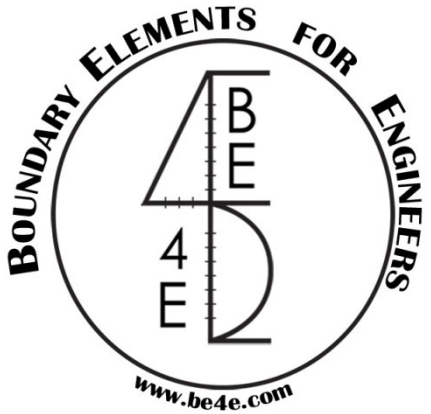
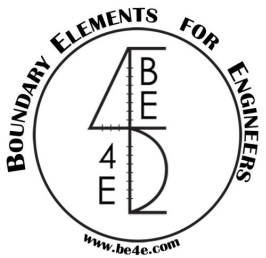


EHSPAK

The Elastic Half Space

The Advanced Single-Floor (Foundation) Package

Simple example for Raft on Elastic half space using the PLPAK-EHSPAK

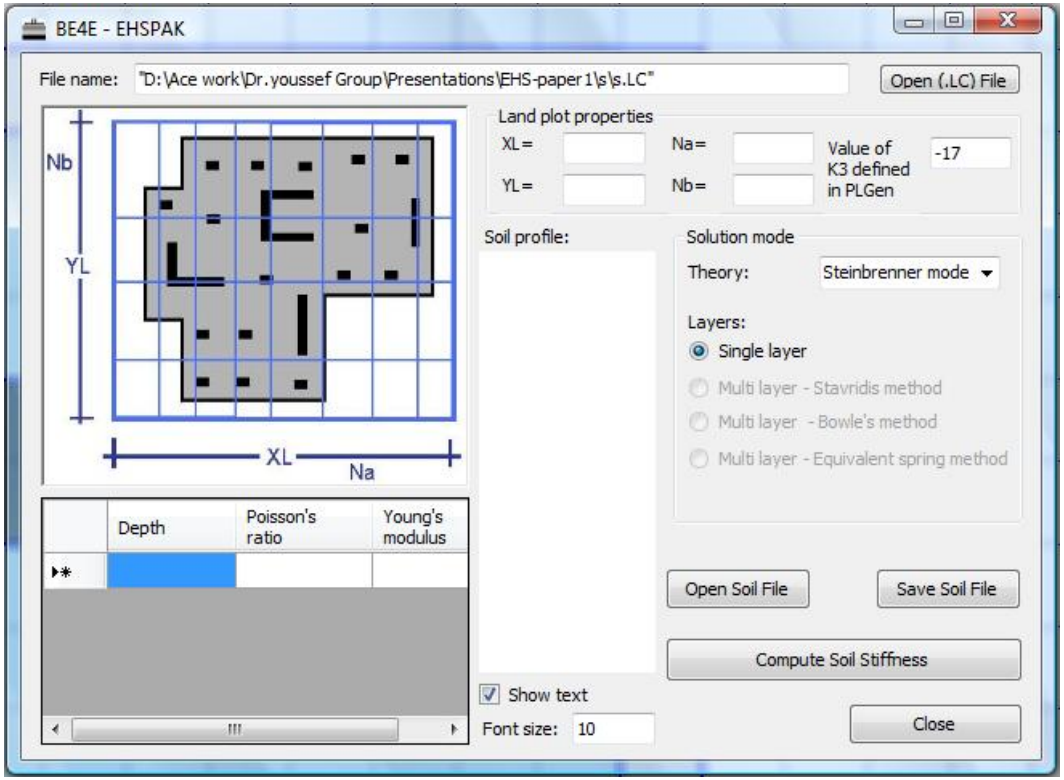


Disclaimer

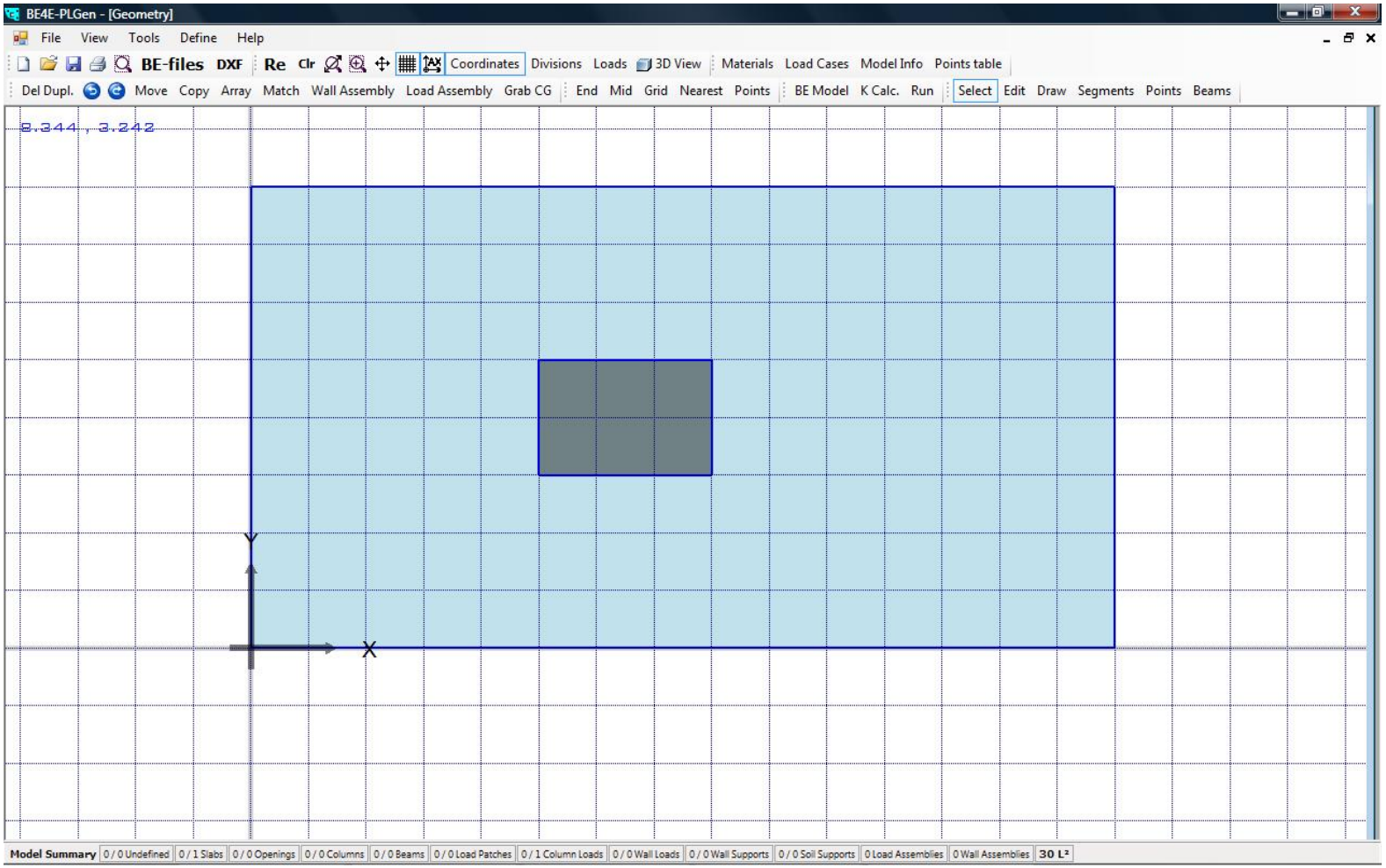
Considerable time, effort and expense have gone into the development and documentation of the PLPAK™ software. The PLPAK™ software has been thoroughly tested and used. The PLPAK™ software should be used by engineers with good understanding of concrete behavior, pre-stressing and structural mechanics. The user accepts and understands that no warranty is expressed or implied by the developers or the distributors on the accuracy or the reliability of the PLPAK™ software. The user must explicitly understand the assumptions of the PLPAK™ software and must independently verify the results produced by the PLPAK™ software.

