruction of the railway corridor as a result of stormwater or flood debris.
- d.** Drainage has been design to be directed to approved legal points of discharge.
- e.** Drains have been designed to be lined with concrete and clear of railway infrastructure.
- f.** Drainage systems have been designed to prevent leakage onto the railway corridor.
- g.** Additional railway formation drainage necessitated by the development has been designed to be accommodated in the development site.
- h.** Piers and foundations have been designed to allow free drainage along the formation and not cause ponding.
- i.** Deck drainage for all road overbridges and footbridges has been designed to discharge in a manner that will not adversely affect railway tracks or associated railway facilities.



- j. Road overbridge and footbridge deck drainage has not been designed to discharge via scuppers from spans over a railway corridor or railway land. Deck drainage pipes have been designed to comply with the requirements for services in QR Technical Requirement Section 9 of *MCE-SR-001 Design of road overbridges*, or *MCE-SR-006 Design of footbridges*, whichever applies.
- k. Bridge decks have been designed to be waterproof to prevent leaking through to the railway corridor and infrastructure.
- l. Drainage and stormwater systems, including pipes for deck drainage, have not been designed to attach to the sides or undersides of structures unless the risks to the railway corridor from failure of the systems have been addressed and the systems approved by TMR.

Part A.4 Services and utilities

Description

Services and utilities associated with a development have the potential to affect railway corridor infrastructure and operations. Where a service or utility has been poorly designed or installed, there is likely to be a need for more frequent maintenance and repair. This increases the potential for interference with railway infrastructure such as electrical and signal systems.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.5

Desired development outcome

Railway operations are protected from the adverse effects of locating services or utilities associated with a development in a railway corridor.

Checklist

- a. Services or utilities associated with the development are not proposed to be located in the railway corridor.
or
 Where circumstances necessitate the location of a service or utility in the railway corridor, the design of the service or utility complies with QR Technical Requirement *MCE-SR-16 Requirements for services under the rail corridor (non-QR services)* and any other QR Standards relevant to the design.
- b. Pipe work (for example, water or sewer pipes) has been designed to not penetrate through any soffit or side of a proposed structure.
- c. Services and their attachment to structures have been designed to be easily repaired or replaced and result in minimal interference to railway services.
- d. The design of the development allows for easy access to railway services and utilities for example, signals, telecommunications and overhead line equipment.
- e. Existing services and utilities under a railway corridor will be protected from increased loads during the construction and operation of the development.

Other advice

All railway corridor land is considered to be contaminated and construction activity that entails disturbance of the land should therefore be managed according to the requirements of the relevant agency.



Part A.5 Design and construction

Description

The delivery of a development in, below or above a railway corridor will necessitate the resolution of a range of structural design and construction management challenges that are far in excess of those experienced on a similar development elsewhere.

A proposed development needs to take account of the practicalities of accessing the railway corridor and of seeking to interrupt railway services. Approval to interrupt services will usually not be granted and access to the railway corridor is permitted only on a very limited basis.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.6

Desired development outcome

The design and construction of a development located in, below or above a railway corridor has ensured the efficient operation of railway services is maintained and there are no adverse impacts on the corridor or railway operations.

Checklist

- a. A risk assessment has been undertaken that shows all potential risks associated with the construction and operation of the development will be appropriately mitigated. (A risk assessment guide is provided in Appendix 1.)
- b. An engineering report has been prepared by a Registered Professional Engineer Queensland confirming that development can be classified as an ‘importance level 2 structure’ for the purposes of *AS 1170.4 Structural design actions: Part 4 Earthquake actions in Australia* and in accordance with *AS 5100* (noting that the lateral restraint force in *AS 5100.2 Cl. 9* is not applicable to footbridges).
- c. Structures have been designed to minimise the risk of collapse during earthquakes.
- d. The proposed development has been designed to ensure construction can be carried out without interfering with railway operations.
- or
- A superstructure of a development to be erected above a railway corridor is proposed to be assembled from precast or prefabricated elements to minimise the construction timeframe and disruption to railway operations.
- e. Existing services and utilities under a railway corridor will be protected from increased loads during the construction and operation of the development.
- f. The development will not obstruct emergency access to the railway corridor.
- g. The design of the proposed development does not direct emergency exits to the railway corridor.
- h. The proposed development does not prejudice the efficient construction of future railway infrastructure.



- i. The design of the proposed development complies with, as relevant, *AS 5100 – Bridge design* and the following QR Technical Requirements:
 - i. *MCE-SR-001 Design of road overbridges*
 - ii. *MCE-SR-005 Design of buildings over or near railways*
 - iii. *MCE-SR-006 Design of footbridges.*

Other advice

1. Compliance with the *Disability Discrimination Act 1992* (DDA) may be required where a proposed development is to be adjoining or over a station or park 'n' ride facility. Information about the DDA can be found at: www.comlaw.gov.au/ComLaw/Legislation/Act1.nsf/asmade/bytitle/53071E1E3AC70505CA256F720017DABE?OpenDocument
2. Crime prevention through environmental design (CPTED) principles should be incorporated in the proposed development. Further information about CPTED can be located at: www.police.qld.gov.au/programs/crimePrevention/cpted.htm
3. A requirement for a geotechnical survey of the development site may be imposed by TMR as a condition of development approval or may form part of an Infrastructure Agreement entered into with TMR.
4. TMR may require a Construction Management Plan to be submitted for the proposed development, either as a condition of development approval or as part of an Infrastructure Agreement.
5. TMR may require a dilapidation survey to be submitted, either as a condition of development approval or as part of an Infrastructure Agreement.
6. Condition monitoring may be required by TMR, either as a condition of development approval or as part of an Infrastructure Agreement.

Part A.6 Maintenance

Description

As the railway line, overhead wires and signals need to be maintained in good working order, the development should not obstruct access to maintenance tracks in the railway corridor.

A development in, above or below a railway corridor will also have maintenance requirements that should be considered during the design phase to ensure access to the development to undertake maintenance does not necessitate access to the railway corridor.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go Part A.7



Desired development outcome

The development has been designed so that:

1. access to the railway corridor is not required to conduct maintenance of the development
2. the Railway Manager's access to the railway corridor for maintenance purposes is maintained.

Checklist

- a. The maintenance of the development will not necessitate access from the railway corridor.
- b. The development will not obstruct, or require the removal or relocation of, a railway maintenance access point or route.
- c. The development will not increase the maintenance requirements of a railway corridor.
- d. The maintenance access arrangements for the development will be separate from the maintenance access arrangements for the railway corridor.
- e. The following will be used, as appropriate, on any part of the development that is vulnerable to graffiti and/or is visible from trains and railway platforms:
 - i. unpainted, galvanised or stainless steel elements
 - ii. self-cleaning windows
 - iii. concrete fascias with no coatings that weather prematurely
 - iv. graffiti reduction coatings.

Part A.7 Amenity

Description

Railway corridors have the potential to generate noise and vibration from the operation of passenger services, freight train movements and railway corridor maintenance. Development needs to minimise the effect of noise and vibration on nearby activities.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.8



Desired development outcome

Development incorporates measures to minimise the emission of noise and vibration from the railway corridor.

Checklist

- a. An acoustic and vibration report has been prepared by a Registered Professional Engineer Queensland to determine how the proposed development can minimise noise and vibration from the railway corridor. The development has been designed in accordance with the Queensland Development Code (QDC) Mandatory Part (MP) 4.4 – Buildings in Transport Noise Corridors (as identified in Chapter 8b of the *Building and Other Legislation Amendment Act 2009*). Noise sensitive uses have been designed to ensure a maximum sound level (between 10.00pm and 6.00am) of not greater than 45 decibels dB(A) and noise sensitive development of two storeys or less meets the external design level noise criteria of:
 - i. 65 dB(A) assessed as a 24-hour average equivalent continuous A-weighted sound pressure level
 - ii. 87 dB(A) assessed as a single maximum sound pressure level when measured one metre from the most exposed part of the noise sensitive place.The acoustic and vibration modeling has taken account of :
 - i. the running of long freight trains hauled by diesel locomotives as well as electric multiple units
 - ii. diesel powered track maintenance machinery, including equipment with audible reversing alarms and significant vibration generation
 - iii. projected increases in railway traffic, including future tracks and platforms.
- b. Consideration has been given to:
 - i. incorporating noise mitigation measures in buildings rather than noise walls or mounding on the corridor boundary
 - ii. building layouts that shield residential balconies and habitable rooms from noise generating activities in the railway corridor
 - iii. shielding noise sensitive uses by utilising buildings that accommodate activities not sensitive to noise as noise barriers.
- c. Balustrades on balconies exposed to railway noise of greater than 87 dB(A) single event maximum and 65 dB(A) Leq will be solid, gap-free and continuous for their complete length other than gaps required for drainage purposes. The total width of any gaps will not exceed 10 mm. The total area of the underside of the roof above these balconies requiring solid balustrades will be treated with an appropriate highly acoustically absorbent material.
- d. Where an acoustic report identifies that a noise barrier may be required, the barrier:
 - i. will be constructed of materials having a serviceable life of more than 40 years
 - ii. will require minimum maintenance over its serviceable life
 - iii. will be constructed from materials that:
 - a. are fire resistant
 - b. do not produce toxic fumes when burnt
 - c. do not cause flames to spread easily when ignited
 - d. do not result in toxic or environmentally harmful ash from burnt material
 - iv. will be vandal resistant and not easily disfigured by scratching with sharp implements
 - v. will be designed in accordance with QR Technical Requirement *MCE-SR-014 Design of noise barriers adjacent to railways*, in particular, section 7.



Part A.8 Protection of the railway corridor from unauthorised access

Description

The railway corridor needs to be protected from unauthorised access to prevent disruption of railway services, damage to railway infrastructure and harm to railway staff or passengers. The main risks associated with a railway corridor and its infrastructure include:

- **Electrocution** - this can be caused by contact with the electrical infrastructure including the overhead line equipment (OHLE).
- **Hazard from thrown objects** - damage can be caused to the OHLE and other railway infrastructure and railway staff and passengers if objects are unintentionally or maliciously thrown onto a railway corridor.
- **Unlawful access** - accidental access to and intentional trespass on a railway corridor have the potential to disrupt services, result in damage and vandalism to railway infrastructure and put trespassers at risk of being hit by a train.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.9

Desired development outcome

Development is designed to prevent unauthorised access to the railway corridor or contact with electrical infrastructure by people, vehicles and projectiles.

Checklist

Windows and openings

- a. Opening windows, doors, balconies and other areas that afford the opportunity for objects to be thrown onto the railway corridor or access to the OHLE, and located less than 20 metres from the centreline of the closest railway track or less than 10 metres from a railway corridor boundary, will have protection screens for anti-throw purposes and/or protection from electrification.

Protection screens - generally

- b. Protection screens have been designed in accordance with QR Technical Requirement *MCE-SR-008 Protection screens*.
- c. Protection screens within three metres of the OHLE will be electrically bonded to prevent any risk of electrocution.
- d. Protection screens will be constructed from materials that are not easily marked by scratching with a sharp implement.
- e. Protection screens will be provided where construction and maintenance works occur on or close to a railway corridor. These screens will be erected no closer than three metres (in a horizontal direction) from the nearest component of the OHLE.

Anti-throw screens

- f. Anti-throw screens will extend 2.4 metres vertically above the highest toe-hold if see-through, or two metres if non see-through, noting that expanded metal is considered to be see-through.
- g. See-through anti-throw screens will not have openings greater than 25 mm x 25 mm.



- h. Anti-throw screens will be returned a minimum of two metres at each end accessible to the public, to prevent climbing onto the back of the screen.
- i. Anti-throw screens will be provided on all bridges. The length of anti-throw screens will inhibit throwing of objects onto tracks/platforms.

