

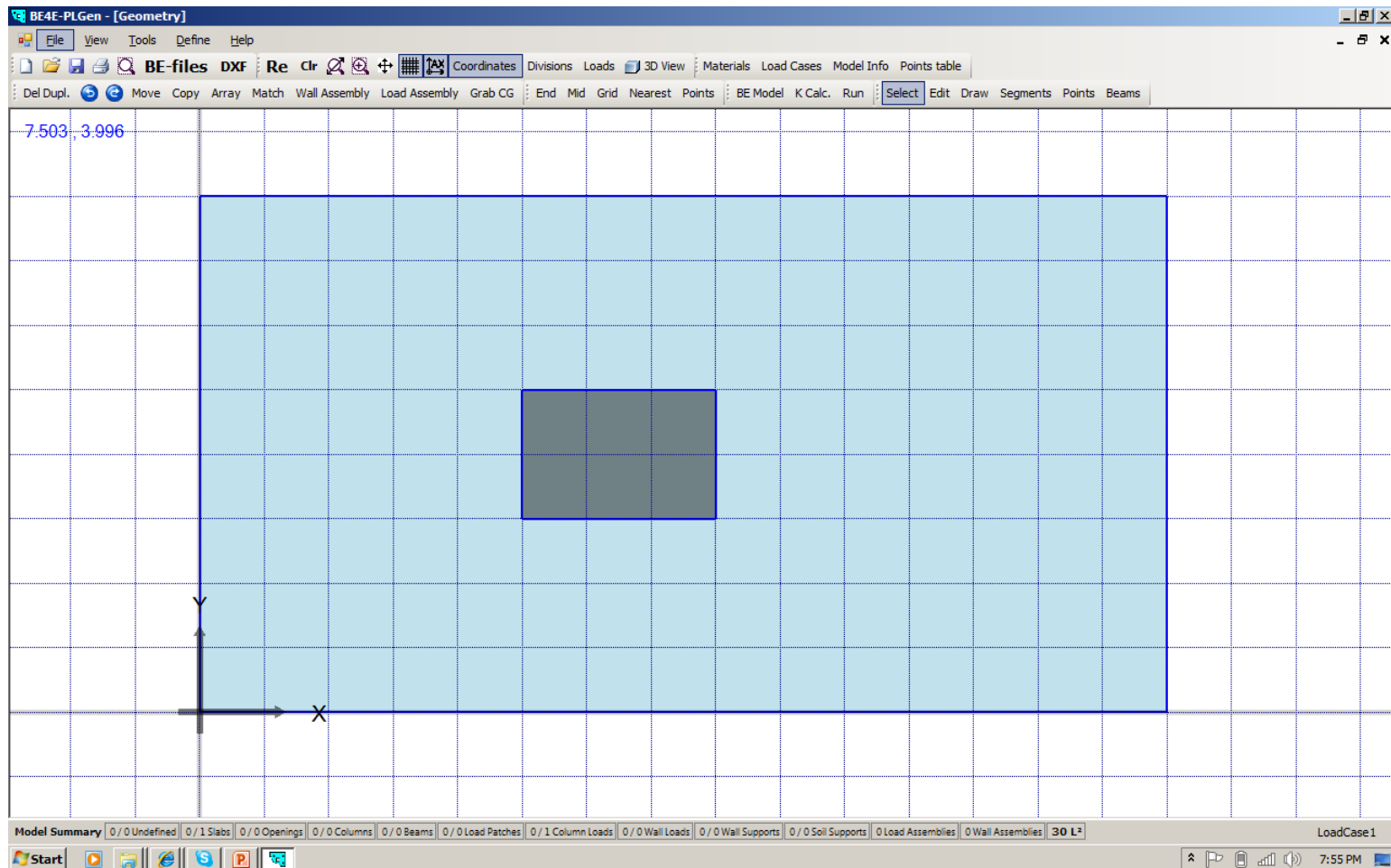
PLPAK applications

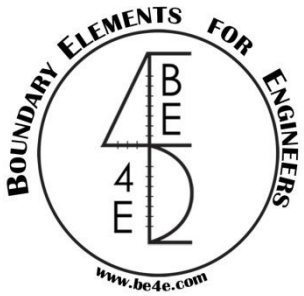
Examples: Raft on Elastic half space using the
PLPAK-EHSPAK...