Copyright

The EHSPAK is an add-in tool to the PLPAK that allows simulation of soil underneath rafts as elastic half space. The EHSPAK is described using simple example problem.



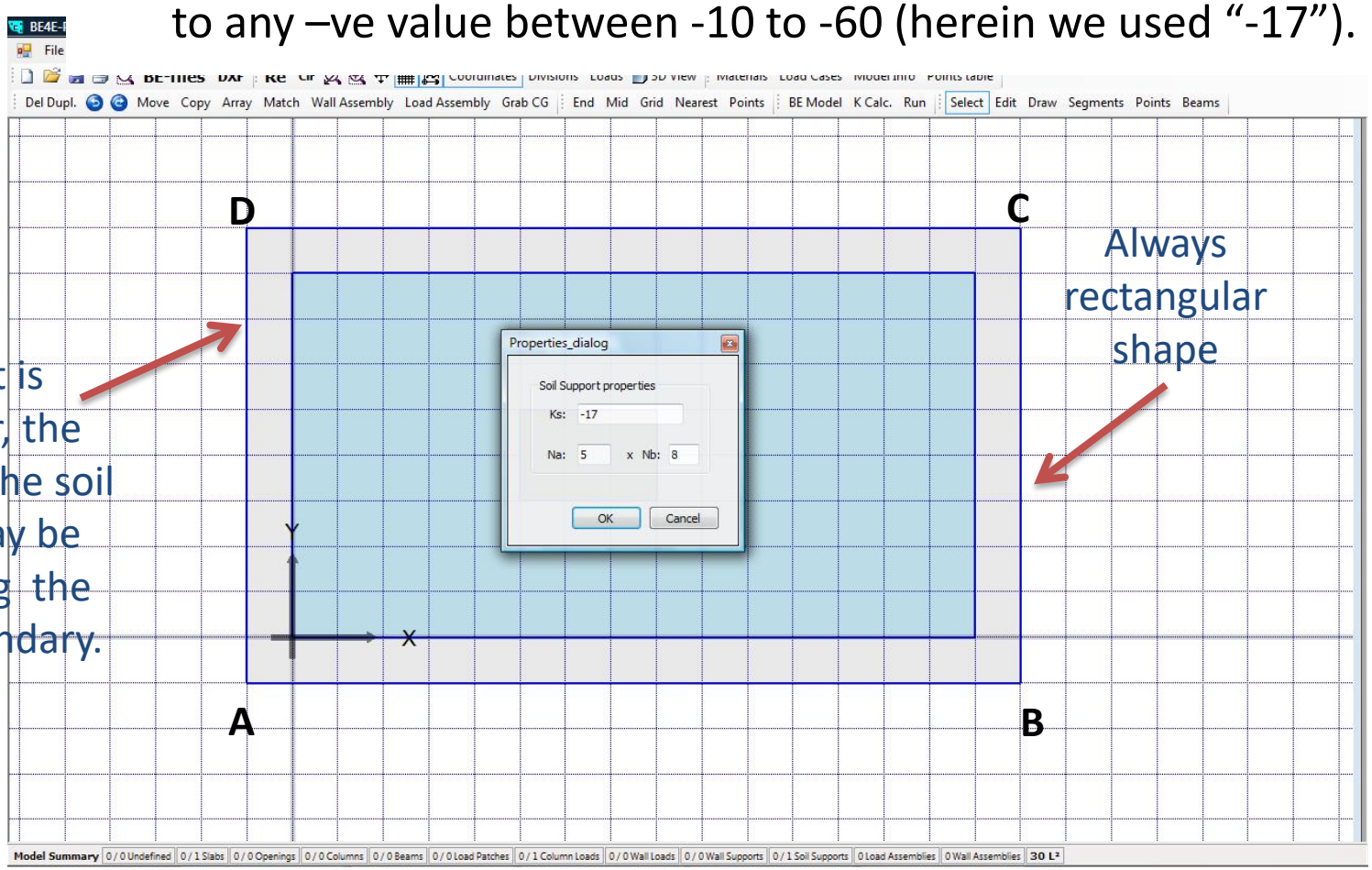
Our problem is 7.5X4 m raft with one centered column on two layered elastic half space. The first step is to model the raft on the PLGen as shown below.