Electrification screens

- j. Electrification screens will be positioned abutting live components of the OHLE to protect railway staff and members of the public from electrocution. Electrification screens will be attached to any accessible part of a development that is within three metres of the OHLE.
- k. The opportunity has been taken, where appropriate, to extend the electrification screens for dual purpose use in locations requiring the fitting of both electrification and anti-throw screens.
- l. Any perforations in electrification screens will be less than 8 mm wide. Where expanded metal panels are to be used, they will be oriented to cause objects pushed through them to protrude upwards.
- m. Where electrification screen perforations are larger than 3.5 mm wide and the bridge clearance above conductors is less than two metres, extra protection will be provided by way of either:
 - i. ensuring the lowest one metre of the screen is solid
 - ii. installing a hood above the overhead wires, extending at least one metre away from the bridge (measured perpendicular to the bridge).
- n. If an electrification screen is within 1.5 metres horizontally of the conductor, it will not have perforations larger than 3.5 mm wide.
- o. Electrification screens will extend at least three metres horizontally past the electrical equipment they are shielding.
- p. Electrification screens will be provided on all footbridges over an electrified railway. Screens will extend at least three metres horizontally both sides of conductors measured perpendicular to the track.
- q. Electrification screens will be provided on stairs and ramps within three metres horizontally of any part of the OHLE.
- r. Electrification screens will extend vertically 1.8 metres above the highest foothold.
- s. Electrification screens will extend from the point where conductors are level with the top of the screen to the top of the stairway or ramp. Below this point, screens will extend one metre towards the bottom, measured horizontally.
- t. Where retaining walls, wing walls and other significant embankments are located within three metres horizontally of the OHLE, electrification screens will be provided.

Road barriers

- u. Road barriers will be installed along roads abutting a railway corridor in accordance with QR Technical Requirement *MCE-SR-007 Design and selection criteria for road/rail interface barriers*.
- v. Road traffic barriers will be provided across road overbridges and on approaches to prevent vehicles leaving the roadway and accessing the railway corridor. Road traffic barriers on road overbridges will be designed in accordance with:
 - i. *AS 5100 Bridge design*
 - ii. QR Technical Requirement *MCE-SR-007 Design and selection criteria for road/rail interface barriers*.



- w. Where car parking structures are provided within or over a railway corridor, traffic barriers, designed in accordance with *AS 5100 Bridge design*, and QR Technical Requirement *MCE-SR-007 Design and selection criteria for road/rail interface barriers* will be provided along any floor with a boundary to the railway corridor to prevent vehicles from accessing the corridor.

Fencing

- x. Fencing will be installed along the property boundary with the railway corridor in accordance with QR Standard Drawings for fencing.

Specific matters

The following matters may or may not apply to development within or over a railway corridor, depending on the nature of the proposed development, the site and the railway corridor.

Part A.9 Collision protection

Description

Any structure located in the railway corridor should be designed and constructed to withstand damage from a derailed train. Deflection walls and structural redundancy may need to be provided in a proposed development. Such measures should also be considered in situations where a development is located at the base of a railway embankment or has a basement that could be impacted by a derailed train.

Is this relevant?

Will the proposed development be located in, below or above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.10

Desired development outcome

A development in a railway corridor is designed to ensure the structural integrity of the development is maintained in the event of an impact from a derailed train.

Checklist

- a. A risk assessment has been undertaken considering all matters relating to the standard of collision protection required for the proposed development, such as the alignment of the railway tracks, the nature and frequency of trains using the track and the proximity of the supporting structure of the proposed development to the railway tracks and other railway infrastructure.
- b. All new structures have been designed for collision loads in accordance with *AS 5100 Bridge design*.
Where the proposed development involves existing piers and columns that do not meet the collision protection and collision load requirements specified in *AS 5100 Bridge design*, deflection walls have been provided. Where space permits, independent deflection walls have been provided.



- c. Given that the collision loads in *AS 5100 Bridge design* do not cover the impact of explosions in the enclosed spaces underneath a development, additional design measures have been be incorporated as relevant, to protect against explosions beneath the development, including:
 - i. the selective location of supporting elements to avoid domino effects
 - ii. the spacing of supporting elements of sufficient number to provide strength, while still providing ventilation
 - iii. the use of structural walls instead of columns where appropriate
- d. A structural redundancy analysis has been carried out to verify the capacity to support the deck load at the ultimate limit state with one or more of the supporting columns removed.
- e. Supporting elements for the proposed development have been designed to comply with QR Technical Requirement *MCE-SR-012 Collision protection of supporting elements adjacent to railways*.
- f. All new development over the railway corridor will utilise clear spans with no piers or supporting elements located in the corridor.

Part A.10 Clearances

Description

It is extremely important to maintain the safety and integrity of the overhead line equipment (OHLE). Development in or above a railway corridor therefore needs to maintain an appropriate clearance above the OHLE.

Is this relevant?

Will the proposed development be located above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.11

Desired development outcome

A development in or above a railway corridor should be designed and constructed to maintain sufficient clearance above railway infrastructure and to have no effect on the OHLE.

Checklist

- a. The proposed development will not impact on existing or planned OHLE or other railway infrastructure.
- b. The proposed development has been designed in accordance with QR Standard Drawing 2754 *Standard clearances for new structures* and complies with the following vertical clearances:
 - i. the lowest part of the proposed development is a minimum of 7.9 metres above the railway track where the proposed development is intended to extend along the railway corridor for a distance of less than 40 metres
 - ii. the lowest part of the proposed development is a minimum of 9.0 metres above the railway track where the proposed development is intended to extend along the railway corridor for a distance of between 40 metres and 80 metres.

(Refer to Figure 3 – Clearances).

A development that is proposed to extend along a corridor for more than 80 metres is considered to form a tunnel and is subject to other requirements as specified by TMR.



- c. Structures have been designed to be set back horizontally a minimum of three metres from the OHLE (Refer Figure 4 – Setbacks).
- d. Any footbridges and road overbridges proposed as part of the development have been designed to comply with the following as relevant:
 - i. AS 5100 – Bridge design
 - ii. QR Technical Requirement *MCE–SR-006 Design of footbridges*
 - iii. QR Technical Requirement *MCE–SR-001 Design of road overbridges*.

Other advice

The plans for the proposed development should show the centre lines of all railway tracks located in the vicinity of the proposed development and include the railway kilometrage at the intersection of railway and bridge centre lines. The plans should also locate all railway infrastructure in the vicinity of the proposed development.

Figure 3 – Clearances

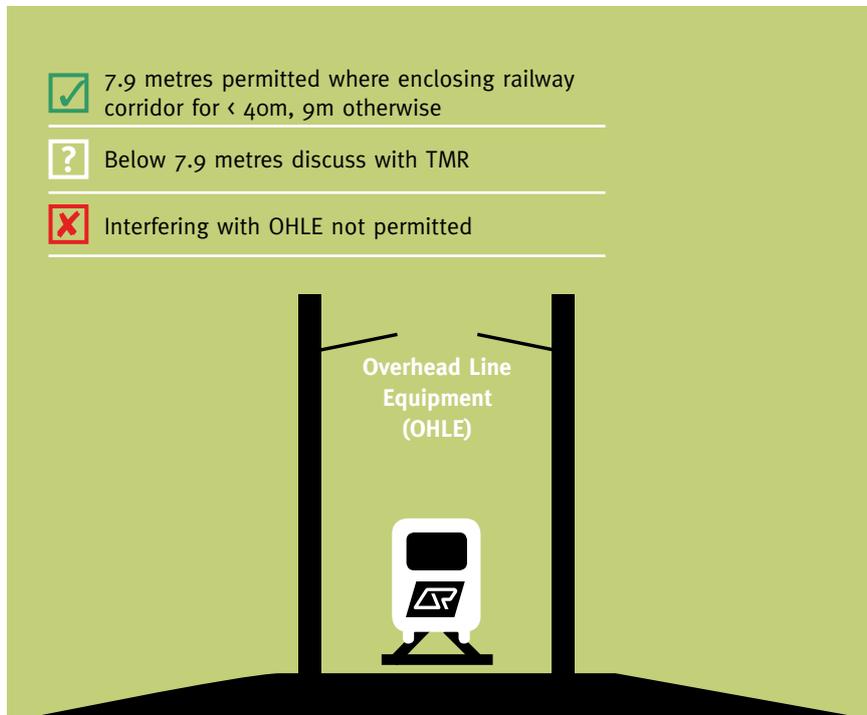
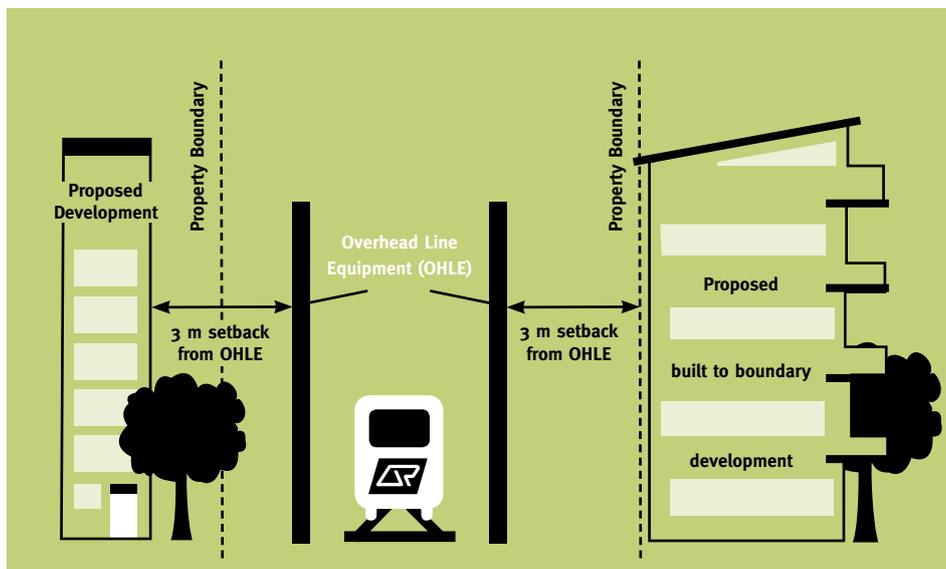


Figure 4 – Setbacks



Part A.11 Integrating with stations and park ‘n’ ride facilities

Description

A development proposed above a railway station should be designed to ensure the station remains functional and accessible. In some situations, the upgrading of a station or a park ‘n’ ride facility may be undertaken in conjunction with the construction of a development subject to station upgrade priorities and the availability of funding. Where appropriate, TMR may enter into an Infrastructure Agreement that contains a cost sharing arrangement for the provision of railway infrastructure.

The Queensland Government does not generally support development proposals that necessitate the total enclosure of station platforms on the basis that the absence of natural light and ventilation increases the operating costs of a station. The Queensland Government also will not generally support a development proposal that involves complex grade separated pedestrian movement arrangements for a station as this would disperse pedestrian flows onto multiple levels, decrease surface level activity around the station and reduce legibility of station entrances.

Is this relevant?

Will the proposed development involve works within or over a railway station or park ‘n’ ride facility?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.12



Desired development outcome

A development above a railway station or park 'n' ride facility is well integrated with the station and enables efficient pedestrian and cyclist movement to and from the station, allowing the convenient and safe use and operation of the railway service.

Checklist

- a. A pre-lodgement meeting has been held with TMR enabling the early assessment of risk.
- b. The proposed development will provide the following, where appropriate:
 - i. maintained or improved access to railway station entrances
 - ii. new, improved or maintained facilities including the following where necessary:
 - taxi access and loading zones
 - park 'n' ride facilities
 - kiss 'n' ride facilities
 - bus stops
 - pedestrian and cycle network connections
 - bike storage and/or end of trip facilities
 - maintenance and emergency access to station facilities.
 - iii. safe and efficient pedestrian access routes between station entrances and associated facilities such as park 'n' ride and kiss 'n' ride facilities, public transport interchanges and any nearby thoroughfares
 - iv. promotion of railway station legibility and incorporation of way finding signs and electronic timetables
 - v. separate emergency access and exit points for the proposed development that do not direct an evacuation onto the railway corridor or toward a railway emergency exit.
- c. Where there is an existing park 'n' ride facility, the proposed development will:
 - i. maintain the required number of park 'n' ride car parking spaces in accordance with TTA's Park 'n' Ride Strategy
 - ii. locate transit supportive uses (extended hours convenience retailing and the like) along the pedestrian link between the station entrance and the park 'n' ride facility.
- d. Pedestrian footpaths connecting to and within 100 metres of a station entrance have been designed to be a minimum of 2.4 metres in width.
- e. Where public access to the railway station is required through the proposed development, a public access easement will be provided for in favour of TMR.
- f. The proposed development will not interrupt efficient pedestrian movement to and from a railway station.
- g. The proposed development, will not locate waste receptacles, waste storage areas, vents or plant equipment in areas adjacent to or in plain sight of railway station platforms.
- h. The proposed development will not have blank, unarticulated or graffiti-vulnerable walls in areas visible from a railway station platform.
- i. The proposed development will provide casual surveillance and activation along pedestrian thoroughfares to stations and park 'n' ride facilities.
- j. The proposed development will provide shade and shelter over pedestrian paths located in or next to the development.



