

The PLPostTM module

USER MANUAL

PLPAKTM Version 1.02

**STRUCTURAL ANALYSIS SOFTWARE USING
THE BOUNDARY ELEMENTS METHOD**

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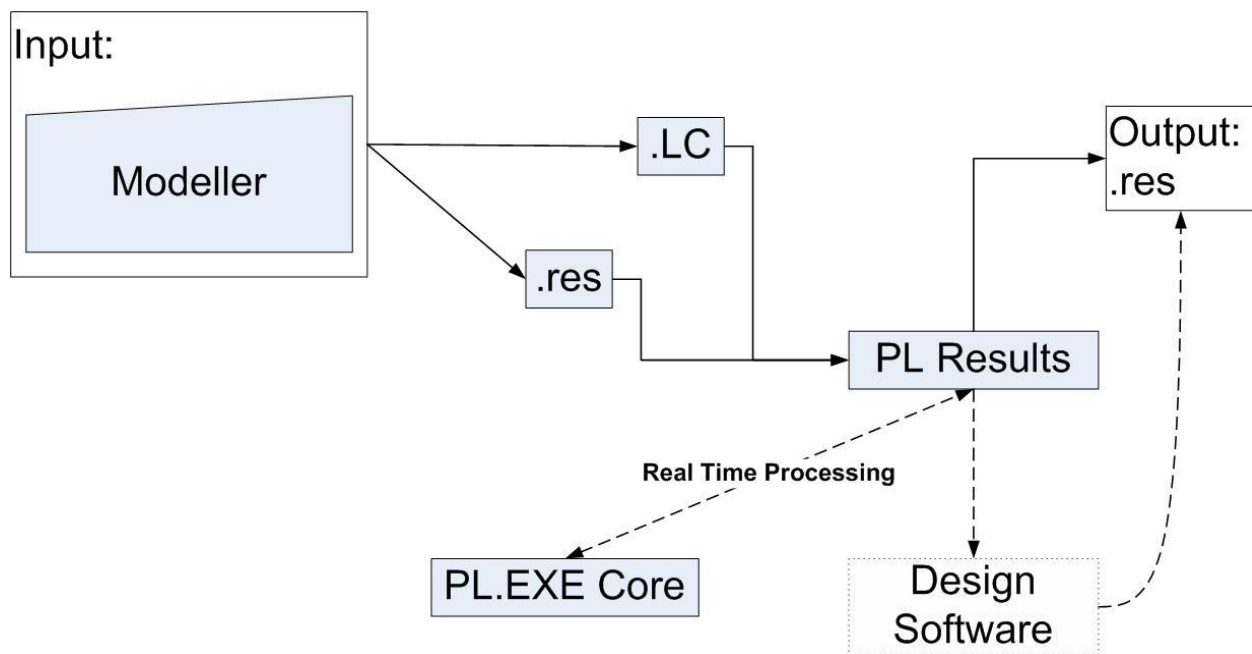
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Introduction

The PLPost component of the PLPak is the one responsible for viewing the structural analysis results after the PL Core Man has performed the structural analysis based on Boundary Element Modeling. The PL Post can be used to view the analysis results at boundaries and supports. In order to view results in internal points, the PL Post will resolve for these internal points.

The PLPost operation diagram

The figure below shows the operation diagram for the PLPost module.



The PLPost philosophy

The PLPost is a post processing module and result viewer. As explained in PLCoreMan manual, the PLCoreMan solves points on supports and boundaries only. The job of the post processor is to calculate the straining actions at any required point in the model, solving required points only allows the user to get the required results with a high level of accuracy in a short processing time. The result viewer includes capabilities that allow the user to view results in the following forms:

Graphical forms:

- Strips for any straining action or generalized displacement in any direction.
- Global and local contours for any straining action or generalized displacement in any direction. The user is allowed to vary the quality of the contour by changing the number of points to be solved. This function enables the user to produce very high quality local contours to study stress concentration areas in great detail.
- Support results which include column, beam, wall and soil support results.
- Paths which is a strip representation which is completely independent from the problem.

Tabulated forms:

The PLPost allows the production of a tabulated form for all of the above results. The produced tables can be viewed and edited using text editors or any spreadsheet software.

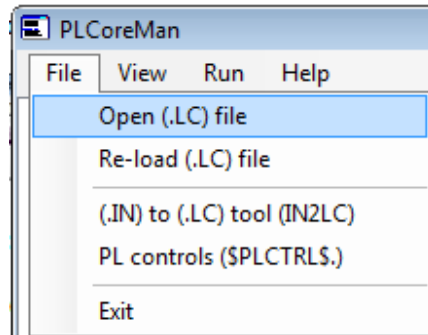
Additional tools

- The PLPost saves a binary file that has all the results, this can be opened later on and results are viewed without any further solving time.
- The PLPost allows the user to define load combinations within the PLPost, this does not require further solving.

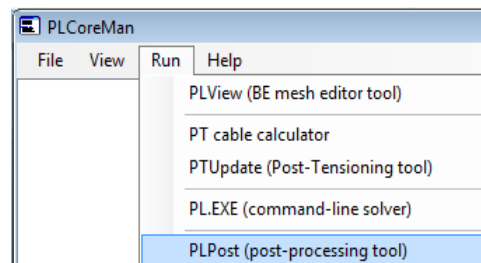
Starting the PL Post

The PLPost could either be run from the PLCoreMan as follows or directly:

Step#1: Load the model from .LC file on PLCoreMan

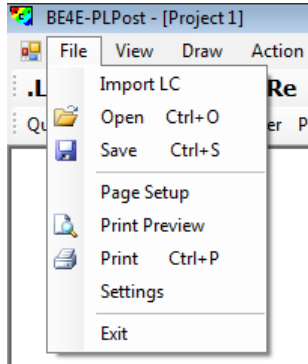


Step#2: Load the PLPost



The PLPost menus

The File menu



File | Import LC

Brings up a dialog box for selecting .LC file. The user can navigate elsewhere to open another .LC file from the default folder.

File | Open

Brings up a dialog box for selecting a .LC file. The dialog box will show the location of the last project that was open. (The user can navigate elsewhere to open another .LC file.)

File | Save

Saves the current state of the open .LC file

File | Page setup

Brings up a dialog box in which the user can choose the size of the paper, setup the orientation and setup the margins

File | Print Preview

Brings up a small window in which the user can preview the .gen file before printing

File | Print

Brings up a dialog box in which the user can choose the printer and print the current .gen file

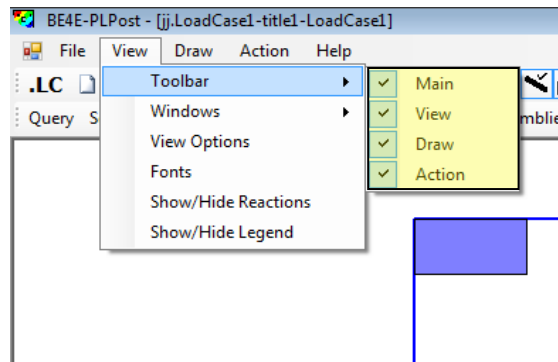
File | Settings

Brings up a dialog box used to define the PLPost solver path.

