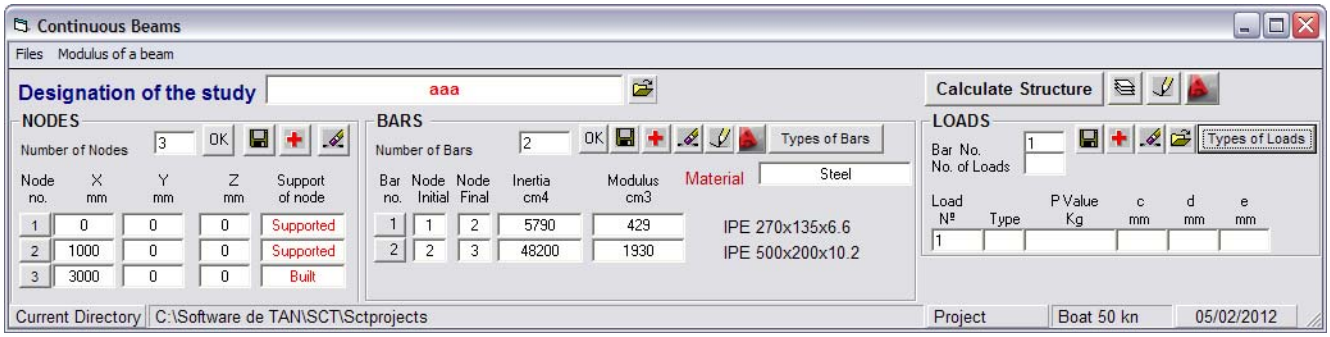
FRAMES AND CONTINUOUS BEAMS

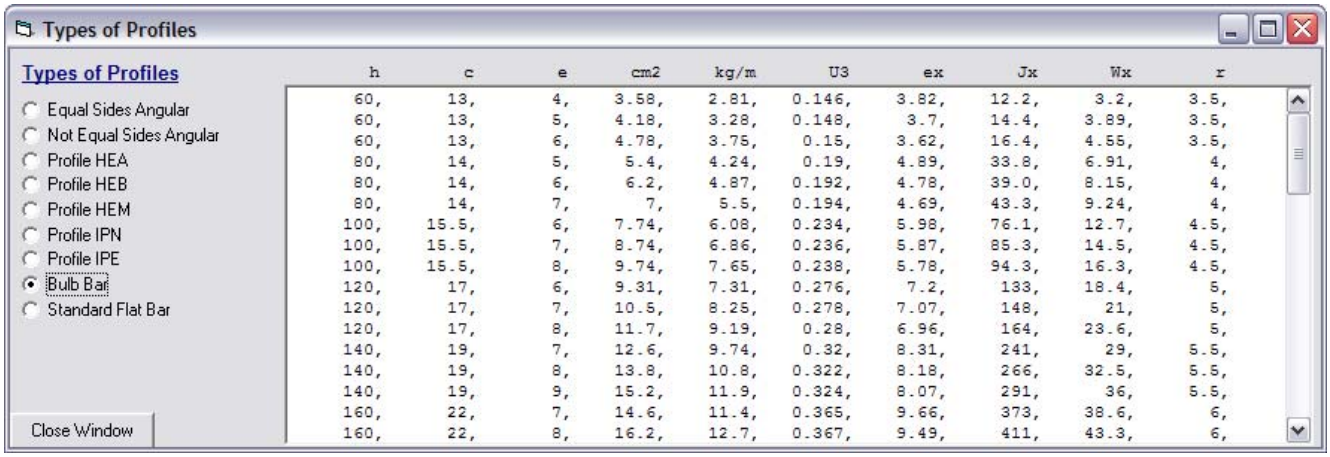
.Aspect of the window



Can be raised structures formed by various beams consisting of any type of profile. Reactions are calculated in the various nodes, bending momments and shear forces in each beam.

