

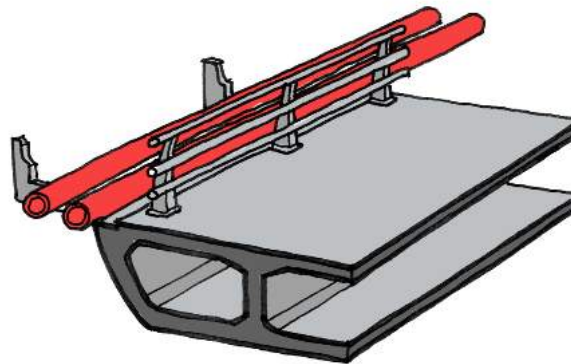
#### 6.4.2 Bridges

Bridges are encountered at grade-separated streets or crossings over waterways, etc. Utilities may be installed at bridges (above, within, between or below bridge decks) as illustrated in Figure 6.11. These utilities generally include pressure pipelines, cables and ducts.

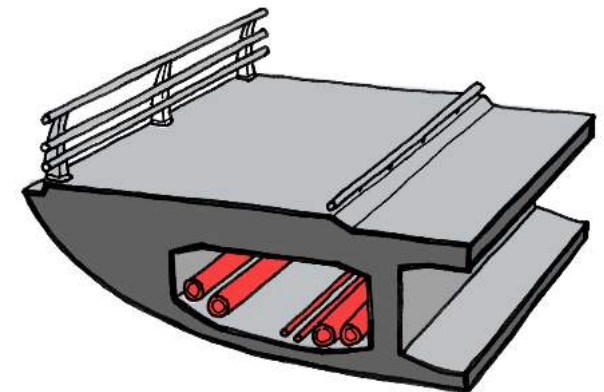
Due to hydraulic and gradient constraints, it is often not possible to install gravity pipelines at bridges. In such situations, alternative solutions may include gravity pipelines installation at-grade or diversion to a suitable alternative crossing location. In exceptional situations, a tunnel and/or lifting station may be required.

Positioning of utilities at bridges must consider operation and maintenance access requirements. Visual impact should be minimised, particularly where utilities are positioned above or below the bridge deck.

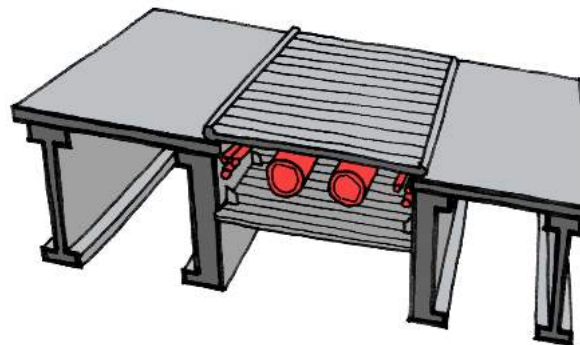
The development of utility arrangements for bridges shall be considered on a case-by-case basis and in conjunction with the requirements of the local Municipality, DoT and the relevant utility providers.



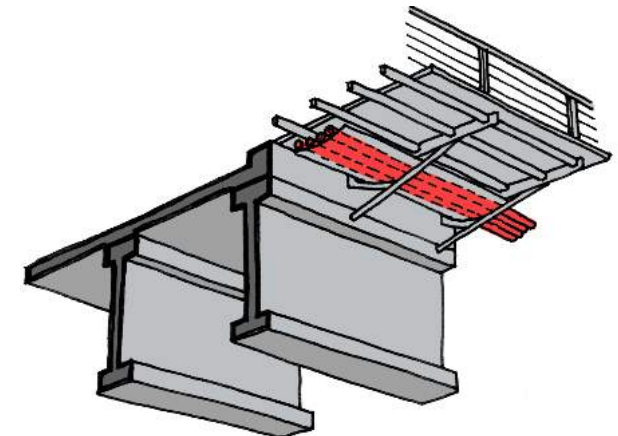
Utilities above the bridge deck



Utilities within the bridge deck



Utilities between bridge decks



Utilities below the bridge deck

**Figure 6.11. Typical examples of utilities at bridges**