Direct solution, no iterations between two programs



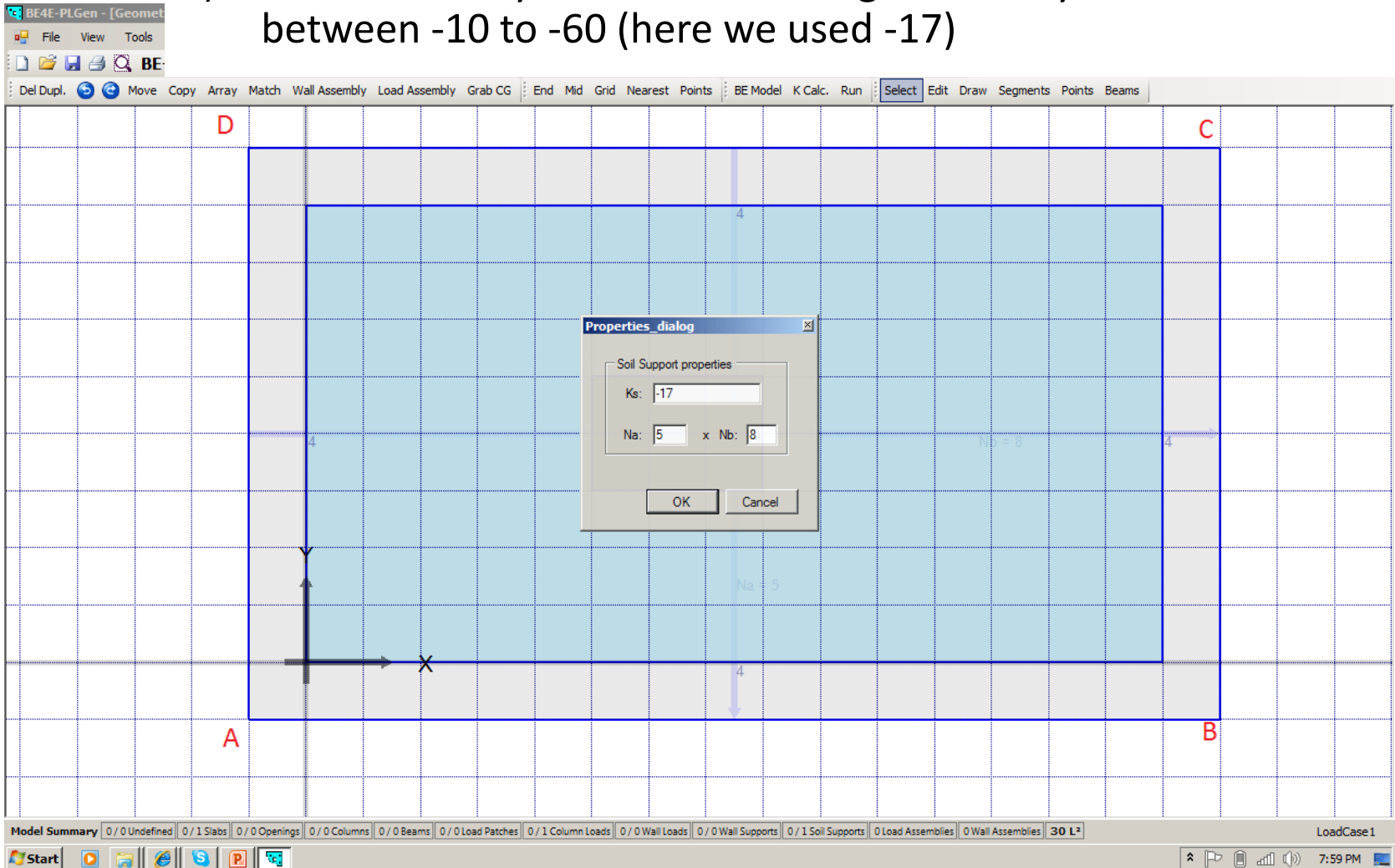
Our problem is 7.5X4 m raft with one centered column on two layered elastic half space. The first step is to model the raft on the PLGen as shown below.

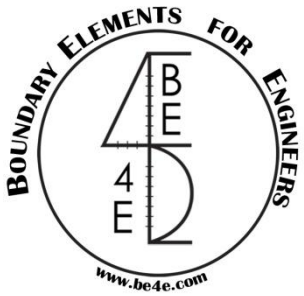




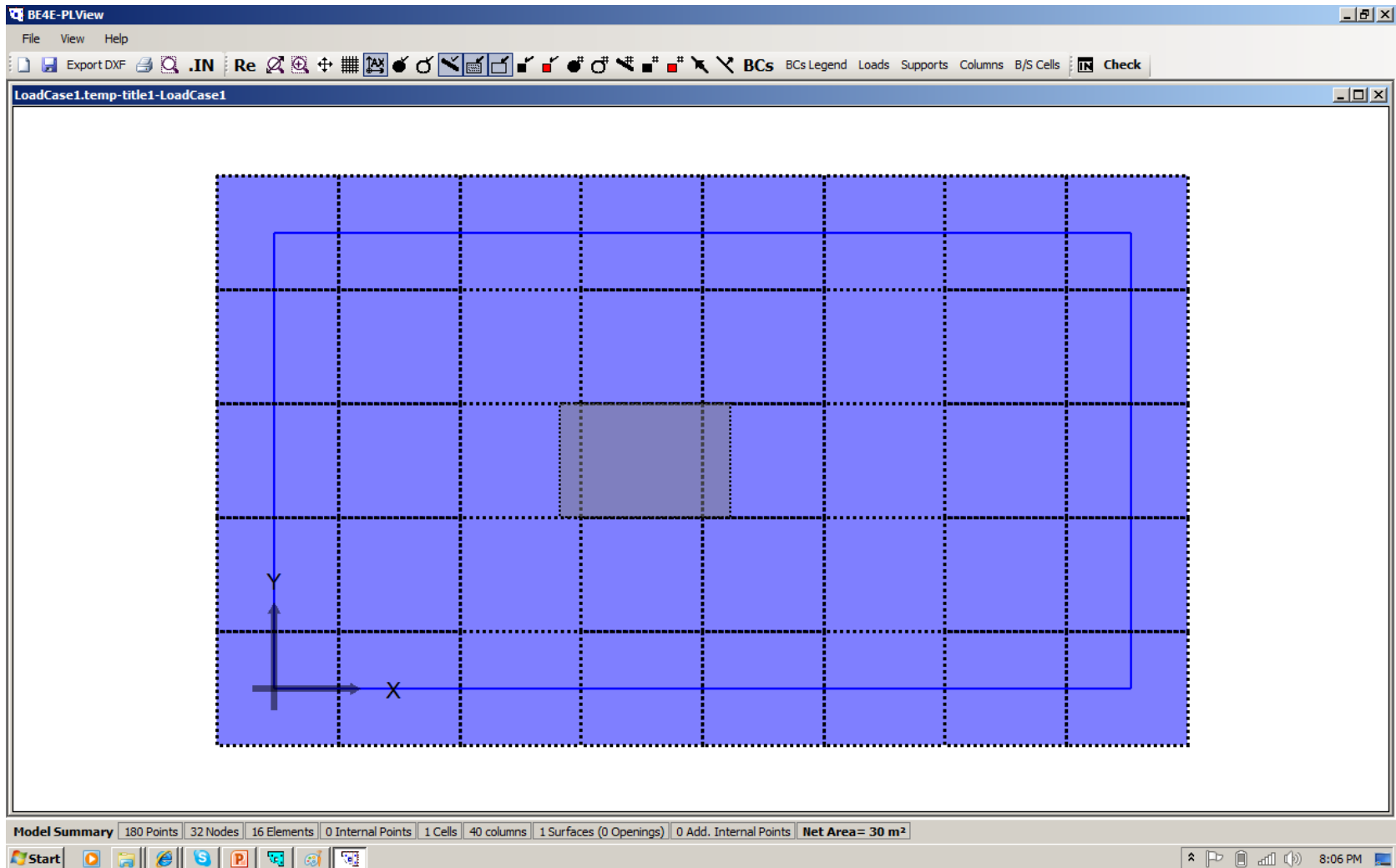
The second step is to draw a soil support around the raft; it should:

