

Specification

Civil - Non-Queensland Rail Underground Services in Queensland Rail Property

MD-20-173
(Previously known as CIVIL-SR-016)

QUEENSLAND RAIL OFFICIAL

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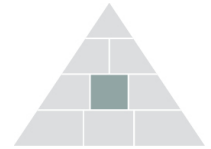
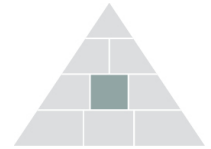


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1 Purpose

This Specification defines the requirements for all underground services within the Queensland Rail reserve, land held or controlled by Queensland Rail that are:

- Jointly owned services between Queensland Rail and external authorities
- Externally owned services where Queensland Rail uses a portion of the service
- Externally owned services.

The requirements of this specification shall be met by external service Owners in addition to existing Australian Standards and Codes of Practice.

The purpose of this specification is to manage the risks associated with whole of life activities related to a service, including the installation, inspection, use, maintenance, decommissioning and removal of services that cross Queensland Rail reserve. Namely, the risks associated with:

- Installation methods and their potential to affect track and rail infrastructure
- Service rupture and structural failure
- Exposure and impact due to excavation.

1.1 Business or technical need

This Specification meets the requirement of the Civil – Utilities within Railway Reserve Standard MD-10-133.

Application of this Specification should result in the installation and management of third party, underground services in the Queensland Rail reserve and under Queensland Rail tracks that:

- are consistent
- are safe
- manages Queensland Rail's organisational risk.

1.2 Scope

This Specification applies to:

- New underground services in the Queensland Rail reserve, including under existing, proposed and disused track
- Existing underground services under New Lines and New Track.



Optical fibre systems that form part of Queensland Rail's Telecommunications Backbone Network are excluded from this specification and shall meet the requirements of Telecommunication – Optical Fibre Cabling Design and Installation Specification MD-13-423.

Queensland Rail owned services are excluded from this specification and shall meet the requirements of Civil - Queensland Rail Underground Services Specification MD-20-348.

2 Requirements of this Specification

2.1 Australian Standards and Codes of Practice

All underground services within railway boundaries shall be designed, installed, and maintained in accordance the following Australian Standards:

- AS 4799 "Installation of underground utility services and pipelines within railway boundaries"
- AS 2885.1 "Pipelines – Gas and liquid petroleum – Design and construction"
- AS 2885.3 "Pipelines – Gas and liquid petroleum – Operation and maintenance"
- AS/NZS 4645.1 "Gas distribution networks – Network management"
- AS/NZS 4645.2 "Gas distribution networks – Steel pipe systems"
- AS 2832.1 "Cathodic protection of metals – Pipes and cables"
- AS 3000 "Electrical Installations".

Where this specification and the standards listed above differ, the more onerous document shall take precedence.

Water Services Association of Australia provides guidance for undertrack crossings by water and sewer pipes through their "Water Supply Code of Australia" and "Sewerage Code of Australia".

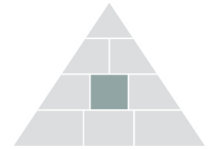
2.2 Design and Location Requirement of Services

The requirements of this section apply to new services in the Queensland Rail reserve. Existing services under New Lines and Track shall meet the requirements of Section 2.5.

2.2.1 General Location and Orientation Requirements

The Owner shall design the alignment of the service:

- to pass through the Queensland Rail reserve in a straight line:
 - not run along the reserve, or
 - not run parallel to track.
- to not pass under a level crossing
- at $90^\circ \pm 5^\circ$ to the track centreline, as shown in Figure 1



- with a minimum clearance of 3 m horizontally from any infrastructure, including foundations
- with a minimum horizontal clearance of 2 m from an existing or proposed service
- not be within 3 m horizontally in front of the toe of switch to 3 m behind the last long bearer of points and crossings, as shown in Figure 2.

The Owner shall obtain the approval of the Rail Infrastructure Manager (RIM) where the service:

- is within 3 m to 5 m horizontally from any infrastructure foundation
- is within 3 m to 10 m horizontally from the toe of switch and the last long bearer of points and crossings, as shown in Figure 2.

