

Preferred Utility Service Locations and Design Criteria



GUIDELINE FOR
**MANAGEMENT OF THE
ROAD RESERVE**

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PREFERRED UTILITY SERVICE LOCATIONS AND DESIGN CRITERIA

1 PURPOSE OF GUIDELINE

This guideline shall be read in conjunction with all other applications as described in the various Annexures. It deals with the requirements regarding preferred utility service locations within the road reserves, including height above or depth below the road or reserve.

Note the following:

- a. This guideline shall be acknowledged and taken into account in preparation of applications for installation or relocation of utility services to Roads Directorate.
- b. As mentioned in all application guidelines it is a specific requirement that the wayleave applicant (representative engineer) shall discuss the relevant pending application with Roads Directorate verbally and/or in writing.
- c. The applicant shall specifically discuss a proposed location and height above or depth of installation not in line with the requirements of this guideline, due to whatever reasons.
- d. The application for the installation of the service shall be evaluated, including the applicant's recommended location and height above or depth of the service. Approvals are issued in the form of a wayleave agreement to install the service, and the wayleave will specifically mention the location and height or depth of the installation.
- e. The applicant may be requested to supply additional information.
- f. The applicant can only proceed with construction after formal approval.

2 GENERAL CONSIDERATIONS FOR LOCATION OF UTILITY SERVICES

2.1 Roads Directorate Road Reserves in Urban Areas

- a. Network utility services shall preferably be located below the sidewalks, and in exceptional cases, below the road.
- b. Subsurface network utility services shall be considered based on capacity limits to serve local catchments, linked to the probability of risks to the environment from the consequences of breakdown or failure, and the need to allocate limited space for network utility services.

- c. The capacity limits for storm-water, water and sewerage lines shall be based on what are considered to be standard sizes to serve local catchments. It is considered that the works associated with the provision and operation of such local services will then not have significant adverse effects.
- d. Above-ground network utility services shall be considered based on their anticipated effects on the visual qualities of the environment.
- e. The strategy for electric lines is to encourage underground reticulation. However, short extensions to existing overhead lines are permitted in defined circumstances.
- f. Telecommunication lines are permitted provided they are underground.
- g. Storm-water works and services including pipelines not exceeding 600 mm in diameter in accordance with an approved comprehensive storm-water catchment management plan are also permitted.

2.2 Roads Directorate Road Reserves in Rural Areas

- a. Network utility services shall preferably be located on the verges, towards the road reserve boundaries ("utility corridor").
- b. Overhead electricity lines are permitted recognising the increased costs of underground reticulation.

2.3 Placing New or Relocation of Existing Utility Services

In identifying the proposed location of a new utility, or relocation of an existing utility service, the applicant shall consider the following:

- a. Existing utilities shall be taken into account when installation of new or relocation of existing utilities is applied for;
- b. An approach called "Service Enquiry" shall be followed, whereby all existing owners of utilities in the relevant area shall be identified and consulted about their existing services in the area, and specific requirements about spacing, etc.
- c. Spacing location and depth in accordance with the requirements in this guideline;
- d. Using the preferred lay positions;
- e. Best use of available underground space, such as installing multiple ducts in a vertical configuration where it is practical and not likely to cause conflict between longitudinal and lateral lines;
- f. Minimising effect on existing above-ground utility services, trees and street / road furniture;
- g. Not unreasonably inhibiting the free flow of traffic, including pedestrians, especially on busy roads (consideration should be given to using less busy streets);
- h. Placing bulk utility services outside of the road reserve;