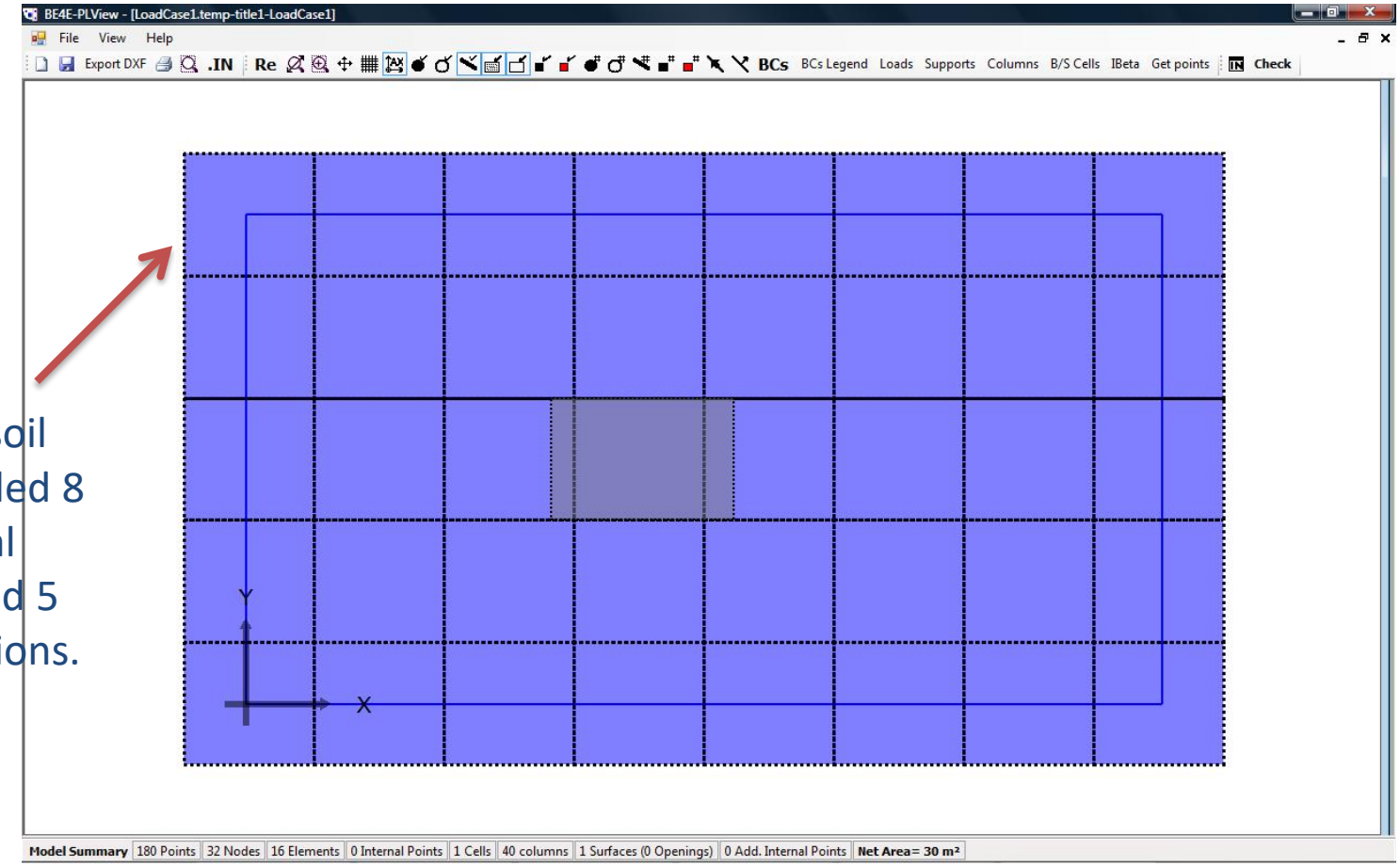
The second step is to draw a soil support around the raft; it should:

1) Contain all the raft
2) Be “rectangle” (not any other shape) in shape
3) Be drawn as follows: from point A➔B ➔C ➔ to point D
4) Be divided into any number of cells and Ks should be assigned to any –ve value between -10 to -60 (herein we used “-17”).

If the raft is rectangular, the boarders of the soil support may be drawn along the the raft boundary.