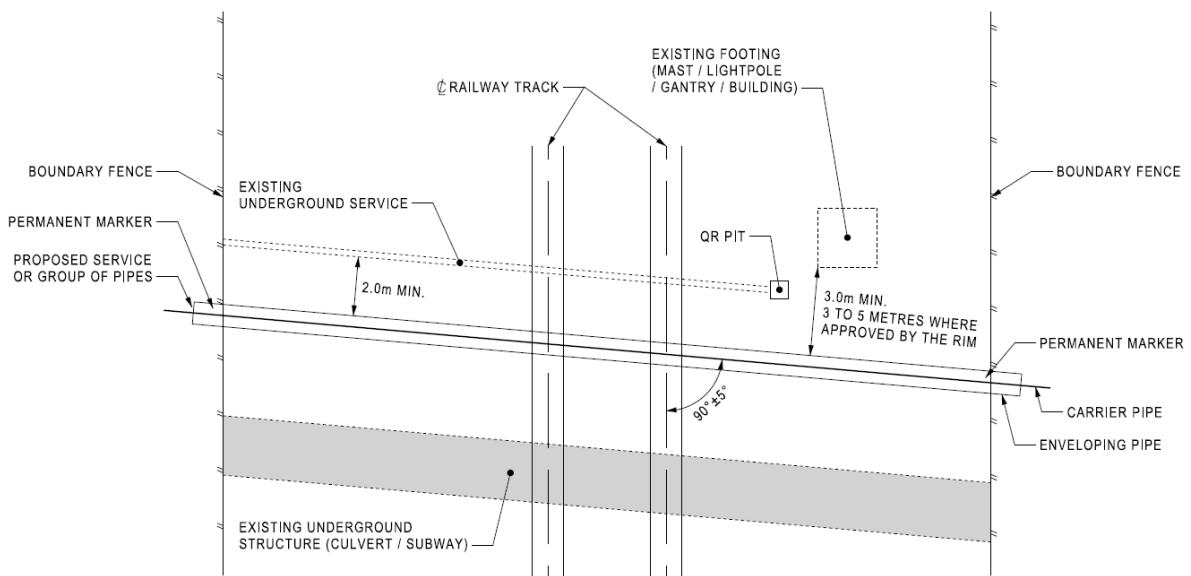


Figure 1: Plan Showing Service Crossing the Queensland Rail reserve

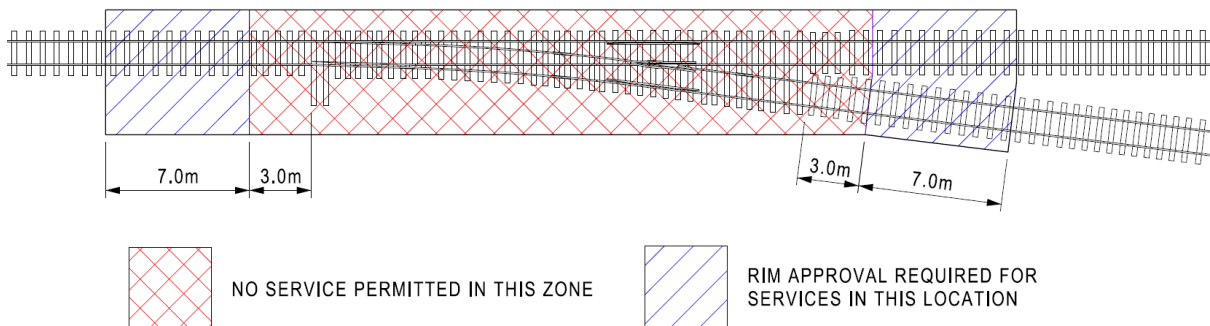


Figure 2: Service clearances from points and crossings

The minimum depth of a service shall be 2 m from the top of formation and ground level to the top of enveloping and carrier pipes as detailed in Figure 3. More onerous depth



requirements apply to specific installation methods (Section 2.2.8) and service types (Sections 2.2.9, 2.2.10 and 2.2.11). Additional depth may be required to allow for protection cover, where required (Section 2.2.4).

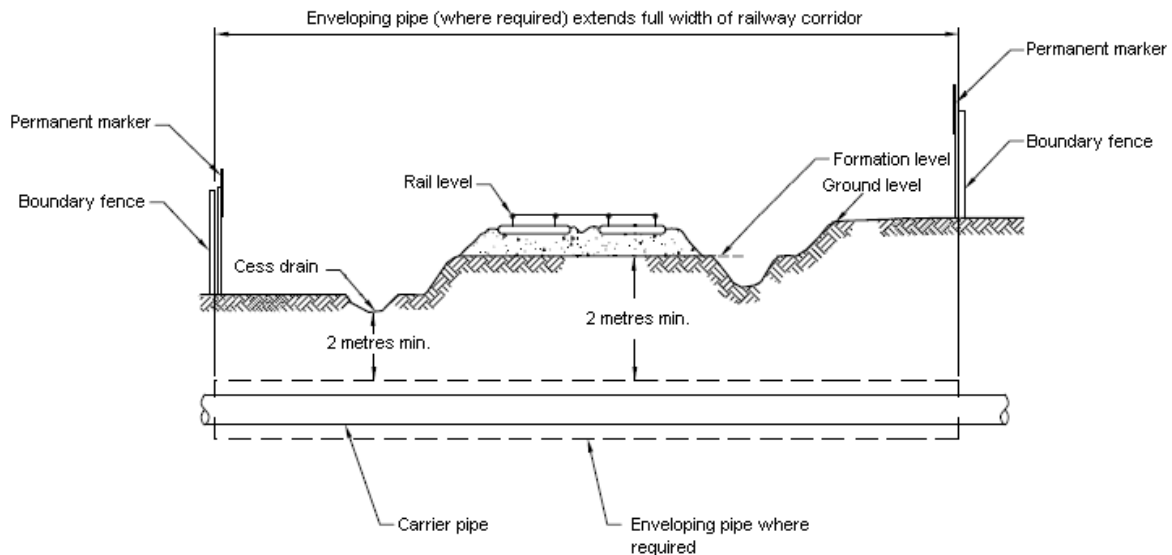


Figure 3: Minimum depth of a service under the Queensland Rail reserve

Where the Owners service consist of multiple carrier pipes and conduits, the minimum horizontal clearance between enveloping and bores shall be 2 m. This clearance is not required where services are combined into a single enveloping pipe or bore.

Where the service is not parallel, it may be vertically above or below an existing or proposed service where the vertical clearance is greater than 500 mm.

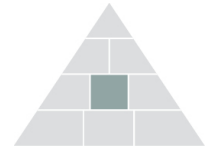
The Owner of the service shall obtain a permit or approval from the existing service Owner.

2.2.2 Design

The Owner shall design enveloping pipes, non-encased carrier pipes and conduits for:

- maintenance, vehicle and rail traffic loading including cyclic loading as appropriate
- a minimum of 50 year service life.

The owner shall have the design certified by an Registered Professional Engineer Queensland (RPEQ) engineer. The design rail traffic load shall be 300A in accordance with AS 5100 or as approved by the Rail Infrastructure Manager.



2.2.3 Enveloping Pipes

Where an enveloping pipe is required, it shall:

- be a materials type detailed in
- Table 1 for the relevant service type
- extend for the length of the service under the Queensland Rail reserve.

