

Technical Note 163

Third Party Utility Infrastructure Installation in State-Controlled Roads Technical Guidelines

July 2023



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1 General

1.1 Background

The Department of Transport and Main Roads (department) manages the State-Controlled Road Corridors (SCRC) on behalf of the State of Queensland. The department's broader objective is to deliver an integrated, safe, efficient and reliable transport system that is accessible to all. One of the department's core values is to provide fair and equitable access to the corridor, while ensuring the safety of the travelling public is at the forefront of all decisions.

State-Controlled Road Corridors are becoming increasingly congested due to population growth, increase in demand by the general public for community and recreational activities, and demands from utility providers to provide a service. It is the responsibility of all parties to ensure the corridor is managed in an efficient manner and that the best outcome is delivered for all stakeholders.

1.2 Document application

The purpose of this Technical Note is to support the permitting application process for third party Public Utility Plant (PUP) Asset Owners to access the SCRC and provide technical requirements governing the installation of its services.

This Technical Note applies to all service types and unless specified, does not apply to a single utility type.

This process applies to the installation of utility services by an Asset Owner or its representative (including developers that gift completed assets back to Asset Owners) within the boundaries of a SCRC declared under the *Transport Infrastructure Act 1994 (Qld)*¹.

All Works must be conducted in accordance with the approval conditions detailed in the Permit issued by the department, and the conditions identified in this document.

2 Definitions and referenced documents

2.1 Definitions

The terms used in this Technical Specification are defined in Clause 2 of MRTS01 *Introduction to Technical Specifications* and Table 2.1 of this Technical Specification.

Table 2.1 – Definitions of terms

Term	Definition
Asset Owner	Organisation or individual (either public or private) that is the Owner of the utility service, network or infrastructure. This is the term that will be used to refer to both Public and Private Utility Providers.
Asset Owner Legislative Obligations	Relevant state and federal government environment, native title and heritage obligations which must be addressed prior to submission of a Permit to the department.

¹ Specifically, ss77-83 of the Act and Part 4 of the 'Transport Infrastructure (State-controlled Roads) Regulation 2006'.

Term	Definition
Brownfield	Previously used land or sections of industrial or commercial facilities that are to be upgraded. For road transport infrastructure projects, this can better be defined as locations on existing roads where work proposals are based on retaining the existing formation to the greatest degree feasible.
Business Day	A day that is not a Saturday, a Sunday or a public holiday. Of note, is that the department also has a two-week Christmas closure period commencing on 24 December. This period is also not considered as Business Days.
Carrier Pipe	The cable, conduit carrying cables and pipes carrying a gas or fluid.
Constrained Road Corridors	Constrained Road Corridors may include but is not limited to verge widths under the minimum, highly congested verges, limited footprint to facilitate trenchless construction methods or shallow non rippable rock. Determination of whether a site is constrained or not is at the discretion of Transport and Main Roads.
Distribution Service	Utility service network that distributes product from Transmission network to retail consumer / end user.
BYDA	Before you Dig Australia.
District Director	Departmental District Director.
GIMS	Geospatial Information Management System.
Enveloping Pipe	A protective pipe through which the carrier pipe placed. Referred to as an 'encasing pipe'.
Greenfield	Land that lacks any constraints imposed by prior work.
High Pressure Gas Service	Gas and liquid petroleum transmission pipelines complying with AS 2885.
Jointing Pit	Chambers installed to facilitate the jointing of cables and optical fibres. The products are divided into two groups: <ol style="list-style-type: none"> 1. Cable jointing access chambers – worker-entry 2. Cable jointing pits – non worker-entry.
Limited Access Roads	A road or part of a road that has been defined in accordance with Section 54 of the <i>Transport Infrastructure Act 1994</i> (Qld). Generally, refers to roads that have been specifically designed and constructed as a high speed road. This includes but is not limited to freeways, expressways, motorways and some bridge structures where, due to safety concerns, access must be restricted.
Low Pressure Gas Service	Gas distribution pipelines complying with AS/NZS 4645.
Maintenance	Any or all activities that are undertaken to ensure the Asset is adequately managed, maintained and replaced when required and that appropriate levels of service are achieved.
MAOP	Maximum allowable operating pressure for a gas network (refer to AS 2558 and AS 4645).
NB	Nominal Bore
Parties	Persons or organisation that install a utility service in a SCRC.
Permit	A conditioned agreement provided from the department pertaining to the access, installation, maintenance, upgrade and removal of a utility service within a SCRC (including future transport corridors).

Term	Definition
PPV	Peak Particle Velocity, parameter used in vibration monitoring.
Public Utility Plant (PUP)	Means plant permitted under another Act or a Commonwealth Act to be on a road.
Public Utility Provider (PUP)	<p>For the purpose of this document only, this means an entity that owns Public Utility Plant. Specifically:</p> <ul style="list-style-type: none"> a) the State or another entity representing the State, or b) the Commonwealth or another entity representing the Commonwealth, or c) a local government, or d) a person authorised by law to provide a public utility service, or e) a person authorised under an Act to provide a particular public utility service f) an entity approved by the Minister as suitable to provide infrastructure for use by another entity in the provision of a particular public utility service, or g) a person approved by the Minister as suitable to provide a particular public utility service. <p>Note: This definition does not supersede applicable legislation.</p>
Private Utility Service	A service connection, such as water, electricity, communication, and so on, that will be used by an individual property owner and not regulated by a Government Act.
RPEQ	Registered Professional Engineer Queensland.
Reticulation Water main	A water main that connects a trunk (distribution) main with service pipes.
Road Footprint	Toe of batter to toe of batter including road surface and pavement layers / subgrade.
Road Surface	Upper most layer of the road pavement from outer edge of shoulder to outer edge of shoulder.
Service Authority	A business organisation, subject to governmental regulation, that provides an essential commodity or service, such as water, sewerage, gas, electricity, transportation, or communication to the public.
Site	An area of ground for construction of infrastructure
State-Controlled Road Corridor (SCRC)	A State-Controlled Road Corridor is a road (or land intended to become a state-controlled road) which is 'owned / managed' by the state and declared under Sections 24 and 25 of the <i>Transport Infrastructure Act 1994</i> (Qld).
Road infrastructure or furniture	Includes but is not limited to bridges, gantries, traffic lights, pole mounted cameras, noise barriers, and so on.
Third Party Access	Provision for a party, other than the department to gain access to a SCRC to install a utility service that will not be owned by the department.
Transmission Service	Utility service network that connects point of supply to the distribution network. Generally high pressure or higher kV networks.
Trunk Water Main	Generally large diameter water mains that transfer water from one area to another acting as a transmission service.

Term	Definition
Utility Service	A publicly, privately, or jointly owned and operated Asset, located on either public or private property, the purpose of which is to transport for either the public or a private party a service or commodity such as electricity, communications, gas, light, oil, power, television, water, wireless signals and waste by means of cables, conduits, ducts, fibre optics, pipes and wires and includes related objects, such as access chambers, pits, valves, towers and other appurtenances.
Valve	A device for controlling the passage of fluid or gas through a pipe or duct.
Works	All tasks required and associated with the installation of a utility service.

2.2 Referenced documents

Table 2.2 lists the documents referenced in this Technical Note.

Table 2.2 – Referenced documents

Reference	Title
AS 2885 (series of standards)	<i>Gas and Liquid Petroleum</i>
AS 5100.2	<i>Bridge Design – Design Loads</i>
AS/NZS 2566.1	<i>Buried Flexible Pipelines, Part 1: Structural Design</i>
AS/NZS 3725	<i>Design for Installation of Buried Concrete Pipes</i>
AS/NZS 4645 (series of standards)	<i>Gas Distribution Networks standards</i>
-	<i>Environmental Protection Act 1994 (Qld).</i>
Industry Code C524:2013	<i>External Telecommunication Cable Networks</i>
MRTS02	<i>Provision for Traffic</i>
MRTS05	<i>Unbound Pavements.</i>
MRTS21	<i>Bituminous Emulsion.</i>
MRTS30	<i>Asphalt Pavements.</i>
MRTS140	<i>Horizontal Directional Drilling (HDD)</i>
MRTS141	<i>Microtunneling and Pipe Jacking</i>
MRTS142	<i>Thrust Boring and Auger Boring</i>
-	<i>Native Title Act 1993 (Cth)</i>
-	<i>Transport Infrastructure Act 1994 (Qld).</i>

3 Access to the State-Controlled Road Corridor (SCRC)

3.1 Approvals

Access to the SCRC is regulated by state and federal legislation. A number of mechanisms including Works agreements, Contracts and Permits are used to condition the terms under which access is managed for third parties. Proposed utility services Works and design plans are to be submitted for a written agreement by the department in accordance with the regulated timeframes.

3.2 Protecting departmental assets

It is the responsibility of all parties to ensure the department's existing infrastructure and assets, either temporary or permanent, surface or sub-surface, are not compromised while working in the corridor. The department does not allow third-parties to interfere with or disturb departmental assets without prior approval.