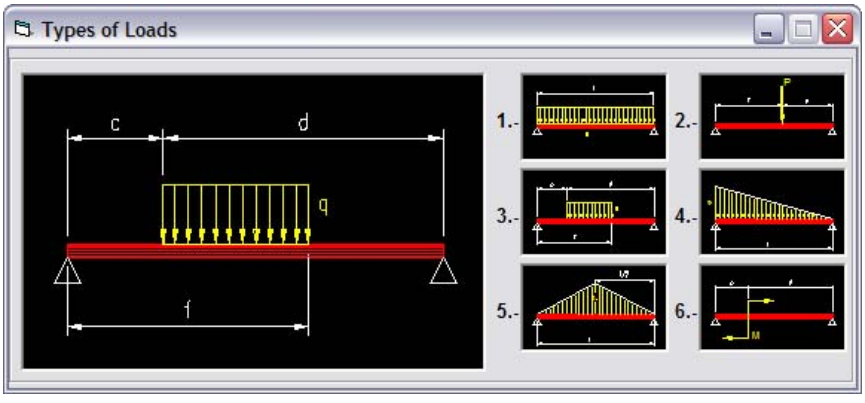
You can study continuous beams or simple frames on a plane or in 3D.

The program provides in its database most types of profiles used in marine structures so that the incorporation of their properties, inertia, module, etc., is very confortable.

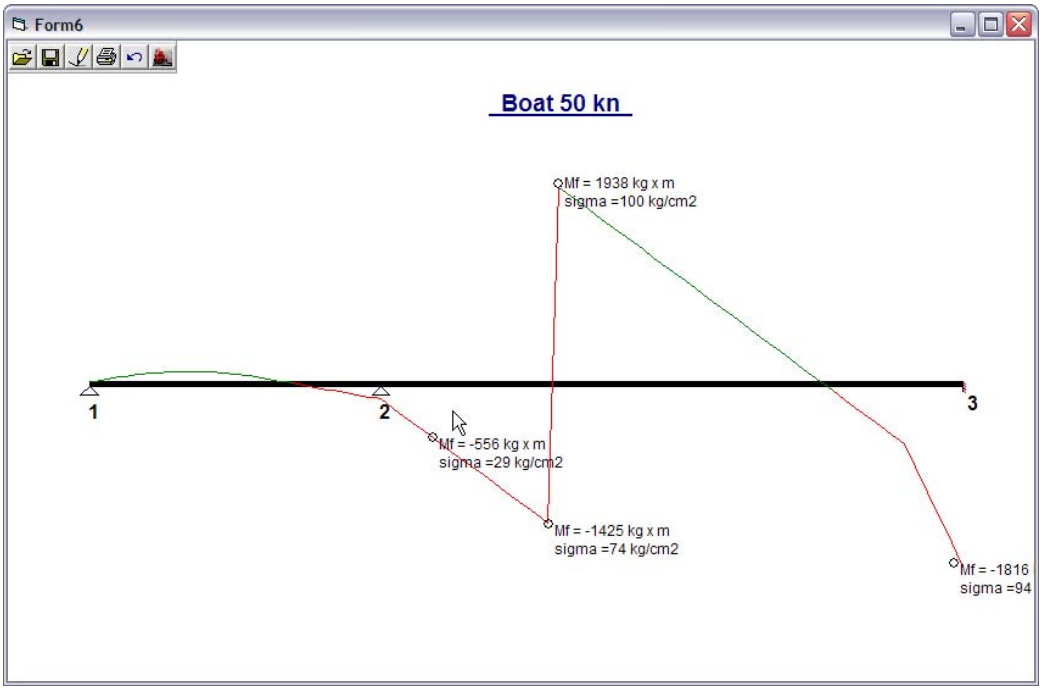


For other non-standard type profiles, the application will help us by calculating the physical properties of any cross section we have previously drawn in AutoCAD.