Table 1: Allowable Material Types for Enveloping Pipes

Service Type	Butt welded High Density Polyethylene (HDPE)	Glass Filament Reinforced Plastics (GRP),	Modified Poly Vinyl Chloride (mPVC) or Unplasticised Poly Vinyl Chloride (uPVC)	Reinforced Concrete	Mild Steel
Power Cables	Yes	Yes	Yes	Yes	Yes
Sewer Pressure Pipelines	No	No	No	Yes	Yes
Water Pressure Pipelines	Yes	No	No	Yes	Yes
All other Non-Flammable Fluids	Yes	Yes	Yes	Yes	Yes
Combustible & Flammable Fluids	Yes	No	No	Yes	Yes
All Other Services	Yes	Yes	Yes	Yes	Yes

Butt welded High Density Polyethylene (HDPE) Pipes shall have a compound classification of PE 100 and a pressure rating of PN 16 or higher. For gas services with HDPE enveloping pipes, the space between the gas pipe and the enveloping pipe shall be sealed and vented at the ends outside of the Queensland Rail reserve.

Glass Filament Reinforced Plastics (GRP) Pipes shall be PN 20 or higher nominal pressure and SN 10000 or higher stiffness class.

Modified Poly Vinyl Chloride (mPVC) and Unplasticised Poly Vinyl Chloride (uPVC) Pipes shall have a material class of 500 and a pressure class PN 20 or higher with solvent weld joints.

Reinforced Concrete Pipes shall be Class 4 or a higher load class.



Reinforced concrete and Mild Steel enveloping pipes shall be internally and externally grouted with a flowable material with a minimum characteristic compressive strength of 1 MPa at 48hrs.

2.2.4 Protection Cover and Warning Tapes

Where a protection cover is required, it shall:

- be at a minimum depth of 2 m below the top of formation and ground level
- be reinforced concrete or polymeric covers
- have a minimum 300 mm above top of carrier pipe from the underside of the cover
- have a width 600 mm greater than enveloping and carrier pipes
- be placed centrally over the conduits
- extend the length of the service under Queensland Rail reserve.

The reinforced concrete protection covers shall have a minimum thickness of 150 mm

Reinforced concrete protection covers may be precast concrete.

Polymeric covers shall:

- have a minimum thickness of 5 mm
- comply with AS 4702 Polymeric Cable Protection Covers.

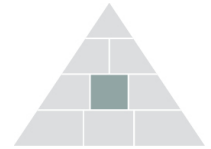
Where multiple polymeric covers are needed to cover the required area, the covers shall be lapped:

- 100 mm minimum along the service route
- 400 mm minimum across the service route

Where buried warning tapes are required, they shall be placed 300 mm below the top of formation and ground level but not less than 200 mm above the enveloping and carrier pipes.

2.2.5 Pits and Access Chambers

The Owner shall locate manholes, chambers, pits and anchor blocks outside of Queensland Rail reserve.



2.2.6 Location of Entry and Exit Pits

The Owner shall locate entry and exit pits for installations of services outside of the Queensland Rail reserve. Where entry and exit pits are in Queensland Rail reserve the locations shall be approved by the Rail Infrastructure Manager and be:

- a minimum of 6 m from the toe of embankment and top of cuttings
- a minimum of 10 m from the nearest rail.

2.2.7 Permanent Markers

The Owner shall provide and install permanent markers at the Queensland Rail reserve boundaries as required by AS 4799. These markers shall remain the property of the Owner and shall be their responsibility to maintain.

The Owner should provide and install ground markers where the service changes horizontal alignment underground without a manhole.

2.2.8 Installation Methods

The requirements of this section manage risks associated with installation methods and applies to all services. Additional or more onerous requirements may apply to specific service types.

Only the installation methods listed in this section shall be used. High pressure water drilling shall not be used.

2.2.8.1 Trenching

Trenching under the tracks shall be approved by the Rail Infrastructure Manager. The Owner shall design trenching installations such that all work within the danger zone, including formation and track reinstatement, can be completed within the available closure.

The section of track where the works is occurring should be removed as a single panel of track and sleepers, and reinstated.

The Owner shall incur the cost of track work.

2.2.8.2 Directional Drilling

Owner shall design services installed using directional drilling to be located (refer to Figure 4):

- 3 m from ground or formation level to top of bore, carrier and enveloping pipes, when the service is within 5.5 m horizontally of centreline of track
- 2 m from ground level to enveloping and carrier pipes elsewhere.



Owners shall design services installed using directional drilling with a bore diameter not exceeding 450 mm

Where the bore diameter exceeds the outside diameter of the carrier or enveloping pipe by more than 25 mm the annulus shall be grouted. The grout shall have minimum compressive strength of 1MPa at 48hrs.

Where an enveloping pipe is required, the enveloping pipe shall extend for the length of the service under the Queensland Rail reserve.

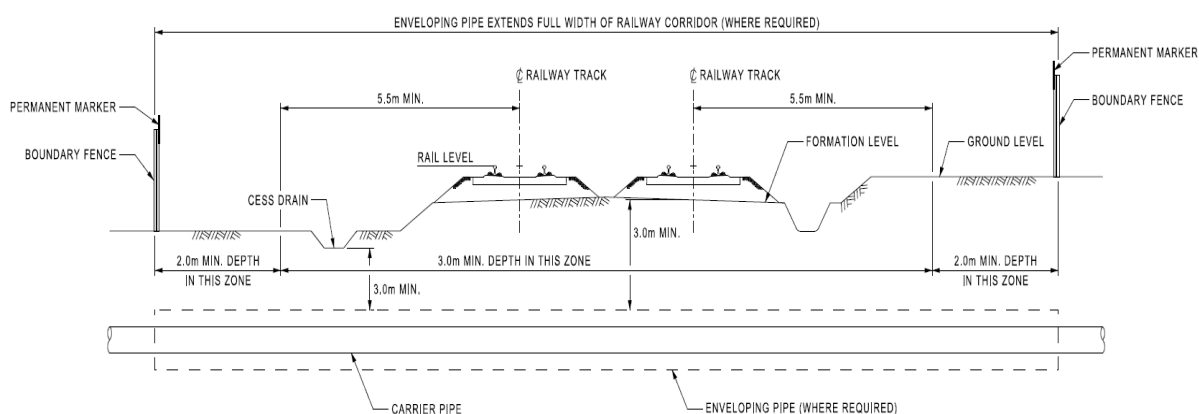


Figure 4: Minimum depth for installation of service using directional drilling

2.2.8.3 Boring

Where the bore diameter exceeds 100 mm, the Owner shall design services installed using boring with an enveloping pipe.

