



Software for Architecture, Engineering and Construction

CYPE Box Culverts

The solution to lower passages



Box culverts is a program developed for the design and analysis of reinforced concrete box culverts used for **underpasses**, **subways**, and **drainage works**. They can be rectangular, trapezoidal or any type of polygon designed on screen, as well as being single cell or multiple cell elements.

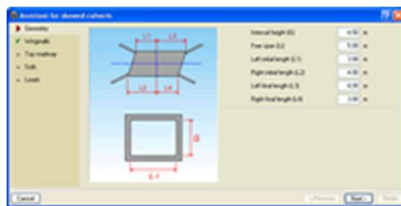
The program can also design culverts made up of various aligned prestressed elements by defining the joints or those to be executed on site.

Consult our [marketing department](#) or your usual distributor of CYPE products for a list of the available national and international codes for this program and their corresponding prices.

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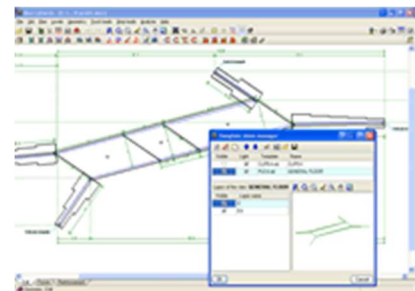
Assistants



Various assistants are available to help the user introduce data for the most common cases: straight culverts, skewed and general culverts.

DXF and DWG templates

A DXF or DWG can be used as a template for the geometrical introduction on plan of the culvert, when the user does not wish to use the assistants. If the drawing of the culvert is generated with the DXF or DWG in the background, the template will appear in the drawing.



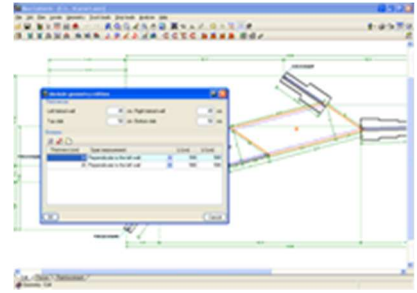


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Module edition

The top and bottom ground elevations can be assigned in order to define sloping planes. The lateral walls will always remain vertical.

By activating specific options various types of wingwalls can be defined.

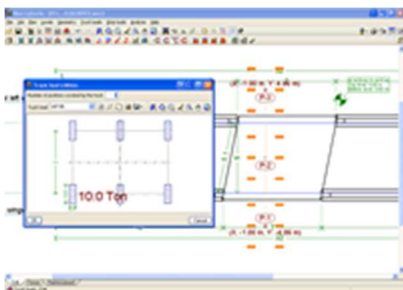
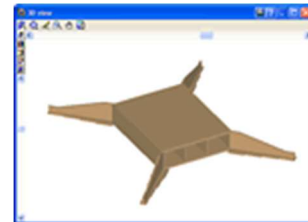


Wingwalls

By activating specific options various types of wingwalls can be defined.

3D View

Complete solid view of the culvert in three dimensions.

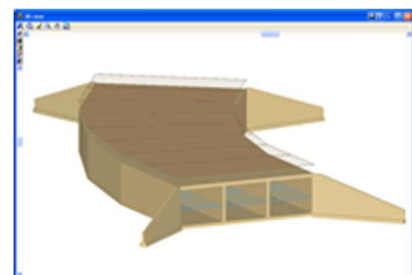


Loads

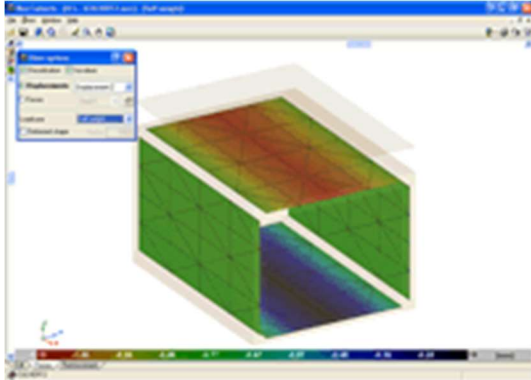
Trolley loads can be introduced (IAP-98, and from a vast vehicle load library) at any position, graphically indicating their axis path and the distance between the sequential load acting positions. Strip loads or surface loads on slabs, etc. may also be introduced.

Trolley loads may be introduced, deleted, duplicated and edited; and selected from those in the library.

It is also possible to introduce **hydraulic loads** acting on the floor slab and internal walls of a culvert composed of one or several modules.



Force analysis



The analysis model used is composed of a thick triangular finite element mesh, which considers shear deformation. They are made up of six nodes, at the vertices and side mid-points, each with six degrees of freedom.

The wingwalls are designed as a bars fixed to the footing subject to ground lateral pressures. They are, optionally, divided into spans, varying in height and dimensions of the footing.

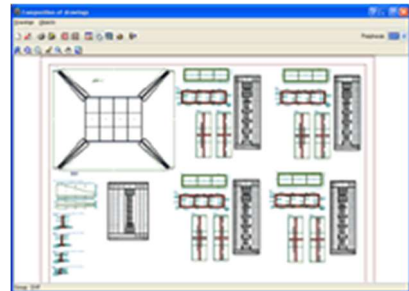
Contours

3D views of the force and displacement contour diagrams and the deformed image for any loadcase.

Design and check

Designs and checks all the elements of the culvert: top and bottom slabs, intermediate cell walls, lateral walls and wingwalls (wall and footing), providing all their reinforcement.

Checks the angular distortion in the top slab, bottom slab, lateral and dividing walls.



The reinforcement of any selected part of the culvert can be consulted or edited.

It is also possible to modify the reinforcement and dimensions of the wall and then carry out a Code check.

The concrete codes implemented in the Box culverts program are:

- ACI 318M-11 (USA International)
- ACI 318-11 (USA)
- BAEL-91 (R-99) (France)
- EHE-08 (Spain)
- EHE-98 (Spain)
- Eurocode 2 (EU)
- Eurocode 2 (France)
- Eurocode 2 (Portugal)
- IS 456: 2000 (India)



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- NTC: 14-01-2008 (Italy)
- REBAP (Portugal)

Reports and drawings

Provides complete reports and drawings of all the data introduced and the analysis results. The reports can be obtained via printer, HTML, PDF or RTF format and drawings in DXF or DWG format, by plotter or printer etc.

Required user license permits

To be able to work with Box Culverts module, users must have the corresponding permission to use the program.

For project consultancy and detailed information; cype@cype.ist or support@cypetr.com