Specialists in Precast & Prestressed Concrete Products

BOX CULVERT
Our Technical team typically design and detail box culverts in accordance with BD 31/01, BD 37/01 and BS 5400: Part 4. Culverts that do not carry highway loading may be specified to BS 8110 if preferred. Permissible dimensional deviations are in accordance with BS 8110.

The lowest grade of concrete used is C50 with a 20mm maximum size of aggregate, a minimum cement content of 430kg/m³ and a maximum free water content ratio of 0.5. The nominal cover to reinforcement is typically 30mm in accordance with BS 5400: Part 4 unless specified otherwise. An experienced team of engineers and technicians backed by Cad facilities provides a flexible and comprehensive design and detailing service enabling the client’s design and specification criteria to be satisfied.

It is the contractor’s responsibility to offload the lorry delivering the culverts at the nearest hard road. Certain box culverts are delivered to site on end rather than as laid for reasons of safety and economy. These units will require a safe method of turning during offloading. A data sheet giving guidance on lifting and turning is available and is issued to clients prior to first delivery. Box culverts should be offloaded using suitable craneage and stacked carefully on a firm level base away from the edge of the excavation trench, and should never be dragged or dropped.

Excavation can be kept to a minimum with only nominal working space required on each side of the box culvert. When working in trenches the normal requirements for safety must be observed. The base of the trench should be uniformly prepared before laying a 200mm bedding of compacted granular material over the full width of the trench.

A surface blinding of fine material will assist levelling. Local packings are subject to settlement and should not be used. As an alternative to 200mm of granular bedding a concrete blinding layer is sometimes preferred to protect the formation or to allow a faster rate of laying culverts. A layer of unreinforced concrete approximately 75mm thick on a trench bottom which has been well prepared to provide a uniform support is generally acceptable, although a 50mm layer of granular material should be used above the concrete.

A culvert line is usually laid directly on the bedding starting from the downstream end with the sockets facing upstream, to receive the next culvert. The trench should be backfilled as soon as possible after the culvert has been laid and it should be filled evenly on each side of the trench. Backfilling should continue in 200mm compacted layers to the required depth. Where loads from construction plant may exceed the design live load of the box culvert protective measures will be required. This is particularly relevant at shallow fill depths.
Jointing

The culvert sections have rebated joints and can be laid open, or sealed using preformed strips and/or pointing materials. Reference should be made to the joining material manufactures specification and recommendation for the use of the product. A system using preformed strip within the joint is most commonly used. When the strip is bitumen based the joint faces should be cleaned, primed and allowed to dry.

The strip is then applied to the internal corner of the socket just before the culvert is laid in the trench. Joints are closed to a nominal gap by pulling against previously laid culverts with an applied load of approximately one tonne per metre of strip plus about half of the weight of the culvert unit to overcome base friction. The applied load can be less if the unit is suspended from the crane whilst jointing. Heat may be required to soften the joint strip when working at low temperature. Where the box culvert is of sufficient size for access, it can be pointed internally with an elastomeric or bitumen based material using a suitable primer. Not all methods of jointing, however, should be expected to be completely watertight.

“Shay Murtagh Precast also manufacture and supply accessories to culverts such as wing walls and header beams to project specifications”