Where the bore diameter exceeds the outside diameter of the carrier or enveloping pipes by more than 50mm the external annulus shall be grouted. The grout shall have minimum compressive strength of 1MPa at 48hrs.

2.2.8.4 Pipe Jacking and Ramming

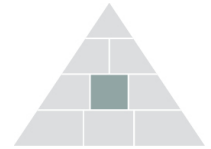
Pipe jacking and ramming is permitted and should be used where bore diameters exceed 450 mm.

2.2.9 Power Services

This section applies to high and low voltage power services.

The service shall be in accordance with AS 3000 and be enclosed in an appropriate Category A System.

High Density Polyethylene conduits are considered as enveloping pipes.



2.2.9.1 Trenching

Where groups of two or more conduits are installed, the trench shall be backfilled with flowable fill with a minimum Characteristic Compressive Strength of 2MPa at 28 days.

Where the depth of a high voltage power service is 2 m from ground or formation level to the top of carrier and enveloping pipes, but less than 3 m, the service shall:

- be installed with warning tapes in accordance with Section 2.2.4 and AS 2648.1
- have a protection cover, extending the length of the service under Queensland Rail reserve.

Further to section 2.2.4, the protection cover shall have a width 1000 mm greater than the enveloping and carrier pipes, as shown in Figure 5.

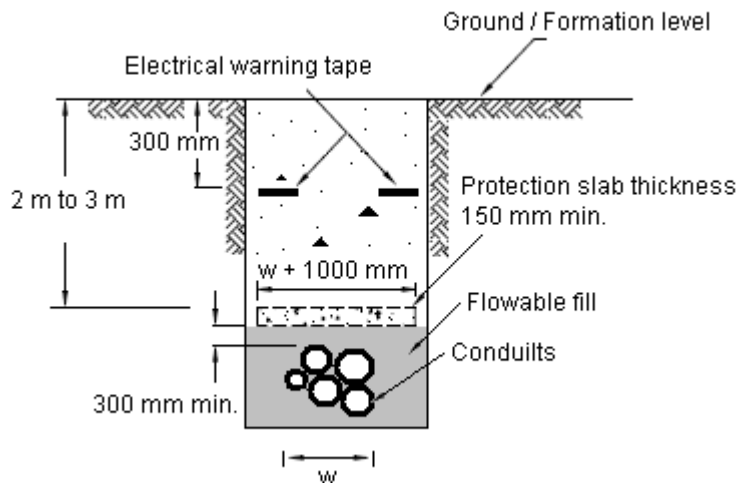


Figure 5: Power Cable Installation in a Trench (Section through trench)

2.2.9.2 Directional Drilling and Boring

Where the bore is 3 m or greater below ground and formation, the Owner shall use High Density Polyethylene conduits installed within a single bore, as shown in Figure 6. The annulus shall be filled with a material with a minimum compressive strength of 1MPa at 48hrs.

Conduits shall be installed within an enveloping pipe for impact protection, where the depth of a high voltage power service is 2 m from ground or formation level to the top of the enveloping pipes, but less than 3 m.

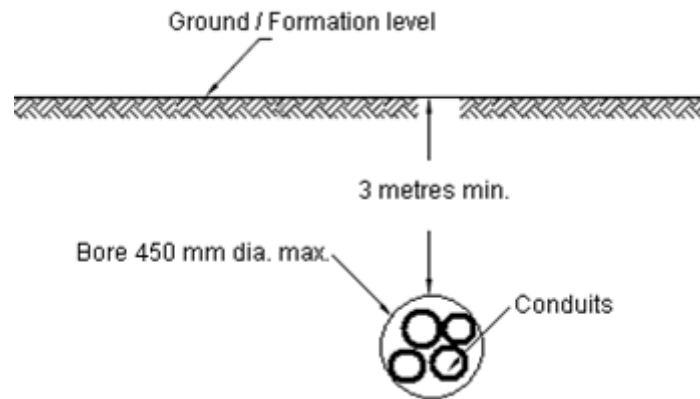


Figure 6: Power Service Installation by Directional Drilling (Section through bore)

2.2.10 Flammable and Combustible Fluids

The Owner shall design, construct and maintain flammable and combustible fluids services in accordance with AS 4799 and AS 2885 or AS 4645, as applicable. Where conflict between the requirements of AS 4799 and this specification occur, the more onerous requirement shall be applied.

Where a flammable or combustible fluids service is 2 m from ground or formation level to the top of carrier and enveloping pipes, but less than 3 m, the services shall be installed with a protection cover and warning tapes in accordance with Section 2.2.4.

Further to section 2.2.4, the protection cover shall have a width 1000 mm greater than the enveloping and carrier pipes.

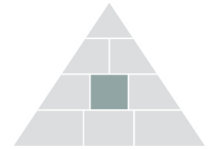
2.2.10.1 Steel Carrier Pipe

The Owner shall protect the steel carrier pipe against corrosion in accordance with AS 2885.1 or AS 4645.2, as applicable. Corrosion mitigation shall be designed for a minimum service life of 50 years.

Where a steel carrier pipe is designed and installed without an enveloping pipe, it shall have a cathodic protection system. The cathodic protection system test points shall be outside of the Queensland Rail reserve and adjacent to a marker post.

2.2.10.2 HDPE Carrier Pipes

The Owner shall design HDPE gas carrier pipes with a HDPE, concrete or steel enveloper pipe.



2.2.10.3 Enveloping Pipes

Where the space between the carrier pipe and the enveloping pipe is not grouted, it shall be sealed and vented at the ends outside of the Queensland Rail reserve. The vent pipes shall be clear of and not attached to the boundary fence, as shown in Figure 7.