The View menu

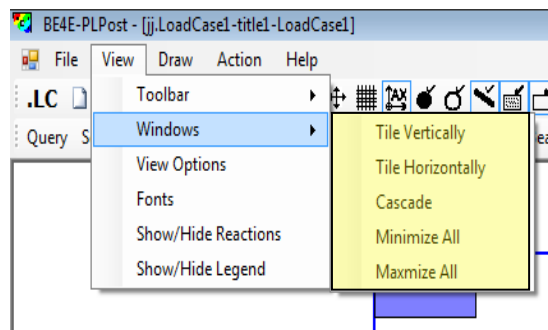
View | Toolbars

Used to control which toolbars should appear on the screen, the same function can be performed using right click on any toolbar.



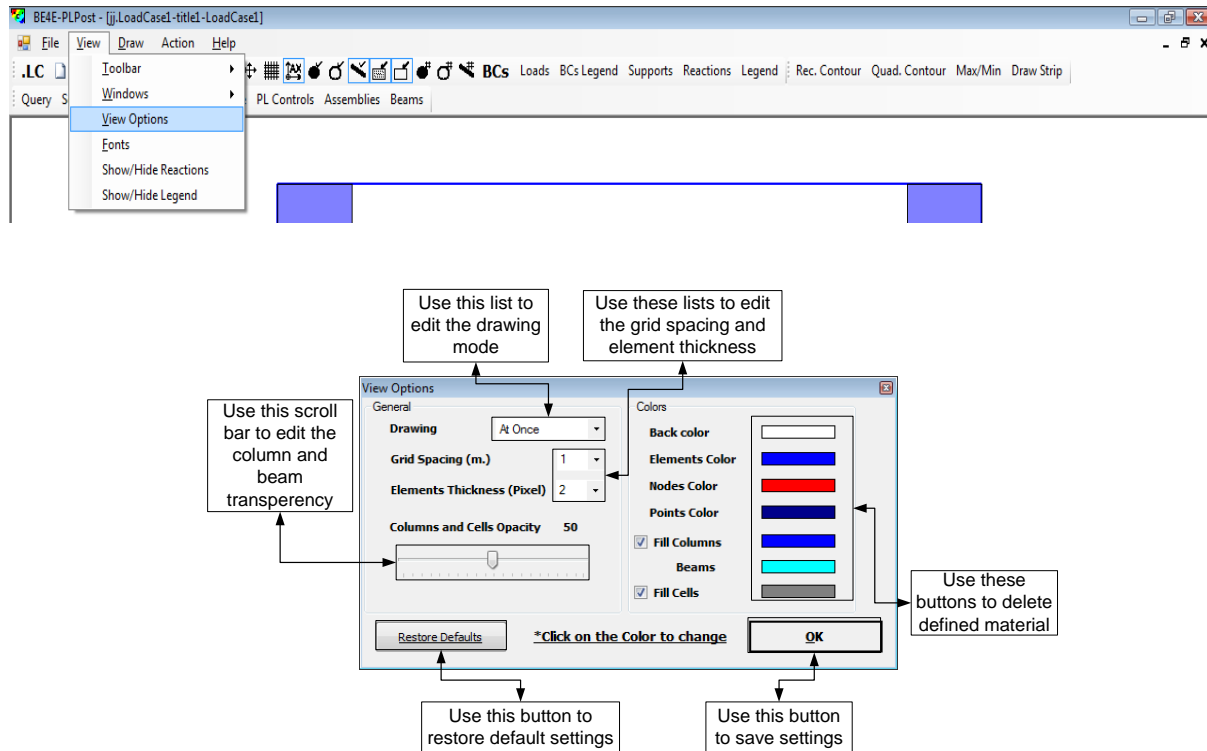
View | Windows

The windows menu provides options of tiling different PLGen windows that are used at the same time.



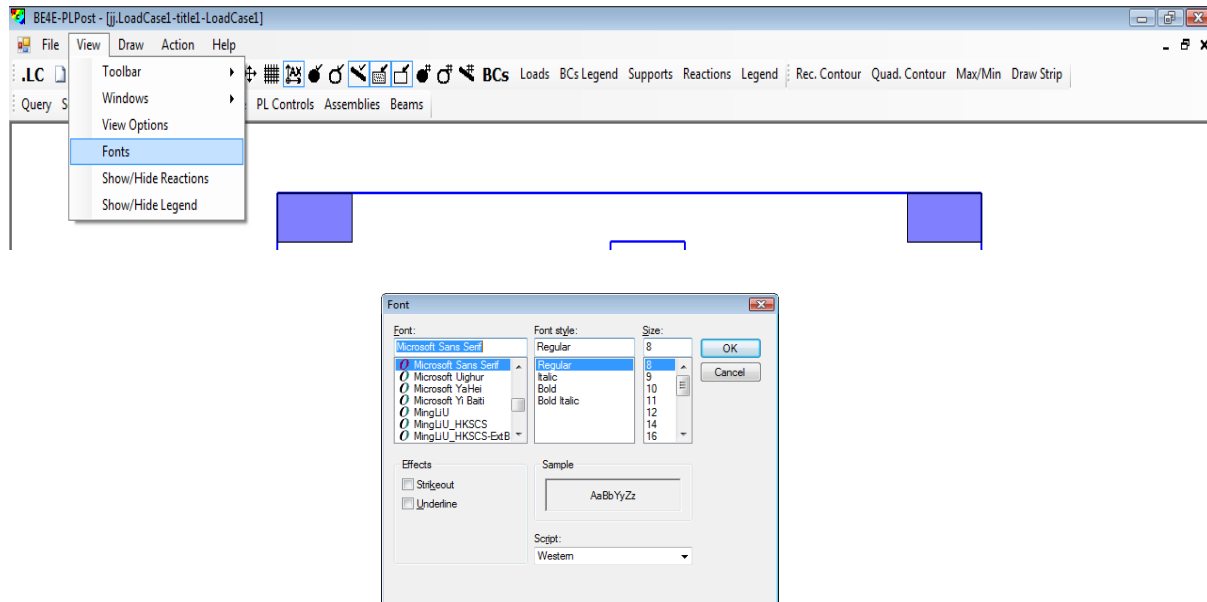
View | View options

Clicking on View Options allows you to change the drawing sequence of the result elements, Grid Spacing, Element Thickness, Opacity and Colors of different elements.



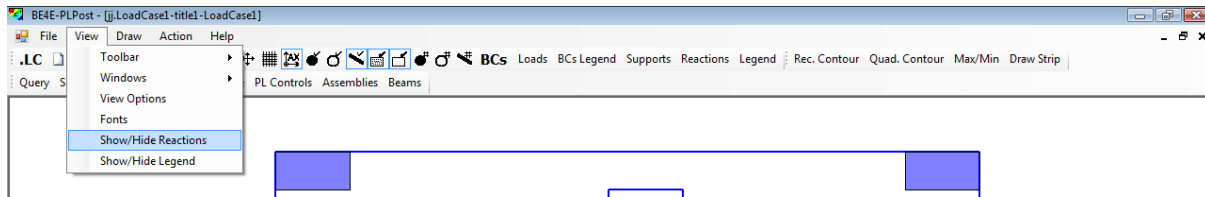
View | Fonts

This option allows you to control the fonts used in the results display.