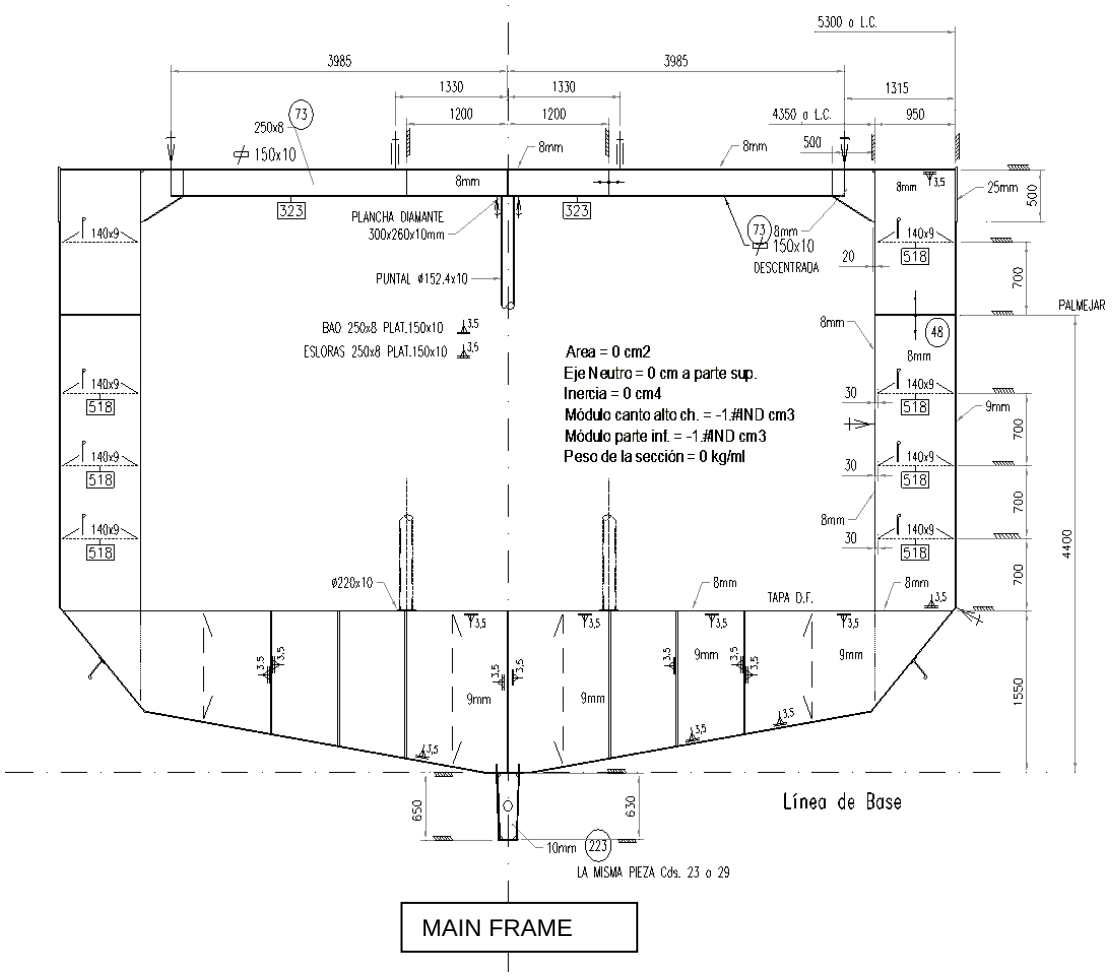
Types of loads applicable to any of the beams that are normal for this type of studies.



The results appear in a special window of the application, in a table with the values and graphically. Also available in AutoCAD, where the application automatically draws them.



Of course, you can calculate the modulus of the main transversal section of a ship.