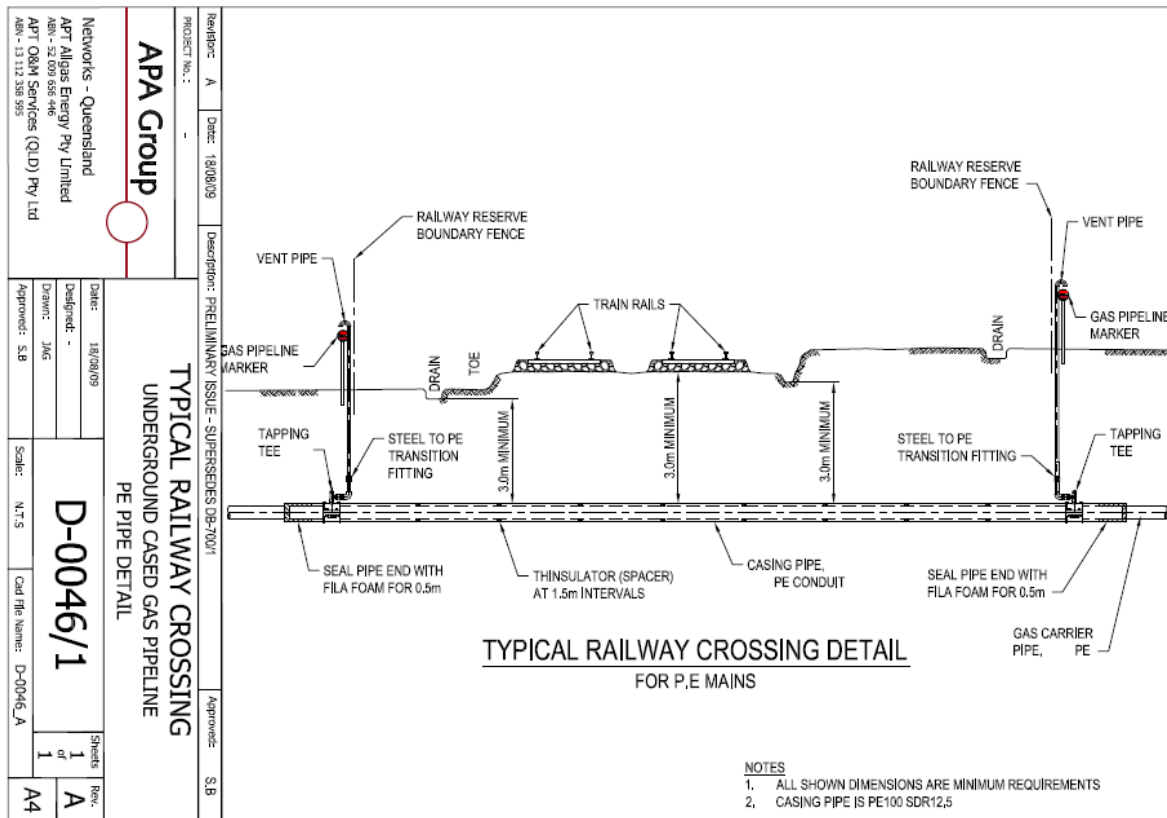


Figure 7: Enveloping pipe and venting arrangement for underground gas pipeline (APA Group)

2.2.10.4 Trenching

The Owner shall design services installed using this method with the following protection:

- a protection cover extending the length of the service under the Queensland Rail reserve, and
- warning tapes.

The gas line below the protection cover is to be protected by backfilling the trench with mass concrete with minimum compressive strength of 20 MPa at 28 days up to a minimum of 300 mm above the top of the enveloping pipe as detail in Figure 8.

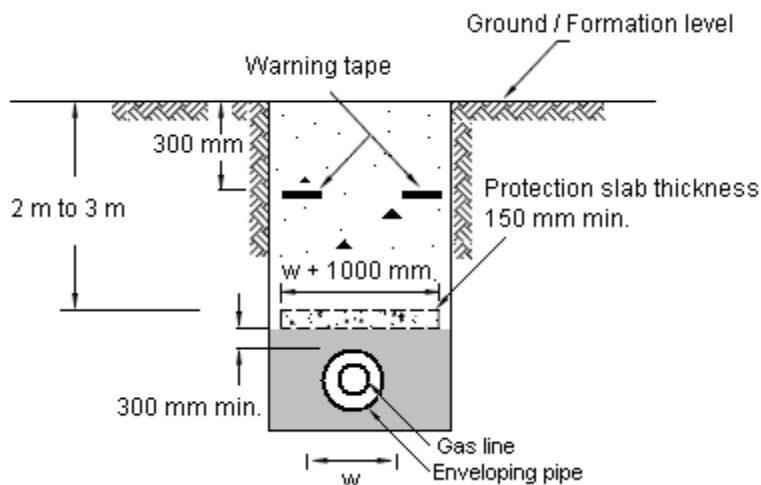


Figure 8: Gas pipeline installation in trench (section through trench)

2.2.11 Non-Flammable Fluids

The Owner shall design non-flammable fluid services, such as water, stormwater and sewer, with an enveloping pipe.

2.2.12 Services Shared by Queensland Rail

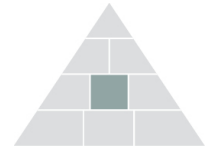
Where a service is jointly owned with Queensland Rail or where Queensland Rail uses a portion of an externally owned service, the service shall meet the requirements of this specification, except for the following:

- A shared service may run along the corridor and shall be located:
 - a maximum of 1 m from the reserve boundary fence
 - a minimum of 6 m from the toe of embankment and top of cuttings
 - a minimum of 10 m from the nearest rail.
- Pits and access chambers should be located outside of the Queensland Rail reserve. Where manholes, chambers and pits for a shared service are located in the Queensland Rail reserve.
 - the locations shall be approved by the Rail Infrastructure Manager
 - they shall be designed to Class E in accordance with AS3996.