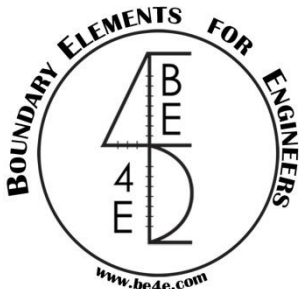
- 1) Contain all the raft
- 2) Rectangle
- 3) Start drawing from point A → B → C → D
- 4) Divide it to any numbers and assign Ks to any -ve value between -10 to -60 (here we used -17)



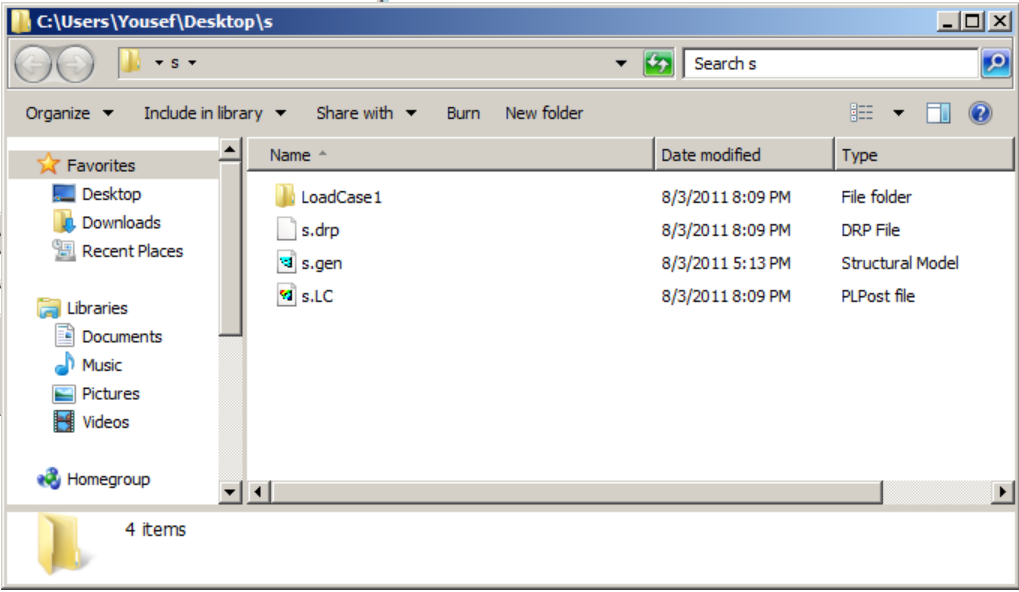
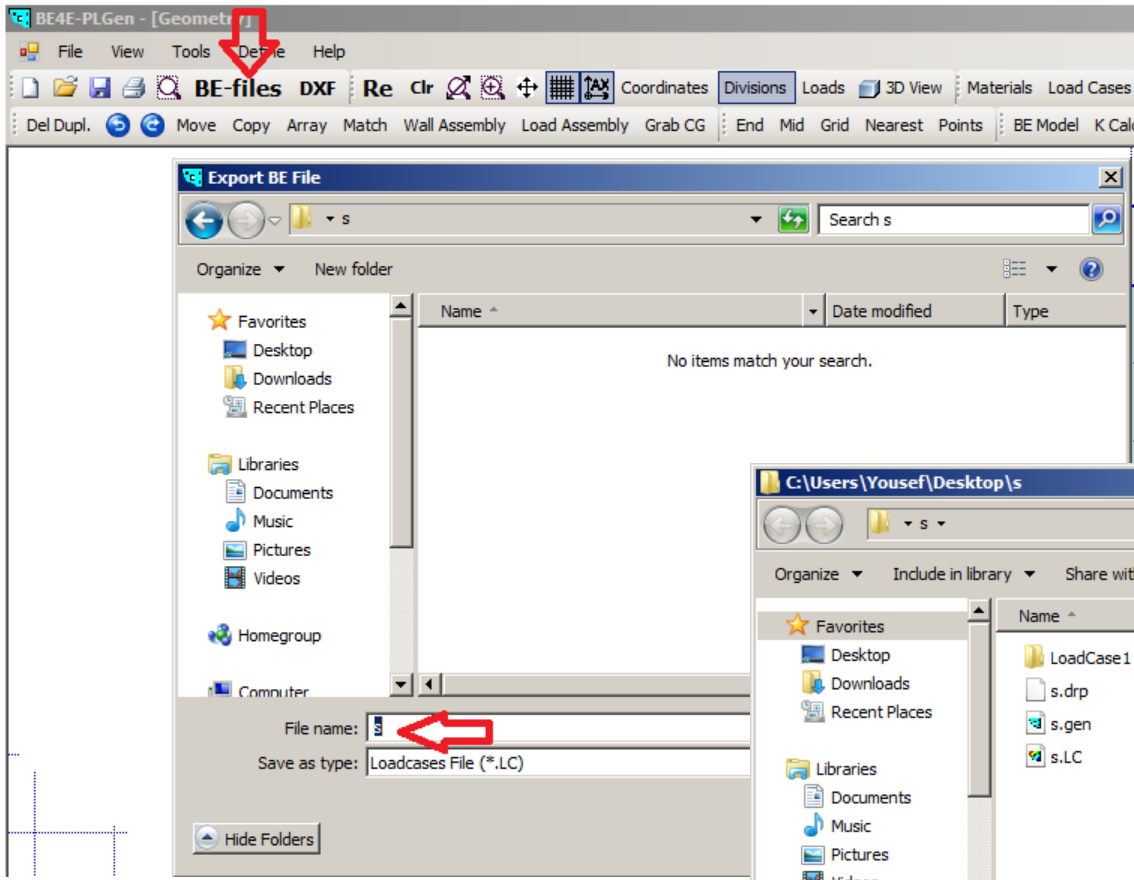