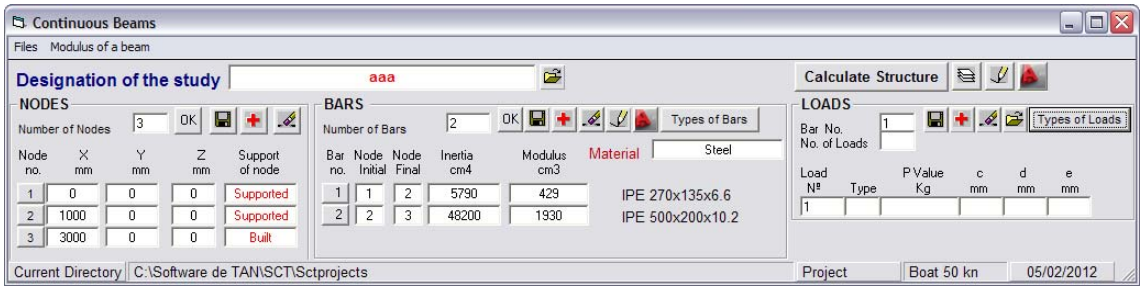


MAIN FRAME

The only requirement is that all plates and sections should be formed by closed polylines, which is not a problem if they have been drawn using the drawing

(See detailed explanations below)

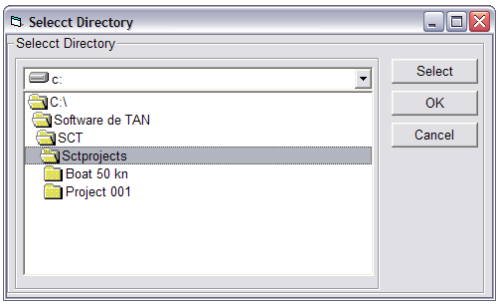
REVIEW OF THE WINDOW OF WORK



The bottom status bar indicates the directory and the project you're working

By clicking on the button, a window with a directory tree, similar to Windows Explorer, change directory if needed.

Now we can click on this button that opens a dialog box with existing projects in the above directory. Now we can choose the project on which we need to work.

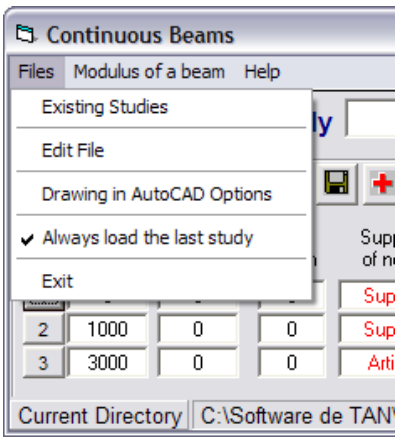


Within the same project can be several studies.

The current study is the one that appears in the text box labeled **Designation of the study**

The header of the window contains several menus

Files



Existing Study : allows you to load on the screen data from a study conducted previously and stored in the current project directory.

Edit File : of any existing study, in order to viewing or manipulating it.

Options for drawing in AutoCAD : results can be drawn automatically, if desired, in AutoCAD. With this option, choose the colors and line types for drawing beams, Bending Moment, etc..

Always load the last study : when starting, the module will load the last study in which we worked.

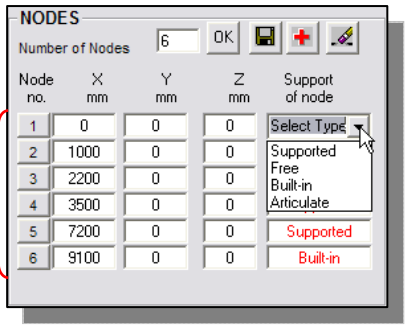
Exit : closes the modulus Beams.

.

Module of a Beam : calculates the modulus, inertia and other physical properties of the cross section of any beam we have previously drawn in AutoCAD.

The module of the Main Transversal Frame can be calculated with this option.

WORKING WITH NODES



In the box labeled **Number of Nodes** indicated the total number of nodes that form the structure and click **OK**

4 cells per node appear, 3 of them to indicate the coordinates (X, Y, Z) of each of the nodes. The 4th box is used to indicate the type of support of each. Clicking on this a drop-down list appears with four options. By clicking on it, the box corresponding to de node will be completed.