2.3 Construction Requirements

Construction shall be in accordance with the following relevant Civil Technical Specifications:

- QR-CTS-Part 32 “Cable Manholes, Pits and Conduits”, clause 32.3.3.
- QR-CTS-Part 06 “Earthworks” (where trenching affects the railway embankment)
- QR-CTS-Part 40 “Trenchless Pipe/Conduit Installation”.



The Owner shall engage a competent contractor whose staff hold relevant national competencies for the tasks they are undertaking.

2.3.1 Track Monitoring

The Rail Infrastructure Manager shall appoint a Track Competent Person to:

- assess the Monitoring Action Plan.
- observe work and take appropriate actions to ensure the safety of railway traffic
- liaise with the Owner and Network Control in the event of track movements exceeding agreed limits
- assess and arrange remediation work to prevent or in response to movement.

The Rail Infrastructure Manager may need to engage a civil engineer where above responsibilities fall outside their competencies of a Track Competent Person.

Undertrack work by the Owner shall not proceed unless the Track Competent Person is on site or receiving monitoring notifications.

2.3.1.1 Monitoring Action Plan

The Owner shall provide for approval by Rail Infrastructure Manager a Monitoring Action Plan prior to the work commencing. The Monitoring Action Plan shall include:

- monitoring methods
- monitoring frequency
- data and report methods
- Notification and Intervention Levels
- actions to be taken for each Notification and Intervention Levels

2.3.1.2 Monitoring Using Traditional Survey

The Owner shall engage a suitably qualified registered surveyor to monitor the alignment and level of all track that the service crosses under.

Survey marks shall be established along both rail of each track. The marks shall be at the centre-line of the installation, and then at 2 m, 5 m, 8 m and 10 m from the centre-line of the installation in both directions along each track.

Readings shall be taken using a Total Station surveying instrument for alignment and level, or a Spirit Level for level.

The owner shall determine the existing track geometry prior to commencement of work to develop notification and intervention levels in accordance with Section 2.3.1.4.



2.3.1.3 Monitoring Frequency

When the service installation is under and within 5.5 m horizontally from centreline track, monitoring readings shall be taken a maximum of 40 minutes prior to the passage of every train across the bore.

For the SEQ Network Main and Suburban lines continuous real time monitoring shall be used when works are not occurring during a closure.

2.3.1.4 Notification and Intervention Levels

The Owner shall establish notification and intervention procedures in accordance with this specification to be approved by the Rail Infrastructure Manager.

The notification and intervention procedures shall be in accordance with the Civil Engineering Track Standard (CETS) MD-10-575 Module 9. The minimum action that shall be taken for the action priorities for track geometry limits in CETS table 9.6 shall be:

- Alarm Level 1 for High limits
- Alarm Level 2 for Very High limits
- Alarm Level 3 for Critical limits

The minimum actions are detailed in Table 2.

In developing track geometry limits, the Owner shall also consider existing track geometry. The Owner may develop limits based on the existing track geometry however those limits shall not exceed CETS table 9.6.

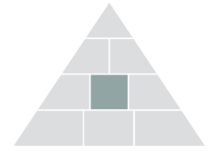


Table 2: Minimum actions for notification and intervention levels

Notification and Intervention Level	Minimum actions
Alarm Level 1	<p>The Owner is to verify movement by reviewing and repeating the survey.</p> <p>The Owner shall notify the Track Competent Person immediately.</p> <p>If movement is confirmed to exceed the predicted settlement and allowable limits, work methods shall be reassessed. Work may re-commence upon approval by a geotechnical engineer.</p> <p>The Owner shall inform the Rail Infrastructure Manager of the alarm level and the actions taken.</p>
Alarm Level 2	<p>The Owner shall cease works immediately and verify movement by reviewing and repeating the survey.</p> <p>The Owner shall notify the Track Competent Person immediately</p> <p>If movement is confirmed, the Owner shall:</p> <ul style="list-style-type: none"> • undertake a geotechnical assessment by a competent geotechnical engineer • review work methods <p>Works shall not recommence until methodology and monitoring procedures are reviewed, remedial measures are completed, and approval is obtained from:</p> <ul style="list-style-type: none"> • a geotechnical engineer, and • the Rail Infrastructure Manager <p>Remedial measures to be implemented prior to re-commencement works, shall be approved by the Rail Infrastructure Manager.</p>
Alarm Level 3	<p>The Owner shall immediately contact Network Control to stop trains on affected tracks.</p> <p>The Owner shall notify the Track Competent Person, immediately</p> <p>All works will cease immediately. Works shall not recommence until work methodology and monitoring procedures are reviewed, remedial measures are completed, and approval is obtained from:</p> <ul style="list-style-type: none"> • a geotechnical engineer, and • the Rail Infrastructure Manager.

2.3.1.5 Data and Reporting

The Owner shall provide data and reporting of track monitoring to the Track Competent Person. The data shall be accompanied with a covering report providing details of relevant site-monitoring information, which may include:

- date of monitoring
- time of monitoring
- name of surveyor
- temperature during monitoring
- general weather conditions during monitoring
- any remarks or comments relevant to the monitoring.

The Owner may present data in numerical and graphical formats detailing lateral and vertical movements.



At least one report per day shall be provided when track is being continuously monitored.

2.3.1.6 Monitoring After the Completion of Work

The owner shall continue monitoring after the completion of the work for the following situations where:

- the bore, enveloping or carrier pipes are greater than 600 mm diameter, or
- directional drilling or boring pass through expansive clays.

Readings shall be taken after each of the next three trains, at the end of the next day, and after another 2 days.

2.3.2 Rail Traffic Restrictions

The Rail Infrastructure Manager shall apply a speed restriction of 25 km/h for trains crossing the excavation. The speed restriction shall be applied when the excavation is 5.5 m horizontally from the centreline of the outside tracks until the work is fully completed.

Where the bore, carrier or enveloping pipes diameter is greater than 600 mm, a speed restriction of 50 km/hr for trains crossing the service shall be applied for 2 days after completion of the work.