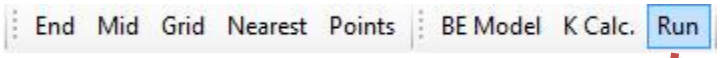


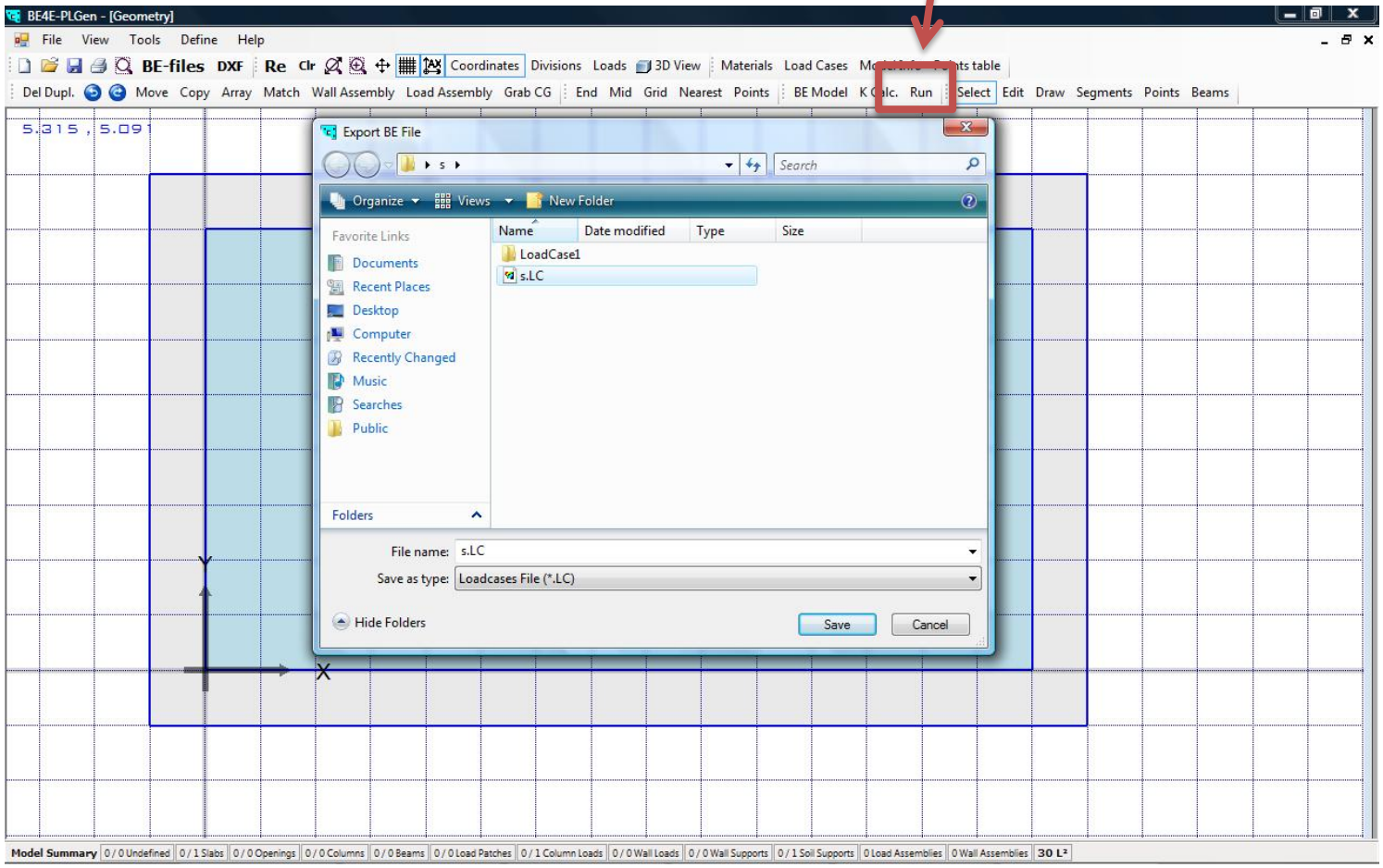
The BE model in the PLView should look like the below figure: (please note the soil cells in “blue” color; as still the PLPAK recognizes the soil as individual (or not connected) supports. This similar to the case of the Winkler spring model).



Note: the soil support divided 8 horizontal divisions and 5 vertical divisions.

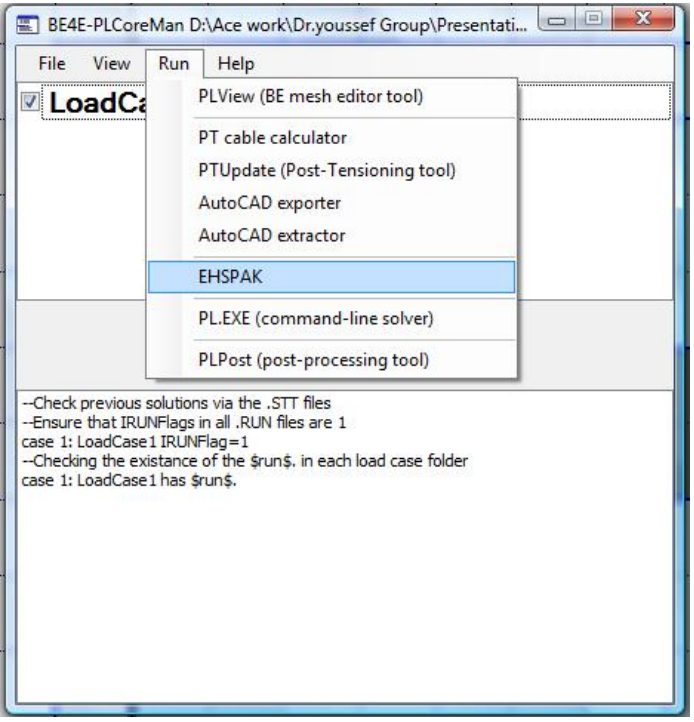
The 3rd step is: from the PLGen, run the model and save the associate (.LC) file.

