

### 6.4 Special Arrangements

In addition to the utility corridors arrangements discussed in Chapter 5, guidance for special arrangements for utility tunnels, bridges, pedestrian underpasses and dedicated transit corridors are presented below.

#### 6.4.1 Utility Tunnels

Utility tunnels are underground enclosed structures used to carry multiple utilities. They are adopted over short distances where it is not possible to allocate the required utilities within a street due to limited RoW, and are generally restricted to Boulevards.

There are also a limited number of other instances in the Emirate of Abu Dhabi where utility tunnels are used: to cross waterways, to carry several utilities across larger street families/highways and as an alternative solution to utilities within bridges.

The development of utility tunnels through all phases requires approval from the local Municipality, UPC, General Directorate of the Abu Dhabi Civil Defense and relevant utility providers.

In all situations, consideration of using utility tunnels shall be dealt with on a case-by-case basis. Adopting a utility tunnel may carry the following advantages:

- Reduction of land take facilitated through narrower RoWs;
- Ease of access to multiple utilities for maintenance and future upgrade;
- Improved leakage detection; and

- Minimal disruption during maintenance activities:
  - to traffic (e.g. pedestrian and motor vehicles);
  - to other utilities; and
  - to the environment (e.g. through noise, air and dust pollution).

Notwithstanding the above, the following considerations should also be taken into account:

- A high initial construction cost, as compared to traditional open cut trenches for utility corridors;
- The effective management of controlled access is required due to multiple stakeholders being involved;
- A limited number of access points in case of fire;
- The impact of a fire or explosion (e.g. due to heat generated from electrical cables); and
- A defect in one system may adversely affect other systems due to their close proximity.

Certain utilities are generally avoided in tunnels:

- Gas, due to safety restrictions; and
- Those dependant on gravity flow, due to gradient constraints.

Power cable joints are not permitted in tunnels.

Figure 6.8 illustrates a typical utility arrangement within a utility tunnel.

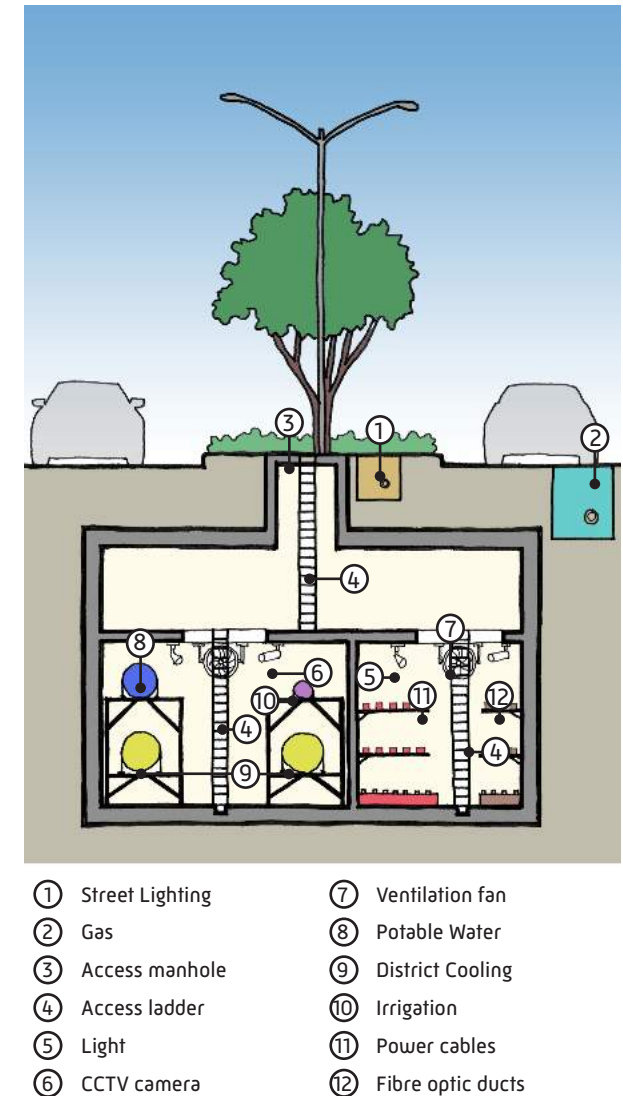


Figure 6.8. Typical utility arrangement within a utility tunnel