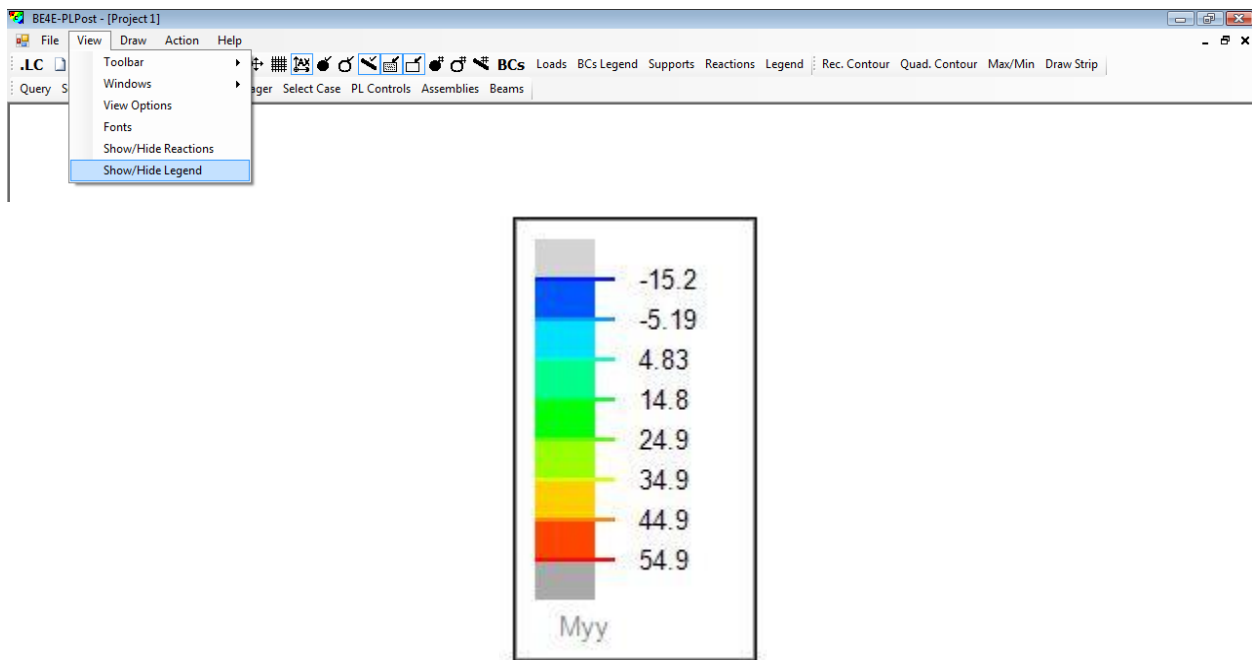


View | Show/Hide Reactions

The Show/Hide commands can be used to show or hide Loads, No. of divisions of every element, Co-ordinates of the cursor, grid and axis.