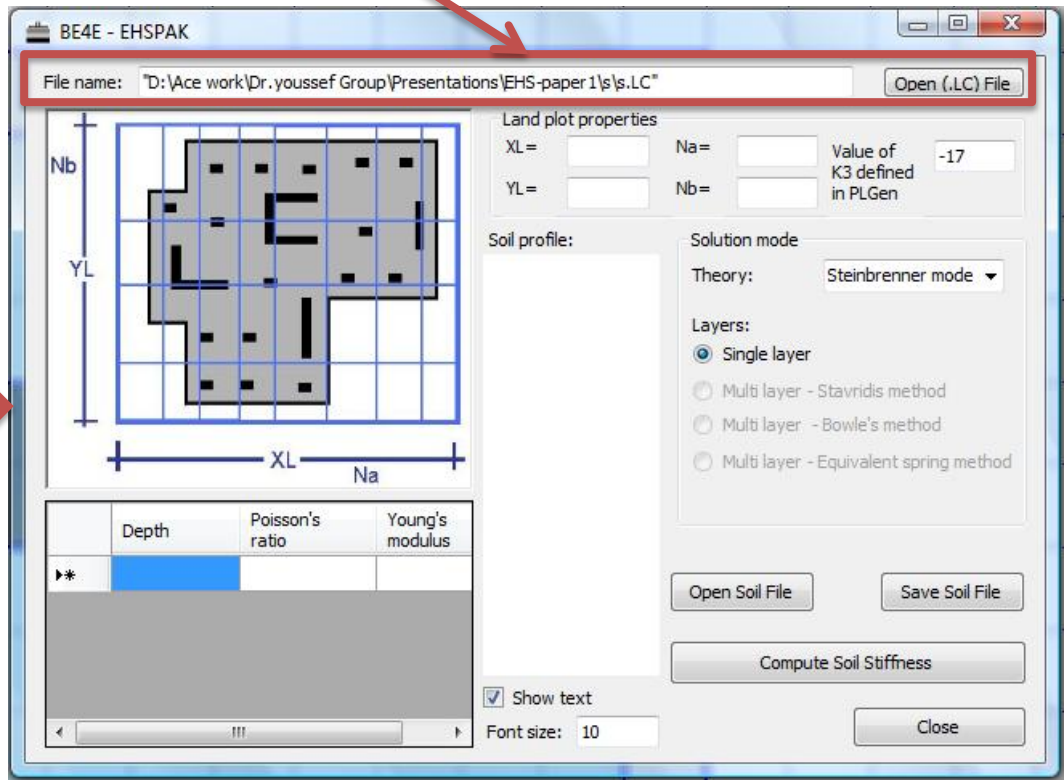




The 4th step is: From the PLCoreMan, click EHSPAK from the "Run" menu. This will open the EHSPAK.

The (.LC) file is loaded automatically in the EHSPAK



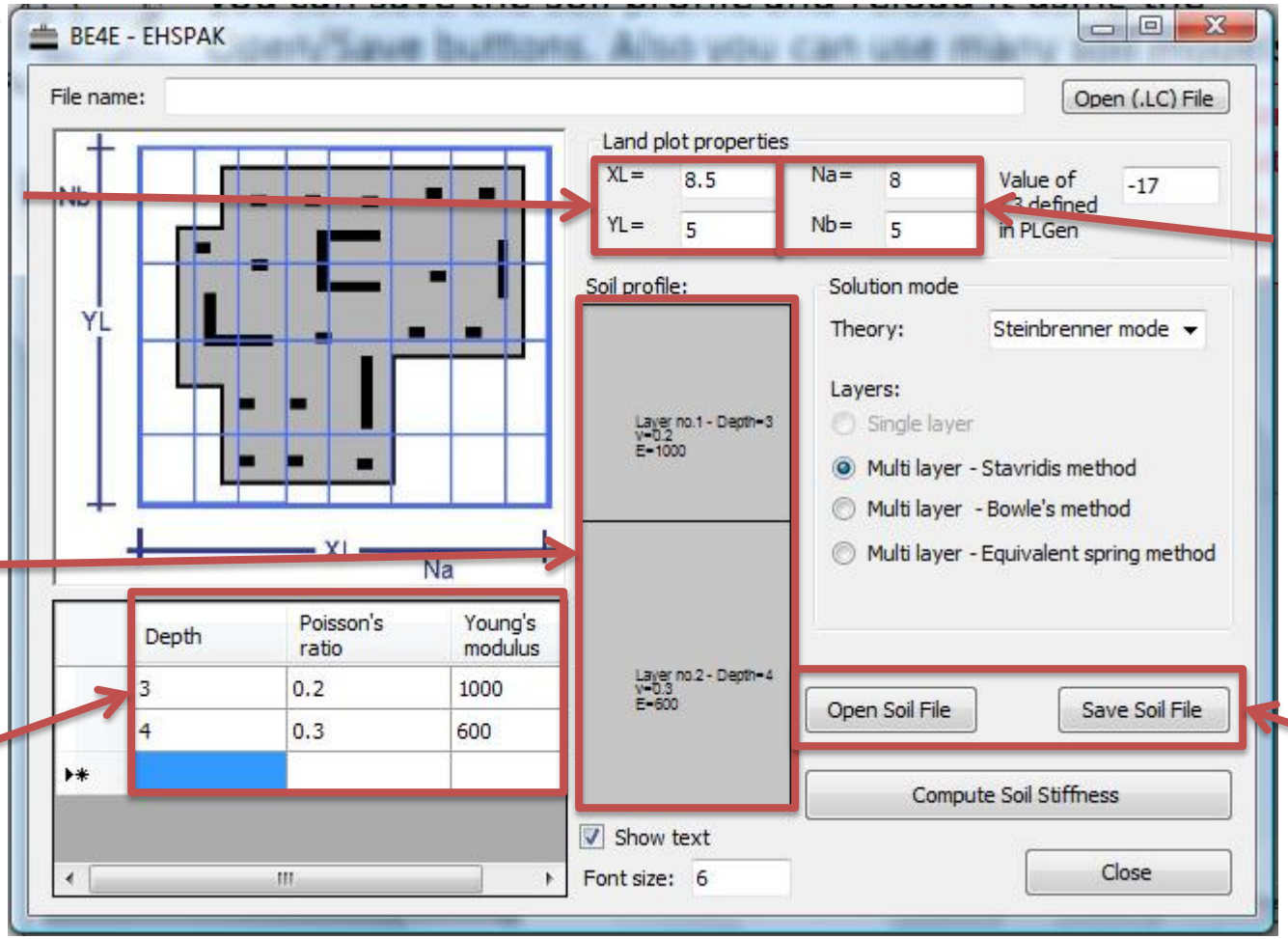


The 5th step is: Define your soil model. Please note that you can save the soil profile and reload it using the Open/Save buttons. Also you can use many soil models as shown below.

The rectangular dimensions of the soil support, as defined previously in the PLGen.