- i. Positioning a utility service so that access to maintain and develop the service network can be undertaken while minimising the effect on traffic;
- j. Minimising the effect of transverse crossings;
- k. Minimising impacts on other utility service providers and property owners and occupiers;
- l. Coordinating works with other parties;
- m. Crossings should avoid deep cuts, footings of bridges and retaining walls, wet or rocky terrain or locations where roadway drainage would be affected;
- n. The risks of land stability or earth movement, if placing utility services in embankments and cuts (specialist technical investigations may be required);
- o. For all crossings, the angle of crossing shall be as near a right angle to the road centreline as practicable, however, lesser angles may be permitted based upon economic considerations of practical alternatives;
- p. Where above-ground utilities and their appurtenances as well as all above-ground appurtenances of below-ground utilities may constitute a roadside obstacle for traffic using the road, they shall be located as close as practical on the edge of the reserve boundary;
- q. If an appurtenance within the road reserve would constitute an unacceptable roadside obstacle, it should be, to the agreement of Roads Directorate, relocated to another place in the road reserve, or converted to a breakaway design, or crash-protected, or relocated to another location outside of the road reserve;
- r. All utility installations shall be located to minimise the need for later relocation to accommodate future roadway improvement. Roads Directorate shall make available information on future upgrading plans for the relevant roads. Utility service providers shall also, within the limits of standard business practice, make available appropriate short and medium range development plans to Roads Directorate;
- s. Existing utilities in road reserves of Roads Directorate may be removed or relocated when road work would disturb the existing utility. All such removal or relocation shall be at the sole expense of the owning utility service provider and all work must be accomplished by the same application process as for new installations;
- t. Notwithstanding reinforcement or protection otherwise provided, a utility service owner shall be responsible for the security of each existing service utility within a road construction zone. Where there are unusual utility service hazards or where heavy construction equipment will be used, the utility owner shall provide adequate temporary protection. In replacing the roadway, the design should give due consideration to the protection of previously existing utility services in the roadway section without sacrificing the geometrics of roadway design.

3 SPECIFIC DESIGN REQUIREMENTS FOR UTILITY SERVICES

3.1 Underground Water and Sewerage Road Crossings

- a. These services shall be installed in sleeves of either culverts or pipes.
- b. Underground crossing of a road shall be at right angles to the road centerline to the extent feasible and practical.
- c. A minimum cover of 1.5 m from the top of the sleeve to the lowest point in the road reserve shall apply.
- d. The sleeves shall extend over the entire width of the road reserve with access chambers no closer than 1 m outside the reserve boundary.
- e. The services shall, as a minimum, extend over the entire width of the road without any joints, but preferably over the entire width of the road reserve without any joints.
- f. Pipe marker posts shall be installed 10 m beyond the edge of the road surfacing on either side of the road.
- g. When possible, the jacking or drilling of pipe sleeves across the road reserve shall be in zones of road fill as the soil conditions are more predictable and the depth of excavations for pits is less extensive.
- h. As a guide, pipes of diameter smaller than 250 mm shall be placed by method of drilling and installing a 350 mm sleeve pipe. It may be considered by the designer to install reinforced concrete lined steel pipes when pipe diameters exceed 950 mm. These reinforced pipes normally do not require sleeves and shall conform to the 100D standard.

3.2 Underground Water and Sewerage Parallel Installations

- a. No parallel service shall be placed under a road carriageway.
- b. Services shall be placed under sidewalks in urban environments, and at road reserve boundaries (utility corridor) in rural environments. In both cases no future road upgrading planning shall be affected.
- c. Unless otherwise approved by the Roads Directorate, all above-ground appurtenances that may constitute a roadside obstacle for traffic using the road shall be located as close as possible to the road reserve edge.
- d. If due to whatever reason an appurtenance location constitutes an unacceptable roadside obstacle, said obstacle must be (1) relocated to another place within the road reserve, (2) converted to a break-away design, (3) crash-protected, or (4) relocated to another location outside the road reserve. Actions (1), (2) and (3) must be approved by Roads Directorate as a condition of wayleave approval.