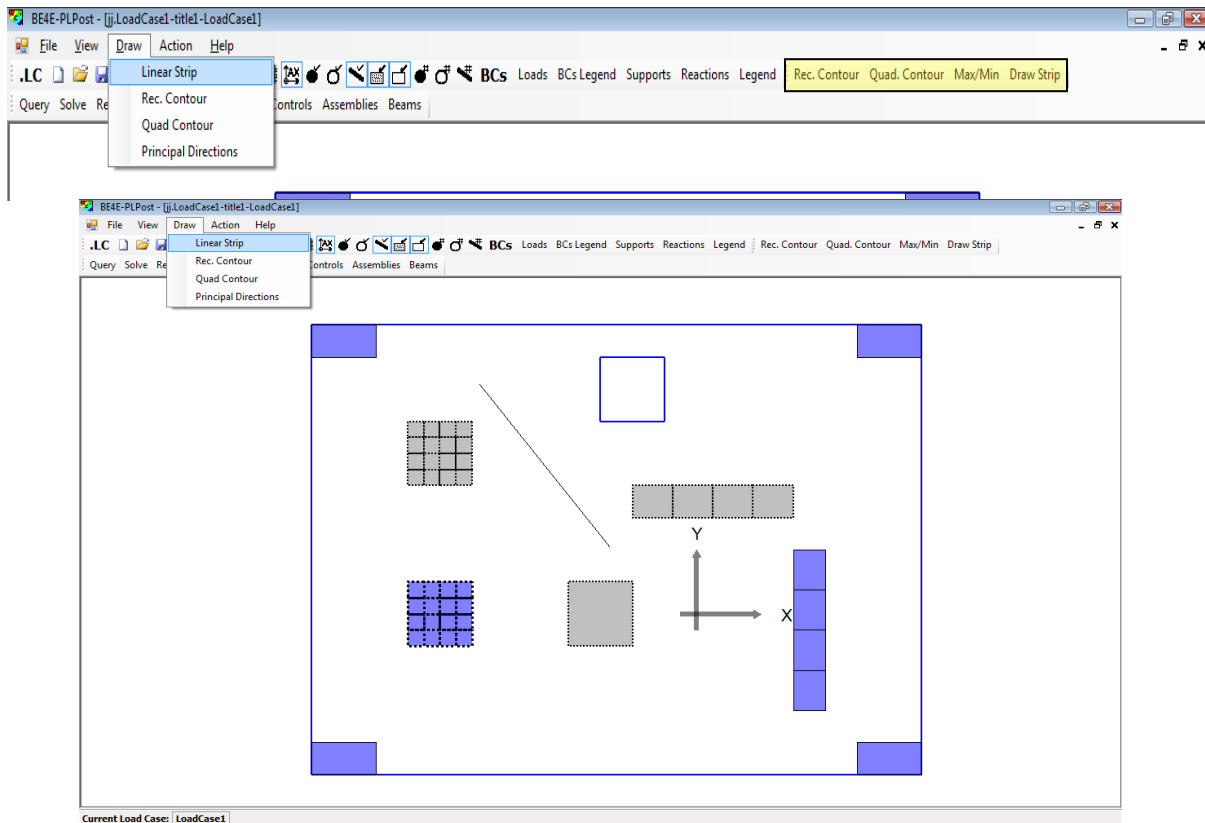


View | Show/Hide Legends



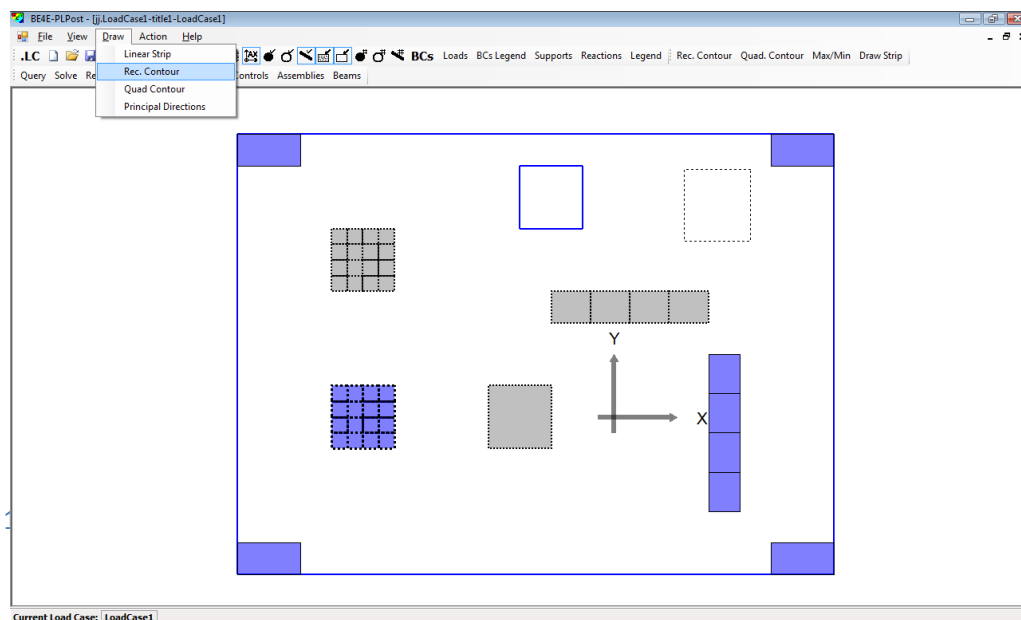
The Draw menu

Items that are available from the Draw Menu are available from the draw toolbar.



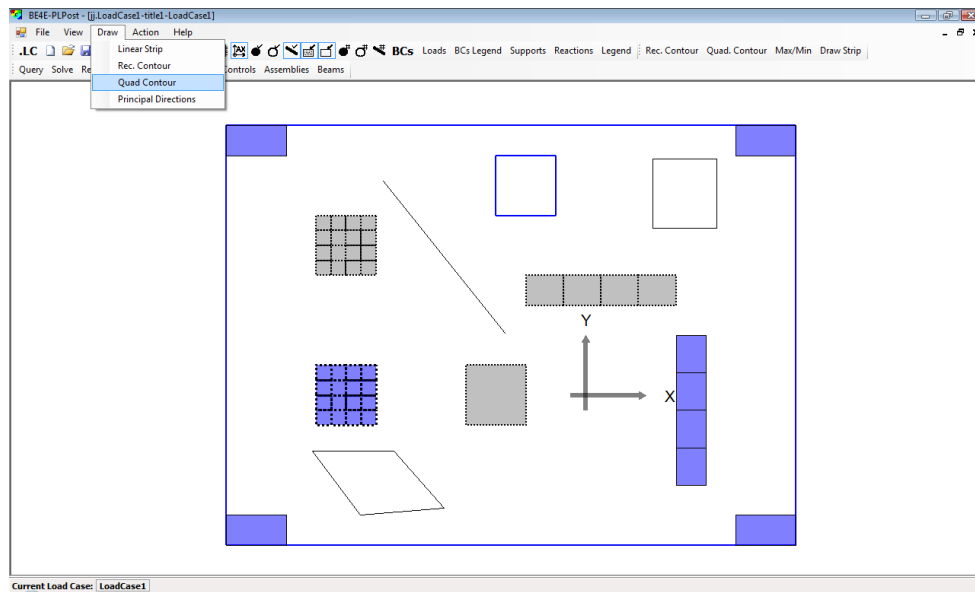
Draw | Rec. Contour

This strip allows you to view stress results on a series of points. After clicking on rectangular strip, draw the rectangle which will represent the results area. To see control of results check section Results Manager.



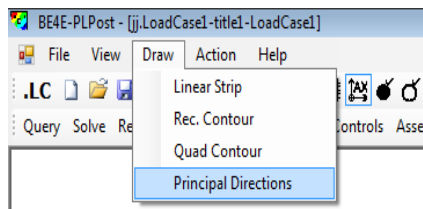
Draw | Quad. Contour

This strip allows you to view stress results on a series of points. After clicking on quadrilateral strip, draw the quadrilateral whose results are under inspection. To see control of results check section Results Manager.



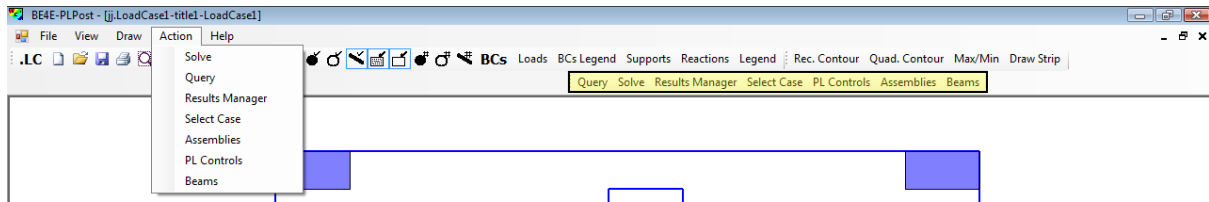
Draw | Principal Directions

This command allows you to view stress resultants maximum and minimum in the whole model. Please note that before showing principal directions, Main Contours have to be solved.



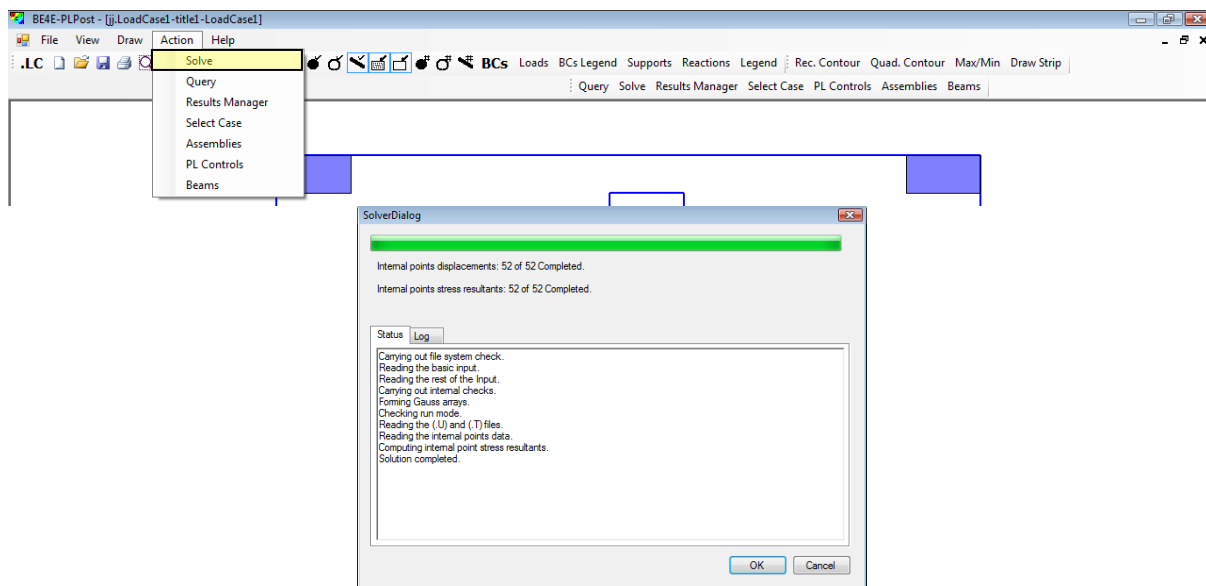
The Action menu

All commands in Action Menu are available from the Action Toolbar.