The Rail Infrastructure Manager may require the Owner to undertake the works outside peak traffic periods or during a closure.

For SEQ Network Main and Suburban lines, the owner should plan all excavations 5.5 m horizontally from the centreline of the outside tracks to occur during Scheduled Corridor Access System track closures.

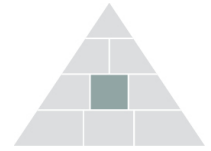
2.3.2.1 Trenching

Where a trench is to remain in place under rail traffic, the Owner shall have the design of the excavation and supporting structure certified by a competent Registered Professional Engineer Queensland (RPEQ). Design shall be in accordance with AS 5100. The design rail traffic load shall be 200A in accordance with drawing QR-C-S3178 or as approved by the Rail Infrastructure Manager.

Excavations shall cease while a train is crossing the site.

2.3.2.2 Directional Drilling

Excavation under the track formation shall stop temporarily while a train is crossing the bore site.



Where the installation is occurring below the water table the works shall be performed during a track closure.

2.3.2.3 Boring

Excavation under the track formation shall stop temporarily while a train is crossing the bore site.

Where the installation is occurring below the water table the works shall be performed during a track closure.

2.3.2.4 Jacking

While a train is crossing the bore site:

- Excavation under the track formation shall stop temporarily, and
- The pipe shall be jacked tight to the face of the excavation.

Where the installation is occurring below the water table the works shall be performed during a track closure.

Excavation ahead of the lead pipe shall not exceed 600 mm and not be left for longer than 2 hours. The pipe shall be jacked tight to the face of the excavation:

- At the end of every shift, or
- When excavation has been left for longer than 2 hours.

The face of the excavation shall be shored.

The face of the excavation shall be shored.

2.3.2.5 Pipe Ramming

Notwithstanding the requirements of Section 2.3.2, speed restrictions are not required where pipe ramming installation is used.

2.3.3 As Constructed Drawings

The Owner shall submit as constructed plans and section drawings to the Rail Infrastructure Manager within 30 working days after practical completion of the service installation.

Drawings shall be:

- in a pdf format and dwg format with electronic survey pickup data.
- show the vertical and horizontal alignment of the service in relation to the ground, formation level.
- show all infrastructure within 10 m of the service.



Where a service is partially owned by Queensland Rail, drawings shall be in accordance with the Production of Drawings by External Consultants Specification MD-15-160.

The Owner shall survey all cabling routes to facilitate future safe planning of works.

The location of the service shall be recorded in 3 dimensions on the GDA project and Australian Height Datum (AHD) co-ordinates at the following locations:

- top of individual service carrier or enveloping pipe, or
- the Invert Level (IL) of Storm water and sewer services, and
- top of protection cover, where installed.

Locations shall be recorded at frequency given in Table 3.

Table 3: Service route surveying frequency requirements

Route	Surveying locations/intervals
Straight runs and Curves with radius of 800 m and greater	10 m
Curves with a radius of less than 800 meters	5 m
Additional locations to be surveyed	Entry and exit to pits, chambers and manholes.

Rail Infrastructure Manager shall register the service in Queensland Rail's GIS (Geographical Information System).

2.4 Maintenance requirements

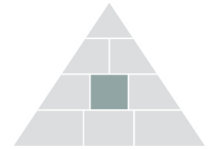
The Rail infrastructure Manager shall:

- Check the installation of the permanent markers,
- Maintain a register of the locations and nature of all services under Queensland Rail property for its own use, and
- conduct future regular inspections in accordance with the Civil Engineering Structures Standard MD-10-586.

The Owner shall maintain integrity of the service and have protocols to:

- access the Queensland Rail reserve to undertake inspection and maintenance
- advised Queensland Rail of any issues affecting the service that have the potential to impact rail traffic.

Where a cathodic protection system is used, the owner shall maintain and register the system accordance with Electrical Safety Regulation. Certification of registration shall be provided to Queensland Rail for each registration period.



The Owner shall provide information indicating the location of the service to the public and maintain that information. This should be achieved using Dial Before You Dig Queensland.

2.4.1 Change of Ownership

Owner shall inform Queensland Rail of change of ownership of a service and facilitate contact between Queensland Rail and the new owner.

2.4.2 Decommission of Services

The Owner shall, upon decommissioning a service, inject flowable grout into the carrier pipe with a minimum characteristic compressive strength of 5MPa at 28 days. Notification of the decommissioning of the service is to be submitted to Queensland Rail's Property Section within 30 working days after the cessation of the service.

The Owner shall indicate the status, location and depth of the decommissioned service on the permanent markers at the Queensland Rail reserve boundaries. The Rail Infrastructure Manager shall maintain the permanent markers.

2.5 Existing Services Under New Line and Track

2.5.1 New Lines

All existing services shall meet the requirements of this specification for the service type where a new Queensland Rail Reserve is being established.

Installation Methods and Construction requirements of the specification shall be met where service installation and construction are occurring under established track.

2.5.2 New Track

The Owner shall submit an application for derogation where a service already exists under adjacent existing track:

- does not meet the requirements of this specification, and
- does not have an existing derogation.

Where there is an existing derogation for the service the Owner shall notify the Discipline Head Track and Structures. Where the service will not be modified to meet the requirement of this specification, the Owner shall make an application for derogation.



2.6 Application for Service Installation

An application for an Owner to install a new service in Queensland Rail property is done through the wayleave process and the Wayleave Application for Non-Queensland Rail Service Form MD-14-134. The following information shall be submitted with the application.

- A geotechnical report for bores greater than 150 mm diameter
- Work method statements
- Drawings.

Additional information may be requested prior to approval and the commencement of work including a program of works and material specifications.

2.6.1 Geotechnical Report

The Geotechnical Report shall:

- confirm the suitability of the proposed installation method based on soil type, location of water table and rail traffic
- include bore logs.