Depending on the Works being undertaken, the department reserves the right to engage its construction and maintenance teams to carry out certain activities. Examples of this are reinstatement of road pavements, disturbing or attaching infrastructure to departmental structures or bridges or disturbing departmental Intelligent Transport Systems and Electrical (ITS&E) Assets. These activities may incur a fee for service cost.

Information relating to the department's existing road transport infrastructure assets can be obtained by contacting the department. This information must be sought to identify departmental assets prior to commencing any ground disturbing activities.

Local offices can be located via: [Regional contacts \(Department of Transport and Main Roads\)](#)

4 Preparing the work Site

4.1 Clearing

The Asset Owner must ensure compliance with relevant legislative obligations during clearing (for example, cultural heritage and environmental obligations). Any proposed clearing or trimming of trees or shrubs, is to be indicated specifically or by way of a general note on the plans submitted to the department for approval.

Clearing must be kept to an absolute minimum. Impacts to any landscaped areas, revegetated areas, and/or fauna management areas, must be reinstated on a like-for-like basis, or as otherwise advised in the Permit.

Cleared vegetation, which is weed free, shall be milled or chipped and returned to Site. Alternatively, cleared vegetation shall be removed from Site and disposed of legally. Any disturbed ground surfaces must be reinstated with turf, seed or mulch as directed by the department.

4.2 Identifying third party assets

It is the responsibility of all parties to ensure existing above and below ground infrastructure is not compromised while working in the SCRC, including the department's assets.

Note, not all Asset Owners (including the department) are members of Before you Dig Australia (BYDA), it is the responsibility of the authorised party to contact all Asset Owners, and the local departmental Project Manager or GIMS Officer to obtain the relevant plans.

Location of third-party or departmental underground assets, within the road pavement, must be undertaken using non-invasive methods.

The department will not approve any disturbance to the road pavement for the purposes of exposing existing sub-surface infrastructure. Exemptions may be approved by the District Director after the Asset Owner provides satisfactory evidence that sub-surface infrastructure cannot be identified using non-invasive methods, is a safety risk, and warrants the integrity of the disturbed area for a period of two years in writing.

4.3 Notifying the public

The Asset Owner managing the Works must provide adequate notice to the public regarding its proposed Works. In general:

- a) the Asset Owner must arrange suitable public communications and media notices to ensure that affected motorists and the local community are advised of any disruptions the project may cause
- b) notices must be provided to affected residents and local businesses located adjacent to the proposed Works, and
- c) the Asset Owner (or its nominated Contractor) must install signage identifying the Works being undertaken and contact numbers for community enquiries.

On request, details pertaining to the content of any advertising must be provided to the department at no cost.

4.4 Working hours

The Asset Owner must comply with any Working Hour restrictions, including traffic control and lane closure requirements imposed by the department. Details of any requirements which apply, will be provided with the departmental Permit or Traffic Control Permit. Extended Working Hours must be negotiated as part of the Permit application; Queensland Manual for Uniform Traffic Control Devices (MUTCD) Section 3.5 for lane closure restrictions.

- a) It should be noted that additional time periods and information may be required by the department's Road Operations Team or District Director for applications applying for extended Working Hours.
- b) Every attempt should be made to maintain capacity on roads which normally run close to its capacity, particularly during peak hours in built-up areas. In addition to maintaining the required number of lanes in accordance with MRTS02 *Provision for Traffic*, note should be taken of the effect on capacity of traffic lanes less than three metres in width and unsealed or rough surfaces. Either condition could lead to lane capacity being reduced.

Works may need to be scheduled so that peak hour capacities are maintained.

4.5 Traffic safety and control

The work involved in installing utility services shall proceed with minimum interruption to the travelling public, including vehicles, cyclists and pedestrians. All steps necessary shall be taken for the protection of the public during construction. Road traffic shall not be diverted to side tracks or detours without the written agreement of the department and the agreement of the police and local government, as may be necessary.

All Works that will impede the flow of vehicles, cyclists and pedestrians on a state-controlled road, including but not limited to reductions in speed, lane closures, footpath closures, and so on, will require a Traffic Control Permit. Traffic Control Permits will only be issued to departmental Registered Traffic Control Companies. For guidance on preparation and requirements of traffic control, refer to the Queensland MUTCD.

For more information refer to <https://www.tmr.qld.gov.au/business-industry/technical-standards-publications/traffic-control-permit.aspx>

4.6 Environment and Cultural Heritage controls

General requirements

Prior to the commencement of Works, the Asset Owner is responsible for:

- a) ensuring that all cultural heritage, native title, and environmental risks are identified, and
- b) ensuring the proposed Works are carried out and managed in accordance with all relevant legislation relating to cultural heritage, native title and environmental.

The Asset Owner or its appointed Contractor will abide by all legal requirements and will exercise the relevant duty of care to ensure that there is minimal impact on areas of conservation value, or cultural heritage significance.

Specific conditions

Where a development or activity is likely to have an impact on state infrastructure or state-owned property or process, the department will condition proposed Works to minimise any negative impacts. Examples of this in relation to environmental values includes:

- a) preservation or, if necessary, restoration of nature conservation values or departmental significant environmental areas
- b) landscaping / revegetation (requirements for the return of the Works areas to pre-existing condition. This also would apply where the department or a departmentally-approved community group has completed previous landscaping / revegetation work in the project area)
- c) pest management
- d) areas of cultural heritage significance
- e) where Works would degrade the Site conditions, and
- f) the Asset Owner must remove any litter generated as part of the Works.

Notification requirements

The department requires that the Asset Owner (or its subcontractors) advise the department (as the land manager) of notification of any environmental or cultural heritage incidents, to any regulatory authorities or Aboriginal Parties completed under any other legislation (for example, the *Environmental Protection Act 1994* (Qld), duty to notify requirements) as a result of the project. This is to be completed within 24 hours in writing.

The department requires the Asset Owner to notify of any meetings with, inspections, audits, or visits from representatives of other state or federal government departments (for example, the Department of Environment and the Great Barrier Reef, Science and Multicultural Affairs, Department of Resources, and Department of Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts).

Should any unexpected Sites or artefacts of potential cultural heritage significance be located during the course of ground disturbance Works, the Asset Owner must:

- a) cease the activities immediately in the vicinity of the find
- b) leave any found items undisturbed and erect a temporary barrier to deter access, and
- c) notify the department's Cultural Heritage Officer on TMR.Heritage@tmr.qld.gov.au to arrange management strategies.

Other requirements

The department makes no warrant as to the existence or non-existence of native title rights and interests over any of the land or waters within the boundaries of the SCRC, proposed to be used for the installation and/or maintenance of utility services. The Asset Owner is responsible for ensuring compliance with the *Native Title Act 1993* (Cth) when constructing or maintaining utility infrastructure under relevant legislation.²

4.7 Drainage

The Asset Owner or its appointed Contractor must not carry out any work which has the potential to detrimentally effect the flow of water on or around a road or carry out any work which will interfere with existing drainage systems, (for example, underground stormwater systems, culverts, table drains and so on), without prior approval from departmental or local government authorities, where required.

All Works are to be adequately drained during construction, so as not to cause damage to existing road facilities or create road safety hazards to travelling motorists or pedestrians.

Any work that proposes alteration to existing drainage arrangements, must be specifically detailed on the plans submitted to the department for approval prior to commencement of Works. Complex drainage treatments need to be designed by an appropriately-qualified designer and certified by an RPEQ prior to submission. Such Works will be treated on a case-by-case basis and may require additional approval from the department's Director of Hydraulics and Flooding (ET_HDS_Hydraulics_and_Flooding2@tmr.qld.gov.au). It should be noted that additional time periods may be required for reviewing applications that impact on existing drainage systems.

5 Working in the (SCRC)

5.1 Clear zones for above ground installations

All above ground fixed object installations erected in the SCRC by the Asset Owner, should be assessed as potential hazards by the Asset Owner in accordance with the Generalised Hazard Assessment process as outlined in the Road Planning and Design Manual 2nd Edition Volume 3 Part 6: *Roadside Design, Safety and Barriers* which can be found at the following internet address: [Road planning and design manual - 2nd edition \(Department of Transport and Main Roads\) \(tmr.qld.gov.au\)](http://www.tmr.qld.gov.au)

² Federal legislation regarding cultural heritage, native title and environmental protection apply. The applicant is required to comply with all legal requirements. A list of some legislation that may apply includes:

- *The Environment Protection and Biodiversity Conservation Act 1999* (Cth) protects World Heritage properties and defines Commonwealth and National heritage-listed places as matters of national environmental significance.
- The Commonwealth and National Heritage Lists which commenced on 1 January 2004.
- *The Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) protects traditional areas and objects from threats in exceptional circumstances.
- *Protection of Moveable Cultural Heritage Act 1986* (Cth) restricts the export of traditionally important Cultural Heritage objects.
- The Australian International Council on Monuments and Sites (ICOMOS) Burra Charter 1999 which is used as a guideline for making decisions under the *Queensland Heritage Act 1992* (Qld) and provides a consistent approach to significance assessment, development proposals and Queensland registered place management. The philosophy behind, and the operation of the *Queensland Heritage Act 1992* (Qld) reflects the principles, processes and practices set out in the charter.