Other advice

1. TMR may agree to coordinate the design of a railway station or park 'n' ride upgrade with the design a development proposal and approve a resource evidence under section 264 of the *Sustainable Planning Act 2009*
2. Crime Prevention Through Environmental Design (CPTED) principles should be addressed where a proposed development is to be in or above a station or park 'n' ride facility.

Part A.12 Ventilation and lighting

Description

Where a development encloses a railway corridor, it should be designed to allow access to natural light and ventilation in the corridor. This is especially important where a development is located above a railway station.

Is this relevant?

Will the proposed development be located above a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.13.

Desired development outcome

A development above a railway corridor is designed to facilitate natural ventilation and lighting of the railway corridor, particularly a station environment.

Checklist

- a. Where a proposed development is planned to extend above a railway corridor for a length of up to 80 metres, sufficient gaps have been designed in the development to ensure adequate natural ventilation. The size of the gaps is in accordance with the recommendations of a ventilation study of the proposed development.
- or
- Where a proposed development is planned to extend above a railway corridor for a length of more than 80 metres, ventilation shafts have been designed at appropriate intervals.
- b. Where a development is proposed above a railway corridor for a length of more than 80 metres, modeling of smoke dispersion has been undertaken by a Registered Professional Engineer Queensland to predict ventilation patterns and inform ventilation design.
- c. Where a proposed development is located above a railway corridor, the ventilation design has resolved how to maintain railway operations during a fire emergency. The ventilation systems have been designed to control smoke and allow emergency response teams to enter safely with appropriate fire fighting and protective equipment.
- d. Where ventilation shafts are provided as part of a proposed development, discharge points for the vents have been designed to be located in a position where escaping toxic plumes will not enter air-conditioning intake ducts or affect nearby sensitive uses such as residential, education and medical uses.

The design of the ventilation system for the proposed development has been prepared in accordance with a dispersion modeling analysis prepared by a Registered Professional Engineer Queensland. The analysis utilised meteorological data applicable to the building location for various combinations of wind speeds and Pasquill stability conditions.



- e. Air-conditioning intakes, when located above or in the vicinity of ventilation vents, are proposed to be fitted with smoke detectors which automatically shut down air-conditioning fans and dampers.
- f. Where a proposed development is located above a railway station, the lighting of the station has been designed to have an uninterrupted power supply and be able to operate in the event of a fire or other emergency situation.

Part A.13 Tunnels

Description

Where a proposed development involves construction, excavation or filling above a railway tunnel, groundwater and geotechnical investigations should be undertaken to ensure the tunnel will not be affected.

Is this relevant?

Will the proposed development be located above a railway tunnel?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.14

Desired development outcome

A development in the vicinity of a railway tunnel should not cause the tunnel to be overloaded vertically or affected by the addition or removal of lateral pressures. The groundwater regime should not be altered in a way that would adversely affect the tunnel.

Checklist

- a. A comprehensive geotechnical assessment, encompassing groundwater assessment, has been prepared by a Registered Professional Engineer Queensland. The assessment demonstrates that the proposed development will not cause the tunnel to be vertically overloaded or affected by the addition or removal of lateral pressures and it will not adversely affect the integrity of the tunnel as a result of directly or indirectly disturbing groundwater.

Other advice

1. Reporting by a Registered Professional Engineer Queensland may not be required depending on the scope and extent of the works and their distance from the railway corridor. This should be confirmed with TMR.
2. Where excavation, drilling or other similar ground disturbing works are to be carried out abutting a railway tunnel, monitoring of tunnel linings throughout construction by a Registered Professional Engineer Queensland may be required. This will depend on the extent of works and their distance from a railway tunnel.

Part A.14 Viaducts

Description

Emergency access to a railway viaduct may be required from time to time, in addition to regular maintenance access. Accordingly, any development located below a railway viaduct is to be limited to temporary structures and minor uses such as car parking and outdoor storage.

Is this relevant?

Will the proposed development be located in or above a railway corridor containing a viaduct?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.15

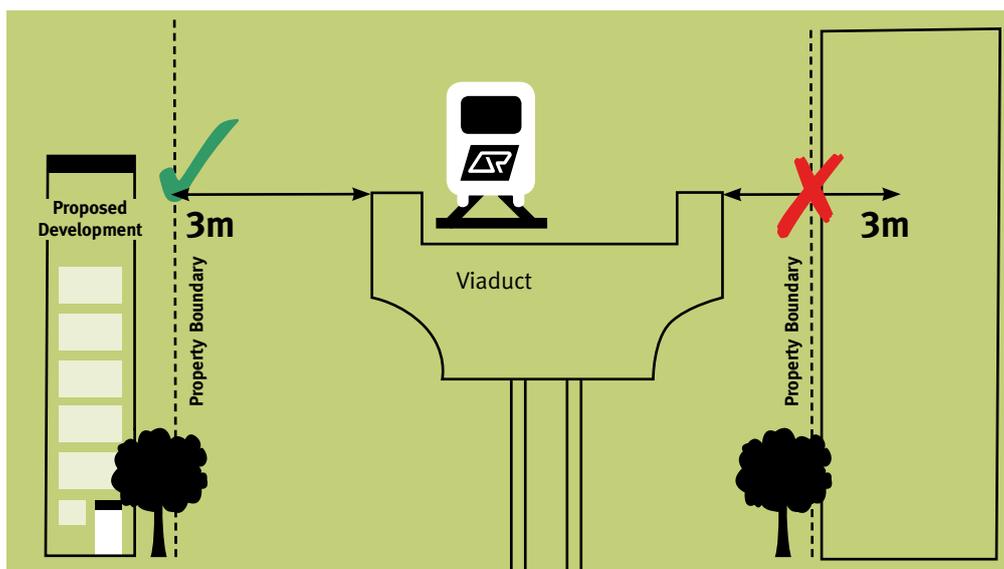
Desired development outcome

A development should be designed to avoid risks to operations and infrastructure associated with a railway viaduct.

Checklist

- a. The part of a proposed development located below a railway viaduct is intended to be used only for temporary activities and will be limited in use to ancillary activities such as car parking or outdoor storage.
- b. Land underneath a railway viaduct is proposed to be clear of permanent structures or any other activity that may impede construction and maintenance of railway infrastructure or emergency access.
- c. The proposed development abutting a railway viaduct will be set back a minimum of 3 metres from the viaduct structure (refer to Figure 5 – Viaducts).
- d. The development will not restrict emergency access to a railway viaduct.

Figure 5 – Viaducts





Part A.15 Excavation, retaining and other ground disturbance

Description

Excavation, retaining works and other works involving ground disturbance can significantly affect the safety and operational integrity of railway corridors and accordingly are generally not permitted. Where such works are unavoidable, it may be necessary to undertake surveying, groundwater and geotechnical investigations to ensure the works will not adversely affect the corridor.

Is this relevant?

Will the proposed development necessitate excavation, retaining or other ground disturbance in or below a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part A.16

Desired development outcome

Excavation, retaining works and other ground disturbance works associated with a proposed development should not impact on the safety and operational integrity of the railway or cause the de-stabilisation of railway transport infrastructure.

Checklist

- a. The design of proposed excavation works, retaining works and other works involving ground disturbance abutting a railway corridor is supported by a report prepared by a Registered Professional Engineer Queensland which confirms that the works will not de-stabilise railway transport infrastructure.
- b. Temporary structures and batters are not planned to encroach into a railway corridor. Where approved, temporary structures or batters in the railway corridor are able to be easily removed and the corridor returned to its former state.
- c. The development will not necessitate the storage of fill, spoil or any other material on a railway corridor at any stage of construction.
- d. Retaining structures necessary to stabilise any excavations for a development will be located outside the railway corridor boundary.

Other advice

Provision should be made to monitor the position of potentially affected track and other railway infrastructure in real time.



Part A.16 Rock anchors and soil nails

Description

The use of rock anchors and soil nails in a railway corridor has the potential to disrupt the safety and operational integrity of the corridor and may constrain future corridor upgrading.

Accordingly, rock anchors and soil nails are generally not permitted in a railway corridor. However, in exceptional circumstances temporary anchors and/or soil nails may be permitted. These anchors or soil nails should be temporary in the sense that they are not required to support a development beyond the period of its construction. The use of temporary anchors and/or soil nails in a corridor should be discussed with TMR prior to lodgement of a development application.

Is this relevant?

Will the proposed development involve the use of rock anchors and/or soil nails in or below a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – assessment against Part 1 completed

Desired development outcome

Railway corridors are not affected by rock anchors and/or soil nails and therefore are not subject to such associated impacts as ground disturbance and constraints on the maintenance or future upgrading of railway infrastructure.

Checklist

- a. Temporary soil nails and/or rock anchors located within a railway corridor have been designed so that they do not interfere with railway infrastructure.
- b. Temporary soil nails and/or rock anchors that are intended to remain in place, are proposed to be de-stressed following construction to avoid unnecessary disturbance to the railway corridor.
- c. The design and installation of temporary soil nails and/or rock anchors within a railway corridor is supported by a report prepared by a Registered Professional Engineer Queensland that confirms the works will not de-stabilise railway transport infrastructure or place any unnecessary risk on the railway corridor.

Other advice

Provision should be made for continuous monitoring of the railway corridor throughout construction including independent geotechnical advice from a Registered Professional Engineer Queensland.



Part B – Development abutting a railway corridor

Matters identified in Part B:

The following matters are likely to apply to all development proposals.

Generic matters:

- Part B.1 Setbacks**
- Part B.2 Future railway corridors and upgrades**
- Part B.3 Stormwater and drainage**
- Part B.4 Services and utilities**
- Part B.5 Design and construction**
- Part B.6 Maintenance**
- Part B.7 Amenity**
- Part B.8 Protection from unauthorised access to a railway corridor**

The extent to which the following matters are relevant to a proposed development will depend on the nature of the development, the attributes of the railway corridor and the characteristics of the site.

Specific matters:

- Part B.9 Integrating with stations**
- Part B.10 Tunnels**
- Part B.11 Viaducts**
- Part B.12 Excavation, retaining and ground disturbance**

Generic matters

Part B.1 Setbacks

Description

It is extremely important to maintain the safety and integrity of the overhead line equipment (OHLE). Development abutting a railway corridor therefore needs to maintain appropriate setbacks from OHLE.

Is this relevant?

Will the proposed development abut a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.2

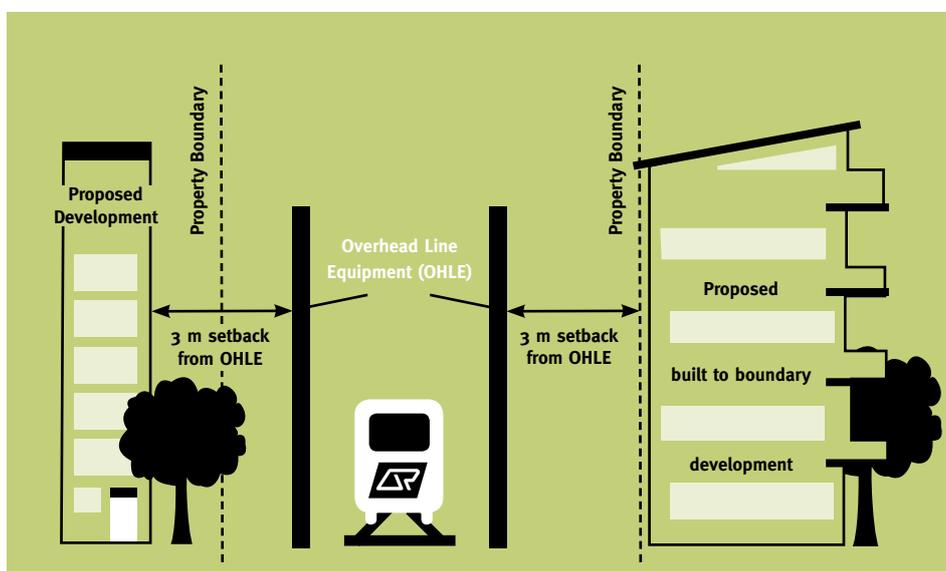
Desired development outcome

A development abutting a railway corridor should be designed and constructed to maintain sufficient clearance to railway infrastructure and to have no effect on the OHLE.