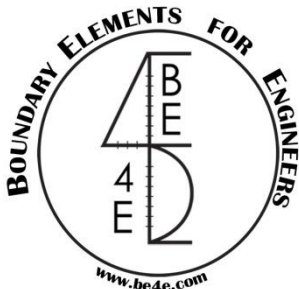
The BE model in the PLView should look like:
(please note the blue color; as still the PLPAK recognize the soil as individual not connected supports as the case of Winkler model)





The 3rd step is: from the PLGen generate the BE-files. Save them in any folder, we will save them in folder called “s” on the desktop and we will call the problem by “s.LC” as demonstrated below:





The 4th step is: to run the EHSPAK as shown:

BE4E - EHSPAK

Land plot properties

XL= Na=

YL= Nb=

Value of K3 ===> defined in PLGen

Solution mode

Theory:

Layers:

- Single layer
- Multi layer - Stavridis method
- Multi layer - Bowle's method
- Multi layer - Equivalent spring method

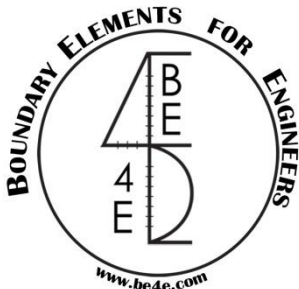
	Depth	Poisson's ratio	Young's modulus
▶*			

Open (*.LC) file

Run Analysis

Show text Font size:

Open Save Close



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.

These numbers should be matched with the ones in the PLGen model

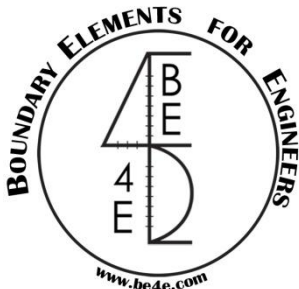
The screenshot shows the BE4E - EHSPAK software interface. On the left, a grid-based land plot is displayed with dimensions XL and Na for the horizontal axis, and YL and Nb for the vertical axis. Below the plot is a table with the following data:

Depth	Poisson's ratio	Young's modulus
3	0.2	1000
4	0.3	600
▶*		

In the center, the 'Land plot properties' section is highlighted with a red box and contains the following values:

- XL = 8.5, Na = 8
- YL = 5, Nb = 5
- Value of K3 ==> defined in PLGen: -17

The 'Solution mode' section shows the 'Theory' set to 'Steinbrenner model' and the 'Layers' section with 'Multi layer - Stavridis method' selected. At the bottom, there are buttons for 'Open (*.LC) file', 'Run Analysis', 'Open', 'Save', and 'Close'. A 'Show text' checkbox is checked, and the 'Font size' is set to 10.



The 6th step is: once you are happy of the soil model, select the Open (*.LC) file button and load the “s.LC” of you model

	Depth	Poisson's ratio	Young's modulus
	3	0.2	1000
	4	0.3	600
▶*			

Land plot properties

XL= 8.5 Na= 8
YL= 5 Nb= 5
Value of K3 ==> defined in PLGen -17

Solution mode

Theory: Steinbrenner model

Layers:

- Single layer
- Multi layer - Stavridis method
- Multi layer - Bowle's method
- Multi layer - Equivalent spring method

Open (*.LC) file

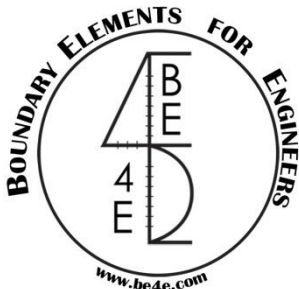
Run Analysis

Show text Font size: 10

Open Save Close

Layer no.1 - Depth=3
v=0.2
E=1000

Layer no.2 - Depth=4
v=0.3
E=600



The 7th step is: select Run Analysis button, and get the log screen that tells you that “Run ended successfully”

Land plot properties

XL= 8.5 Na= 8
YL= 5 Nb= 5
Value of K3 ===> defined in PLGen -17

Solution mode
Theory: Steinbrenner model

Layers:
 Single layer
 Multi layer - Stavridis method
 Multi layer - Bowle's method
 Multi layer - Equivalent spring method

Depth	Poisson's ratio	Young's modulus
3	0.2	1000
4	0.3	600
▶*		

Open (*.LC) file

Run Analysis

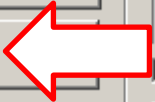
Show
Open

Layer no.1 - Depth=3
v=0.2
E=1000

EHSPAK run log

Starting run
\$Soil\$ file saved
EHS.exe run succesfully
Starting LoadCase1 1/1
LoadCase1 - \$Current\$.in created succesfully
LoadCase1 - \$vvv\$ created succesfully
LoadCase1 - PR.exe run succesfully
LoadCase1 - PL\$MATK\$.4 copied succesfully
Run ended succesfully