<http://www.tmr.qld.gov.au/Community-and-environment/Environmental-management>
The Native Title Act 1993 (Cth) and the *Native Title (Queensland) Act 1993* (Qld).

Assessment reports certified by an RPEQ shall be provided to the department to demonstrate compliance with this requirement. Installations within the clear zone will be subject to special conditions which the Asset Owner must comply with to ensure the safety of the travelling public.

5.2 Depth of cover, orientation, and proximity to structures

5.2.1 Depth of cover

The department acknowledges that various Australian Standards and Service Authority's own standards stipulate many different minimum depth requirements and clearances for underground assets.

For this reason, the department will not nominate minimum depths of cover or clearances specific to each individual utility provider. Instead, the department has set absolute minimum cover requirements that each type of utility service must adhere to within SCRCs. However, should a Service Authority's own standard or an Australian Standard require a greater depth of cover, then the higher value of cover must be used.

It must be noted that this minimum cover may be reviewed on a case-by-case basis by the department. Deeper cover may be required depending on the material and class of the pipe proposed and the type of service being installed.

Unless otherwise approved, the minimum depth of cover for utility services installed within an SCRC (either parallel with, or crossing, the road footprint) are as specified in Tables 5.2.1(a) to 5.2.1(d) and Figure 5.2.1.

The design of enveloping pipes shall comply with Section 5.10 of this document.

Table 5.2.1(a) – Minimum depth of cover for electrical and communications utility services

Location	Nominal Cover
Road Surface (from top of enveloper pipe / conduit to surface level at the lowest point of the pavement cross section).	1200 mm ¹
Footpath / verge (below lowest point in footpath allocation).	600 mm ² / 750mm ³
Table drains (below invert level of table drains).	900 mm
Between pavement subgrade and utility service / service conduits.	800 mm / 400mm ⁴
Bored, jacked, or microtunnelled installations (under road footprint).	1500 mm

1. Services under vehicle crossing driveways or private property access, are to be reviewed on a case-by-case basis but not less than 900 mm.
2. 600 mm measured from the underside of an existing or proposed path.
3. 750 mm where no path is present, that is, from natural surface.
4. Cover may be reduced to 400 mm with the incorporation of a protection slab. Top of slab to be no higher than the pavement subgrade level, unless otherwise agreed by the department.

Table 5.2.1(b) – Minimum depth of cover for water utility services

Location	Nominal Cover (<200NB)	Nominal Cover (>200NB)
Road Surface (from top of envelope pipe / conduit to surface level at the lowest point of the pavement cross section).	1500 mm ¹	1500 mm ¹
Footpath / verge (below lowest point in footpath allocation).	600 mm	1000 mm
Table drains (below invert level of table drains).	900 mm	900 mm
Between pavement subgrade and utility service / service conduits	900 mm	900 mm
Bored, jacked, or micro tunnelled installations (under road footprint)	1500 mm	1500 mm
Road Surface (existing installations / constrained Sites)	750 mm ²	1000 mm ²

- Services under vehicle crossing driveways or private property access are to be reviewed on a case-by-case basis but not less than 900 mm.
- In situations where existing assets are to remain and do not meet 1500 mm minimum requirement, or Site constraints prevent increased depth, service may have reduced cover, subject to additional protection measures such as concrete encasement and/or protection slab subject to detailed calculations and approval from the department on a case-by case basis.

Table 5.2.1(c) – Minimum depth of cover for sewer utility services

Location	Nominal Cover (<200NB)	Nominal Cover (>200NB)
Road Surface (from top of envelope pipe / conduit to surface level at the lowest point of the pavement cross section).	2000 mm ¹	2000 mm ¹
Footpath / verge (below lowest point in footpath allocation).	600 mm ³	1000 mm ^{2,3}
Table drains (below invert level of table drains).	900 mm	900 mm
Between pavement subgrade and utility service / service conduits.	1200 mm	1200 mm
Bored, jacked, or micro tunnelled installations (under road footprint).	2000 mm	2000 mm
Road Surface (existing installations / constrained Sites).	750 mm ⁴	1000 mm ⁴

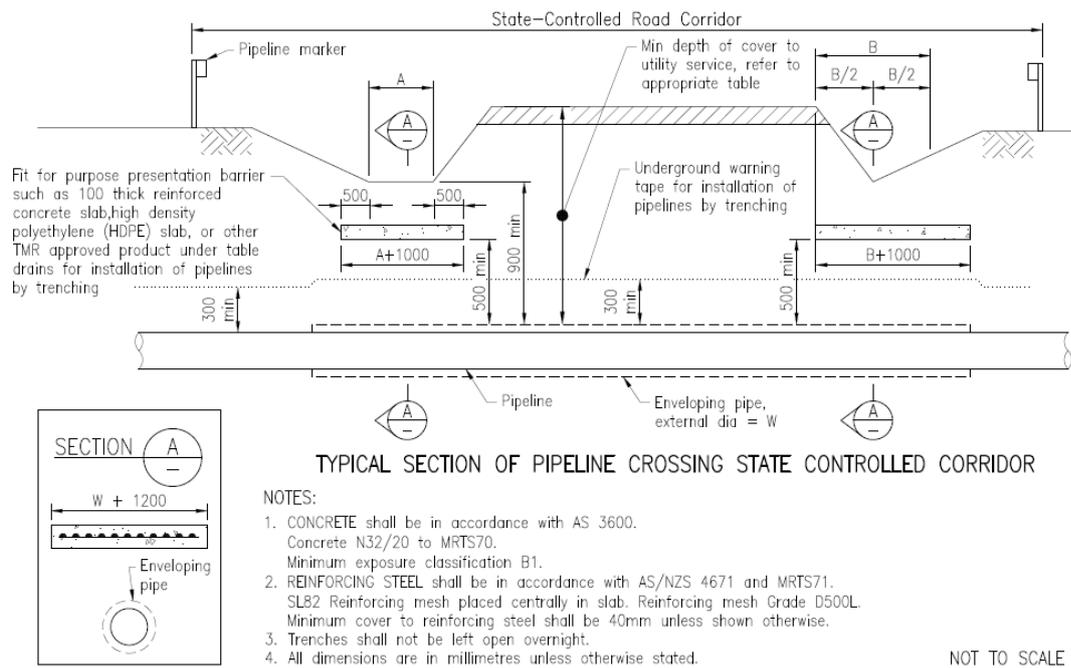
- Services under vehicle crossing driveways or private property access, are to be reviewed on a case-by-case basis but not less than 900 mm
- Refer to utility providers design code to confirm minimum depths. The highest of the two standards shall govern.
- Gravity sewer minimum cover in the verge shall be 900 mm. Refer to relevant sewer authority standards for depths of services when parallel to other services.
- In situations where existing assets are to remain and do not meet 2000 mm minimum requirements, or Site constraints prevent depth, service may have reduced cover subject to additional protection measures such as concrete encasement and/or protection slab subject to detailed calculations and approval from the department on a case-by-case basis.

Table 5.2.1(d) – Minimum depth of cover for gas utility services

Location	Nominal Cover Transmission	Nominal Cover Distribution
Road Surface (only existing installations / constrained Sites)	1200 mm ^{1 2}	1200 mm ^{1 2}
Footpath / verge (below lowest point in footpath allocation)	600 mm / 1200 mm ³	600 mm / 1200 mm ³
Table drains (below invert level of table drains)	900 mm	900 mm
Between pavement subgrade and utility service / service conduits	1500 mm	1500 mm
Bored, jacked, or micro tunnelled installations (under road footprint)	1500 mm ¹	1500 mm ¹

1. If an enveloping pipe is impractical or not feasible for use, the minimum cover to a gas or liquid petroleum line shall be increased to:
 - a) 2100 mm for pipelines when low speed (< 70 km/hr) roads in high density constrained urban areas or low volume roads (under 4000 AADT) in constrained rural areas, and 3000 mm for pipelines for all other locations including limited access roads. Additionally, the design must comply with other requirements of Section 5.10 of this Technical Note, and
 - b) in constrained locations where, trenchless methods are not viable, the pipe shall be 600 mm below pavement subgrade, or 1200 mm below the surface level (whichever is greater) and shall have additional physical controls in the form of casings, concrete slabs and/or concrete encasement, or a combination of these treatments as defined in AS 2885.1 (b)(ii). Depths outside the above table values, shall be reviewed on a case-by-case basis with final solution agreed with the department.
2. Services under vehicle crossing driveways or private property access, are to be reviewed on a case-by-case basis, but not less than 900 mm.
3. Depth of cover in verges, where existing pressurised utilities greater than NB200 mm is adjacent to the gas allocation corridor, depth of new installations shall be increased in accordance with minimum clearances. Where the gas alignment is within the department's service corridor, the depth shall be increased to 1200 mm minimum.