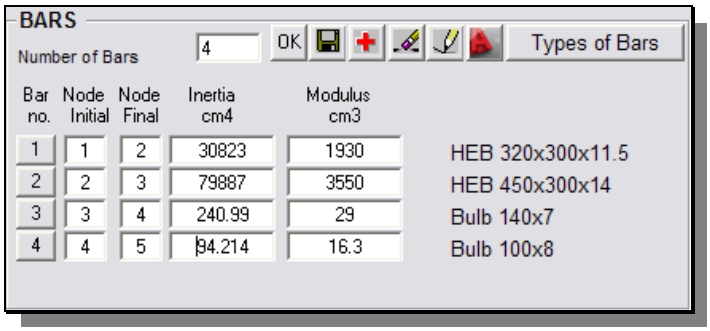
Once completed the data from all nodes, should be saved

Until you sabe this data, it will not be activated the check boxes to define the bars. (see below)

Adds nodes in the existing list. Click on the button before of which we need to insert it, then we press +.

Deletes a node. Press this button and then the button with the number of the node we want to delete..

DEFINITION OF BARS

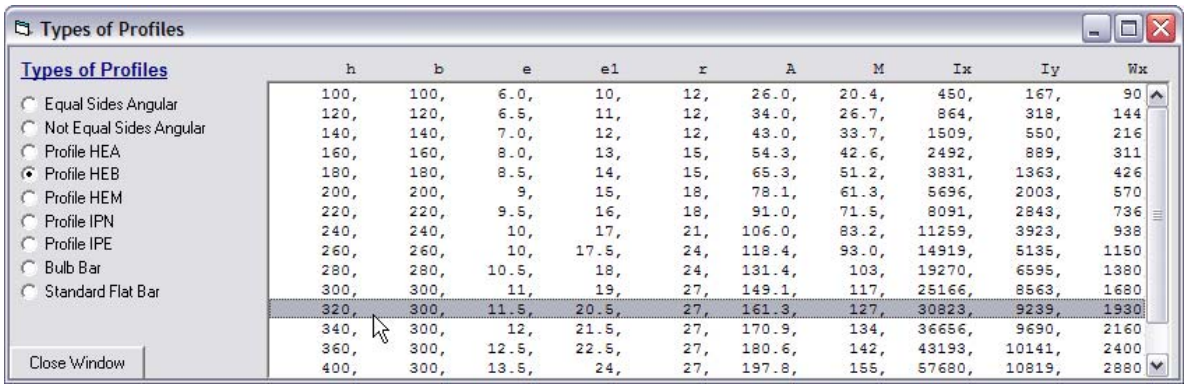


Indicate the number of beams that make up the structure and click OK.

4 boxes appear for each beam, so that to put the ends nodes of each one, its inertia and its module.

The inertia and modulus, when it is very special beams, must introduce by hand, once they have been calculated. For this purpose you can use the header menu seen above.

In the case of beams formed by standard profiles, the method is greatly simplified: Acting on the button **Type of Bar ,** it will be displayed a window with a list of the standard profiles included in the database of the application.



The procedure is as follows:

1. We mark the on the corresponding button of the beam 1 o 2, etc.
2. In the types list on the left note the desired type.
3. In the profile list of such type, note the one with appropriate dimensions.

Boxes of inertia and modulus of the beam are filled with the values of selected profile.

Mark another button or .. 2.... and repeat the procedure.

DO NOT FORGET TO SAVE THE BEAMS. Until you do, check boxes to define the loads will not be activated.

BUTTONS OF THE WINDOW *BARS*

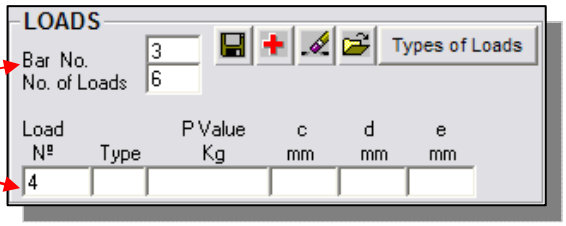
OK	After entering the number of bars, this button prepares and numbers the boxes for every bars data.
	Stores the data of the bars. Only after that will activate the check boxes to define the loads of bars.
	Add a new bar before the button 1 o 2, etc that we must mark before pressing this button
	Deletes the bar whose number you have marked before.
	Draw the structure, without loads, in the auxiliary drawing window of the modulus.
	Draw the structure, without loads, in AutoCAD
Types of Bars	Open the window with the standard profile types, as seen on the previous page.