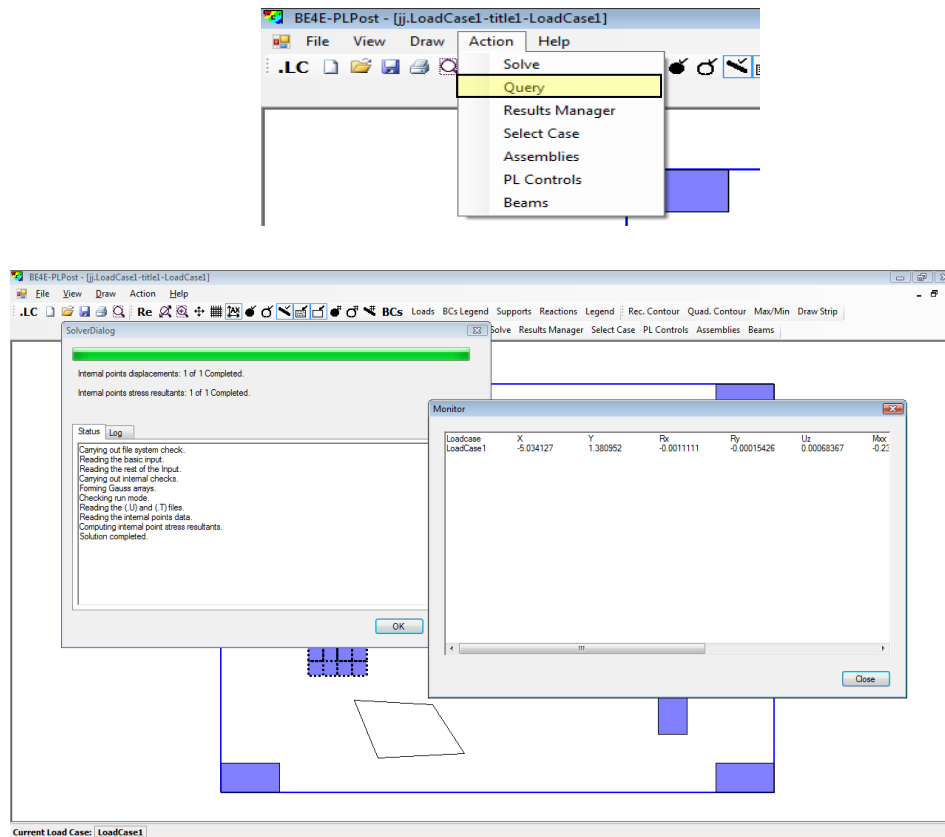
Action | Solve

After drawing any strip or results area, click on Solve command to Solve all points within the drawn areas.



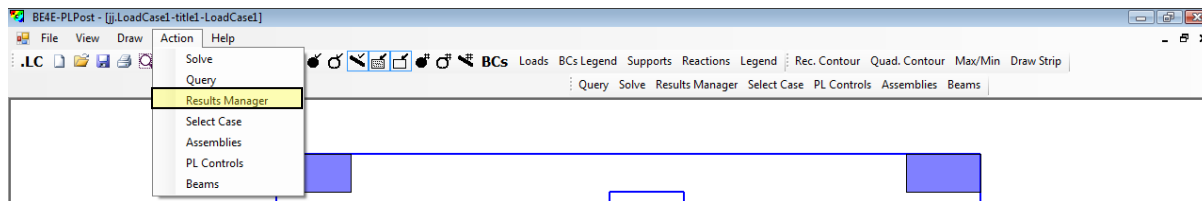
Action | Query

This command is used to show stress resultant one single point, Click on Query then click on the required point. The results shown are explained in the next section (Results Manager).



Action | Results Manager

This command shows the results manager which is used to control the properties of the strips and result areas which have been previously drawn.

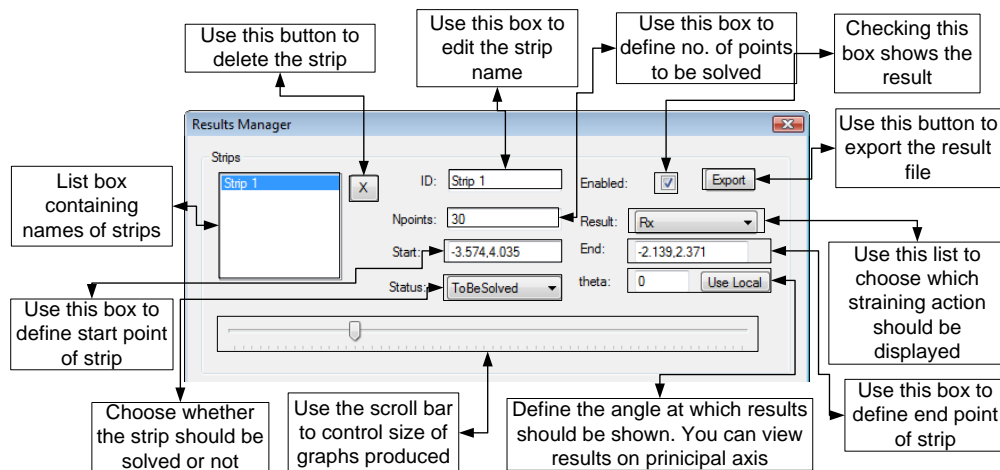


PLPost Results

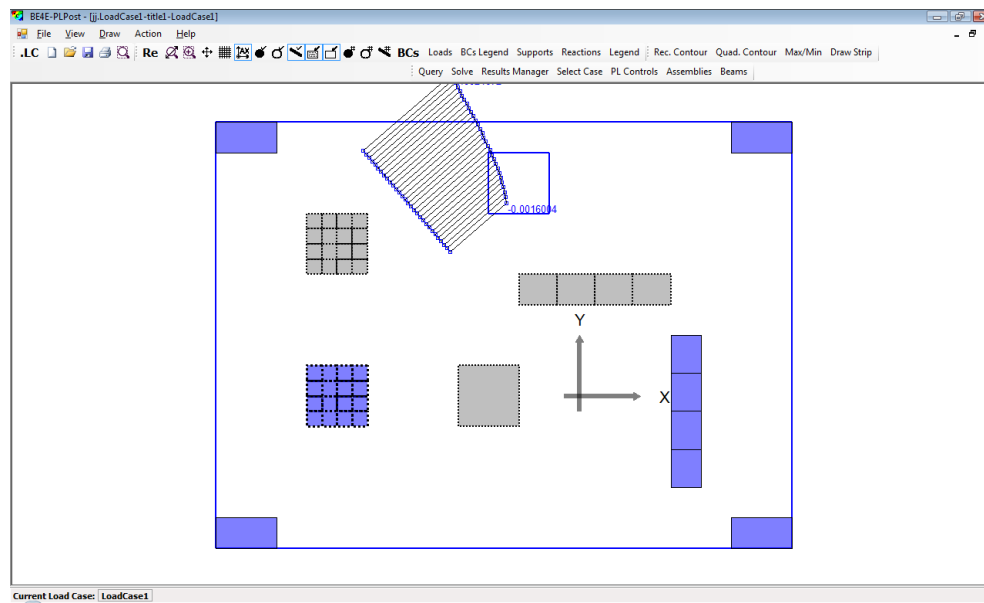
The following table shows the results that can be shown by PLPost.