Figure 5.2.1 – Example of typical section



5.2.2 Orientation

Unless otherwise approved, all underground utility services crossing a SCRC must not be within 20 m of the lowest point of the road (road sag) and be located so as to cross as close as 90° as practicable; however a greater oblique angle shall be used to prevent bends being located below the pavement area.

Overhead electrical and telecommunication assets may cross a SCRC at an angle up to 45° to the road subject to departmental requirements for:

1. all horizontal and vertical clearance requirements being addressed for current and proposed transport infrastructure (that is, future street lighting, traffic signals, and so on)
2. consideration of all constraints that would be placed on workers installing and maintaining overhead assets, including departmental assets throughout the life of the service, and
3. consideration of any impact that the crossing may have on the safety of the travelling public and other users of the SCRC.

Overhead electrical / telecommunication assets crossing less than 45° to the road, may be approved on a case-by-case basis, subject to the departmental District Director (or their delegate) discretion.

Overhead electrical / telecommunication diagonal crossing at intersections will NOT be approved, all crossing at intersections MUST be 90° to the road, unless approved by the department's District Director (or their delegate).

5.2.2.1 Alignment

Utility providers adhere to standards, guidelines and codes of practice when designing and operating utility assets. Such standards need to be considered within the context of the department's SCRC and the department's requirements for providing transport services. The Technical Note alignment requirements enable the department to:

- space proof the corridor and limit congestion
- limit non-favourable design solutions
- prevent project cost blow outs, and
- provide Permits for access that may prohibit the department from operating and maintaining its assets effectively.

The SCRC primary use is for transport assets that benefit the community. It is the department's obligation to ensure the land use continues to be fit-for-purpose for this primary transport function. This takes priority over any other third-party asset uses.

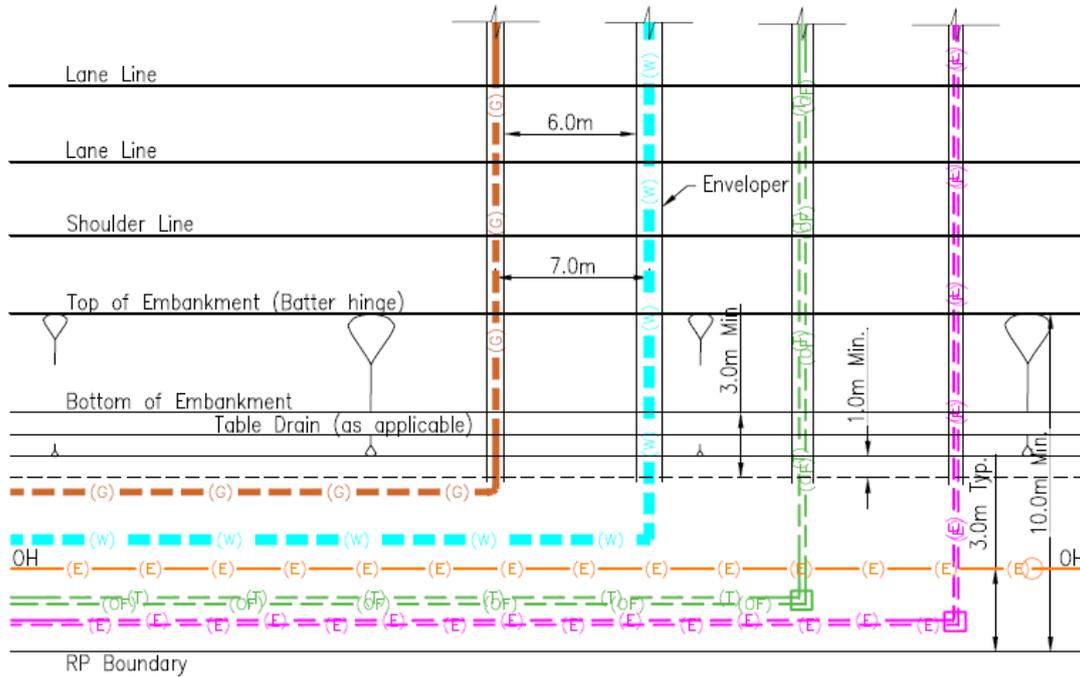
Further, utilisation of the SCRC by third-parties should keep this primary purpose in mind when considering the available space to install and maintain utility assets. If utility asset location is not installed in alignments agreed to by the department, and managed appropriately, this causes significant expense to taxpayers during SCRC upgrades.

To prevent future impacts on utility services, utility providers shall first seek to install utility assets outside the SCRC, as State-controlled roads are more likely to be widened or upgraded than local roads or adjacent land. The alignment of the utility assets in the SCRC is entirely at the discretion of the department.

5.2.2.2 Service crossing offsets – installation exclusion zones

Where multiple services cross a SCRC, offsets between services are required to cater for future installation of the service via trenchless technology. Spacing between different service types shall be no less than 7.0 m from the pipeline centreline to the pipeline centreline or 6.0 m outer wall to outer wall, whichever is greater. Refer to Figure 5.2.2.2.

Figure 5.2.2.2 –Typical service crossing offsets



TYPICAL SERVICE CROSSING OFFSETS

5.2.2.3 Service meters

No meters, including those servicing adjacent properties, are to be installed within the SCRC, except in exceptional circumstances.

5.2.3 Proximity to structures

Any service and/or pipeline that is proposed to be laid within a 5 m horizontal distance from a departmental structure (that is, bridge abutment, culvert, gantry, and so on) will be assessed on a case-by-case basis to ensure the installation method and/or the type of service does not present an unacceptable risk to the department. Specific requirements for services installed within a 5 m horizontal distance from a departmental structure, will be stipulated in the Permit.

It should be noted that additional time periods and information will be required for the review of applications identifying the installation of a service within a 5 m horizontal distance from a departmental structure.

The installation of services longitudinally within an existing drain must be avoided due to maintenance issues that may result in the future. Where, due to an alternative routing being impractical, a service must be located longitudinally within an existing drain, consideration must be given to how the service will be accessed and maintained throughout its operational life and how the drain is to be maintained. Additional protection or depth of cover may be required to minimise the risk of the service being damaged during drainage maintenance Works.

5.3 Longitudinal services

Where no other reasonable alternative routes are available, installation of a new utility asset or upgrades to existing utility assets, will not be permitted longitudinally in a limited access road, unless it is required for road infrastructure purposes, or at the department's District Director's, (or their delegate's) discretion.

If permitted, the installation must not adversely affect the design, safety or operation of the limited access road and must be maintained and serviced without access from the carriageway of the limited access road, or any associated ramps. The installation needs to be constructed in a manner so that all future access and maintenance to such utility services will be carried out from outside the limited access SCRC.

The need to set this condition for installation within limited access roads is primarily to maintain road safety at the highest degree, to which these roads have been specifically designed and constructed.

Longitudinal services may be permitted in State-controlled roads other than limited access roads, if

- the proposed service does not have a negative impact on the travelling public or the operations of the State-controlled road
- there is insufficient space available to accommodate the proposed service without interfering with departmental assets and other services already occupying the verges
- the utility provider provides adequate justification that other areas outside the SCRC is unavailable
- the proposed services do not have a negative impact on the department's future planning and expose the department to unnecessary relocation costs and time delays during future road upgrades, and
- the utility provider acknowledges this location is temporary and agrees, in writing that, if land becomes available due to future road upgrades, the utility provider will contribute financially to the relocation of this asset outside of the pavement footprint.

5.4 Boring, jacking and microtunnelling

Unless otherwise agreed in writing by the department's District Director, or their delegate, all utility services crossing under sealed SCRC, shall be bored or jacked with no disturbance to the pavement or shoulders and have the minimum cover as stated in Tables 5.2.1(a) to 5.2.1(d)

The department's Technical Specifications MRTS140 *Horizontal Directional Drilling (HDD)*, MRTS141 *Microtunnelling and Pipe Jacking*, and MRTS142 *Thrust Boring and Auger Boring* shall comply to the construction of services by means of trenchless installation.

Enveloping pipes and/or other physical controls shall be used for all pressurised services, such as high-pressure gas, combustible fluids, water mains, rising sewer mains and gravity sewers, in accordance with relevant industry standards and this Technical Note.

For non-pressurised services, where a bank of conduits is required for the road crossing (that is, more than two conduits) an enveloper is also required. The requirements in this document for enveloping pipes or other protection measures (physical controls), shall take precedence over the Asset Owner's preferences for installations in the SCRC.

All construction Works under SCRCs, must be carried out by certified quality assured (ISO 9001) or industry-accredited (by relevant Service Authority) specialist Contractors with experience in similar Works (diameter, length, ground conditions). A departmentally-nominated inspector (or representative) must be present at a prestart meeting prior to construction and frequent Site inspections will occur during the activity. On Site boring or jacking Works are only permitted to commence after the department's inspector (or representative) has attended the prestart meeting. This prestart meeting must confirm that the proposed Works reflect the approved plans, relevant departmental Technical Specifications and all conditions of the Permit.

A minimum of five working days' notice is required to the departmental services inspector prior to commencement of Works.

