E-RETE (MALAYA) SDN. BHD.

PRECAST REINFORCED CONCRETE BOX CULVERTS

General Description

E-RETE has the facilities for the manufacture and load testing of the following types of box culverts:

(i) Standard Precast R.C. Box Culverts, widths in the range of 600 mm to 1800 mm:

  (a) Box Culvert that comprises of a U-shape and a separate lid slab,

  (b) Box Culvert that comprises of a U-shape section incorporated with a dry weather flow section and a separate lid slab; and

(ii) Large Precast R.C. Box Culverts, widths in the range of 2100 mm to 4800 mm :

  (a) Box Culvert that comprises of a U-shape section and a separate lid slab,

  (b) Box Culvert that comprises of a U-shape section incorporated with a dry weather flow section and a separate lid slab.

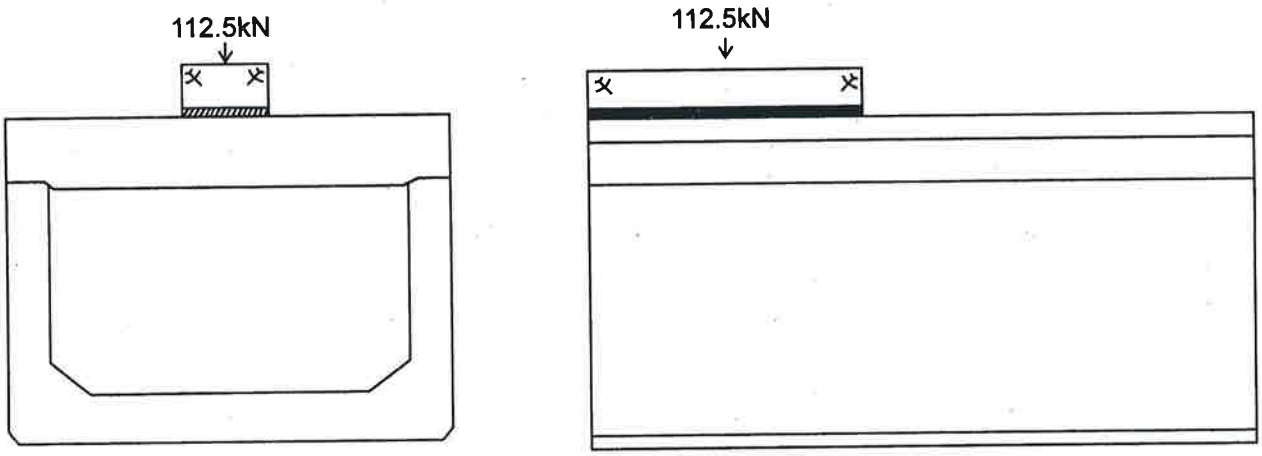
Load Testing of R.C. Box Culverts

E-RETE (MALAYA) SDN. BHD.

Design and Specification

Standard E-RETE Reinforced Concrete Box Culverts are designed to the Malaysian Standard Specification: MS 1293: PART 1:1992. (Specification for Precast Concrete Box Culverts not exceeding 1800 mm width and 1800mm depth with a maximum backfill depth of 2m inclusive pavement, if any) and are tested to withstand a proof load of 112.5kN and ultimate load of 140kN applied over and area of 320mm x 320mm at any position on the cover/lid slab.

E-Rete large box culverts are designed to BS 8110 : 1985 to cater full MOT Type HB loading.



Application

E-RETE Box Culverts are designed as a precast unit for culvert works and may be used in the construction of

(1) Open Drains
(2) Ducts
(3) Tunnels, sumps, etc.

E-RETE Box Culverts are designed to take a more severe loading than the standard culvert pipe. They are able to withstand direct traffic loading and so may be placed at pavement level or immediately under the road surfacing. As such E-RETE would recommend the use of Box Culverts in areas where the depth of fill over the crown is less than 600 mm in place of culvert pipes as the latter may have to be encased in concrete in order to obtain the required strength. Concrete encasement is a very expensive installation and it is usually not recommended.