Quantity	Description
Rx	Rotation about the X axis
Ry	Rotation about the Y axis
Uz	Deflection in Z axis direction
Mxx	Bendng moment in X direction
Mxy	Twisting moments about X and Y directions
Myy	Bendng moment in Y direction
Qx	Shear Force in X direction
Qy	Shear Force in Y direction
Mii	Bendng moment in i direction
Mij	Twisting moments about i and j directions
Mjj	Bendng moment in j direction
Qi	Shear Force in i direction
Qj	Shear Force in j direction
Mmax	Maximum principal bending moment
Mmin	Minimum principal bending moment
Mxxdes	Design moment in X direction
Myydes	Design moment in Y direction
Miides	Design moment in i direction
Mjjdes	Design moment in j direction

Strips:

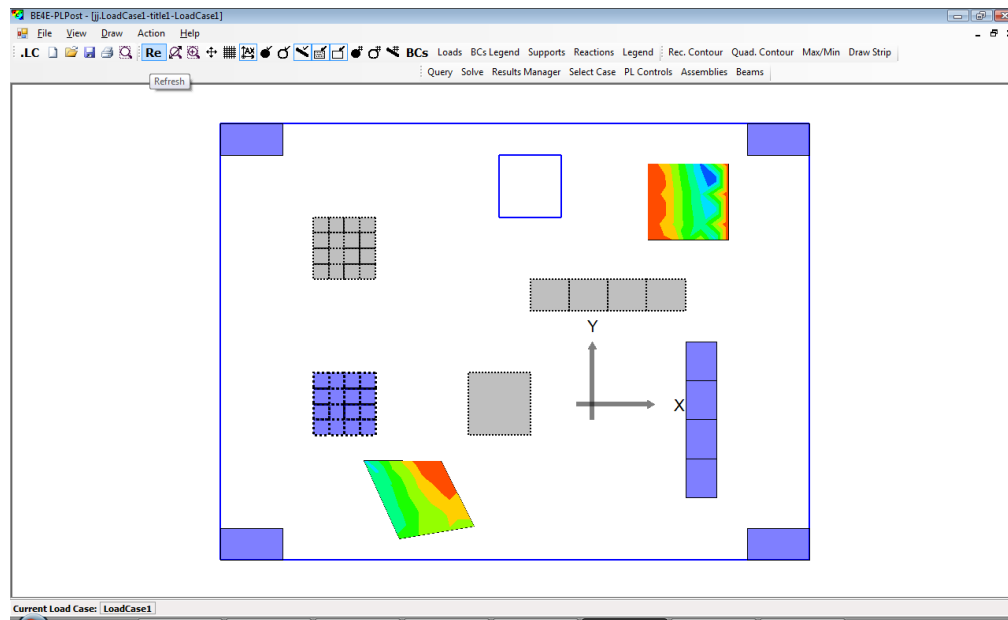
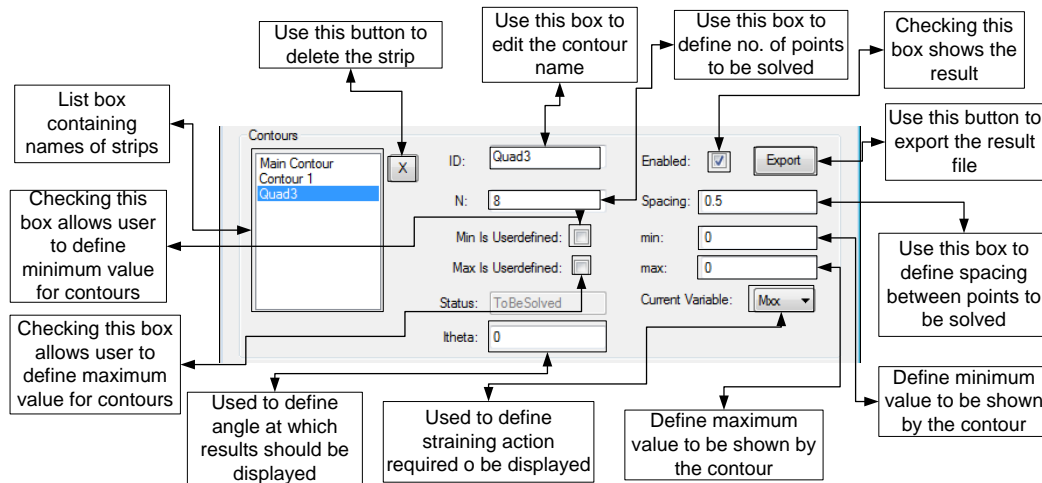


Strips: This part of results manager is used to control strip properties including ID, Start and End points, No. of points within the strip, type of stress resultant that is required to be displayed at this strip. Export command is used to export a tabulated format of the strip results, the produced tables can be used by any spreadsheet software.