Enveloping pipes are to extend a minimum of 3 m beyond the batter or 1 m beyond the table drain or kerb alignment. This minimum requirement may be extended to accommodate future road enhancement Works where known, or local conditions. The Permit will stipulate if the enveloper must be extended.

Minimum horizontal and vertical clearances to other utility services must be maintained as specified by Australian Standards, Service Authority Standards and Legislation, or as detailed in the conditions contained within the department's Permit or agreement for the Works.

5.5 Trenching

Where boring, jacking or microtunnelling has been shown to be either uneconomical or impractical, approval may be given for a utility service to be installed under a road via trenching methods. Such approval will be at the discretion of the District Director and any conditions pertaining to an approved trenching installation will be provided in the Permit.

Trenching is generally considered as the installation method that will be employed for installations within areas of the SCRC that are not developed for traffic or are not currently under traffic. Any damage caused to existing infrastructure, as a result of trenching Works, must be repaired by the Asset Owner whose Works have caused the damage, at no cost to the department. Such repairs must address relevant Australian Standards, industry practices and any relevant departmental standards and specifications. Any repair work must be completed in a timeframe agreed to by the owner of the damaged service. For clarity, the reinstatement of sub-soil drainage is included in the above requirements.

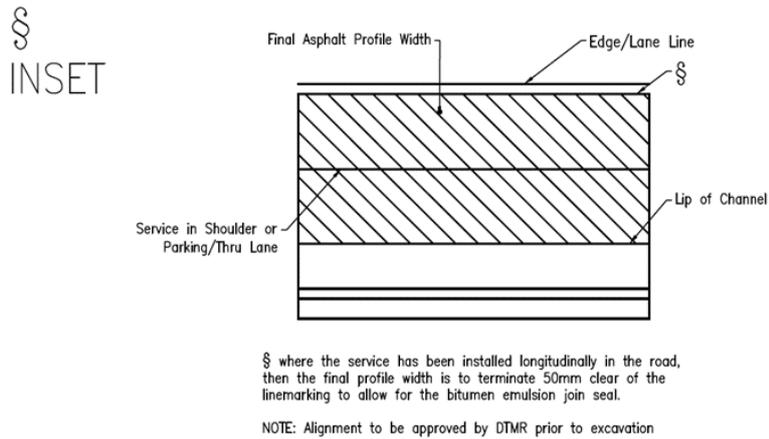
Should the installation under a road via trenching be approved, the pavement reinstatement must comply with Figure 5.5(a) and Figure 5.5(b). Unless otherwise agreed, the actual reinstatement must also be witnessed and certified by an RPEQ for compliance with the details provided in Figure 5.5(b). Such certification shall be provided to the department on completion of Works, at no cost to the department.

While minimum depths of cover have been identified in Tables 5.2.1(a) to 5.2.1(b), it is the Asset Owner's obligation to ensure that load bearing requirements are addressed for any road crossing. RPEQ-endorsed drawings must therefore be provided, at no cost to the department, confirming that all drainage, verge reinstatement Works, load bearing requirements and relevant departmental Technical Specifications have been addressed. It should be noted that additional time periods and information may be required for the review of applications identifying the installation of a service through a road via trenching.

Trenches must not be left open overnight. Trenches are to be backfilled, covered with a steel plate lid, or be protected by a barrier perimeter approved by the department. Details of the proposed barrier systems must be provided with the application and approval will be confirmed in the Permit.

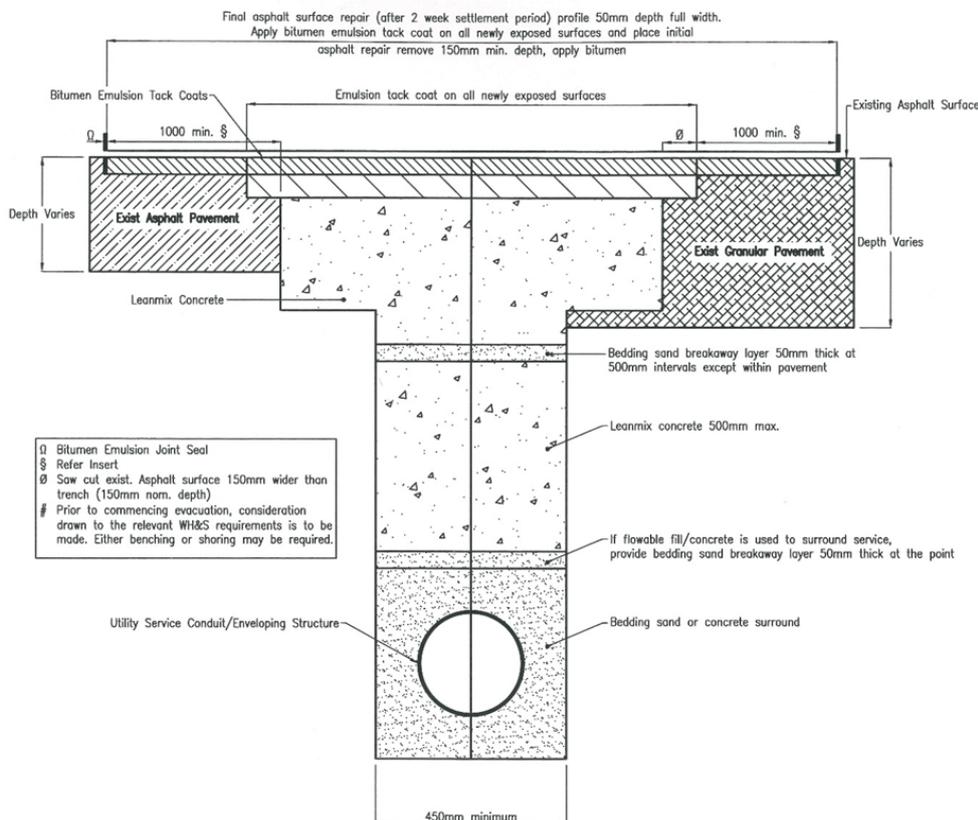
Conduits must be bedded in accordance with the relevant Australian Standard or Service Authority Standard and maintain minimum horizontal and vertical clearances to other utility services as specified by Australian Standards, Service Authority Standards, legislation, or as detailed in the conditions contained within the department's Permit.

Figure 5.5(a) – Location of longitudinal services under existing road



PLAN – LONGITUDINAL SERVICES UNDER ROAD PAVEMENT

Figure 5.5(b) – Backfill of trenches – typical treatment



Trench reinstatement cross section depicted in Institute of Public Works Engineering Australasia Standard Drawing RS-170, may be used as an alternative subject to load calculations, cover to sub-grade and RPEQ pavement design / treatments.

5.5.1 Backfill in trenches shall be as follows:

5.5.1.1 Sealed pavement and shoulders

- a) Reinstatement of road pavement is to be carried out in accordance with the cross section detailed in Figure 5.5(b) under the supervision of the Asset Owner's RPEQ or, if specified, the department's inspector.
- b) The bedding, and the backfill above the bedding, shall conform to MRTS04 *General Earthworks*, AS/NZS 3725 *Design for Installation of Buried Concrete Pipes* and Standard Drawing 1359 *Culverts – Installation, Bedding and Filling / Backfilling against / over Culverts* or as otherwise agreed to by the District Director.³ Backfill must be compacted in layers of a minimum depth of 125 mm and a maximum of 150 mm. Where gravel backfill is used testing in accordance with MRTS05 *Unbound Pavements* may be required. Such testing will be at the District Director's, or his delegate's, discretion and, if required, will be specified in the Permit. Compaction testing results shall be provided to the department on request at no cost.
- c) Bedding sand 'breakaway' layers 50 mm thick, are to be installed at 500 mm intervals, except within pavements for lean mix installations.
- d) The finished surface of the lean mix concrete is to be a minimum of 150 mm below the existing road surface.

5.5.1.2 Unsealed pavement and shoulders

- a) The backfill above the bedding shall be of lean mix, compacted sand, or approved gravel as detailed in MRTS05 *Unbound Pavements*⁴. The backfill material shall be placed in uniform layers of not more than 150 mm to sub-grade level.
- b) The finished surface of the backfill is to be a minimum of 150 mm below the existing surface, or the bottom of the existing pavement, whichever is the greater.
- c) Compaction of layers shall be as follows:
 - i. Below a plane 400 mm below the sub-grade (that is, the trimmed or prepared surface of the formation on which the pavement and shoulders are constructed) – minimum relative compaction of 95% (Test Methods Q140A *Relative compaction of soils and crushed rock* and Q142A *Dry density-moisture relationship of soils and crushed rock – standard*).
 - ii. Above a plane 400 mm below the subgrade – minimum relative compaction of 97% (Test Methods Q140A *Relative compaction of soils and crushed rock* and Q142A *Dry density moisture relationship of soils and crushed rock – standard*).
- d) Compaction testing results shall be provided to the department on request at no cost.
- e) Final layering shall match the existing materials in accordance with either MRTS04 *General Earthworks* or MRTS05 *Unbound Pavements*.

