4.5 Utility Depths of Cover

This Manual deals with horizontal requirements for utility corridors. The depth and minimum vertical clearances of utilities shall be in accordance with the respective utility providers' requirements. Gravity pipelines should, in general, take precedence when developing vertical alignments due to gradient constraints. Two specific requirements are listed below:

- Potable water should be installed at a higher level than wastewater and irrigation pipelines with a minimum 300 mm vertical clearance. In cases where a wastewater or irrigation pipeline crosses over a potable water pipeline, all pipes shall either be installed in a concrete encasement or within a sealed sleeve; and
- Cables and/or pressurised pipelines should be installed above gravity pipelines. These may only be installed below gravity pipelines if the necessary pipeline protection are provided.

4.6 Integration of Utilities within Complete Streets

4.6.1 Introduction

As discussed in Chapter 1, this Manual provides guidance for the integration of utilities within a Complete Street. A Complete Street enables greater mobility and safety for non-vehicular traffic, as well as providing a pleasant environment to walk/cycle. It is therefore important to consider during the planning and construction stages, how utilities may impact the street finishes in the Pedestrian Realm, Frontage Lane and Traveled Way, with regards to safety and aesthetics.

The PRDM shall be used as the primary reference when considering the visual identity and composition of the Pedestrian Realm. This section complements the PRDM with regards to the following utility specific aspects.

Installation of all utilities shall be carried out in accordance with the relevant utility providers' requirements.

Coordination between relevant agencies shall take place to ensure that all necessary utilities that are to be placed under asphalt surfaces will be installed prior to the completion of the street construction.

Utilities shall be installed prior to the final street finishing (e.g. surface course on Travel Lanes, interlocking pavers on Parking, etc.) in order to avoid breaking up of newly finished surfaces.

4.6.2 Locating Chamber Access Covers

Wherever utility chambers are located under the Frontage Lane or the Traveled Way, chamber cover slabs shall be installed beneath the street pavement structure, in order to limit hard spots and the impact of differential settlements.

It is also desirable to locate a chamber access away from motor vehicle wheel paths (i.e. as close as possible to the centre of a Travel Lane) to minimise the impact that motor vehicles running over a chamber access may have on:

- **Chambers**: structural fatigue;
- **Motor vehicles**: driver comfort; and
- **Members of the public**: noise pollution and aesthetics.