Checklist

- a. The proposed development has been designed to be set back horizontally a minimum of 3 metres from the OHLE (refer to Figure 6 – Setbacks).
- b. The proposed development has been designed with setbacks that provide for an access way abutting the railway corridor to facilitate building maintenance.

Figure 6 – Setbacks





Part B.2 Future railway corridors

Description

Railway corridors are continuously being upgraded to increase the capacity of the network, minimise maintenance and respond to legislative changes aimed at improving safety, sustainability and amenity. TMR's website contains plans of future railway corridors and shows the extent of these corridors as 'future railway land'. If development is proposed abutting a future railway corridor, a pre-lodgement meeting should be held with TMR to determine the applicable development requirements.

Is this relevant?

Will the proposed development abut a railway corridor that is to be upgraded or a future railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.3

Desired development outcome

Development accommodates proposed railway corridor upgrades and future railway corridor plans.

Checklist

- a. A pre-lodgement meeting has been held with TMR to discuss the potential impact that any upgraded or future railway corridor may have on the proposed development.
- b. The proposed development has been designed to accommodate a proposed upgrade to the railway corridor and/or future railway corridors.

Part B.3 Stormwater and drainage

Description

Railway corridors should have a high level of flood immunity. Development should generally not discharge or direct stormwater, roof water or floodwater onto a railway corridor. Where circumstances necessitate the crossing of a railway corridor by stormwater and drainage infrastructure associated with a development, TMR may require a resource evidence prior to the lodgement of a development application.

Is this relevant?

Will the proposed development abut a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.4



Desired development outcome

The stormwater and drainage infrastructure associated with a development does not adversely impact on the function, operation or maintenance of a railway corridor.

Proposed development and its associated drainage and stormwater should not adversely impact on the function, operation or maintenance of a railway corridor.

Checklist

- a. The development will not cause the following to be directed to or increased or concentrated in a railway corridor:
 - i. stormwater
 - ii. roof water
 - iii. ponding
 - iv. floodwater
 - v. any other drainage.
- b. The development will not impede any drainage, stormwater or floodwater flows from a railway corridor.
- c. Stormwater or floodwater flows have been designed to:
 - i. maintain the structural integrity of the railway corridor infrastructure
 - ii. avoid scour or deposition
 - iii. prevent obstruction of the railway corridor as a result of stormwater or flood debris.
- d. Drainage has been design to be directed to approved legal points of discharge.
- e. Drains have been designed to be lined with concrete and clear of railway infrastructure.
- f. Drainage systems have been designed to prevent leakage onto the railway corridor.
- g. Additional railway formation drainage necessitated by the development has been designed to be accommodated in the development site.
- h. Piers and foundations have been designed to allow free drainage along the formation and not cause ponding.
- i. Retaining structures for excavations abutting the railway corridor have been designed to include provision for drainage.
- j. Drainage and stormwater systems have not been designed to attach to the sides of structures unless the risks to the railway corridor from failure of the systems have been addressed and the systems approved by TMR.

Part B.4 Services and utilities

Description

Services and utilities associated with a development have the potential to affect railway corridor infrastructure and operations. Where a service or utility has been poorly designed or installed, there is likely to be a need for more frequent maintenance and repair. This increases the potential for interference with railway infrastructure such as electrical and signal systems.

Is this relevant?

Will the proposed development about a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.5



Desired development outcome

Railway operations are protected from the adverse effects of locating services or utilities associated with a development in a railway corridor.

Checklist

- a. Pipe work (for example, water or sewer pipes) has been designed to not penetrate through the side of a built-to-boundary wall abutting the railway corridor.
- b. Services have been designed to be easily repaired or replaced and result in minimal interference to railway services.

Part B.5 Design and construction

Description

The safety and operational integrity of the railway corridor is a high priority. The construction of a development should therefore not involve access to the railway corridor or cause any interruption to services.

Is this relevant?

Will the proposed development abut a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.6

Desired development outcome

The design and construction of a development abutting a railway corridor has ensured the efficient operation of railway services is maintained and there are no adverse impacts on the corridor or railway operations.

Checklist

- a. The proposed development has been designed to ensure construction can be carried out without interfering with railway operations.
- b. The proposed development has been designed to enable the development to be demolished with minimal interference to the railway corridor and its operations.
- c. The development will not obstruct emergency access to the railway corridor.
- d. The design of the proposed development does not direct emergency exits to the railway corridor.

Other advice

1. A proposed development abutting a railway corridor may need to incorporate some degree of collision protection depending on the type of development, the railway track alignment and the proximity of the proposed development to track centreline.
2. Compliance with the *Disability Discrimination Act 1992* (DDA) may be required where a proposed development abuts a railway corridor. Information about the DDA can be found at: www.comlaw.gov.au/ComLaw/Legislation/Act1.nsf/asmade/bytitle/53071E1E3AC70505CA256F720017DABE?OpenDocument
3. Crime prevention through environmental design (CPTED) principles should be incorporated in the proposed development. Further information about CPTED can be located at: www.police.qld.gov.au/programs/crimePrevention/cpted.htm



Part B.6 Maintenance

Description

As the railway line, overhead wires and signals need to be maintained in good working order, the development should not obstruct access to maintenance tracks in the railway corridor.

A development abutting a railway corridor will also have maintenance requirements that should be considered during the design phase to ensure access to the development to undertake maintenance does not necessitate access to the railway corridor.

Is this relevant?

Will the proposed development abut a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.7

Desired development outcome

The development has been designed so that:

1. access to the railway corridor is not required to conduct maintenance of the development
2. the Railway Manager's access to the railway corridor for maintenance purposes is maintained.

Checklist

- a. The maintenance of the development will not necessitate access from the railway corridor.
- b. The development will not increase the maintenance requirements of a railway corridor.
- c. The development will not obstruct, or require the removal or relocation of, a railway maintenance access point or route.
- d. The maintenance access arrangements for the development will be separate from the maintenance access arrangements for the railway corridor.
- e. The following will be used, as appropriate, on any part of the development that is vulnerable to graffiti and/or is visible from trains and railway platforms:
 - i. unpainted, galvanised or stainless steel elements
 - ii. self-cleaning windows
 - iii. concrete fascias with no coatings that weather prematurely
 - iv. graffiti reduction coatings.



Part B.7 Amenity

Description

Railway corridors have the potential to generate noise and vibration from the operation of passenger services, freight train movements and railway corridor maintenance. Development needs to minimise the effect of noise and vibration on nearby activities.

Is this relevant?

Will the proposed development abut a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.8

Desired development outcome

Development incorporates measures to minimise the emission of noise and vibration from the railway corridor.

Checklist

- a. An acoustic and vibration report has been prepared by a Registered Professional Engineer Queensland to determine how the proposed development can minimise noise and vibration from the railway corridor. The development has been designed in accordance with the Queensland Development Code (QDC) Mandatory Part (MP) 4.4 – Buildings in Transport Noise Corridors (as identified in Chapter 8b of the *Building and Other Legislation Amendment Act 2009*). Noise sensitive uses have been designed to ensure a maximum sound level (between 10.00pm and 6.00am) of not greater than 45 decibels dB(A) and noise sensitive development of two storeys or less meets the external design level noise criteria of:
- i. 65 dB(A) assessed as a 24-hour average equivalent continuous A-weighted sound pressure level
 - ii. 87 dB(A) assessed as a single maximum sound pressure level when measured one metre from the most exposed part of the noise sensitive place.
- The acoustic and vibration modelling has taken account of :
- i. the running of long freight trains hauled by diesel locomotives as well as electric multiple units
 - ii. diesel powered track maintenance machinery, including equipment with audible reversing alarms and significant vibration generation
 - iii. projected increases in railway traffic, including future tracks and platforms.
- b. Consideration has been given to:
- i. incorporating noise mitigation measures in buildings rather than noise walls or mounding on the corridor boundary
 - ii. building layouts that shield residential balconies and habitable rooms from noise generating activities in the railway corridor
 - iii. shielding noise sensitive uses by utilising buildings that accommodate activities not sensitive to noise as noise barriers.



- c. Balustrades on balconies exposed to railway noise of greater than 87 dB(A) single event maximum and 65 dB(A) Leq will be solid, gap-free and continuous for their complete length other than gaps required for drainage purposes. The total width of any gaps will not exceed 10 mm. The total area of the underside of the roof above these balconies requiring solid balustrades will be treated with an appropriate highly acoustically absorbent material.

- d. Where an acoustic report identifies that a noise barrier may be required, the barrier:
 - i. will be constructed of materials having a serviceable life of more than 40 years
 - ii. will require minimum maintenance over its serviceable life
 - iii. will be constructed from materials that:
 - a. are fire resistant
 - b. do not produce toxic fumes when burnt
 - c. do not cause flames to spread easily when ignited
 - d. do not result in toxic or environmentally harmful ash from burnt material
 - iv. will be vandal resistant and not easily disfigured by scratching with sharp implements
 - v. will be designed in accordance with QR Technical Requirement *MCE-SR-014 Design of noise barriers adjacent to railways*, in particular, section 7.

Part B.8 Protection of the railway corridor from unauthorised access

Description

The railway corridor needs to be protected from unauthorised access to prevent disruption of railway services, damage to railway infrastructure and harm to railway staff or passengers. The main risks associated with a railway corridor and its infrastructure include:

- **Electrocution** - this can be caused by contact with the electrical infrastructure including the overhead line equipment (OHLE).
- **Hazard from thrown objects** - damage can be caused to the OHLE and other railway infrastructure and railway staff and passengers if objects are unintentionally or maliciously thrown onto a railway corridor.
- **Unlawful access** - accidental access to and intentional trespass on a railway corridor have the potential to disrupt services, result in damage and vandalism to railway infrastructure and put trespassers at risk of being hit by a train.

Is this relevant?

Will the proposed development abut a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.9



Desired development outcome

Development is designed to prevent unauthorised access to the railway corridor or contact with electrical infrastructure by people, vehicles and projectiles.

Checklist

Windows and openings

- a. Opening windows, doors, balconies and other areas that afford the opportunity for objects to be thrown onto the railway corridor or access to the OHLE, and located less than 20 metres from the centreline of the closest railway track or less than 10 metres from a railway corridor boundary, will have protection screens for anti-throw purposes and/or protection from electrification.

Protection screens - generally

- b. Protection screens have been designed in accordance with QR Technical Requirement *MCE-SR-008 Protection screens*.
- c. Protection screens within three metres of the OHLE will be electrically bonded to prevent any risk of electrocution.
- d. Protection screens will be constructed from materials that are not easily marked by scratching with a sharp implement.
- e. Protection screens will be provided where construction and maintenance works occur on or close to a railway corridor. These screens will be erected no closer than three metres (in a horizontal direction) from the nearest component of the OHLE.

Anti-throw screens

- f. Anti-throw screens will extend 2.4 metres vertically above the highest toe-hold if see-through, or two metres if non see-through, noting that expanded metal is considered to be see-through.
- g. See-through anti-throw screens will not have openings greater than 25 mm x 25 mm.
- h. Anti-throw screens will be returned a minimum of two metres at each end accessible to the public, to prevent climbing onto the back of the screen.

Electrification screens

- i. Electrification screens will be positioned abutting live components of the OHLE to protect railway staff and members of the public from electrocution. Electrification screens will be attached to any part of a development that is within 3 metres of the OHLE.
- j. The opportunity has been taken, where appropriate, to extend the electrification screens for dual purpose use in locations requiring the fitting of both electrification and anti-throw screens.
- k. Any perforations in electrification screens will be less than 8 mm wide. Where expanded metal panels are to be used, they will be oriented to cause objects pushed through them to protrude upwards.
- l. Where electrification screen perforations are larger than 3.5 mm wide and the clearance from the screens to the conductors is less than 2 metres, extra protection will be provided by way of either:
 - i. ensuring the lowest one metre of the screen is solid
 - ii. installing a hood above the overhead wires, extending at least 1 metre away from the nearest surface (measured perpendicular to that surface).
- m. If an electrification screen is within 1.5 metres horizontally of the conductor, it will not have perforations larger than 3.5 mm wide.
- n. Electrification screens will extend at least 3 metres horizontally past the electrical equipment that they are shielding.