Where excavation is proposed to occur during the operation of rail traffic, the Geotechnical Report should include:

- estimated settlement
- vibration analysis
- for pipe jacking:
 - maximum progression of excavation ahead of leading end of pipe
 - maximum period of time excavation can be left unsupported.

Geotechnical investigations, including bore holes and Cone Penetration Tests (CPT), shall be within 10 m of the centreline of the service.

2.6.2 Work Method Statements

The Owner shall provide Queensland Rail with a Work Method Statement which includes controls related to track and electrical safety. The Work Method Statement shall include all controls required for the safe construction of the service, which should include the following:

- Site Establishment arrangements
- Survey arrangements to establish the bore alignment
- A risk assessment including risks and methods of control for possible problems related to the rail corridor environment (e.g. the Electrical Exclusion Zone, the Danger Zone) and that could cause interference to the railway track (e.g. lift or settlement affecting track alignment)



- Track monitoring processes and procedures in accordance with Section 2.3.1.

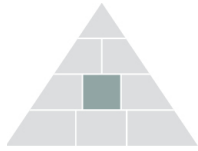
2.6.3 Drawings

The Owner shall submit plan and section drawings. Drawings shall:

- Be in a pdf format
- Show a typical cross section of the service, including:
 - bore and carrier and enveloping pipe diameters
 - clearance of the protection cover from carrier or enveloping pipe
 - grouting arrangements.
- Show the vertical and horizontal alignment of the service in relation to the ground, formation and railway track level, including:
 - clearance from nearby infrastructure
 - the extent of protective covers
 - depths of service to top enveloping pipe or carrier pipe, as appropriate.
- Show all infrastructure within 10 m of the service
- Include Aerial Photograph showing access routes, location of machinery, distance to rail and Overhead Line Equipment.

2.6.4 Authorisations

The Owner shall obtain permits or approvals from the Owner of the adjacent existing service where the new service is less than 3 m from the existing. The Owner of the new service shall provide a copy of the permit and approval to Queensland Rail prior to mobilisation.



3 Terms and definitions

The following key terms and definitions are unique to this Procedure. Please refer to the [Business Glossary](#) for other terms not included in this section.

Term	Definition	Source ¹
Boring	Tunnelling Boring and micro tunnelling	
Carrier pipe	The cable, conduit carrying cables and pipes carrying a gas or fluid.	
Category A System	An underground wiring system as defined by AS 3000	
Enveloping Pipe	A protective pipe through which the carrier pipe placed. Referred to as a “encasing pipe” in AS 4799. Conduits are not considered to be Enveloping Pipes unless permitted by a section of this specification.	
Formation Level	Interface level between ballast and earth support	
Ground Level	The ground level that is not railway embankment, including cuttings, natural surface and cess drains.	
High Voltage	Voltage exceeding 1000 V a.c or 1500 V d.c.	AS 3000 clause 1.4.128
Long bearer	A railway sleeper supporting two tracks of a turnout.	
New Lines	A track of completely new construction on a new alignment a newly established Queensland Rail Reserve.	
New Track	A track of completely new construction on a new alignment in as existing Queensland Rail Reserve.	
Non-encased carrier pipe	A carrier pipe without an enveloping pipe	
Owner	The authority, body, applicant licensee, licensee’s agent or any party applying for, being granted, installing, using or maintaining any underground service on Queensland Rail property.	
Protection Cover	Mechanical protection systems for carrier pipe. May include a protection slab or hard cover strips in accordance with Section 2.2.4	
Queensland Rail reserve	Land controlled by Queensland Rail, set aside for and containing existing, proposed or disused Queensland Rail owned infrastructure.	
Service	All externally owned utility or pipelines, including conduits, cables, pipelines or another conveyance system underground as well as its fittings and accessories. Referred to as a “utility” in MD10-133	
Toe of Switch	Thin end of the moveable blade of a turnout, also referred to as a switch blade.	

¹ Where left blank, Source is not applicable.



Term	Definition	Source ¹
Track Competent Person	A person who is competent in accordance with Track – Training Framework MD-16-677 for road patrol or track inspections. May be a track competent Engineer.	



4 Document history

Document Information

Current Version	1.1
First Released	07 December 2020
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Review Frequency	Every 3 years
Review Before	09 December 2024
Document Authoriser	Chief Executive Officer (CEO)
Functional Owner	Discipline Head Track & Structures
Document Owner / Approver	Discipline Head Track & Structures
Content Developer*	Senior Standards Engineer
Review Stakeholders	SEQ Assets, Supply Chain North, Supply Chain South, Property
Audience	All employees, contractors and consultants

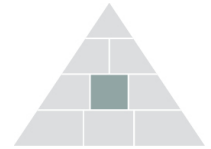
*Contact for further information

Document Amendment History

Version	Date	Section(s) Amended	Summary of Amendment
1.1	09/12/2021	2.2.3	HDPE Enveloping Pipe minimum strength requirement reduced from PN 20 to PN 16
		2.2.10	Minor clarification to some requirements
1.0	07/12/2020	New	First release as a Managed Document.

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5 Appendices

Appendix 1 – Related documents

Queensland Rail documents

Document type	Document title
Principle	N/A
Standard	MD-10-133 Civil - Utilities within Railway Reserve MD-10-575 Civil Engineering Track Standard (CETS) MD-10-586 Civil Engineering Structures Standard
Strategy / Plan	N/A
Specification / Framework	MD-13-423 Telecommunications - Optical Fibre Cabling Design and Installation MD-15-160 Production of civil engineering drawings by external consultants and contractors MD-16-677 Training Framework - Track MD-20-348 Civil - Queensland Rail Underground Services
Procedure	N/A
Instruction	N/A
Guideline	N/A
Form / Template	MD-14-134 Wayleave Application for Non-Queensland Rail
Other	Earthworks Civil Technical Specification QR-CTS-Part 06 Cable Manholes, Pits and Conduits Civil Technical Specification QR-CTS-Part 32