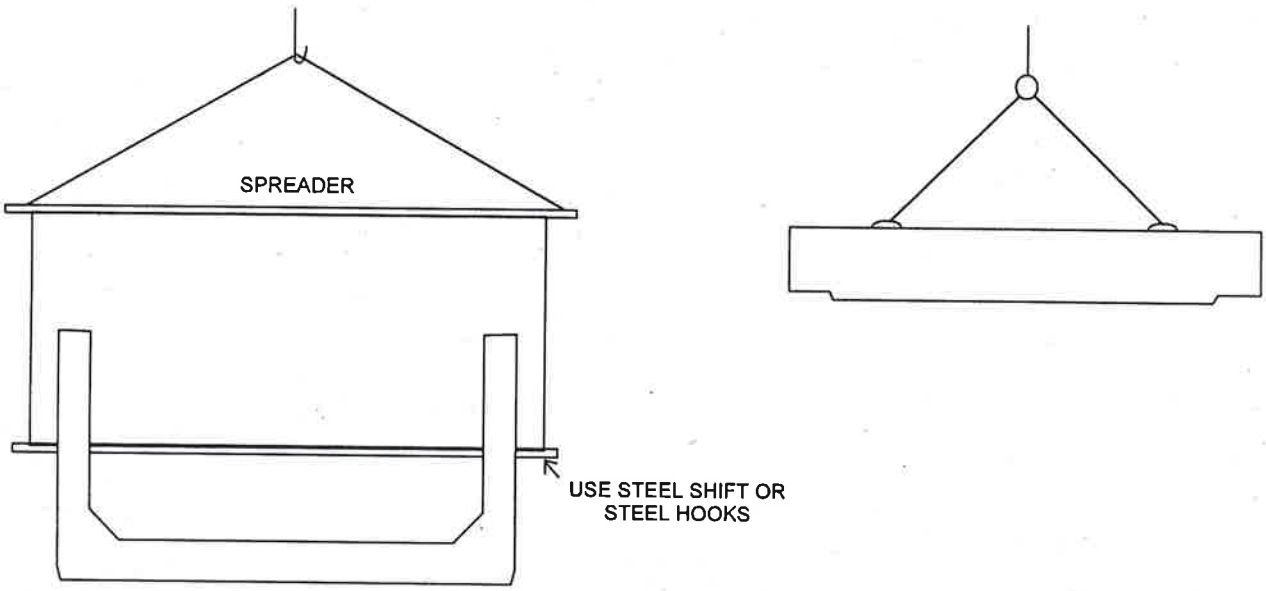
Standard and large E-RETE Box Culverts incorporated with a dry-weather flow section would be very ideal for culvert works in areas where the normal flow is relatively small.

E-RETE (MALAYA) SDN. BHD.

Handling

E-RETE Box Culverts are provided with lifting holes in the U-Shape Section and lifting hooks in the lid slab for easy handling.

- DO NOT attempt to lift the U-Shape Section without a spreader bar to avoid causing any cracks to its legs.
- At site, placed U-Shape Section evenly on ground and stack the lids properly.
- DO NOT stack the U-Shape Section or lids within the U-Shape Section.
- Do not use the U-Shape Section for the crown type of construction, if they are not designed for this purpose.



U-Shape Section

Loading of E-RETE large Precast R. C. Box Culvert with proper facilities and equipment.

E-RETE (MALAYA) SDN. BHD.

Installing Segmented Box Culverts

Installing R.C. Large Box Culverts

E-RETE (MALAYA) SDN. BHD.

R.C. Open Drains with DWF Section

R.C. Open Drains with DWF Section

R.C. twin Large Box Culverts & 'L' Shape Unit.

Installation

For most box culvert installation, it is not necessary to provide an insitu concrete bedding, particularly to culverts with larger width.