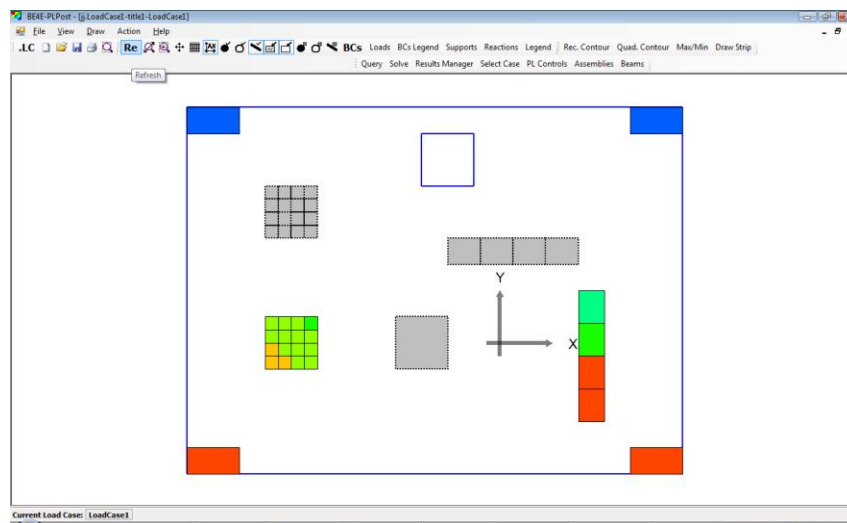
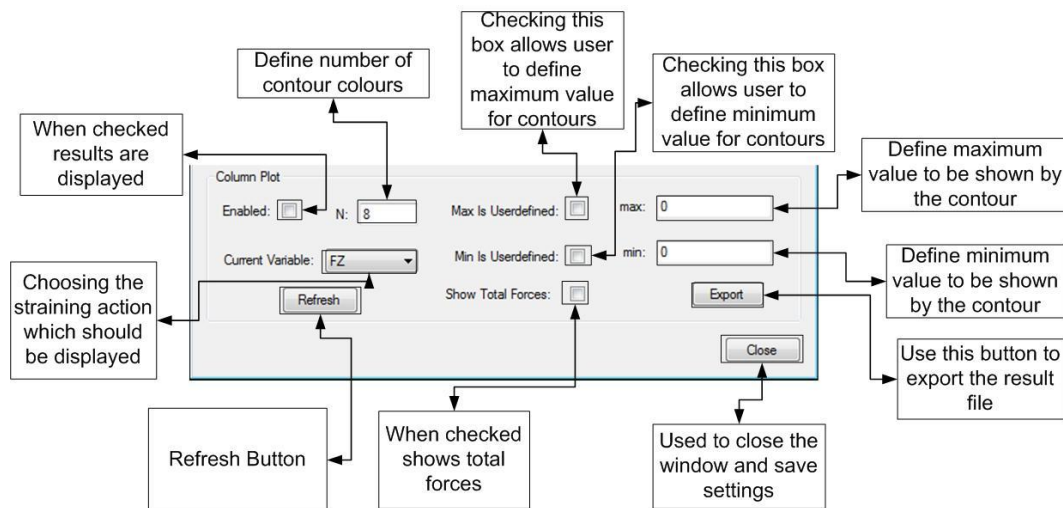
Contours:

This part of the Results Manager is used to control properties of the contour areas. Main Contour is used to display contours all over the model, this is the only contour that can not be deleted. Using this dialogue you can control Contour ID, Type of stress component to be displayed, N which is the number of colours within the contour, spacing between points to be solved within the contour. Export command is used to export a tabulated format of the strip results, the produced tables can be used by any spreadsheet software.

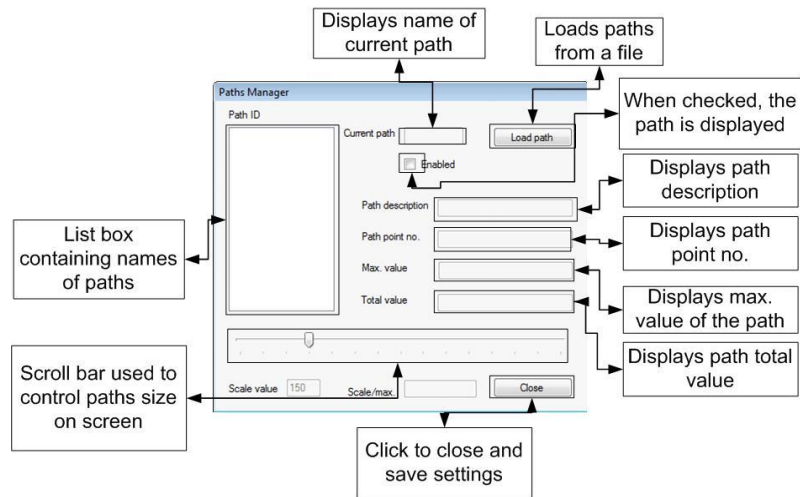


Column Plot:

This part of result manager is used to show contour results at supports. This part is used to control the number of contour colours and type of stress component to be displayed. Export command is used to export a tabulated format of the strip results, the produced tables can be used by any spreadsheet software.

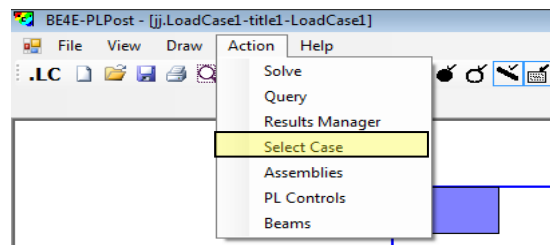


Action | Paths Manager



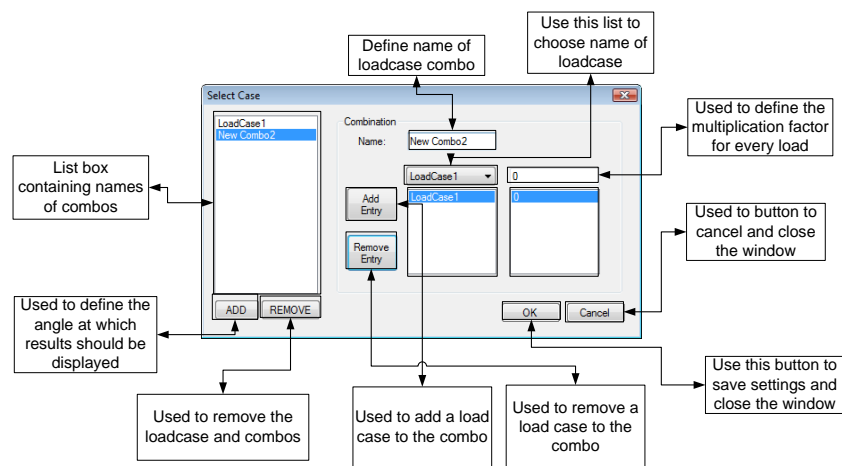
Action | Select Case

This command is used to add, modify or remove load cases and combos that are required to be solved and displayed by PLPOST.