³ Flowable fill or stabilised sand maybe provided as part of the backfill at the Regional / District Director discretion.

⁴ To view Transport and Main Roads Specifications visit: www.tmr.qld.gov.au/Business-and-industry/Technical-standards-and-publications.aspx.

5.5.1.3 Trenches in unpaved areas of the SCRC

- a) backfill above the bedding may be sand or earth compacted in uniform layers of not more than 150 mm to a level 100 mm below natural surface. Compaction of the layers to a minimum relative compaction of 90% (Test Methods Q140A *Relative compaction of soils and crushed rock* and Q142A *Dry density moisture relationship of soils and crushed rock – standard* shall be achieved. Compaction testing results shall be supplied to the department on request at no cost.
- b) The top 100 mm of the trench shall be filled with an approved top-soil, unless otherwise agreed to by the department.
- c) Ground disturbance or exposed bare earth shall be treated as detailed in Section 1.
- d) The reinstatement of an existing concrete footpath shall be for the full width. The full width must match the existing footpath. Concrete type, depth, cover to reinforcement, and so on must be like for like.
- e) Gas pipelines may have a lesser standard of compaction as agreed to by the district office on a case-by-case basis. This would be agreed to, provided that a process is in place regarding the monitoring of trench subsidence with suitable soil infill placement in a timely manner.

5.5.1.4 Longitudinal installation

Lean mix and/or flowable fill must not be used for services installed longitudinally in or adjacent to the pavement without a pavement drain, due to the potential to trap water under the pavement.

5.5.2 Reinstatement of pavement and surfacing

5.5.2.1 Sealed pavement and shoulders

- a) Reinstatement of road pavement is to be carried out in accordance with the cross section detailed in Figure 5.5(b), including pavement drains and any conditions contained in the Permit issued by the department.
- b) Pavement reinstatement Works shall be carried out under the supervision of the Asset Owner, or its nominated Contractor. The department may stipulate that an RPEQ or departmental inspector must be present when pavement reinstatement Works are being performed at no cost to the department.
- c) The surface of the final lean mix concrete layer or granular layer (refer backfill in trenches) and the remaining sides of the trench, shall be dry and given a thorough brooming before being uniformly covered with a bitumen emulsion tack coat applied at a nominal spray rate of 1 litre/m².
- d) The bitumen emulsion shall comply with the requirements of MRTS21 *Bituminous Emulsion*.
- e) The 150 mm (minimum) asphalt pavement surface layer shall comply with the requirements of MRTS30 *Asphalt Pavements* and shall be placed between the initial saw cuts original profile level.
- f) In areas where it is uneconomical or impractical to source asphalt, the method of pavement reinstatement shall be at the District Director's discretion and will be specified in the Permit which may include the temporary use of cold mix.

5.5.2.2 Unsealed pavement and shoulders

- a) Unsealed pavement and shoulder material shall be an approved soil aggregate material conforming to the requirements for base material, Type 2.3, Grading B or C, contained in MRTS05 *Unbound Pavements*.
- b) In addition, the material shall have a maximum particle size of 25 mm. It shall be compacted to a minimum relative compaction of 95% (Test Methods Q140A *Relative compaction of soils and crushed rock* and Q142A *Dry density moisture relationship of soils and crushed rock standard*).

5.6 Attachment to existing bridge structures and culverts

Where alternative routing of utility services has been shown to be either uneconomical or impractical, utility services (dependant on type and size) may be attached to bridges or culverts at the discretion of, and with the conditions stipulated, by the department's District Director, or their delegate, in the Permit. Details identifying alternative routes that have been deemed to be uneconomical or impractical MUST be provided to the department as part of the Permit application, at no cost to the department.

The method and conditions pertaining to the installation of a utility service on or within a bridge, will be treated on a case-by-case basis and will require additional approval from the Director (Structures Design, Review and Standards). It should be noted that additional time periods and information will be required for the review of applications identifying the installation of a service on or within a bridge structure. Any additional information requested, must be provided at no cost to the department.

No Works that will impede the flow of vehicles, cyclists and pedestrians on the bridge or culvert, will be permitted, without the approval Director of Structures (Manage and Operate). Safe access to the utility service on a structure, remains the Asset Owner's responsibility.

Under no circumstances are utility services to be directly encased in concrete within the superstructure due to potential future maintenance issues. Envelopers may be accepted on a case-by-case basis and the location of such enveloper pipes will be determined at the District Director's, or their delegate's, discretion.

Where the installation of a utility asset is approved on a bridge structure or culvert, the utility service Asset Owner must install jointing pits (for fibre optic and electrical installations) or shut-off valves allowing a minimum of 20 m separation on each approach to the bridge and make provisions for the service to be isolated during the department's maintenance Works and economically relocated, should the bridge be altered for maintenance operations or replaced.

Should the design life of the proposed utility Asset exceed the remaining design life of the bridge structure / culvert, the Asset Owner must agree to remove its utility asset at its expense should the bridge structure / culvert be demolished and replaced. It should be noted that, if the staging of demolition / construction Works requires part or all the existing bridge structure / culvert to be removed before construction can commence, the Asset Owner will be required to remove its asset within six months of written notification and arrange for any temporary bypass required, at no cost to the department. The department will endeavour to provide for existing utility asset during the upgrade of the transport corridor, however it will not fund any relocation.

The utility service Asset Owner shall maintain at its own cost, the conduit, cabling, pipe, enveloper and any associated infrastructure in good order and condition to the department's satisfaction.

Unless specifically approved otherwise, closure of any part of the roadway or footpath, or the parking of service vehicles on the bridge or culvert during installation or maintenance, will not be permitted.

5.7 Conduits through drainage culverts

Where alternative routing of utility services has been shown to be either uneconomical or impractical, utility services (dependant on type and size) may pass through a drainage culvert at the discretion of, and with the conditions stipulated by, the District Director, or their delegate, in the Permit.

Details identifying alternative routes that have been deemed to be uneconomical or impractical, must be provided to the department including an RPEQ-certified hydraulic report detailing all impacts on the current system as part of the Permit application, at no cost to the department.

Where this method of installation has the written agreement of the District Director, or their delegate, the conduit is to be attached to the soffit, with no appreciable sag and along the wings of the specified culvert and then underground to a depth so that the cover specified in Section 5.2 is achieved.

Except as provided above, the conduit is not to interfere with the existing drainage system in any way. Where the installation of a utility asset through drainage culverts is approved, the Asset Owner must install jointing pits or valves allowing a minimum of 20 m on each approach to the drainage culvert and make provisions for the service to be isolated during the department's maintenance and upgrade Works.

Should the design life of the proposed utility asset exceed the remaining design life of the culvert, the Asset Owner must agree to remove its utility asset at its expense should the culvert be demolished and replaced. It should be noted that, if the staging of demolition / construction Works requires part or all of the existing culvert to be removed before construction can commence, the Asset Owner will be required to remove its asset with six months of written notification and arrange for any temporary bypass required, at no cost to the department. The department will endeavour to provide for existing utility asset during the upgrade to the transport corridor, however it will not fund any relocation.

5.8 Installation within the department's underground asset

Where alternative routing of non-pressurised utility services has been shown to be either uneconomical or impractical, utility services (dependant on type and size) may occupy the department's underground assets at the discretion of, and with the conditions stipulated, by the District Director, or their delegate, in the Permit. Such approval will be treated on a case-by-case basis and will also require the Asset Owner to enter into a commercial agreement with the department prior to any approvals.

Details identifying alternative routes that have been deemed to be uneconomical or impractical shall be provided to the department as part of the Permit application, at no cost to the department.

It should be noted that additional time periods and information may be required for reviewing applications proposing to use departmental underground assets. Any additional information requested must be provided at no cost to the department.

Where the installation of a utility asset is approved in the department's underground infrastructure, the Asset Owner must ensure jointing pits are installed prior to any point of connection. Such jointing pits shall be no greater than 20 m from the entry and exit points. Additionally, all cables must be labelled using permanent labels, before and after each point of connection, and within any departmental access pit or chamber.

Should any departmental underground infrastructure be damaged as a result of the service asset installation, the Asset Owner agrees to fund all repair costs.

5.9 Conduits carrying combustible liquids or flammable liquids

Details of the design regarding an installation that is to carry combustible liquids / gases, or flammable liquids / gases shall be negotiated on a case-by-case basis with the District Director, or their delegate. The requirements for the installation of such utility services will be dependent on the pressure and volume of liquid / gas that is to be carried. It should be noted that additional time periods and information may be required for reviewing applications identifying the installation of a service proposed to carry combustible liquids / gases, or flammable liquids / gases. Conduits carrying combustible or flammable liquids are not permitted on departmental bridges or structures.

5.10 Design of enveloping pipes for underground pressure utility services crossing SCRCs

5.10.1 Introduction / applicability

The improvements in trenchless installation methodologies have enabled natural gas and liquid petroleum pipelines to be installed under roads, rivers, levees, and railroads using engineered designs that do not require open cutting of ground surfaces. Historically, casings have been installed routinely at Sites requiring additional structural support and mechanical protection in locations such as highway and railroad crossings. While offering structural support and mechanical protection, the casings themselves, dependent on material type, may be susceptible to pipeline integrity threats that are unique to cased crossings.