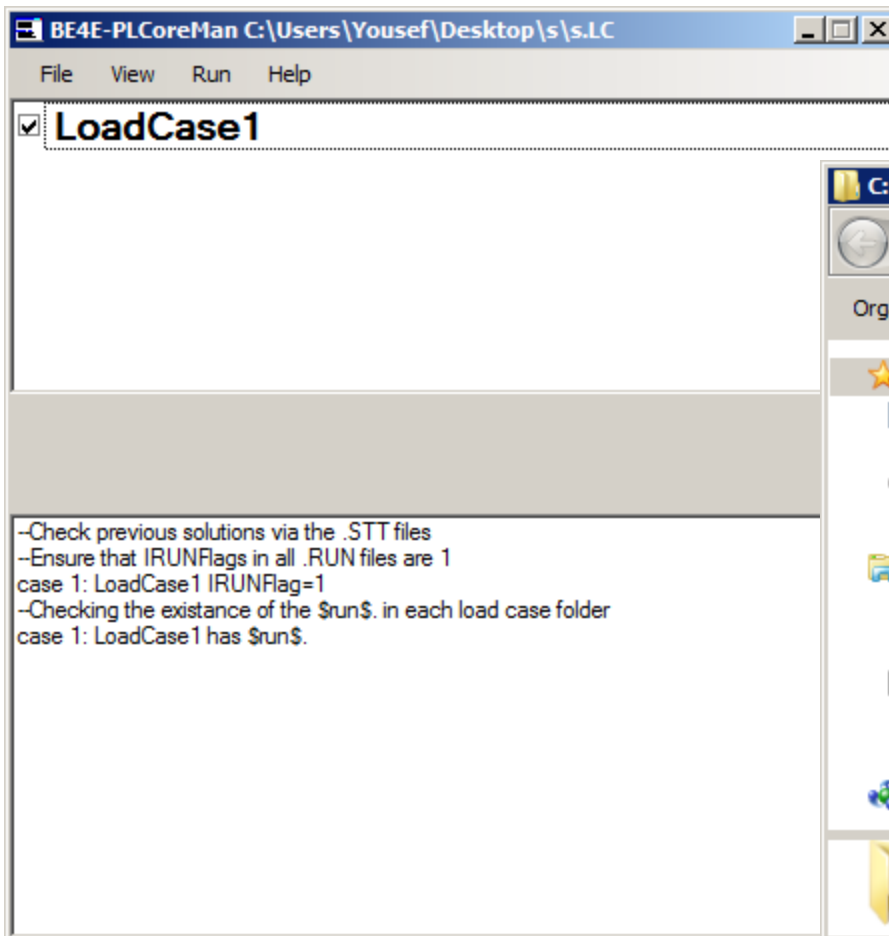
Close



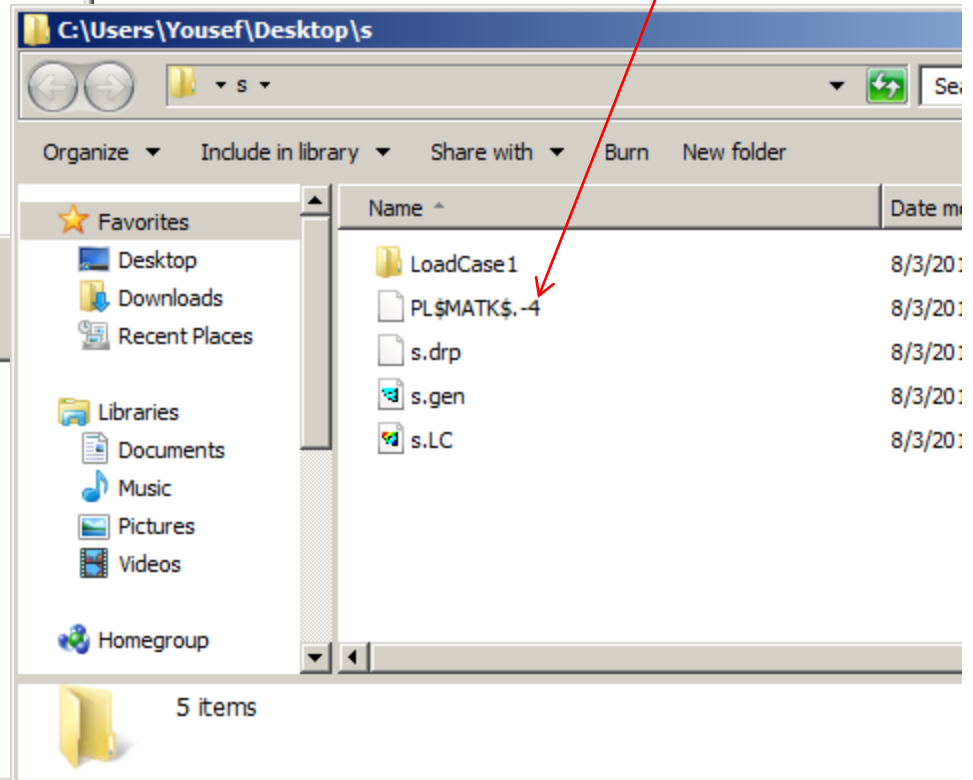


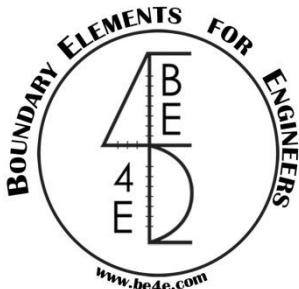
The final step is run the PLCoreMan and load the s.LC, your file is now ready to be treated as any problem solved using the PLPAK.

Now run your PL.EXE and see results on PLPost.