The soil profile

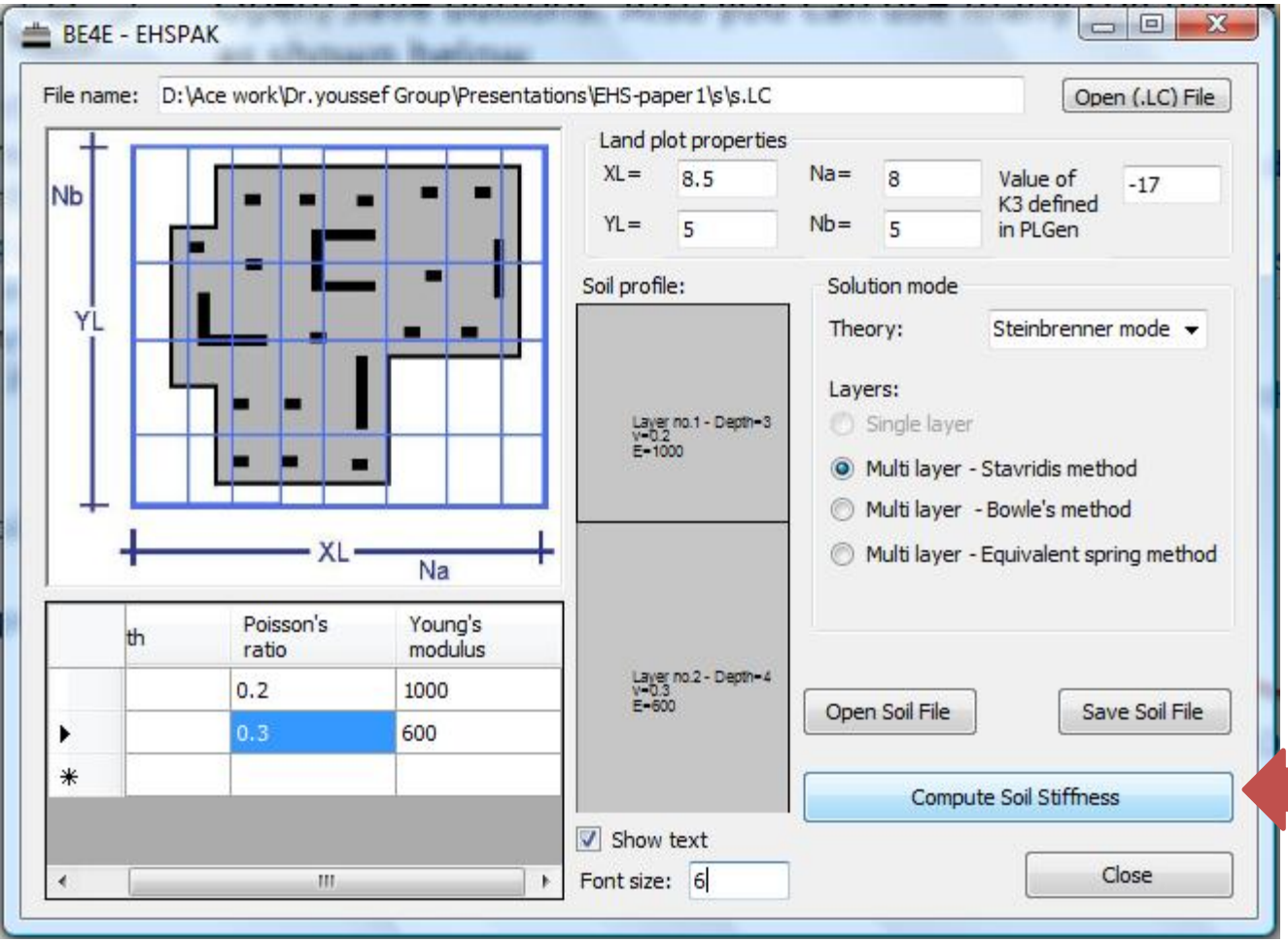
The associate soil properties

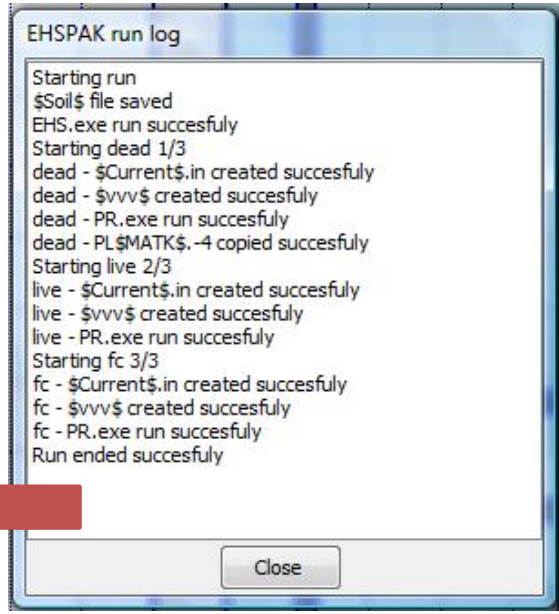


HL/VL divisions of the soil support defined previously in the PLGen.