This section outlines the requirements for the design of enveloping pipes for protecting underground pressure utility services crossing SCRCs from external interference threats. Examples of the potential sources of external interference are construction or maintenance of roads and excessive external loads from traffic.

5.10.2 Design of enveloping pipes

The ownership of enveloper pipes is acknowledged as follows:

- Along the SCRC, the area surrounding the enveloper pipe is the department's responsibility. However, the enveloper pipe itself and what is inside the enveloper pipe, is the responsibility of the Asset Owner.

5.10.2.1 Grouting, venting and cathodic protection

The outer annulus of the enveloper pipe (between the enveloper pipe and surrounding ground) shall be grouted as per MRTS140 *Horizontal Directional Drilling (HDD)* if the enveloper pipe is installed by pipe jacking, directional drilling, thrust or auger boring. The department does not prescribe or mandate filling the inner annulus between the carrier pipe or conduit and the enveloper with grout or other material.

Likewise, the department does not prescribe or mandate venting or cathodic protection requirements of the carrier pipe or conduit within the enveloper pipe. It is the responsibility of the Asset Owner to design and install the carrier pipe or conduit installation within the enveloper, to ensure the long-term durability and safety of the installation and ensures safety to the road network and public. The department acknowledges safety and regulatory aspects for some pipes which require regular testing

for asset integrity assurance. As such, it is up to the pipe asset owner to provide adequate venting and cathodic protection requirements for the pipe to achieve these requirements.

In all cases, the enveloper pipe shall be designed to resist the required loading imposed on the ground conditions, height of fill over the enveloper pipe, vibration from pavement construction Works and traffic loading, without any support from internal grout or other material that is used to fill the enveloper pipe.

5.10.2.2 Material types

The following material types shall be used for enveloping pipes:

- a) Mild steel
- b) Reinforced concrete
- c) Glass Filament Reinforced Plastic (GRP)
- d) High Density Polyethylene (HDPE) with compound classification of PE 100, or
- e) modified Poly Vinyl Chloride (mPVC) and unplasticised Poly Vinyl Chloride (uPVC) with material class of 500.

A summary of the allowable material types for enveloping pipes is shown in Table 5.10.2.2.

Alternate material types, including full technical details, shall be submitted to the Director of Structures (Manage and Operate) for review and acceptance.

Table 5.10.2.2. Material types for enveloping pipes

Type of Pipeline / Service	Material Type for Enveloping Pipes (✓ - Allowed) (✗ - not Allowed)				
	Reinforced Concrete, Class 4 or higher load class	Steel	Glass Filament Reinforced Plastics (GRP), jacking pipe, SN 40000 or higher stiffness class	Butt welded High Density Polyethylene (HDPE), PE 100 compound classification, PN 20 or higher pressure rating	modified Poly Vinyl Chloride (mPVC) or Unplasticised Poly Vinyl Chloride (uPVC), material class of 500, PN 20 or higher-pressure class with solvent weld joints
High pressure gas and liquid petroleum transmission pipelines complying with AS 2885	✓	✓	✓#	✓	✗
Gas distribution networks complying with AS/NZS 4645	✓	✓	✓#	✓*	✗
Pressure water mains	✓	✓	✓#	✓	✗
Pressure water service pipelines	✓	✓	✓	✓	✓^ Allowable for pipelines of DN32 or smaller only
Pressure sewers	✓	✓	✓#	✗&	✗
Gravity Sewer	✓	✓	✓#	✗	✗

* PE100 SDR11 is permitted

subject to asset owner's requirements for use

^ may be considered for trench installation only outside road footprint

and may be considered for enveloper sizes NB400 and below, subject to installation method, soil properties, depth, obstacle being avoided and Asset Owner's consent

& may be considered for enveloper sizes NB400 and below, subject to installation method, soil properties, depth, obstacle being avoided and asset owner's consent

5.10.2.3 Design life

The design life of enveloping pipes shall be equal to, or longer, than the design life of the carrier pipe.

5.10.2.3.1 Design life exception to steel

In accordance with Clause 4.7 of AS 2832.1, steel casings shall not be coated or lined, and shall not be connected to a cathodic protection system. In this situation, it is impractical to stipulate a design life.

5.10.2.4 Design loads

The design of the enveloping pipes shall account for the types of design load addressed in the design references specified. Superimposed live loads shall consider the following construction and road vehicles loads.

a) Construction loads:

- i. truck and dog trailer with a minimum height of compacted fill of 0.5 m over the top of the enveloping pipe. The load configuration is defined in Figure 5.10.2.4(a)
- ii. 25.9 tonne excavator with a minimum height of compacted fill of 1.0 m over the top of the enveloping pipe. Load configuration is defined in Figure 5.10.2.4(b)
- iii. 580 mm wide compaction wheel with a minimum height of compacted fill of 1.0 m over the top of the pipe. Load configuration is defined in Figure 5.10.2.4(c)
- iv. allow a dynamic load allowance of 0.4 for zero fill height, 0.1 for 2 m and greater fill height and linear interpolation between 0.4 and 0.1 for depths between zero and 2 m respectively.
- v. where additional load cases, other than those listed above, are required as part of the construction sequence, these additional cases shall be considered in the design, and
- vi. if the actual construction sequence results in lower fill heights, and/or heavier equipment / vehicle(s) is used than those specified, then the capacity of the enveloping pipe shall be reassessed. Adopt a higher load class of pipe if the specified load class is structurally inadequate.

b) Road vehicle loads:

- i. W80
- ii. A160
- iii. SM1600, and
- iv. iHLP400.

Note these loads and related dynamic load allowance are defined in AS 5100.2 *Bridge Design – Design Loads*. Distribution of road vehicle loads through fill, shall be determined in accordance with Table 5.7.2 of MRTS25 *Manufacture of Precast Concrete Pipes*.

Figure 5.10.2.4(a) – Load configuration: truck and dog trailer

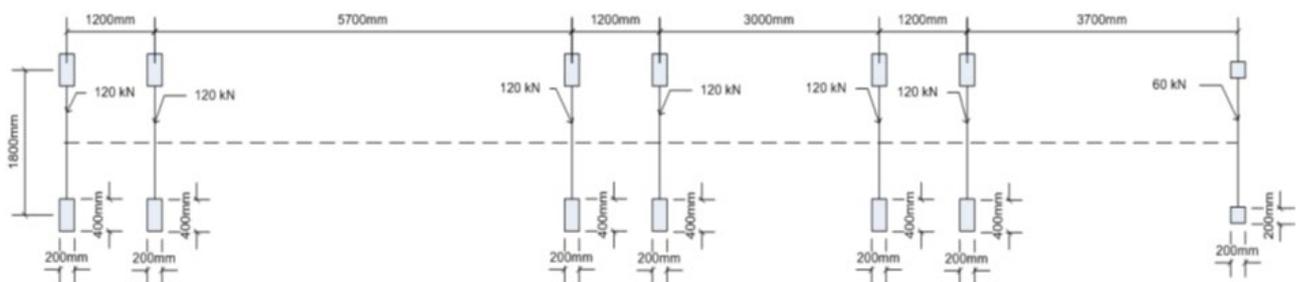
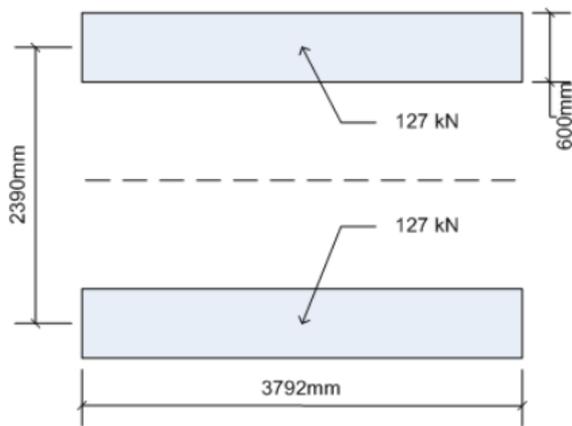
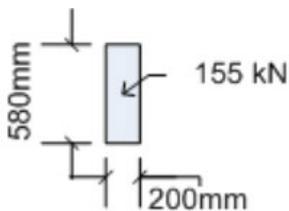


Figure 5.10.2.4(b) – Load configuration: 25.9 tonne excavator**Figure 5.10.2.4(c) – Load configuration: 580 mm wide compact wheel**

5.10.2.5 Vibration assessment for third-party instigated Works

5.10.2.5.1 General

The utility provider shall conduct a vibration assessment for the proposed Works for potential impacts to all assets within the SCRC in proximity to the Works, including other utility provider services, and the department's below and above ground infrastructure, as applicable.

For any non-departmental assets, the utility provider's vibration specialist shall undertake a Construction Vibration Assessment and shall meet the requirements specified in applicable industry standards, other asset owner's requirements, British Standard BS 5228-2:2009 and/or German Standard DIN 4150-3:1999 as nominated by the utility provider's vibration specialist.