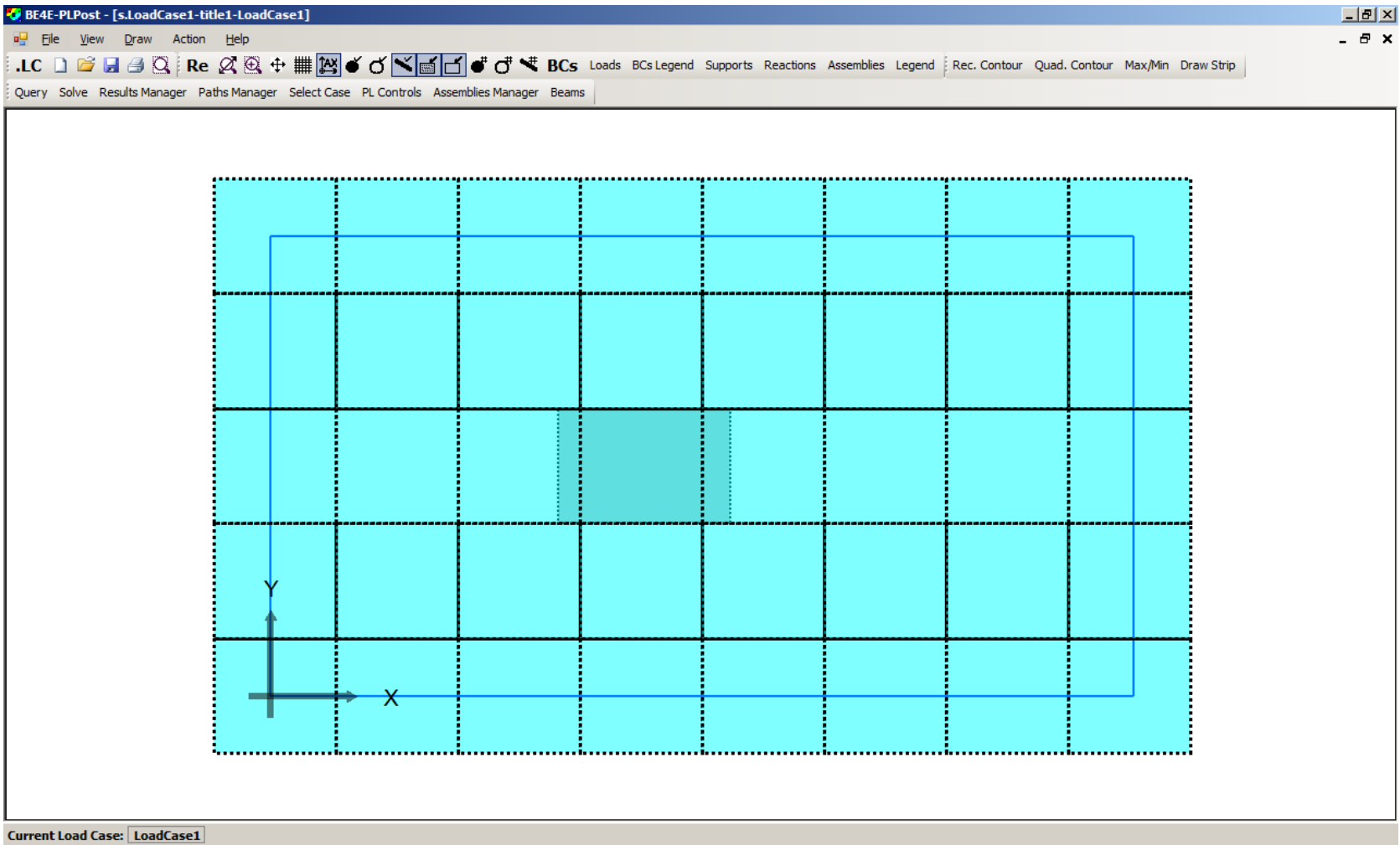


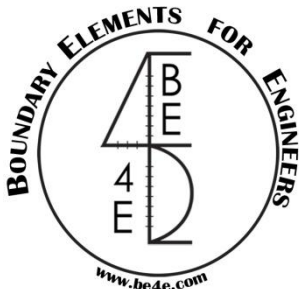
Please note: the following stiffness file is appeared



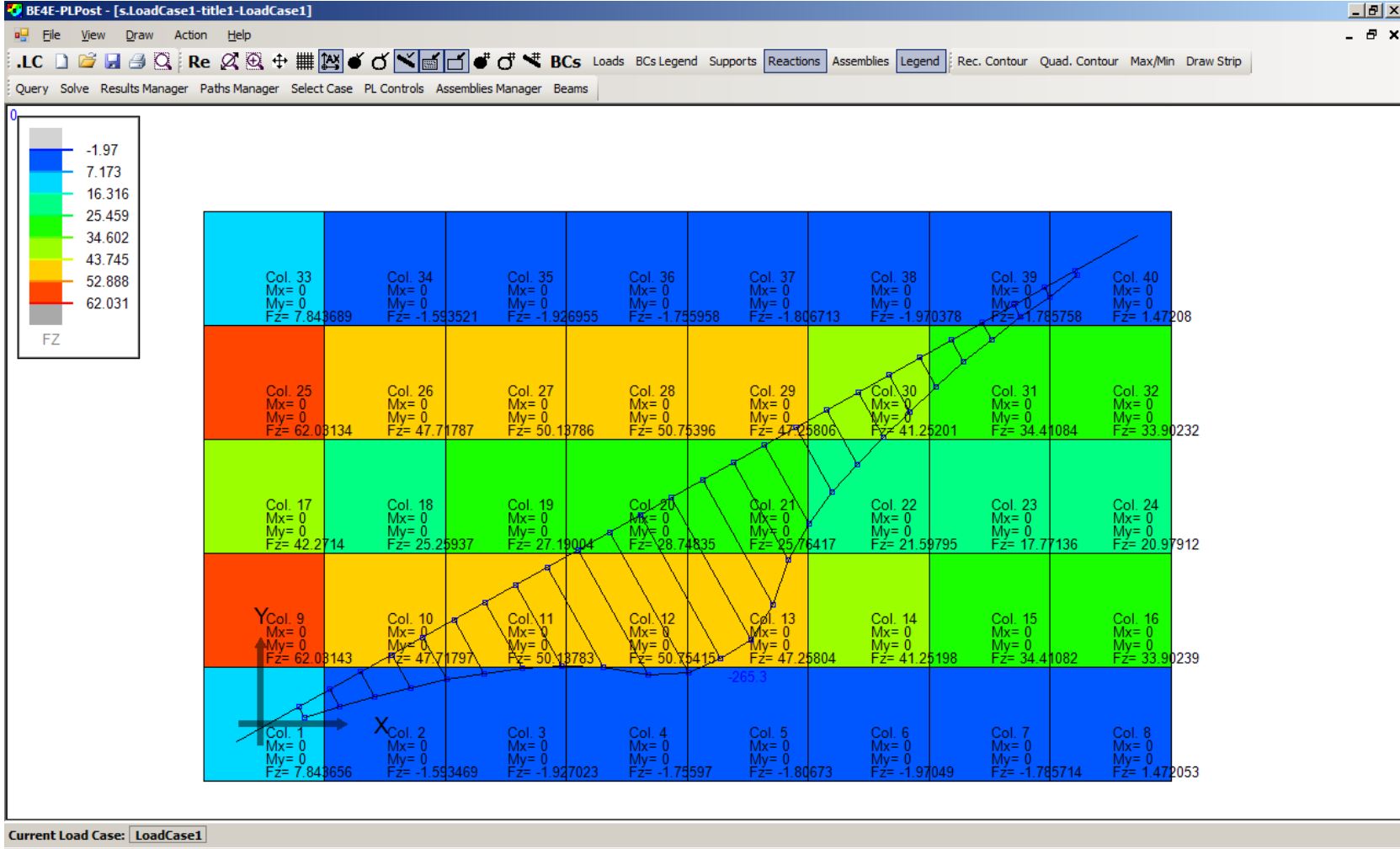


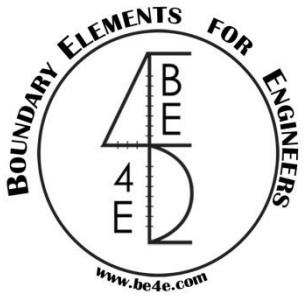
Once you loaded the PLPost you will see that the soil supports appear as beam (or stiffness) cells.