- o. Electrification screens will be provided on stairs and ramps within 3 metres horizontally of any part of the OHLE.
- p. Electrification screens will extend vertically 1.8 metres above the highest foothold.
- q. Electrification screens will extend from the point where conductors are level with the top of the screen to the top of the stairway or ramp. Below this point, screens will extend 1 metre towards the bottom, measured horizontally.
- r. Where retaining walls, wing walls and other significant embankments are located within 3 metres horizontally of the OHLE, electrification screens will be provided.

Road barriers

- s. Road barriers will be installed along roads abutting a railway corridor in accordance with QR Technical Requirement *MCE-SR-007 Design and selection criteria for road/rail interface barriers*.
- t. Where car parking structures are proposed abutting a railway corridor, traffic barriers, designed in accordance with *AS 5100 Bridge Design*, and QR Technical Requirement *MCE-SR-007 Design and selection criteria for road/rail interface barriers* will be provided along any floor with a boundary to the railway corridor to prevent vehicles from accessing the corridor.

Fencing

- u. Fencing will be installed along the property boundary with the railway corridor in accordance with QR Standard Drawings for fencing.

Specific matters

The following matters may or may not apply to development within or over a railway corridor, depending on the nature of the proposal, the site and the railway corridor.

Part B.9 Integrating with stations

Description

A development abutting a railway station should be designed to ensure the station remains functional and accessible. Maximising the visibility of the railway station and the legibility of access to the station is of greatest importance in the design process.

Is this relevant?

Will the proposed development abut a railway station?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.10



Desired development outcome

A development abutting a railway station should enable efficient pedestrian and cyclist movement to and from the station, allowing the convenient and safe use and operation of the railway service.

Checklist

- a. A pre-lodgement meeting has been held with TMR enabling the matters that will need to be resolved prior to lodgement of a development application to be identified.
- b. The proposed development will provide the following, where appropriate:
 - i. maintained or improved access to railway station entrances
 - ii. new, improved or maintained facilities including the following where necessary:
 - taxi access and loading zones
 - park 'n' ride facilities
 - kiss 'n' ride facilities
 - bus stops
 - pedestrian and cycle network connections
 - bike storage and/or end of trip facilities
 - maintenance and emergency access to station facilities.
 - iii. safe and efficient pedestrian access routes between station entrances and associated facilities such as park 'n' ride and kiss 'n' ride facilities, public transport interchanges and any nearby thoroughfares
 - iv. promotion of railway station legibility and incorporation of way finding signs and electronic timetables
 - v. separate emergency access and exit points for the proposed development that do not direct an evacuation onto the railway corridor or toward a railway emergency exit.
- c. Where a proposed development abuts a railway station access and the length of the development is more than 200 metres, safe and direct pedestrian and cyclist connections will be provided through the development.
- d. Where public access to the railway station is required through the proposed development, a public access easement will be provided for in favour of TMR.
- e. Pedestrian footpaths connecting to and within 100 metres of a station entrance have been designed to be a minimum of 2.4 metres in width.
- f. The proposed development will not locate waste receptacles, waste storage areas, vents or plant equipment adjacent to or in plain sight of the railway station platforms.
- g. The proposed development will not have blank, unarticulated or graffiti-vulnerable walls in areas visible from a railway station platform.
- h. The proposed development will provide casual surveillance and activation along pedestrian thoroughfares to the railway station.
- i. The proposed development will provide shade and shelter over pedestrian paths located in or next to the development.



Part B.10 Tunnels

Description

Where a proposed development involves construction, excavation or filling abutting a railway tunnel, groundwater and geotechnical investigations should be undertaken to ensure that the tunnel will not be affected.

Is this relevant?

Will the proposed development about the railway environment associated with a railway tunnel?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.11

Desired development outcome

A development in the vicinity of a railway tunnel should not cause the tunnel to be overloaded vertically or affected by the addition or removal of lateral pressures. The groundwater regime should not be altered in a way that would adversely affect the tunnel.

Checklist

- a. A comprehensive geotechnical assessment, encompassing groundwater assessment, has been prepared by a Registered Professional Engineer Queensland. The assessment demonstrates that the proposed development will not cause the tunnel to be vertically overloaded or affected by the addition or removal of lateral pressures and it will not adversely affect the integrity of the tunnel as a result of directly or indirectly disturbing groundwater.

Other advice

1. Reporting by a Registered Professional Engineer Queensland may not be required depending on the scope and extent of the works and their distance from the railway corridor. This should be confirmed with TMR.
2. Where excavation, drilling or other similar ground disturbing works are to be carried out abutting a railway tunnel, monitoring of tunnel linings throughout construction by a Registered Professional Engineer Queensland may be required. This will depend on the extent of works and their distance from a railway tunnel.



Part B.11 Viaducts

Description

Emergency access to a railway viaduct may be required from time to time, in addition to regular maintenance access. Accordingly, any proposed development abutting a railway viaduct is to be limited to temporary structures and minor uses such as car parking and outdoor storage.

Is this relevant?

Will the proposed development abut a railway corridor containing a viaduct?

- Yes – consider the desired development outcome and checklist below
- No – go to Part B.12

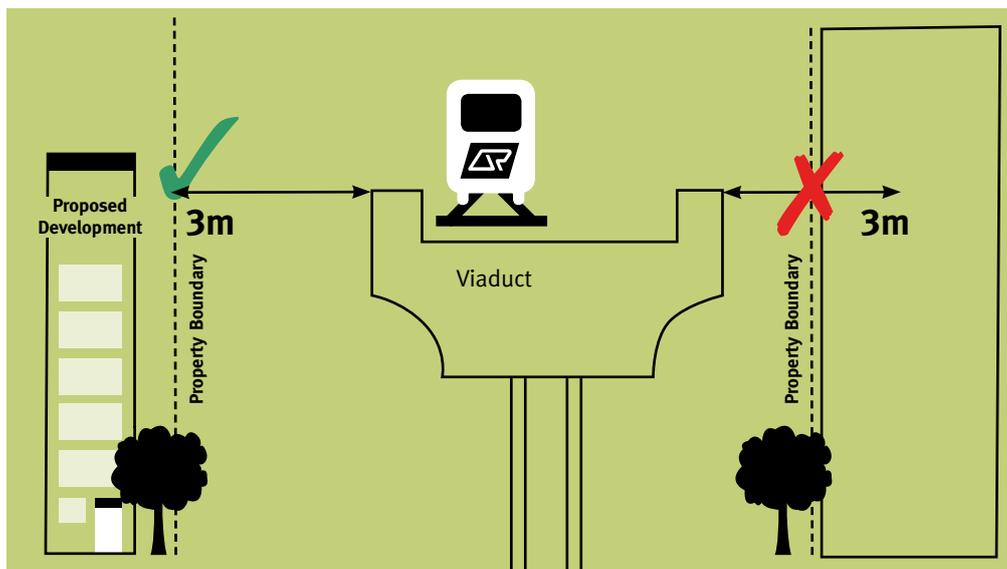
Desired development outcome

A development should be designed to avoid risks to operations and infrastructure associated with a railway viaduct.

Checklist

- a. The part of a proposed development abutting a railway viaduct is intended to be used only for temporary activities and will be limited in use to ancillary activities such as car parking or outdoor storage.
- b. Land underneath a railway viaduct is proposed to be clear of permanent structures or any other activity that may impede construction and maintenance of railway infrastructure or emergency access.
- c. The proposed development abutting a railway viaduct will be set back a minimum of 3 metres from the viaduct structure (refer to Figure 7 – Viaducts).
- d. The development will not restrict emergency access to a railway viaduct.

Figure 7 – Viaducts



Part B.12 Excavation, retaining and other ground disturbance

Description

Excavation, retaining works and other works involving ground disturbance can significantly affect the safety and operational integrity of a railway corridor and accordingly are generally not permitted. Where such works are unavoidable, it may be necessary to undertake surveying, groundwater and geotechnical investigations to ensure the works will not adversely affect the railway corridor.

Is this relevant?

Will the proposed development necessitate excavation, retaining or ground disturbance abutting a railway corridor?

- Yes – consider the desired development outcome and checklist below
- No – Checklist complete



Desired development outcome

Excavation, retaining works and other ground disturbance works associated with a proposed development should not impact on the safety and operational integrity of the railway or cause the de-stabilisation of railway infrastructure.

Checklist

- a. The design of proposed excavation works, retaining works and other works involving ground disturbance abutting a railway corridor is supported by a report prepared by a Registered Professional Engineer Queensland which confirms that the works will not de-stabilise railway transport infrastructure.
- b. The development will not necessitate the storage of fill, spoil or any other material on a railway corridor at any stage of construction.
- c. Retaining structures necessary to stabilise any excavations or a will be located outside the railway corridor.
- d. The development will not necessitate a track formation to be supported by a reinforced earth retaining structure.

Other advice

1. Provision should be made to monitor the position of potentially affected track and other railway infrastructure throughout the period of the ground disturbance.
2. For additional requirements where a development abutting a railway corridor involves the use of soil nails and/or rock anchors in the railway corridor, refer to the checklist at Part A.16.



4 Access to railway land

As part of a development proposal, access may be sought to railway land, including airspace.

This section explains the parties, processes and requirements involved in obtaining temporary or permanent access to railway land.

4.1 Railway land ownership

As the holder of the perpetual lease over railway land on behalf of the Queensland Government, TMR is the 'owner' of the land. QR and other railway managers sublease railway land from TMR.

A number of sites in various railway corridors have not been included in the perpetual lease due to the complexity of dealing with intervening rights held by private third parties. These sites are defined in legislation as 'commercial corridor land'. Although QR holds the freehold title to these sites, TMR is regarded as the owner. Central Station is an example of such a site.

4.2 Sale of corridor land, including airspace

TMR can arrange freehold title for parts of the corridor, including the airspace, for the purposes of facilitating development. However, given the complexity of undertaking airspace development in an operating railway environment, airspace sales only occur where all design requirements have been met and the appropriate agreements are in place to protect the railway corridor.

The development of corridor airspace may involve a development agreement, a contract of sale, a development lease and either a building management statement or a suite of easements. In some cases, short-term occupation of the corridor can be dealt with by way of a licence.

Transfer of title does not usually take place until the development is completed and the envelope of the building is accurately defined by survey. A long term leasehold arrangement may be more appropriate than a freehold arrangement, particularly where a plan for a future corridor may affect the site.

4.3 Private treaty dealings

Private treaty dealings are rare and the disposal sale of most government owned sites will be by way of a tender process. Owning or having an option to purchase land adjacent to a railway corridor will not necessarily be regarded as sufficient basis for a private treaty disposal.

Private treaty dealings may only occur where it is practically necessary or commercially advantageous to the Queensland Government and not contrary to the best interests of the community. Private treaty dealings require the endorsement of the Property Management Committee in accordance with Government Land Policy Disposal Policy 5: Private Treaty Disposal (DERM 2005). The policy sets out the criteria for approval of a private treaty.

4.4 Approval for works on or near the railway corridor

Certain works in the railway corridor are deemed to be exempt under the *Sustainable Planning Act 2009* (SPA). These works generally involve railway infrastructure, including stations.

QR assesses and approves proposals for railway-related infrastructure. The Department of Public Works (Project Services) is involved in certifying compliance with various building regulations.

Where railway infrastructure works are proposed as part of a development, TMR will advise the works that are exempt under SPA and which therefore will not form part of the development application.



4.5 Owner's consent and resource entitlement

If a development application involves railway corridor land held in perpetual lease, owner's consent is required from both TMR and QR. If a development application involves QR freehold land, owner's consent is required from QR.

If a development application involves TMR freehold land, a resource evidence is required from TMR. A request for resource evidence is to be made in writing to TMR. A copy of the development application (in the form that it will be lodged with the local government) is to be provided to TMR to enable the evidence to be issued. TMR will endeavour to provide the resource evidence within five business days of receipt of the request and development application.

