

4.6 Types of Major Culvert Structures

Major culverts are often preferred structures in suitable situations. Their advantages over bridges may include:

- economics – culverts are generally cheaper than bridges for typical sizes used;
- reduced maintenance when installed correctly; and
- greater flexibility in terms of alignment options – culverts are suited to sites with horizontal and vertical curves; they can be fit to suit the road alignment and approaches so as to minimize impacts; and they enable maintenance of road widths and provide for road widenings more readily than bridges.

Steel and aluminum culverts are typically soil-metal structures. The soil and the metal work together to provide the structural integrity to support loads on the structure. The metal without the soil is insufficient to support the design loads and would collapse. Soil is compacted in lifts immediately adjacent to and in contact with the culvert bottom and sides, to combine with the metal to support the design loads. Uncompacted fill is not sufficiently dense to combine with the metal to support the design loads.

For most soil-metal culvert installations, the metal is galvanized steel. Some aluminum culverts exist, but they are less common than galvanized steel. For a given installation, aluminum culverts are generally thicker but lighter than galvanized steel. However, the aluminum culverts tend to be more easily damaged during installation.

Culverts come in a variety of shapes and sizes. The selection of appropriate size and shape should be a function of the design parameters. Where floating debris is minimal and regular maintenance is anticipated, consider the use of debris catchers/traps. Where significant volume or size of floating or other debris is anticipated, a culvert may not be an option, and a bridge will be necessary to allow high water and debris to pass.