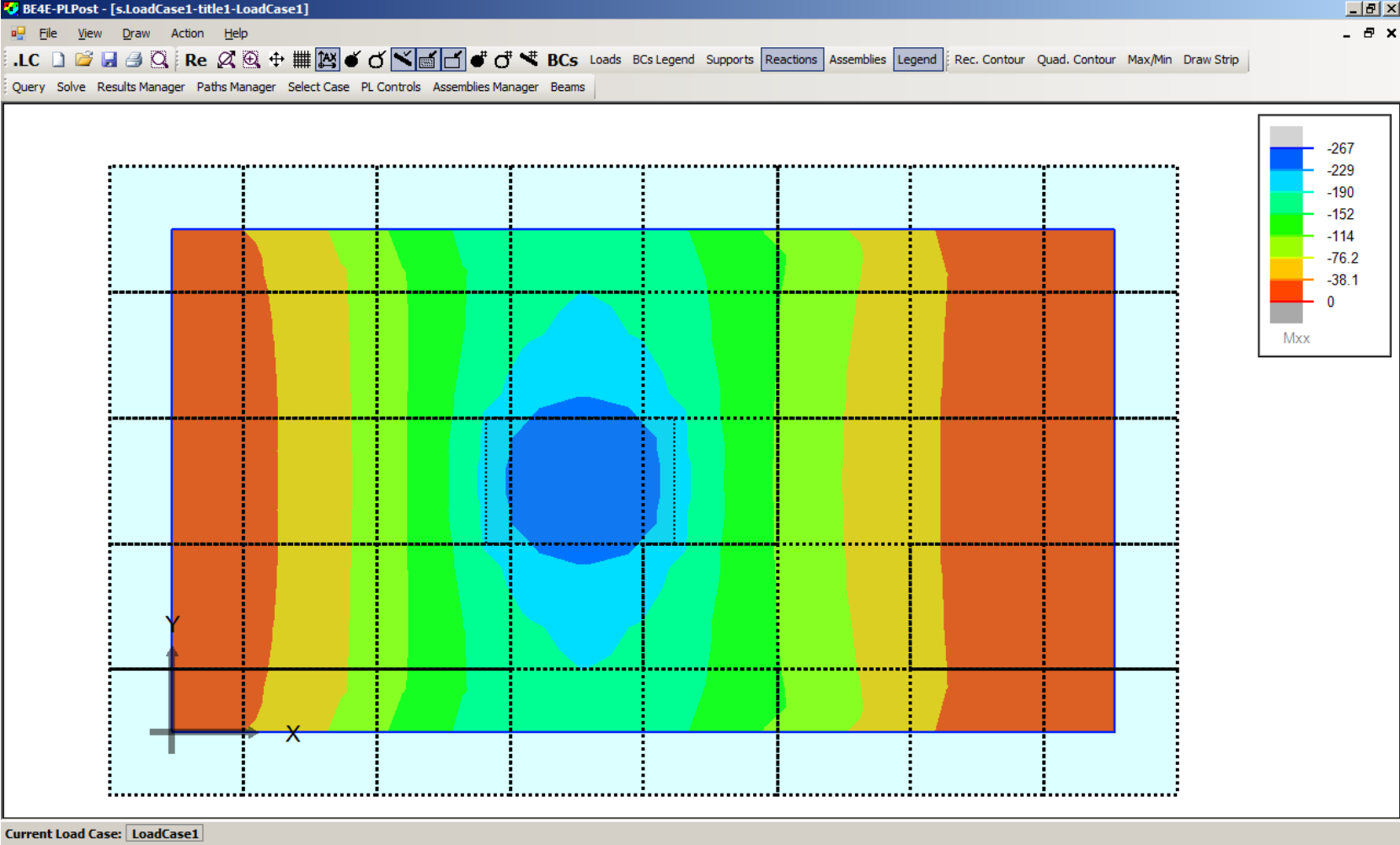


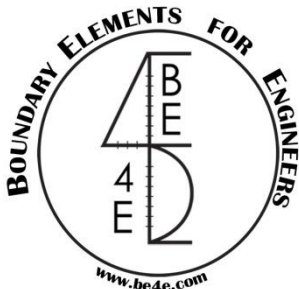
See your results in normal way.





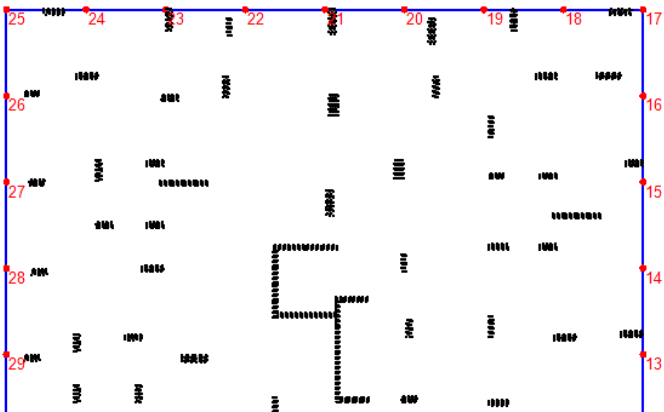
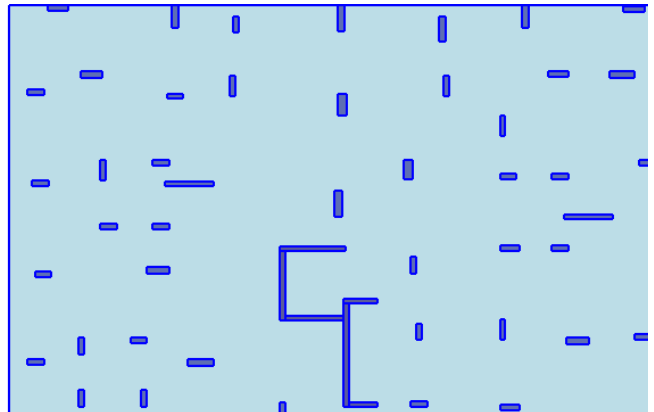
Or as contour lines





Using PLPAK – EHSPAK for practical raft in one step.