DEFINITIO OF LOADS ON EACH BAR

After saving the configuration of the bars, the window is activated to define the loads on each one of them.

For each bar we have to indicate the number of loads acting on it

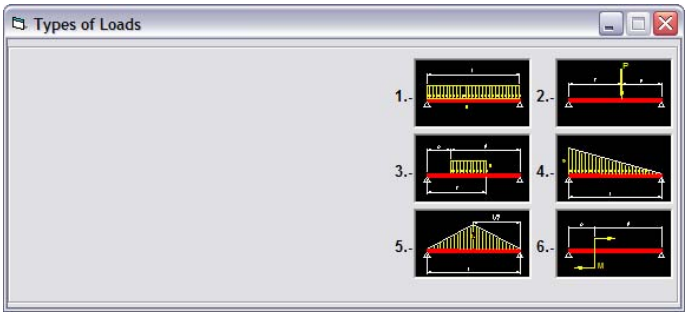
It will be shown on which bar we are working with and the number of the load we have to define.

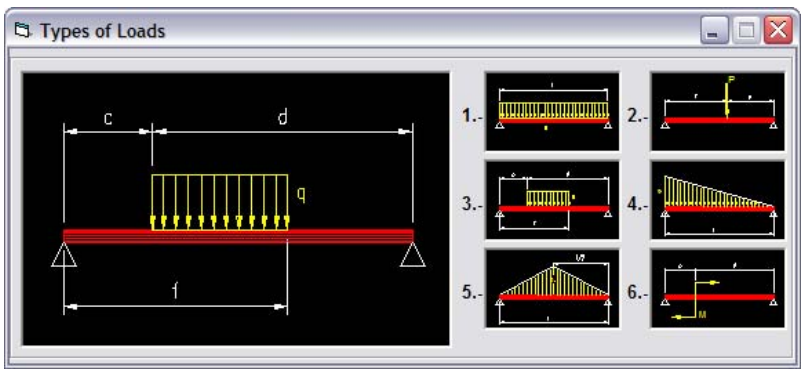


The type of load is indicated by pressing the button Types of Loads

Following window is shown.

Here we click on the desired type of load. The window will now show us the dimensions necessary to define it, while the type is written in the second section of the window LOADS.





These dimensions, as well as the value of the load, we introduce them by hand in the window boxes LOADS.

Each load, once defined, must be SAVED

This done, the application moves to the next load on the current bar or to the next bar.

BUTTONS ON THE WINDOW *LOADS*

Saves data of the load just defined.

Adds a new load on the current bar.

Deletes current load.

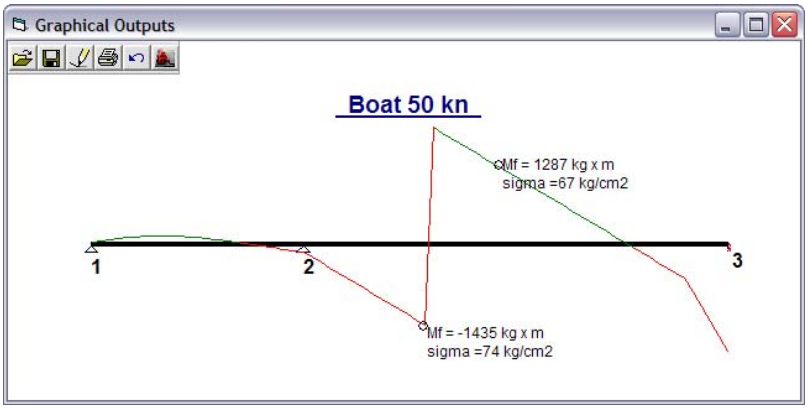
Opens an auxiliary window with loads defined and saved, so far.

Tipos de Cargas — Open the window with types of loads.

Having done all this, you press the button Calculate Structure

The results appear in two windows,

A graphical window



Opens another file of results

Saves changes.