For departmental assets, the utility provider shall undertake a Construction Vibration Assessment in accordance with the department's current *Transport Noise Management Code of Practice*⁵ Volume 2. The utility provider shall also meet the requirements specified in applicable industry standards.

The utility provider is also to conduct an assessment of its existing asset no less than 50 m either side of the tie-in Works to determine the residual service / design life of its asset and provide a predicted allowable Peak Particle Velocity value for potential future Works for the department's records.

The assessments shall be conducted and/or supervised by an RPEQ with relevant experience in vibration assessment for infrastructure projects. The report shall be signed by the RPEQ with the application or notice relating to the Works.

⁵ <http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Transport-noise-management-code-of-practice.aspx>

5.10.2.6 Vibration assessment for departmentally-instigated Works

5.10.2.6.1 General

The design consultant is responsible for liaising with the relevant utility provider during the design phases in accordance with the department's Functional Specification Templates for all PUP annexures from C7521 to C7524. The construction Contractor is responsible for liaising with the relevant utility authority based on its work methods to seek approval during construction to manage potential impacts in accordance with MRTS170 *Public Utilities in Road Projects Site Works*, MRTS171 *Public Utilities in Road Projects Principal Contractor Responsibilities* and utility provider requirements.

Design consultants are to refer to the Functional Specification Templates PUP addendums for further details.

5.10.2.7 Structural design

5.10.2.7.1 Mild steel

Mild steel design shall be in accordance with relevant Australian Standards and utility provider design standards.

In relation to liquid and petroleum gas, and the stress levels conforming to the requirements of AS 2885 *Gas and Liquid Petroleum*, the asset owner shall protect the steel carrier pipe against corrosion in accordance with AS 2885.1 or AS/NZ 4645.2 *Gas Distribution Networks standards*, as applicable.

Where a steel carrier pipe is designed and installed without an enveloping pipe, it shall have a cathodic protection system, physical penetration barrier and marker tape (if open trenched). The designer shall use an appropriate penetration barrier, set out in Clause 5.4.5(b)(ii) of AS 2885.1. Other protective methods that should be considered to prevent third-party interference are:

- extra depth
- heavy wall pipe, and
- higher grade steel.

The mandatory AS 2885.6 *Pipeline Safety Management* evaluates the threats and the controls for this application in the relevant location.

5.10.2.7.2 Reinforced concrete

Reinforced precast concrete enveloping pipes shall be designed in accordance with AS/NZS 3725 with the load distribution through fill in accordance with AS 5100.

Reinforced concrete enveloping pipes shall be Class 4 or higher load class and be supplied in accordance with MRTS25 *Steel Reinforced Precast Concrete Pipes* and have flush joints (Spigot-socket connection).

5.10.2.7.3 GRP

GRP enveloping pipes shall be designed in accordance with AS/NZS 2566.1 *Buried Flexible Pipelines, Part 1: Structural Design*.

GRP enveloping pipes shall have a stiffness class of SN 40000 or higher.

5.10.2.7.4 HDPE

HDPE enveloping pipes shall be designed in accordance with AS/NZS 2566.1.

HDPE enveloping pipes shall have a pressure rating of PN20 PE100 (SDR9) or higher. HDPE enveloping pipes for gas pipelines PE100 (SDR11) or higher as a minimum requirement.

5.10.2.7.5 mPVC and uPVC

mPVC and uPVC enveloping pipes shall be designed in accordance with AS/NZS 2566.1.

mPVC and uPVC enveloping pipes shall have a pressure class of PN20 or higher.

5.10.2.8 Geotechnical assessment

Geotechnical investigation shall be carried out to assess the ground / sub-soil conditions. The assessment / investigation shall include an analysis of the ground surface settlement and differential settlement due to the carrier and enveloping pipes.

5.10.2.9 Design certification

The design of the enveloping pipes shall be certified by a competent RPEQ.

5.10.2.10 Departmental design review

The RPEQ-certified drawings and design report of the enveloping pipes shall be submitted to the department's Regional Office and Director of Structures (Manage and Operate) for review prior to commencement of Works on Site.

5.11 Overhead electrical clearances

Overhead clearance to any existing or planned road infrastructure or furniture, must comply with the distances / heights shown in the Electrical Safety Regulation 2013, Public Utility Provider's *Overhead Design Manual* (as applicable) and the department's Standard Drawing 1333 *Traffic Signals / Road Lighting / ITS - Minimum Clearance of Overhead Electric Lines from Ground and Structures* as a minimum.

Consultation with departmental offices needs to be undertaken to identify over-dimensional vehicle routes, future planning requirements, and so on, that will influence vertical clearance requirements.

The clearances given (in particular horizontal clearances) are relevant to the maximum insulator swing predicted under service conditions, with confirmation obtained from the local electricity entity.

Clearances for plant and personnel should also be considered during maintenance activities of departmental road furniture and infrastructure, in line with the relevant electrical code of practice exclusion zones.

5.12 Overhead telecommunication clearances

Overhead clearances to any existing or planned road infrastructure or furniture for telecommunication lines located within state SCRCs must comply with the distances / heights shown in the Electrical Safety Regulation 2013 or adhere to Industry Code C524:2013: *External Telecommunication Cable Networks* Table 1 for service not situated over any part of the carriage way.

Consultation with departmental offices needs to be undertaken to identify over-dimensional vehicle routes, future planning requirements and so on, that will influence vertical clearance requirements.

6 Maintaining the SCRC and third-party assets

6.1 Responsibilities and warranties

The Asset Owner will maintain the area affected by the Works for a minimum period of twelve months (or for the period stipulated in an agreement) from the date of notification of completion of Works, or acceptance by the department.

The department reserves the right to charge the Asset Owner for any ongoing maintenance Works required in an SCRC as a result of any failure attributed to a service installation.

6.2 Restoration of work site

On completion of the activity, the Site will be returned to a condition as or near practical to what was in place prior to Works commencing, particularly for street scaping Works. Restoration includes, but is not limited to, removal of any litter or materials and revegetation.

For Works not contained within pavement and/or gravel shoulder areas, any ground disturbance or exposure of bare earth (by either clearing or machinery), in urban areas, shall be replaced / reinstated in a 'like-for-like' basis unless otherwise agreed to by the department.

Exposed bare earth in rural areas is to be covered by mulch or similar, or reseeded, immediately after the activity is completed (unless otherwise agreed to by the department). Soil on embankments and cuttings along the road are not to be exposed or damaged. Stumps must be retained for the short term stability of slopes.

6.3 Recording, maintaining and providing records

The Asset Owner will be responsible for ensuring that any new installations are captured according to TMR Surveying Standards and registered with a suitable organisation such as BYDA to enable future Site location.

Additionally, provision should be made for all installations to be clearly marked using marker posts or location marker discs for all road crossings and identifiable by electronic means to Level B of AS 5488 where suitable to do so.

Electronic As Constructed plans, electronic survey models, or suitable reports that clearly outline the location of the underground asset must be produced and made available to the department on request, at no cost to the department after installation, in a format specified by the department.

The Asset Owner must carry out and meet all the conformance, As Constructed and delivery requirements as prescribed under Clause 11 *As Constructed Survey*, Sub-clause 11.11 *Third Party Underground Assets – including Public Utility Plant (PUP)* in *MRTS56 Construction Surveying*.

6.4 Managing and recording redundant / abandoned networks

Existing network and/or infrastructure, being replaced by proposed departmental Works or upgraded by the Asset Owner, that will become redundant or be abandoned, will only be permitted to remain within a SCRC at a District Director's, or their delegate's, discretion. It is the responsibility of the Asset Owner to manage its assets in its set alignments.

Abandoned / redundant assets that are left insitu, will remain the responsibility of the Asset Owner to maintain. Should these abandoned / redundant assets impact on the operation of, or upgrade to, the road in the future, the Asset Owner will be responsible for funding any rectification Works.

If approved, it is the Asset Owners' responsibility to grout-fill any redundant networks left insitu and provide information as prescribed under Clause 13, 'Existing Underground Assets Survey' in MRTS56 *Construction Surveying* to identify the entire length of the redundant network.

6.5 Asbestos

The department does not require existing underground Asbestos Concrete (AC) pipes, ducts, conduits, or service pits still in operation to be removed, because they contain asbestos, provided the asset is in good repair and presents no hazard to the operation of the SCRC. However, any product / asset removed that contains asbestos, must be handled and disposed of as required by current legislation.

Where existing underground services are located in AC pipes, ducts or conduits, or service pits / access chambers contain asbestos, the Asset Owner shall ensure all Works meet:

- a) legislative requirements (including maintaining an asbestos register for live and abandoned asbestos assets which, on request, shall be provided to the department)
- b) current best practice standards for workplace health and safety, and
- c) the current standards used by the service owner or authority.

Producing, supplying, and adhering to the above requirements helps minimise risk for all parties that utilise the SCRC.