1-Create the analysis model using PLGen



2-Check the BE model

BE4E - EHSPAK

Land plot properties
 XL= 100 Na= 100
 YL= 30 Nb= 30
 Value of K3 ==> defined in PLGen -17

Solution mode
 Theory: Steinbrenner model

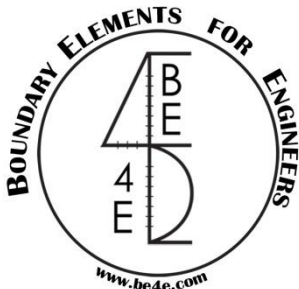
Layers:
 Single layer
 Multi layer - Stavridis method
 Multi layer - Bowle's method
 Multi layer - Equivalent spring method

	Depth	Poisson's ratio	Young's modulus
▶	2	0.2	3000
*			

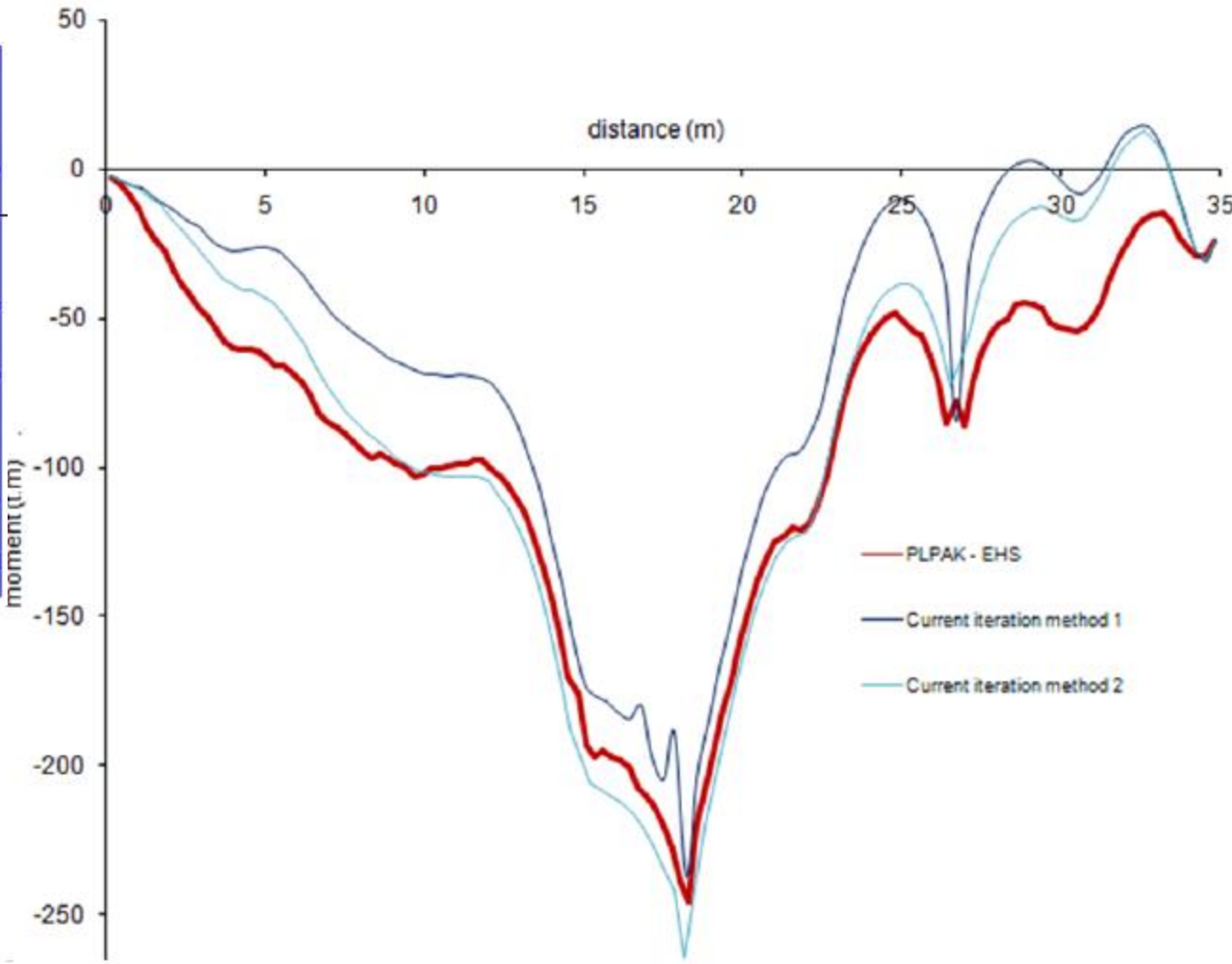
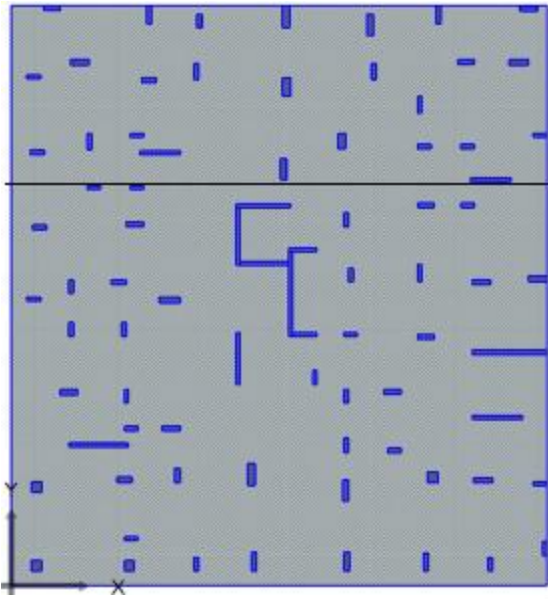
Layer no.1 - Depth=2
 v=0.2
 E=3000

Buttons: Open (*.LC) file, Run Analysis, Show text, Open, Save, Close

3-Use EHSPAK to input soil profile and include soil structure interaction in a single step.



PLPAK- EHSPAK results



Get the accuracy of second iteration in a single step using the PLPAK



Enjoy the PLPAK and EHSPAK ...

<http://www.be4e.com>