Redraws curves

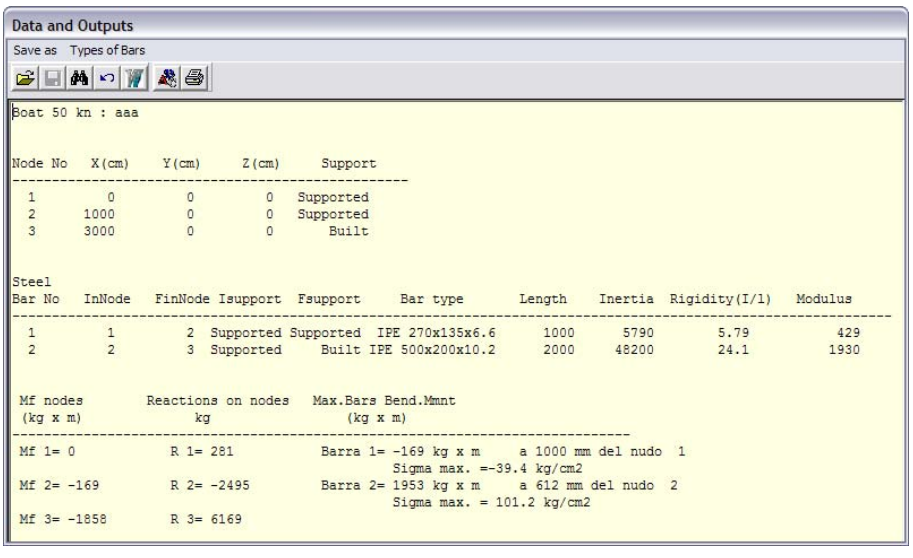
Print

Exit

Draws bars and curves in AutoCAD

Pointing the cursor over a point on the curve and pressing the right mouse button, the settings of the Bending moment and tension at that point in the beam will appear.

And another text window



Opens another file of results

Save changes

Looks for a text on the screen

Closes the window

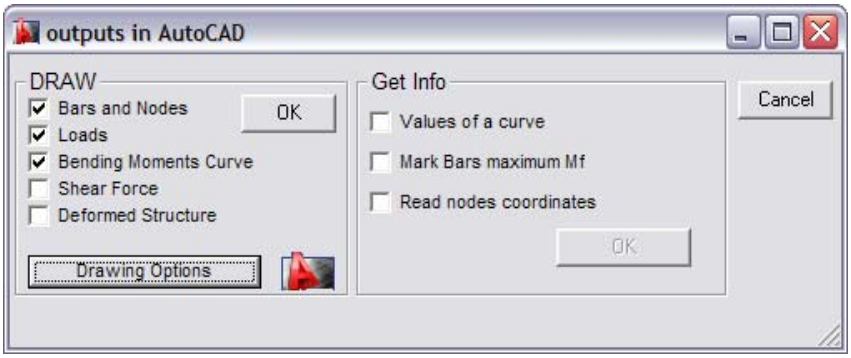
Passes results into MS Word

Increases letters size.

Print

Draw bars and curves in AutoCAD

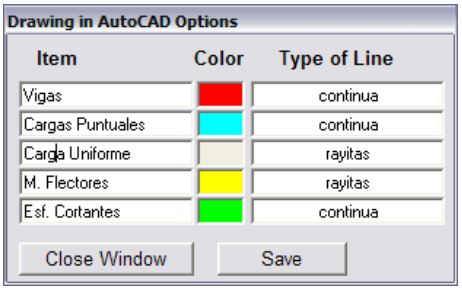
Pressing this button, the following window will be shown, where you select what you want to draw.



Pressing OK curves, whose cells have been selected, are drawn.