As outlined in Section 2 of this guide, if it is proposed to occupy or temporarily or permanently close a local road, DERM will also need to provide the applicant with evidence of resource entitlement.

4.6 Building management statement

If the proposed development involves both private land and railway land in an integrated development, and involves shared access and services a building management statement (BMS) may be required. The Queensland Government and QR will both be a party to the BMS.

In accordance with Section 294D of the *Land Act 1994*, the BMS will contain provisions about:

- the provision of services
- rights of access
- rights of support and shelter
- insurance arrangements.

The BMS may also restrict the development of some part or parts of the land to maintain natural light and ventilation to the railway corridor.

The BMS will generally require the owner or lessee (as applicable) to agree to not take any action against the State of Queensland, QR or its subsidiary companies in relation to the operations of the railway or any disturbance arising from those operations.

4.7 Encroachment into the railway corridor

QR may approve a temporary encroachment into the railway corridor by way of a licence. The licence will cover such matters as the conditions of use, security of the corridor, supervision (for railway safety purposes) and insurances or indemnities.

A permanent encroachment into the railway corridor will be subject to a negotiated commercial agreement between the proponent, QR and the state government. This may involve a volumetric lease.



4.8 Easements

A permanent easement will generally not be granted over the railway corridor because of the need to preserve the ability to upgrade or relocate infrastructure in the corridor at any time.

Where provision needs to be made for a utility service, the preferred means of granting a right of occupation is by way of a licence or 'wayleave'. A wayleave will usually allow the service to be altered or removed, at the grantee's expense, in the event that this is necessary to enable the railway infrastructure to be maintained or upgraded.

The state government may require an easement through a development to protect and preserve public access to a railway station.

4.9 Indemnities, insurances and securities

If a proposed development integrates with the railway corridor, the current and subsequent owners will be required to:

- have adequate insurance cover
- indemnify QR and TMR against any claims arising from events occurring during the life of the development.

Security may also need to be provided to cover such costs as the expense of rectification works required to maintain the operational efficiency of railway operations in light of the development.

4.10 Native title

Before entering into negotiations with a private party, TMR will undertake an assessment to determine if there is a need to address native title matters in relation to the railway corridor land.

4.11 Commercial dealings process

The process for obtaining access to railway corridor land can occur in parallel with the consideration of the related IDAS application. The processes by which access is secured to the railway corridor land will be coordinated by TMR, including negotiation of access arrangements, the necessary approvals and any associated development or infrastructure agreements.

A plan will need to be provided to TMR showing the nature and extent of the proposed encroachment onto or over the railway corridor. If a proposed development necessitates a station upgrade, TMR will establish an agreement to concurrently undertake concept design for the development and the station upgrade.



5 Operational constraints

This section provides high-level advice regarding operational constraints that may affect development in or around the railway corridor.

The way that development in or around the railway corridor is designed may have an ongoing effect on the operations of the railway in addition to short-term effects during construction. It can also affect future expansion of the railway or fetter opportunities for future development in the railway corridor.

Accordingly, the design of the proposed development must take a long-term view and address issues such as construction, operations, maintenance (both of the railway and the development) refurbishment and demolition, and future track and platform requirements. Proper consideration of design and construction issues (such as designing for a dangerous goods incident) will help in determining the financial viability of the proposed development, and is best undertaken early in the design process.

5.1 Contaminated soils in the railway corridor

All soils in the railway corridor are deemed to be contaminated unless proven otherwise by sample testing. If excavation is being undertaken in or below the corridor, the development proponent is responsible for testing the soils and treating or disposing of them using a method acceptable to DERM, at the proponent's cost.

Water running off the surface or percolating from the subsoils of the railway corridor into drainage systems incorporated into the development's retaining structures may be contaminated and should be treated as such.

5.2 New or altered assets

On completion, any new or altered assets must be transferred with full documentation to the state government or railway manager. This includes 'as built' drawings, specifications, manuals, quality assurance documentation and warranties.

5.3 Access to stations

The TransLink Transit Authority (TTA) designs stations as public places with a user-friendly layout that facilitates patronage on and off the train.

Stations may include ancillary uses such as a ticket office, communication rooms, amenities and, in some cases, retail uses.

A well-designed station is an asset to the state and the local community as it contributes to achieving high levels of customer satisfaction, increased public transport patronage and higher land values for properties near the station.

While station design may relate or be sympathetic to the adjoining development, the station's identity must be separate from the development.

Good practice urban design principles must be applied in the layout of the proposed development to promote seamless connectivity from the street to the station, from the proposed development to the station and between various transport modes.

Directional signage from the street to the station must meet TTA and railway manager requirements, with travel paths avoiding narrow choke points and complex or convoluted routes. Consideration must be given to egress in the event of emergencies or power failures.

New stations and station upgrades must be designed to ensure that mobility-impaired passengers can move between the street and station via step-free routes between levels. This generally requires a combination of lifts, ramps and level access between platform and trains.



A number of railway standards, including a station design guide, are available on QR's website, www.qr.com.au

Station design must comply with Australian Government legislation and standards, namely the *Disability Discrimination Act 1992* and the *Disability Standards for Accessible Public Transport*.

Station environments should:

- enable the station to provide a high standard of service
- be easily accessible by all
- be cost-effective to maintain
- be safe and secure by applying Crime Prevention through Environmental Design principles
- provide a pleasant and safe work environment
- provide protection from weather while maintaining natural light and ventilation
- include a station plaza
- generate high levels of community satisfaction
- generate community pride and a sense of ownership in Queensland's public transport system (e.g., involving local community groups and schools in selecting or preparing the finishes).



6 Construction requirements

The safety of railway operations and workplace health and safety in the railway corridor are paramount. QR has a Zero Harm Policy, which extends to all works undertaken by third parties in or around the railway corridor.

It is particularly difficult undertaking construction in a railway corridor. In the electrified South East Queensland railway system in particular, windows of opportunity to cease railway traffic, shut down the railway and occupy track areas to permit construction activity are limited.

This section outlines the requirements of QR (as the railway manager) when construction is being undertaken in the railway corridor.

6.1 QR standards

QR's standards, '*Requirements for work on or about QR property*' and '*Requirements for work adjacent to overhead line equipment*', are of critical importance to any construction work. Any building contract must ensure compliance with these standards, which are available from QR on request.

6.2 Safety

The railway is potentially a very dangerous environment, which is made safe by strict observance of established safety measures and QR's Safety Management System.

QR has a legal duty of care to advise on, and approve, specific safety issues. Any breaches of QR's safety requirements may result in severe penalties, including large fines and custodial sentences. For this reason, no access to the railway corridor is permitted at any time without the express permission in writing of QR.

All access to the railway corridor must be under QR's supervision and will be at the applicant's expense.

Work within the railway corridor may require:

- submission of a safety management plan
- submission of work method statements as part of the Section 255 application
- supervision as agreed with QR, including the use of specialist QR safety personnel, such as protection officers, lookouts and electrical supervisory staff
- appropriate insurances and indemnities in favour of QR
- the developer agreeing to meet all reasonable costs incurred by QR in managing safety issues, payable monthly
- maintenance of the security of the railway corridor to the required standard
- a quality assurance system and a quality plan approved by QR
- a dilapidation survey of any QR infrastructure before construction commences.

The safety of the public is to be maintained at all times during construction. Any temporary arrangements, such as temporary access, must meet QR's safety and operational requirements. QR requires all personnel intending to work within the railway corridor to complete the QR Trackside Awareness Course. Completion of this course is evidenced by a 'pink card', which must be provided upon demand when inside the railway corridor.

A construction methodology will need to be devised that is appropriate to the available construction windows as part of the design process. Sufficient equipment and labour must be available to respond effectively to contingencies. QR strongly recommends that the construction methodology is planned collaboratively to avoid rework due to safety issues.

The 25 kilovolt overhead line equipment (OHLE) is a particular source of danger. QR must approve in writing any work in proximity to the OHLE. The safety requirements dictated by the OHLE will affect the design, construction, maintenance and ultimately the demolition of the development (refer to QR standard '*Requirements for work adjacent to overhead line equipment*').



6.3 Environmental management plan

During the construction phase, the applicant is to submit an environmental management plan and comply with all statutory requirements, including:

- preservation and rehabilitation of the environment
- control of noise and vibration
- control of air pollution
- waste disposal
- waterways
- vegetation removal
- contaminated land.

A safe and user-friendly environment must also be maintained for QR staff and customers.

6.4 Principal contractor

The contractor for the development construction must be the principal contractor for the development site. While QR's workforce may be engaged on associated works on the site, the responsibility for workplace health and safety issues will remain with the principal contractor.

QR may appoint the same building contractor or another building contractor or principal contractor in relation to any works being carried out on the railway corridor that is not part of the site.

6.5 Working in the railway corridor

Prior to entering the railway corridor (including working over or under the railway corridor), all workers are required to attend a 'Track Safety Awareness' training course and an 'Electrification Safety Basic Awareness' training course conducted by QR. On request, workers must produce a current safety training course completion card (a 'pink card') endorsed and issued by QR.

Movements of trains and individual items of rolling stock through a development site are a source of danger. QR does not permit any work that impinges within three metres of any track centreline or OHLE without strict QR control and supervision.

Unless otherwise agreed with QR, all construction operations must be carried out so that no labour, plant, equipment, buildings, shelter framework or material is located within three metres of any operating track.

QR may permit reduced clearances to trains and OHLE if special barrier screens are used during construction, for limited periods, under a regime of strict QR control and supervision.

6.6 Appointment of protection officers and site protection supervisor

Where work is being carried out over, under or adjacent to the operating railway, QR will appoint protection officers to ensure the safety of the operating railway. Protection officers will be entitled to stop or direct the movement of construction workers and the location of plant and equipment in accordance with the safe working procedures.

Where QR considers it necessary to coordinate the activities of several protection officers appointed in connection with the work, QR may appoint a site protection supervisor.

A requirement for protection officers should be raised with QR as early as possible. The costs of the protection officers and supervisor should be factored into construction costs.



6.7 Contractor's safety liaison representative

A safety liaison representative is to be appointed with responsibility for:

- safety of the contractor's employees, plant and equipment during the execution of work in the railway corridor
- coordinating and programming the contractor's work in the corridor
- receiving directions from the QR superintendent, the site protection supervisor or protection officers on matters relating to the safety of the operating railway
- ensuring that all plant and equipment is operated and all employees of the contractor act in accordance with such directions.

The safety liaison representative is present on site at all times while works are being undertaken on railway property.

If the safety liaison representative leaves the site at any time while works are being undertaken, a competent relief representative must be appointed.

6.8 Twenty-five kilovolt environment

Electrified railway infrastructure has overhead power systems and related cabling and cable support structures. Poles, masts, signals and substations all have power cabling associated with them. Safety issues associated with these electrical systems include risks of electrical arcing and electrocution.

Although the equipment is nominally energised to 25 kilovolts, some items of equipment—such as transformers and feeder wires—may operate at much higher voltages.

Where construction is able to proceed without the OHLE being de-energised, metal items near the railway may have induced voltages that could give rise to electric shocks. Temporary or permanent earthing and bonding of elements may be necessary for safety both during construction and when in service.

QR's standard *'Requirements for work adjacent to overhead line equipment'* is to be complied with.

An applicant is responsible for seeking advice from QR or another competent electrical engineer. Early consultation with QR's electrical engineers, arranged through the QR Project Manager for the proposed development, is essential.

6.9 Work adjacent to overhead line equipment (OHLE)

Works associated with the proposed development may require construction activity within three metres of the 25 kilovolt alternating current OHLE.

QR is an electrical entity under the *Electrical Safety Act 2002* and must be contacted before any work around the OHLE commences. Any instructions given by QR on how to perform the work around the OHLE must be complied with in full.

QR will undertake all work on the OHLE required to facilitate the development, and will charge the costs to the applicant.

As none of the components of the OHLE have protective covering, they are potentially dangerous, and people must not approach them either directly or indirectly with any item of material or equipment.

All OHLE must always be regarded as energised with 25 kilovolts of electricity unless an isolation has been carried out and a permit to work has been issued. If, in the opinion of a protection officer or the site protection supervisor, any activity of the contractor is dangerous or contravenes any of these requirements, the protection officer or the site protection supervisor will direct that such activity cease immediately.