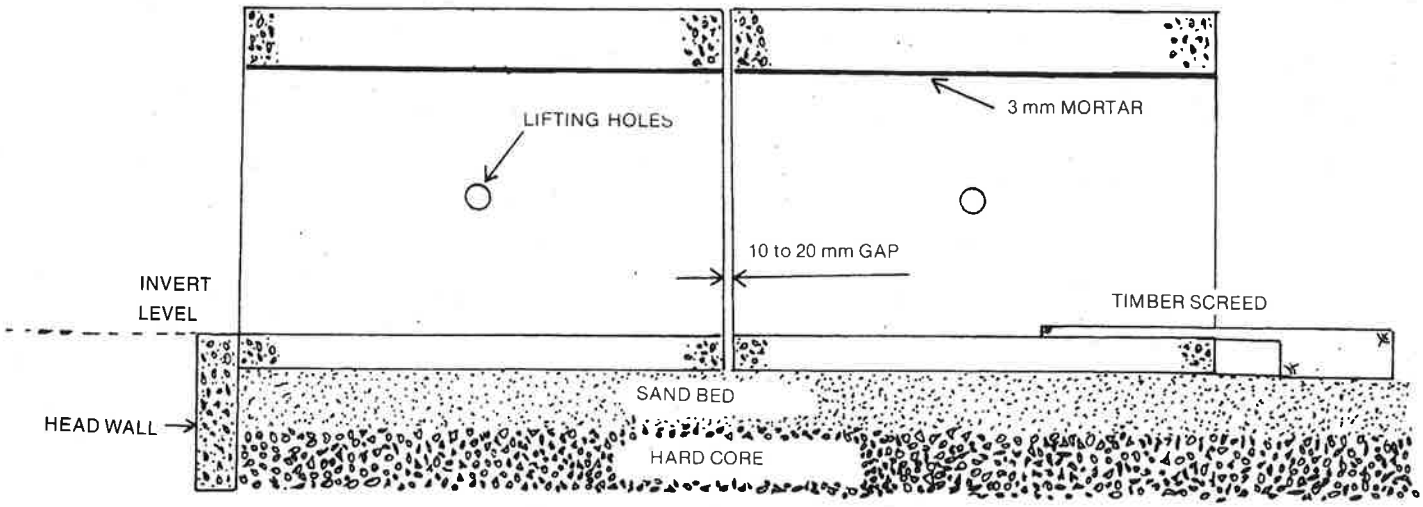
Box Culverts should be laid on sand bedding.

In bad ground it may be required to excavate deeper and place a layer of hard core before placing the sand bedding.

Sand bedding should be compacted by tamping or watering and screeded off to the required level.

A layer of 3 mm thick mortar should be spread on top of the legs of a U-shape section to ensure uniform bearing between the U-shape section and lid slad.

Lifting holes may be filled with mortar or left as weep holes after installation. To complete the culvert structure wing walls, aprons and kerb should be constructed as required but for minimum installation a cut-off wall is required to prevent erosion of the bedding.

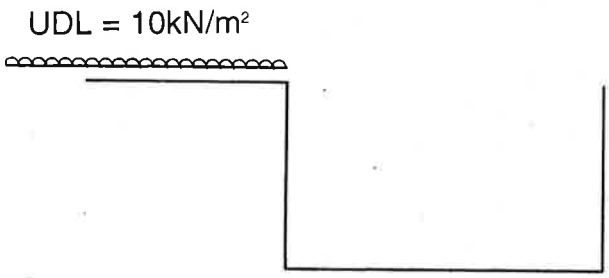


LAYING DETAILS - LONGITUDINAL SECTION

PRECAST REINFORCED CONCRETE U-DRAINS

DESIGN CRITERIA

E-rete Standard U-Drain are designed in accordance with B. S. 8110 : 1985 and based on the following type of loading conditon.



1) Minimum cover = 25mm
2) Concrete Grade = 40N/mm²
3) Angle of industrial friction of soil backfill to be 30°
4) Bulk density of soil backfill to be 19.2 kN/m³
5) The standard length is 1000mm