3.3 Underground Electric Power Cable Crossings

- a. Casings / sleeves shall be required for roadway crossings where casing is required by appropriate industry code or where local features, embankment materials, construction methods or other conditions may result in any possible damage to the protective coating during installation.
- b. Sleeves shall be placed across the full width of the road reserve.
- c. Sleeves shall be placed at a minimum depth of 0.6 to 1.2 m (voltage specific) below the lowest point of the road reserve.
- d. For A and B major roads, a jacking or drilling method shall be used, unless it can be shown through special site specific investigation that such methods are not feasible. For B minor, C and D roads, with less than 1000 vehicles per day, open trenching is allowed.
- e. Casing pipes shall be designed to support the load of the road and superimposed loads thereon and, as a minimum, shall equal the structural requirements for road drainage facilities.
- f. Casings shall be composed of materials of sufficient durability to withstand any conditions to which they may normally be exposed.
- g. Unless otherwise approved by the Roads Directorate, all above-ground appurtenances that may constitute a roadside obstacle for traffic using the road shall be located as close as possible to the road reserve edge.

3.4 Underground Electric Power Cables Parallel Installations

- a. No parallel service shall be placed under a road carriageway.
- b. Services shall be placed under sidewalks in urban environments, and at road reserve boundaries in rural environments (utility corridor). In both cases no future road upgrading planning shall be affected.
- c. Unless otherwise approved by the Roads Directorate, all above-ground appurtenances that may constitute a roadside obstacle for traffic using the road shall be located as close as possible to the road reserve edge.
- d. If due to whatever reason an appurtenance location constitutes an unacceptable roadside obstacle, said obstacle must be (1) relocated to another place within the road reserve, (2) converted to a break-away design, (3) crash-protected, or (4) relocated to another location outside the road reserve. Actions (1), (2) and (3) must be approved by Roads Directorate as a condition of wayleave approval.

3.5 Overhead Electric Power Cables Crossing

- a. The minimum vertical clearance for overhead power lines above the road and the minimum lateral and vertical clearance from bridges and other structures shall be in compliance with the Electrical Safety Code (voltage specific).

- b. The minimum height of a road crossing shall be measured from the lowest portion of the line crossing the road.

All towers, poles, anchors or any relevant structure of a power line:

- a. For A and B major roads: The closest pole shall not be closer than 20 m from outside the road reserve boundary.
- b. For B minor, C and D roads: The closest pole shall not be closer than 16 m from outside the road reserve boundary.

3.6 Overhead Electric Power Cables Parallel Installations

- a. In exceptional circumstances with motivation short lengths of overhead power cable installations that extend existing installations are allowed in urban environments.
- b. Overhead power cable installations (low voltage) are allowed at road reserve boundaries in rural environments (utility corridor). No future road upgrading planning shall be affected.
- c. No parallel service shall be placed closer than 10 m from the edge of the road's surfacing.
- d. The minimum vertical clearance of all access road crossings shall be specified.
- e. The minimum vertical clearance to the road reserve over the length of road where the service will run parallel shall also be specified.
- f. The following conditions apply for road reserve installations:
 - i. No posts or anchors shall be placed closer than 7.5 m from the yellow edge line.
 - ii. No posts or anchors shall be placed further than 1 m inside the road reserve.
 - iii. Only single wooden poles shall be used.
 - iv. Double wooden poles shall only be used at direction changes if necessary.
 - v. No structures, for example mini-substations, meter boxes, transformers etc. shall be allowed inside the road reserve.

3.7 Underground Telecommunication Cables Crossing

- a. Casings / sleeves shall be required for roadway crossings where casing is required by appropriate industry code or where local features, embankment materials, construction methods or other conditions may result in any possible damage to the protective coating during installation.
- b. Sleeves shall be placed across the full width of the road reserve. For planned roads with the road reserve not yet declared, sleeves shall also be placed across the full width of the planned road reserve.