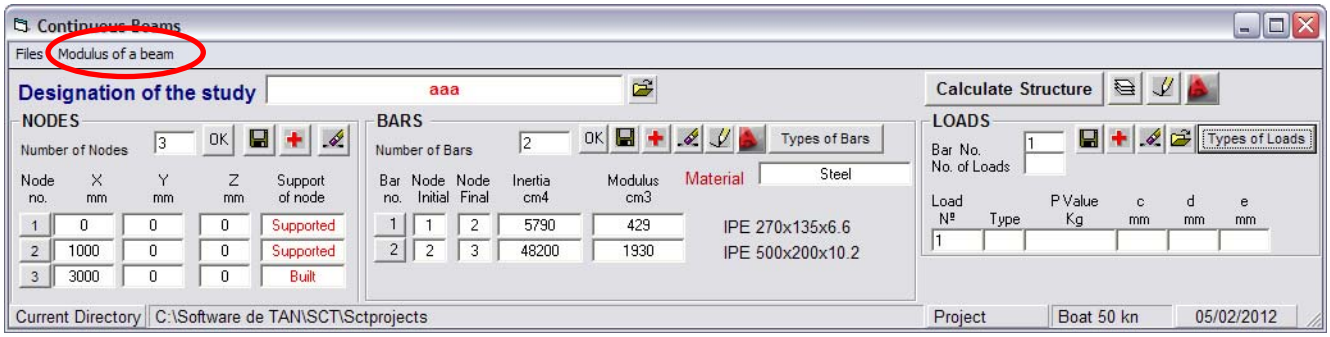
Once the drawing is done, the right options allow us to obtain information from its objects.

The button Drawing Options opens the window on the right in which indicate the colors and types of lines for each of the elements in the drawing.



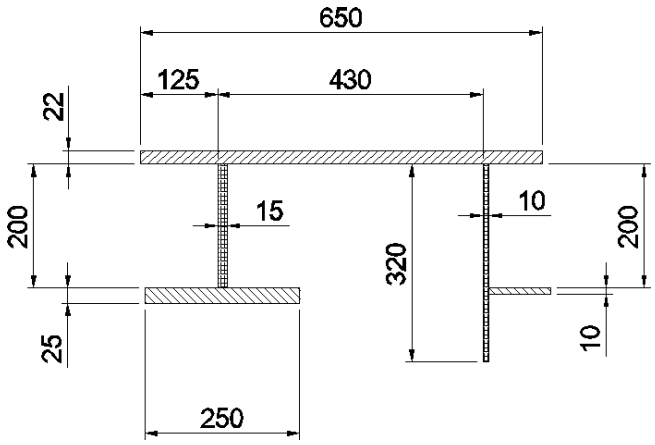
COMPUTATION OF THE MODULE OF A BEAM

It is an option that appears in the header menu of the application window.

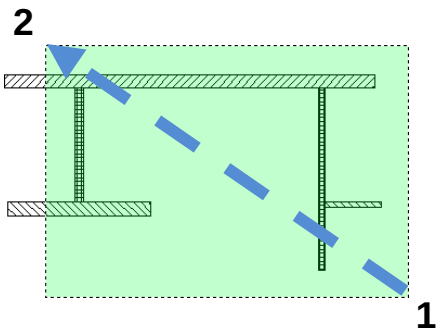


The beam in question must have been previously drawn in AutoCAD. Must be drawn in true scale, dimensions in millimeters, and each of its elements must be a closed polyline.

1. Draw the beam of the figure

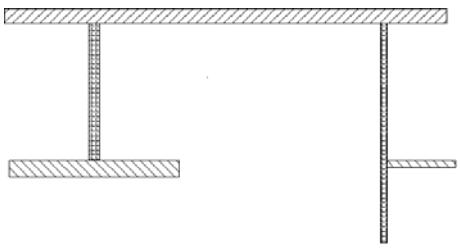


2. Press on the menu **Module of a beam**.
3. In the AutoCAD screen select all elements of the beam. For example, click on point 1 and, without releasing the mouse button, move the cursor to point 2



4. Now you are prompted to enter another point on the screen where you want to insert the results

Final result :



Area = 277.5 cm2
Neutral Axis = 10.08 cm a parte sup.
Inertia = 30357.0927 cm4
Module to the upper edge of the plate = 3010.657 cm3
Module to the lowest edge = 1258.753 cm3
Weigth section = 217.837 kg/ml