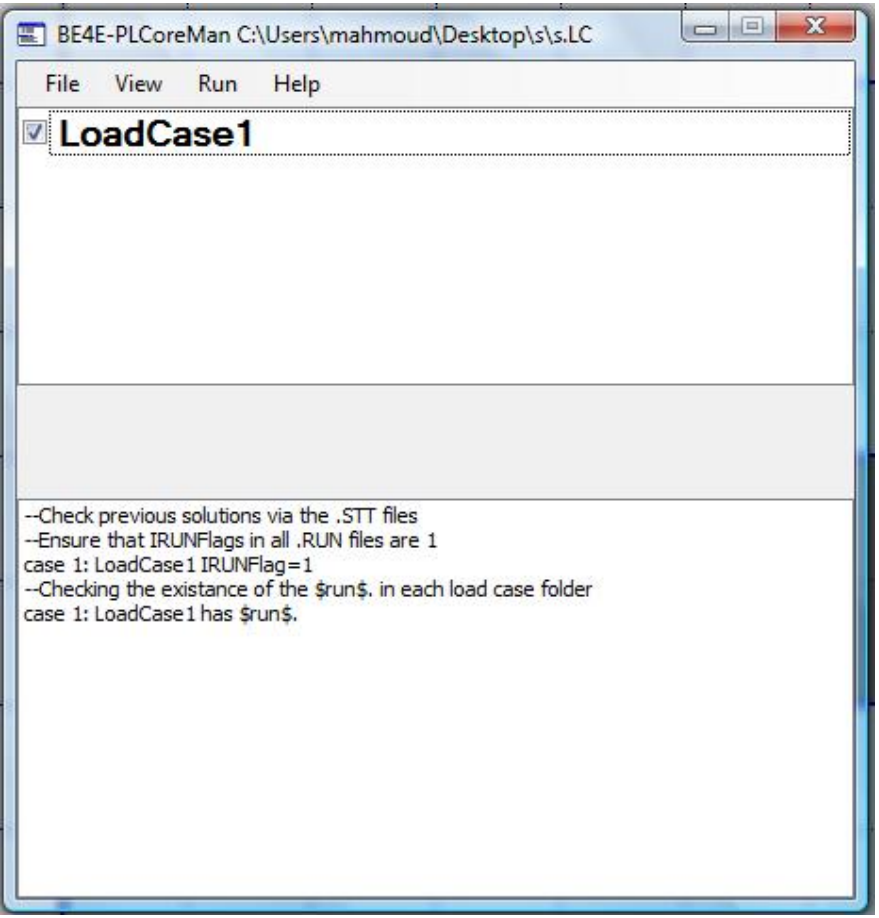
Open/Save soil file buttons

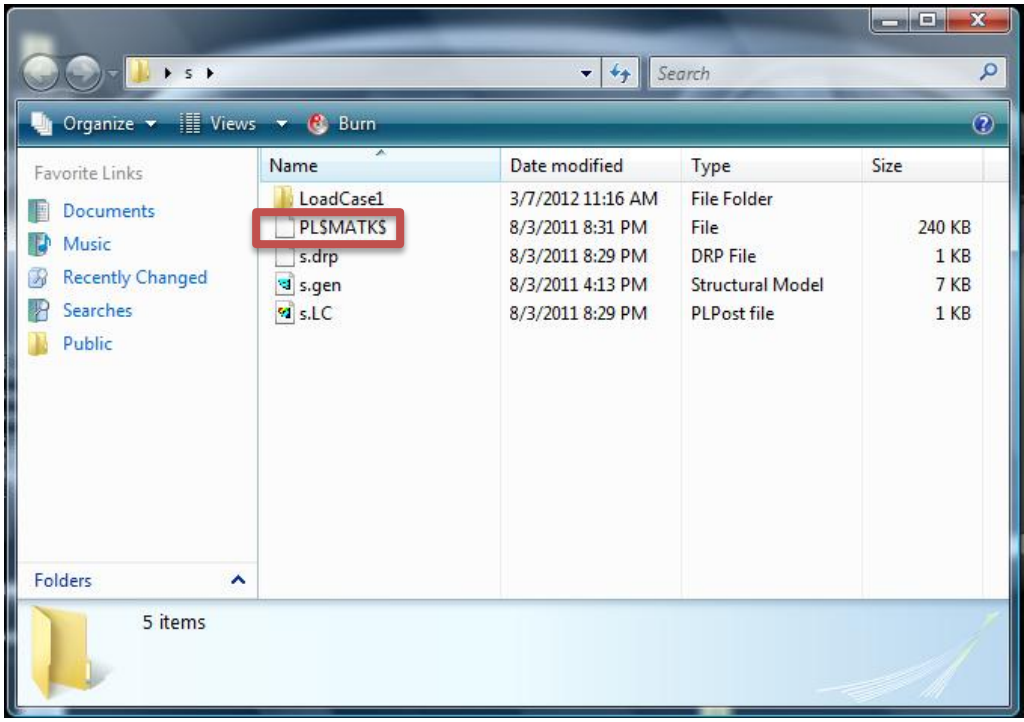
The 6th step is: click on the “Compute Soil Stiffness” button to get the associate soil stiffness matrix. A log screen will appear and the statement: “Run ended successfully” will appear when finishes. Then close the EHSPAK.