- c. Sleeves shall be placed at a minimum depth of 0.45 to 0.6 m below the lowest point of the road reserve. For planned roads with the road reserve not yet declared, sleeves shall also be placed 1.5 m below the lowest point of the planned road reserve.
- d. For A and B major roads, a jacking or drilling method shall be used unless it can be shown through special site specific investigation that such methods are not feasible. For B minor, C and D roads, with less than 1000 vehicles per day, open trenching is allowed.
- e. No manholes shall be permitted inside the road reserve.
- f. All maintenance shall be done from outside the road reserve.
- g. Casing pipes shall be designed to support the load of the road and superimposed loads thereon and, as a minimum, shall equal the structural requirements for road drainage facilities.
- h. Casings shall be composed of materials of sufficient durability to withstand any conditions to which they may normally be exposed.
- i. Unless otherwise approved by the Roads Directorate, all above-ground appurtenances that may constitute a roadside obstacle for traffic using the road shall be located as close as possible to the road reserve edge.

3.8 Underground Telecommunication Cables Parallel Installation

- a. No parallel service shall be placed under a road carriageway.
- b. Services shall be placed under sidewalks in urban environments, and at road reserve boundaries in rural environments (utility corridor). In both cases no future road upgrading planning shall be affected.
- c. No parallel service shall be placed closer than 10 m from the edge of the road's surfacing.
- d. Manholes shall not be placed closer than 500 m from each other within the road reserve.
- e. For all installations of fiber-optic communication cables, a buried marker tape identifying the nature of the installation shall be included and placed above the installed cables.
- f. The service shall be installed in a sleeve with a maximum diameter of 150 mm.
- g. Unless otherwise approved by the Roads Directorate, all above-ground appurtenances that may constitute a roadside obstacle for traffic using the road shall be located as close as possible to the road reserve edge.
- h. If due to whatever reason an appurtenance location constitutes an unacceptable roadside obstacle, said obstacle must be (1) relocated to another place within the road reserve, (2) converted to a break-away design, (3) crash-protected, or (4) relocated to another location outside the road reserve. Actions (1), (2) and (3) must be approved by Roads Directorate as a condition of wayleave approval.

3.9 Overhead Telecommunication Lines Crossing

- a. The minimum vertical clearance for overhead telecommunication lines above the road and the minimum lateral and vertical clearance from bridges and other structures shall be in compliance with relevant industry code.
- b. The minimum height of a road crossing shall be measured from the lowest portion of the line crossing the road.

All towers, poles, anchors or any relevant structure of an overhead telecommunication line:

- a. For A and B major roads: The closest pole shall not be closer than 20 m from outside the road reserve boundary.
- b. For B minor, C and D roads: The closest pole shall not be closer than 16 m from outside the road reserve boundary.

3.10 Overhead Telecommunication Lines Parallel Installation

- a. In exceptional circumstances with motivation overhead telecommunication line installations are allowed in urban environments.
- b. Overhead telecommunication line parallel installations are allowed at road reserve boundaries in rural environments (utility corridor). No future road upgrading planning shall be affected.
- c. No parallel service shall be placed closer than 10 m from the edge of the road's surfacing.
- d. The minimum vertical clearance of all access road crossings shall be specified.
- e. The minimum vertical clearance to the road reserve over the length of road where the service will run parallel shall also be specified.
- f. The following conditions apply for road reserve installations:
 - i. No posts or anchors shall be placed closer than 7.5 m from the yellow edge line.
 - ii. No posts or anchors shall be placed further than 1 m inside the road reserve.
 - iii. Only single wooden poles shall be used.
 - iv. Double wooden poles shall only be used at direction changes if necessary.

4 STANDARDISED COLOUR CODING OF UNDERGROUND SERVICES

It is typical for underground services to be colour coded, which assists in the identification of the services during excavations. Colour coding is typically industry specific. It is recommended that utility service providers recommend and agree on colour coding amongst them.

5 TYPICAL LOCATION OF UTILITY SERVICES IN ROAD RESERVES

The following table provides guidelines for the accommodation of services in road reserves and utility service providers are not constrained to comply with these guidelines. Requirements may be different at different locations and a technical investigation should be undertaken to establish the optimum location of the services.

NOTE: Roads Directorate reserves the right to alter, delete or add to the contents of this guideline without prior warning or notification.



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