6.10 Closures and isolations

If QR is not satisfied that work near the OHLE can be safely performed, arrangements will be made to isolate the OHLE. Isolations take time to put in place and remove due to the need to ensure the equipment is earthed properly at each end of the work site. This reduces the time available for actual construction work and must therefore be allowed for in programming of activities to be carried out during isolations.

QR does not permit anyone to walk or work within three metres of any operational track without special approval and controls and procedures being in place, to ensure safety and avoid disruption of railway operations. Where work is required within the three metres, a track possession or line closure will be required.

As closures and isolations interfere with normal railway operations, they must be kept to a minimum. At least six months (preferably 12 months) notice is required. QR maintains a rolling program of isolations and closures and the requirements of the proposed development will need to be incorporated into this program. The risk of cancellation due to inclement weather means that contingency periods for closures and isolations should also be booked.

The applicant will incur the costs of closures, isolations and cancellations. There may be additional associated costs for bussing passengers, arranging for diesel haulage of freight trains or sending freight by road.

Detailed planning and efficient use of construction windows is vital, as a late finish to work will cause closures and isolations to over-run and may attract penalties.

6.11 Emergency provisions

As part of the development agreement or other agreement, in the event of an emergency QR may need to resume services, regardless of any pre-arrangements. If this occurs, the applicant will be required to take all necessary steps to facilitate the restoration of services without any cost to QR.

6.12 Delays to trains

Various railway operators on the network have contractual obligations to meet in the transport of passengers, freight, livestock and minerals. Consequently, any unscheduled delays to trains, which are attributed to the proposed development, will result in penalties.

6.13 Lifting over railway lines

QR will not permit lifting operations over operational tracks or live OHLE without closures or the erection of protective structures in the corridor that will withstand the impact of a failure in lifting operations, without affecting the railway corridor.

6.14 Temporary access

Temporary access during construction will generally be subject to the same design requirements as permanent access (apart from durability), where these are designed for use by QR staff and the public. Temporary access for the construction of the development may encroach on the railway corridor, subject to conditions. Co-use of QR access roads may be acceptable. QR may permit temporary crossings of the railway tracks under QR's control and supervision, if the safety, risk and operational impacts are acceptable.



6.15 Construction management plan and work method statements

For construction over railway tracks, the contractor must provide a construction management plan detailing the construction procedure and interfaces with railway operations. For each package of work within the railway corridor, a detailed work method statement must be prepared and submitted to QR for review. These will include detailed methodologies for excavations, installation of retaining systems, erection of supporting elements near the track, construction over the tracks and overhead line equipment, and construction access around the railway, including hoardings, gantries and barriers to ensure public safety.

A program for construction of the development, with details of major track possessions and any required OHLE isolations, must be submitted with the construction management plan.

Construction must not commence until QR has approved the construction management plan and individual work method statements.

6.16 Track monitoring

In circumstances where works for a development might affect track alignment, QR may require monitoring of the track alignment to ensure that movement is detected and rectification action taken before the alignment becomes unsafe. The monitoring may be required to be 'real time' remote telemetric monitoring, with independent access for QR staff.

6.17 Railway operational issues

The construction process must also consider railway operational issues such as signal sighting requirements. Train drivers' sighting of signals depends on factors such as train speed and track curvatures. Permanent structures (for example, columns) and temporary structures (for example, fences and scaffolding) must not obstruct the sighting of signals.

6.18 Practical completion

During construction and on practical completion of the proposed development, QR will inspect any works that interface with the railway and issue a list of defects that affect QR assets or may affect the operation of the transport facilities. Rectification should be immediate if the defect has the potential to affect the management, operation, maintenance or safety of the transport facilities. Otherwise, the normal period for rectification is one month or as agreed by all parties. Depending on the urgency, the railway manager may elect to carry out the rectification and charge the costs to the applicant.



Attachment 1: Risk assessment guide

1. Introduction to risk assessment

The railway environment is a challenging setting for development. The railway corridor can impose risks on development such as impacts from a train derailment, potential amenity impacts, including noise, as well as risks associated with the transport of dangerous goods along the railway. Conversely, development can pose risks to the railway corridor by interfering with the railway corridor and overhead line equipment. It can also create the potential for vandalism of railway infrastructure and cause disruption to the operational safety and integrity of the railway corridor.

At all times, the operational safety and integrity of the railway corridor must be protected and maintained when developing abutting or over a railway corridor. Development will not be permitted to proceed unless the risks to both the railway corridor and the development itself are appropriately managed and mitigated.

A risk assessment is the fundamental tool to assist developers in better designing development to address the potential impacts associated with building near a railway corridor. The risk assessment exercise must:

- i. identify all potential hazards to the operational railway, its staff, customers and the users of the development
- ii. take into account the operational requirements of the railway corridor and the whole life cycle of the development
- iii. identify design and construction issues that may impact on the feasibility of development
- iv. identify the potential risks and necessary safety controls and design measures required to reduce the risks to the safety and operational integrity of the railway corridor and avoid long term disruptions to railway operations that would arise from a defect or failure of structure elements
- v. identify how an incident could be managed if it were to occur.

The Department of Transport and Main Roads (TMR) strongly recommends that developers liaise when preparing a risk assessment to ensure that all relevant matters are addressed.

This document sets out the minimum generic requirements to be addressed as part of a risk assessment accompanying a development application for land within or abutting a railway corridor. By no means does this document represent the ultimate content solution and as such, additional topics may need to be addressed in a risk assessment depending on the unique nature of the site and the proposed development. Pre-lodgement meetings with TMR will assist developers in understanding the information requirements for a risk assessment unique to their development.

1.1 Risk assessments for preliminary approvals

Further, it is acknowledged that many developers may seek a preliminary approval in accordance with section 241 of the *Sustainable Planning Act 2009* for development which limits the amount of detailed information relating to design and construction at the development application stage. This affects the amount of information that can be reasonably included in a risk assessment. As such, risk assessments for preliminary approvals need only address the following matters as detailed in this document:

- i. site details
- ii. railway details
- iii. development details (specifically items ii, iv, v and ix in Section 4 of this document)
- iv. construction details (specifically items i and iv in Section 5)
- v. identify hazards and risks
- vi. control measures to mitigate risks

The following sections set out the basic content to be addressed in a risk assessment.



2. Site Details

The risk assessment will need to include a detailed understanding of the subject site in order to create a strong understanding of the context through which risks may arise. Matters to be considered include, as a minimum:

- i. site condition, cutting, embankment, etc.
- ii. soil type, geology
- iii. topography
- iv. prevailing drainage patterns over the site
- v. proximity to railway corridor and railway infrastructure/utilities
- vi. noise levels at the development site.

3. Railway details

The nature and details of the railway corridor itself will also be important in determining the potential risks associated with development abutting or over a railway corridor. Key points of interest in this section of the risk assessment should include, as a minimum:

- i. track geometry and alignment (for example, straight or curved section of track)
- ii. track speed
- iii. type of rolling stock using the corridor (for example, electric passenger vs. diesel freight locomotives)
- iv. derailment history
- v. current and future estimated usage and growth in patronage (10-year horizon)
- vi. details of any future/planned corridor upgrades/works
- vii. formation of the track (for example, in cut, on an embankment or at grade)
- viii. potential for the carrying of freight and dangerous goods
- ix. operational requirements of the railway corridor.



4. Development details

Details of the development itself, its design and operational components, are important in understanding whether the building has been designed to withstand potential risks as a result of the railway corridor, as well as ensuring that the development will not pose any adverse risks upon the railway corridor. The risk assessment is to include the following information, as a minimum:

- i. structural integrity/collision protection in the event of a train derailment, dangerous goods incident and/or explosion, other significant incident and/or explosions (for example, terrorist attack within, under or in close proximity to the development), or earthquake
- ii. proximity of proposed development to railway corridor, railway infrastructure and railway station access points
- iii. potential traffic generation which may impact on the railway corridor (i.e. increased traffic using a level crossing, or development may require a new crossing)
- iv. clearances and setbacks from railway infrastructure
- v. demolition design of any existing buildings on site
- vi. ventilation system design for development that encloses the railway corridor in the event of normal operation and an emergency event within the railway corridor (involving smoke/gas emissions). Details to be provided must include:
 - a. the ability of the system to operate in an emergency situation to allow emergency crews to safely enter the enclosed area for fire fighting or restorative purposes
 - b. details of the location of air intakes and external vents for the ventilation system
 - c. smoke modelling to demonstrate that the most appropriate ventilation system for the site and building has been designed.
- vii. emergency management details are crucial and information should include:
 - a. details of fire detection and alarm systems that can operate independently of the buildings main power supply in the event of a power outage
 - b. fire sprinklers and liquids to be used with the sprinklers (water may not be appropriate on dangerous goods railway lines that are known to carry materials/chemicals that combust when in contact with water)
 - c. evacuation plans for the development in the event of an incident (fire and/or explosion) within the development or the railway corridor
 - d. details of emergency exits for the railway corridor (where development encloses the railway corridor creating a tunnel) suitable for the mass evacuation of passenger trains in the event of an incident (fire and/or explosion) caused by a train derailment or dangerous goods emergency
 - e. details and location of emergency access points into the corridor when emergency services may be required to attend to a situation within the railway corridor either under or abutting the development.
- viii. planned maintenance program for the development including whether access within the railway corridor will be required. This program should include trimming and management of landscaping as well as maintenance of the building itself.
- ix. details of the development's potential impacts on nearby (within 50 metres measured horizontally) railway tunnels. This must include design loads, geological implications of development, impacts on ground water etc.



5. Construction details

TMR understands that construction details will not yet be finalised at the development application stage, as it is unknown exactly what will be approved. However, given the complexities involved with developing in the vicinity of a railway corridor, there are a number of impacts associated with construction that need to be considered prior to development approval. Some impacts associated with construction are not acceptable to TMR and it is generally best to identify these prior to decision of a development application to determine whether viable alternatives are available.

Construction impacts involving the railway corridor need to be considered as part of the risk assessment. TMR will require a risk assessment to ensure that the railway corridor, infrastructure, staff and general public railway users can be adequately protected from activities associated with the construction of development.

The information to be considered in a risk assessment includes:

- i. method of construction—for example, the use of pre-fabricated or pre-cast materials where building along the property boundary with the corridor to prevent track closures associated with construction
- ii. timing of construction—specify staging and timing of proposed construction works to determine the impact of any disruption to services and make the state government aware of the timing of potential incidents impacting on the railway corridor
- iii. details of the use and storage of hazardous and dangerous goods on site during construction which have the potential to impact on the railway corridor and operations
- iv. describe the anticipated impact of construction on access:
 - a. for pedestrians using railway stations and associated interchange facilities such as bus stops, taxis, park ‘n’ ride and kiss ‘n’ ride
 - b. for public transport routes and the flow of traffic for people accessing railway stations
 - c. detail how the general public and surrounding residents will be informed of changes in access arrangements.
- v. corridor encroachment—provide details with regard to:
 - a. whether access to the railway corridor will be required
 - b. whether any materials will be lifted over the railway corridor
 - c. whether any temporary vehicle-crossing points are required
 - d. whether there will be any disruption to services or other railway operations as a result of construction
 - e. whether there will be any requirement for de-energising of a section of the overhead line equipment to accommodate construction within or adjacent to the railway corridor.

Generally encroachment within a railway corridor for construction is not permitted and alternative construction options will need to be identified.

- i. provide details of how the security of the railway corridor will be maintained during construction, (e.g. providing details about the type and height of security fencing to be used).
- ii. provide details of any planned demolition, excavation and retaining works within 25 metres of the railway corridor and specify the type and quantity of works to be undertaken.
- iii. services and utilities—provide details of:
 - a. whether any services or utilities will be required to cross the railway corridor
 - b. whether any existing railway services/utilities be interfered with.
- iv. stormwater, drainage, sediment and erosion control—provide details of how any temporary stormwater and drainage will operate during construction, and how sediment and erosion control will be managed.