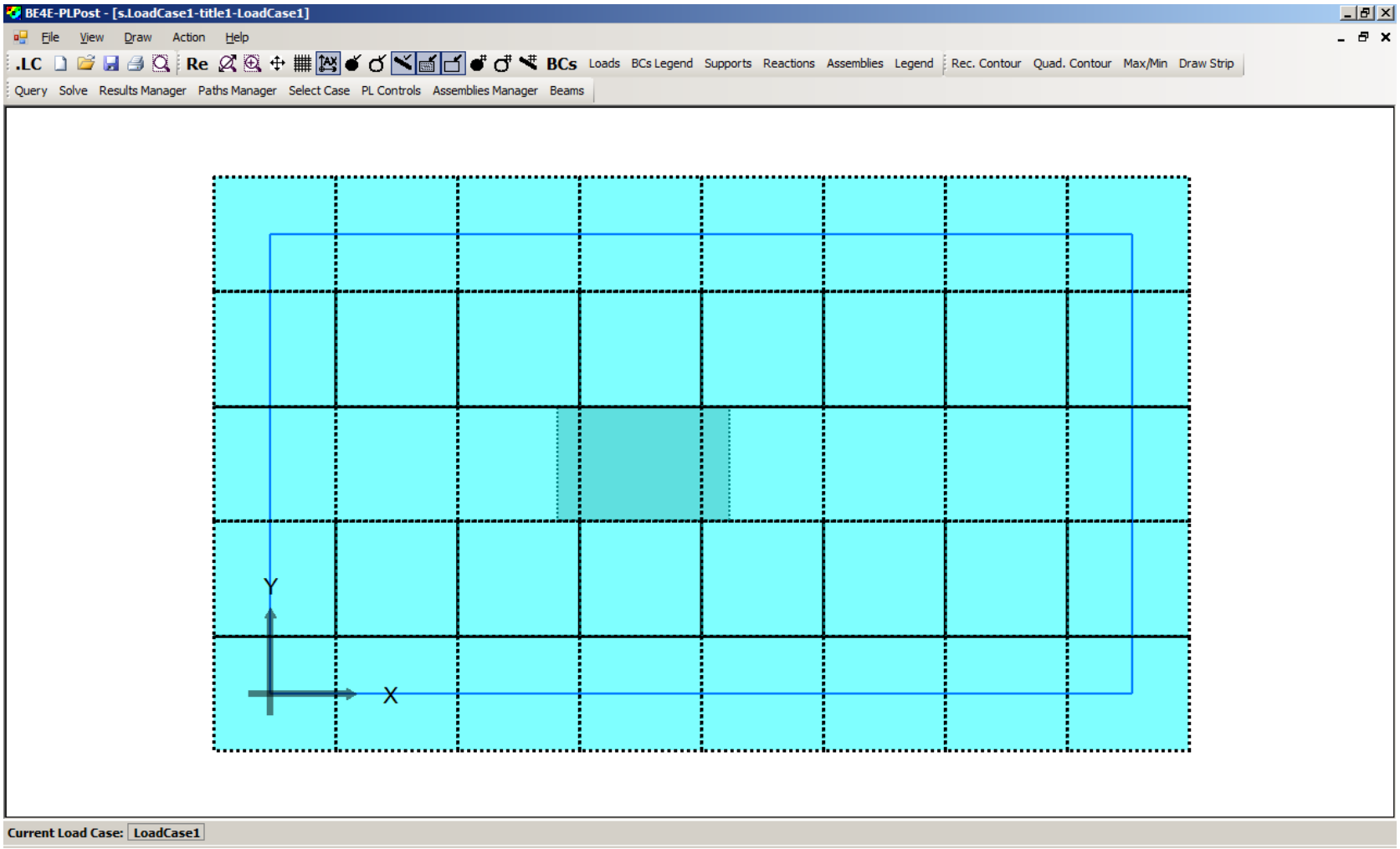


The final step is return to the PLCoreMan and select the “PL.EXE” from the run menu to sun your model as usual. Now your file is ready to be treated as any problem.
Please note that in your problem folder the stiffness matrix of the elastic half space in already generated in the file “PLSMATK$.

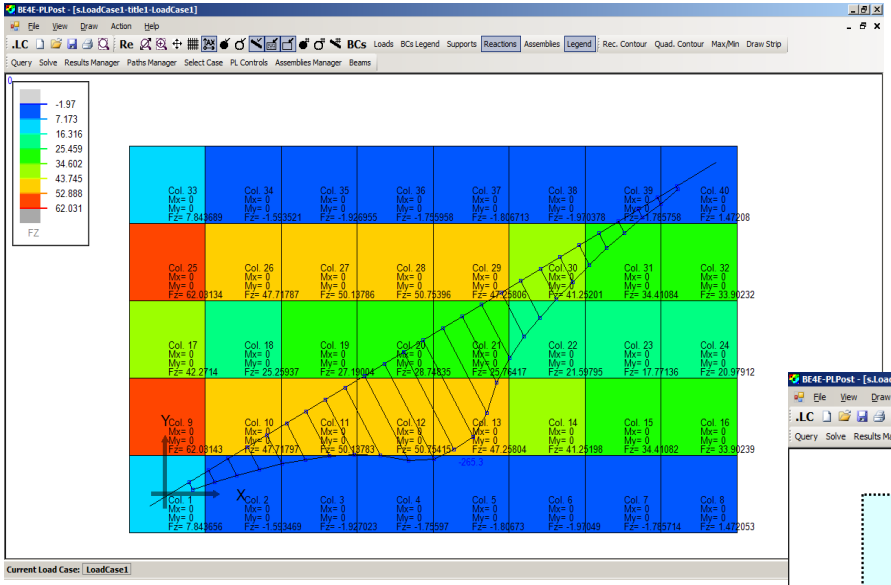


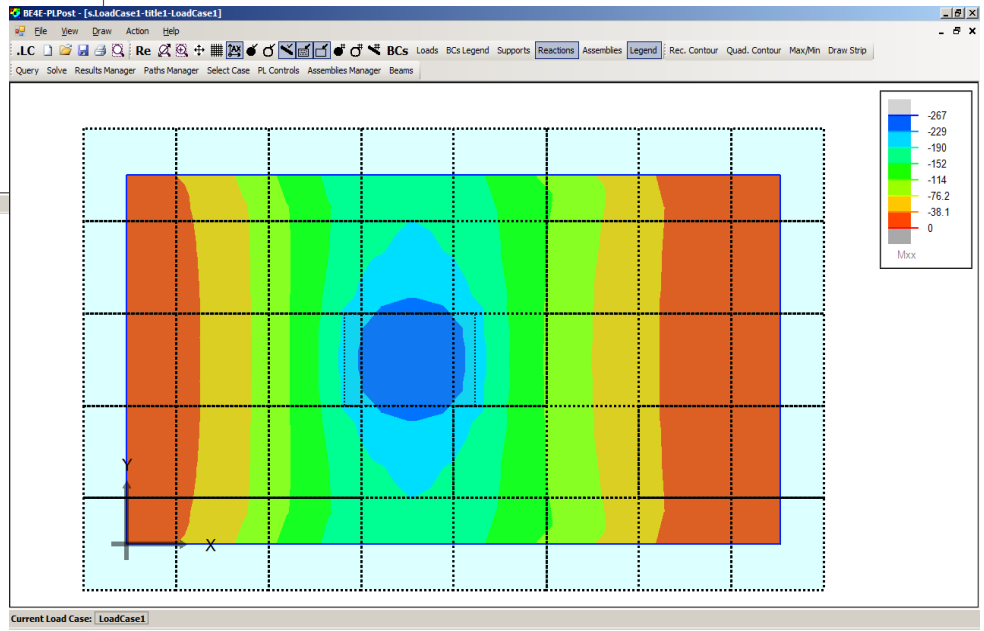


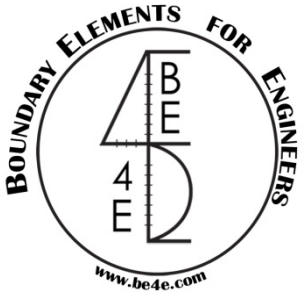
Tread the solution normally by continuing to the post-processing stage by running the PLPost. Once you loaded the PLPost you will see that the soil supports appeared stiffness cells (i.e. in “cyan” color).



See your results in normal way.







For additional help please visit:
https://www.plpak.com

or send e-mail to:
plpak@be4e.com