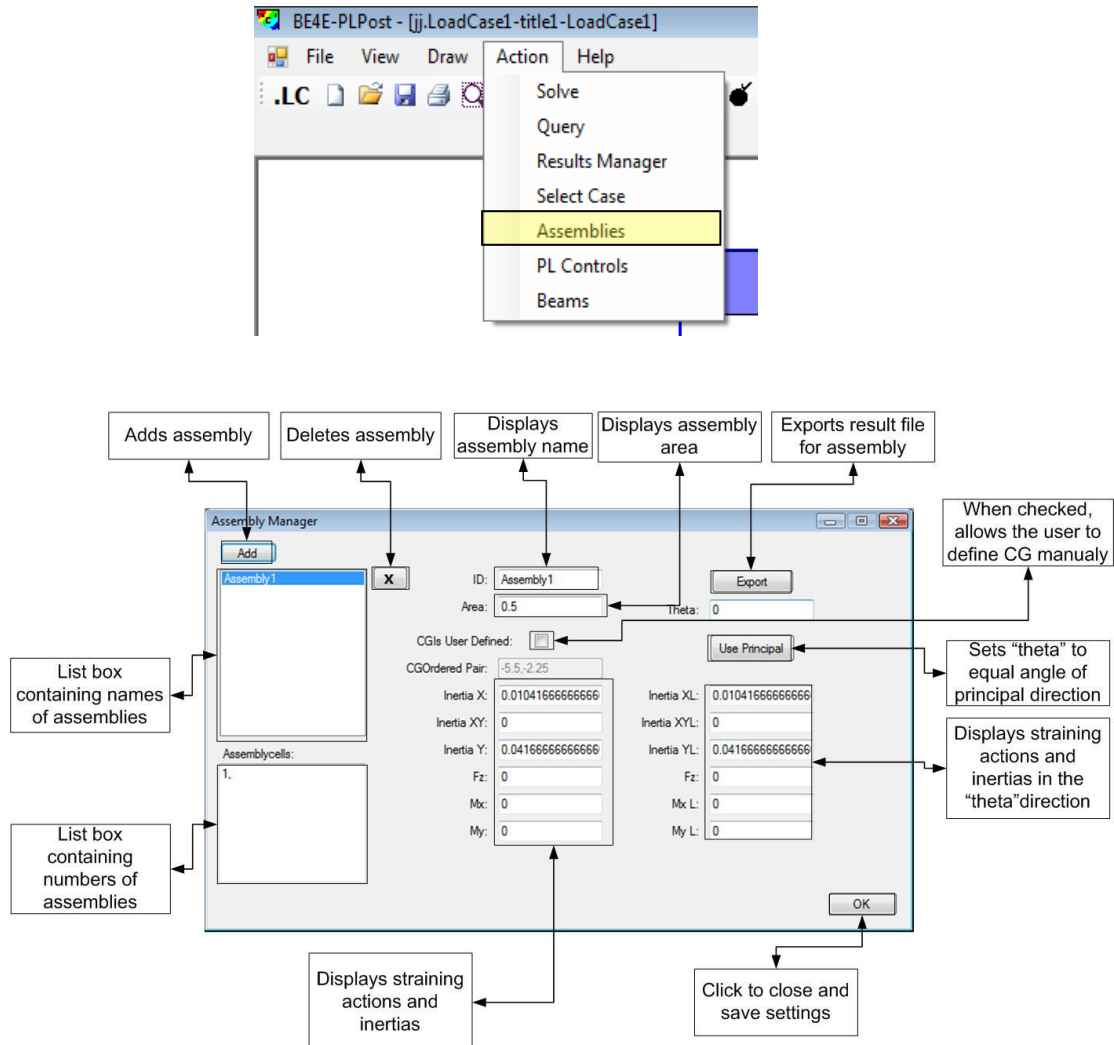
Defining load combinations:

Load combos can be defined from this combo.



Action | Assemblies

This command is used to show the cell properties. In order to show assembly results, type the cell number in the lower left box, then click add. The assembly results can be read at the normal X and Y directions or at any direction. The results at principal directions can be shown using the command “use principal”. The results can be exported to a file with a format that can be opened using any spreadsheet software.

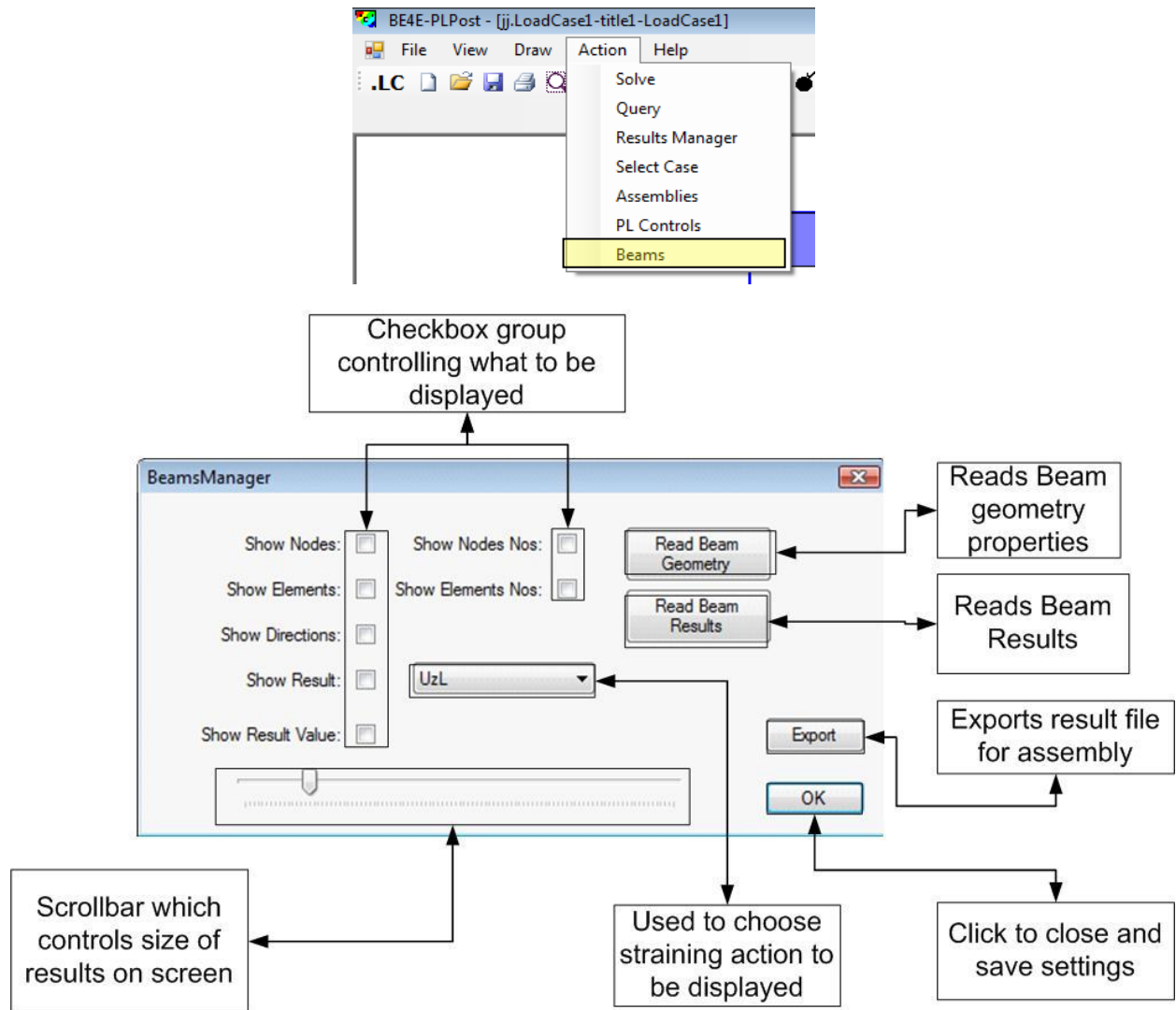


Action | PL controls

Refer to PLCoreMan manual.

Action | Beams

This command is used to display and edit beam results. The produced dialogue is used to show beam nodes, directions, and type of stress component that should be displayed on the beam.



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