6. Identify hazards and risks

Once details unique to the site, railway corridor, development design and construction have been determined, the individual risks must be identified and evaluated with control measures planned for each. Such risks may include injury or loss of life and damage to public and private infrastructure and considerations should include, but not be limited to:

- i. safety of people occupying the development
- ii. safety of people on platforms or in trains under or near the building
- iii. structural damage to the building and/or adjacent structures
- iv. potential explosion or fire associated with loss of containment of dangerous goods, whether or not involving a train derailment
- v. increasing risks as a result of transporting dangerous goods by train through areas of increasing population and infrastructure density
- vi. collision from a derailed train
- vii. act of terrorism along the railway corridor or within the development
- viii. trespass by members of the public into the railway corridor
- ix. vandalism of railway corridor and/or development
- x. interference with railway corridor infrastructure, especially overhead line equipment
- xi. impingement on railway corridor operations and/or damage to the railway corridor itself
- xii. business interruptions and financial loss to building occupants in the event of railway incidents affecting the building
- xiii. commercial risks in the potential loss of freight and passenger business in the event of incidents
- xiv. adverse public perceptions of the dangers of transporting dangerous goods through enclosed platforms, especially security related issues.

A recommended process for the identification of hazards and risks has been provided below to guide developers.

Step one

Identify all potential hazards to the operational railway and its staff and customers as well as the development and its users. This exercise is to link the risks with the source of the risk and identify potential outcomes. Unique risks associated with the construction of development must also be addressed as construction can impose significant risks to the operational safety and integrity of the railway corridor (i.e. lifting of building materials over the railway corridor, excavation and retaining works along the railway corridor boundary etc). Table 1 provides examples of this process.

Table 1: Identification of risks as a result of development

Risk	Risk source	Potential outcome
Collision of rolling stock with proposed development.	Derailed freight train due to broken wheel axle.	Derailed train collides with building. Potential for destabilisation of building's supporting elements and subsequent collapse resulting in injury, loss of life and damage to public and private property.
Throwing of objects onto overhead line equipment.	Locating non-screened private balconies too close to the railway corridor boundary.	Damage to overhead line equipment and potential for disruption to railway services/ operations.



Step two

Once the risks, their sources and potential outcomes have been identified, the severity of these events must be determined. The severity of the risk is to be rated from 1 to 5 as indicated in Table 2.

Table 2: Severity of Risk

Severity (S)	Extent of consequences	Examples
1	Minor	No harm to railway corridor staff, customers, passengers, users of the development and external public. No damage to railway corridor infrastructure. No damage to development or structural elements. No fire or blast.
2	Medium	No harm to railway corridor staff, customers, passengers, users of the development and external public. No damage to railway corridor infrastructure. No damage to development or structural elements. Minor fire.
3	Major	Minor injuries/harm to railway corridor staff, customers, passengers, users of the development and external public. Some damage to railway corridor infrastructure. Some damage to development or structural elements. Fire or blast.
4	Catastrophic	Injuries/harm to railway corridor staff, customers, passengers, users of the development and external public. Death. Major damage to railway corridor infrastructure. Major damage to development or structural elements. Major fire or blast. Impact largely contained to development/railway corridor.
5	Catastrophic external	Impacts of a catastrophic event. Significant impact beyond the boundaries of the premises.



Step three

Once the risks and their severity have been identified, the likelihood of their occurrence must be determined in order to prioritise the risk. Table 3 indicates what values are to be assigned to risks.

Table 3: Likelihood values

Likelihood (L)	Likelihood of occurrence
0	totally eliminated
1	rare
2	unlikely
3	likely
4	certain
5	imminent

Step four

The identified risks must then be prioritised. Calculate the 'Relative level of risk' (R), by multiplying the value obtained for the 'Likelihood' (L) by the value obtained for the 'Severity' (S):

$$R = S \times L$$

Step five

Once the Relative level of risk has been obtained, assess the risks according to priority and identify the appropriate implications to development based on the criteria in Table 4.

Table 4: Risks and implications to development

Relative risk (R)	Assessment of risk	Implications to development
1 – 2	Low	Appropriate control measures must be in place to allow development to proceed.
3 – 4	Medium	Significant control measures must be in place to allow development to proceed. Such control measures may require design changes to components of the development.
5 – 9	High	It is unlikely that suitable control measures can be put in place. Development is unlikely to be approved by TMR.
10 or more	Totally unacceptable	Development cannot proceed.

7. Control measures to mitigate risks

Once the risks of development over or abutting a railway corridor have been identified, appropriate control measures must be designed to mitigate the risk and any associated impacts on the railway corridor and the development. The necessary safety parameters required to reduce the risk of long term disruptions to railway operations that would arise from a defect or failure of structure elements must also be clearly identified.

Each risk may require multiple control measures and the developer is strongly encouraged to provide as much information as possible when detailing the design and construction measures proposed to mitigate each risk.

To assist in documenting the control measures proposed, Table 5 is provided as an example.



Notes

1. Risk assessments will be assessed on an individual basis and according to their merits. The amount of information required will be dependent on the proposed development, the location and logistics of the site, the nature and extent of works being undertaken and the level of impact on the railway corridor and its operation. The information provided above is intended as a guide only and **additional details may be required** in some cases.
2. A site plan may need to be submitted with a risk assessment for TMR to assess the suitability of proposed mitigation measures. For instance, how access to the railway station and corridor and any other associated interchange function and park 'n' ride facility will be maintained during construction.
3. Please note that in rare instances where approval is given to access a railway corridor for construction purposes, there may be a requirement for the applicant to indemnify the state government against all claims, damages or otherwise arising out of the use of railway corridor land to facilitate construction.



Glossary

Term	Definition
Abutting	To be adjacent to or have a common boundary with and, for the purposes of Part 2, applies to development located in the 25 metre wide strip of land running along each side of a surface railway corridor or the 50 metre wide strip of land running along each side of a tunnel.
Airspace development	Any development that encroaches into or passes through the airspace of a railway corridor. This term includes buildings, footbridges, road-over-railway bridges and any other structures.
Assessment manager	Is responsible for receiving and assessing development applications under the Integrated Development Assessment System (IDAS). The assessment manager is usually the local government but may be a state government agency.
Building Management Statement (BMS)	Is a document that is registered in the Titles Office. It is an encumbrance on the title of each of the lots to which the statement applies. The document contains terms and conditions that benefit and burden the land to which the statement applies. The owners of the lots must sign the BMS agreeing to its terms before the statement can be registered.
Cess drain	A drain that conveys waste from the railway corridor.
Concurrence agency	For a development application, means an entity prescribed under a regulation as a concurrence agency for the application, or if the functions of the entity in relation to the application have been devolved or delegated to another entity, the other entity. A concurrence agency has the power to direct the outcome of an application. It can require that: <ul style="list-style-type: none"> • certain conditions be imposed on an approval • an approval be for part only of the development or for a preliminary approval only • that an application be refused. A concurrence agency can also ask an applicant for further information about an application. A concurrence agency may only exercise its powers within its defined jurisdiction.
Development	All structures including buildings, footbridges, road-over-railway bridges, and any supporting elements (for example, piers, columns etc), unless otherwise specified.
Dilapidation survey	Is usually undertaken immediately before a contractor commences site work. The purpose of the survey is to record the pre-construction condition of properties adjoining the contractor's site and/or which may be influenced by the contractor's work. The survey encompasses the external elements of these properties and may extend to the internal condition if deemed appropriate.
Gantry	Is a structure that carries signaling equipment above the railway tracks.
Grade separation	Is the process of aligning a junction of two or more transport axes at different heights (grades) so that they will not disrupt the traffic flow on other transit routes when they cross each other. This usually takes the form of an underpass/overpass.
Hoardings	Are barriers to deny access to certain areas, or to provide construction noise barriers; often with a secondary role as advertising devices.
Overhead Line Equipment (OHLE)	Refers to overhead lines, cabling and associated structures used to provide power to electric trains.



Term	Definition
QR	Queensland Rail Ltd and all its corporate divisions, branches, departments, and so on.
Railway corridor	All existing and future railway infrastructure and land and is taken to incorporate the definitions 'existing or future Public Passenger Transport' under the <i>Transport Planning and Coordination Act 1994</i> and 'railways and future railways' under the <i>Transport Infrastructure Act 1994</i> .
Railway Manager	Has the meaning given to that term in the <i>Transport Infrastructure Act 1994</i> and refers to the person accredited for managing the railway under Chapter 7, Part 3 of that Act.
Referral trigger	Is activated if there is a requirement under the <i>Sustainable Planning Regulation 2009</i> (IP Reg) for an entity other than the assessment manager to have input in the assessment of a development application. In these cases the development application may be referred to an IDAS referral agency to: <ul style="list-style-type: none"> • seek advice on an application • determine any requirements an agency may impose on an application.
Remote telemetric monitoring	Is the automatic transmission and measurement of data from remote sources by wire or radio or other means.
Resource entitlement	Means the permission of the state to occupy or otherwise interfere with a state resource. The provision of resource entitlement for the use of state land for the purpose of a development application means that the state as owner of the land has no objection to the lodgement of the development application to the assessment manager. It does not: <ul style="list-style-type: none"> • imply approval of the development application • affect the functions exercised as the assessment manager or a referral agency of the agency who provides the resource entitlement, or • authorise a right to use and occupy land.
Resource evidence	Is documentation from the state confirming a resource entitlement.
Rock anchor	Is a steel rod or cable placed in a hole drilled in rock, held in position by grout, mechanical means, or both.
Soffit	The underside of a structural component, such as a beam, arch, staircase, or cornice.
Structural redundancy	Is the replication of critical components of a building or structure with the intention of increasing its reliability, usually in the case of a backup or fail-safe in the case of an unlikely event.
Structure	Buildings, road/railway bridges, footbridges, retaining walls, drainage etc.
Track possession	Means the temporary closure of a section of the railway corridor for the purposes of carrying out construction or maintenance work.
Viaduct	A railway raised on a freestanding structure but does not include a railway bridge which is designed to cross a specific point (for example, a water body).
Volumetric subdivisions	Are three-dimensional subdivisions in the space above or below the railway corridor that can accommodate a development such as a building or carpark. A volumetric parcel must be bounded in all dimensions.



References

Australian Government, *Disability Discrimination Act 1992* and the *Disability Standards for Accessible Public Transport 2002*, accessible via www.austlii.edu.au

Department of Environment and Resource Management 2005, *Government Land Policy Disposal Policy 5: Private Treaty Disposal*, can be viewed at www.nrw.qld.gov.au/about/policy

Department of Infrastructure and Planning 2006, *IDAS Guide 23 Referrals in relation to public passenger transport, and rail safety and efficiency*, can be viewed at www.dip.qld.gov.au/docs/ipa/forms/IDAS

Department of Transport and Main Roads, www.transport.qld.gov.au

Office of the Queensland Parliament Council, www.legislation.qld.gov.au

Queensland Police Service 2007, *Crime Prevention through Environmental Design – Guidelines for Queensland*, State of Queensland, Brisbane, Australia.

Acknowledgements:

Parts of this guide have been prepared utilising information from the following report:

- *GSM Information Paper No. 6: Carry out a risk assessment for dangerous goods under the Dangerous Goods Safety Management Act 2001*—Department of Community Safety, October 2003.

Contact Details

This guide for developers and practitioners highlights important elements that TMR, QR (as the railway manager) and other state agencies will consider when development is proposed in or around the railway corridor in Queensland.

While this document provides high-level advice on what can be expected when embarking on such a project, it should be borne in mind that specific issues will need to be discussed in detail once a concept design for a proposed development is available.

Applicants are strongly encouraged to contact TMR at the earliest opportunity to ensure the necessary information is available prior to the commencement of design.

The department will also assist in determining what other specifications, standards or guidelines are applicable to a proposed development, the approvals that should be sought and how to obtain them.

As described in the previous sections, a range of stakeholders may be involved in assessing and approving a development application for building in and around the railway corridor, particularly transport agencies and the railway manager, QR. TMR is the first point of contact for those seeking to undertake development in a railway environment.

The TMR contact is:

The Director
Development Leadership
Integrated Transport Planning Division
Department of Transport and Main Roads
Ph: 07 3146 1427

For those seeking advice about transit oriented development or with enquiries about the content of the *Transit oriented development: Guide for practitioners in Queensland*, contact:

Department of Infrastructure and Planning
Ph: 07 3238 3000
or visit www.dip.qld.gov.au/TOD.