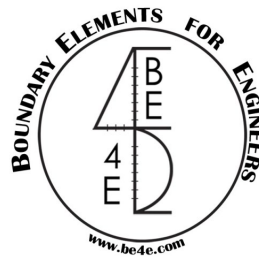


PLPAK applications

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

Direct solution, no iterations between two programs



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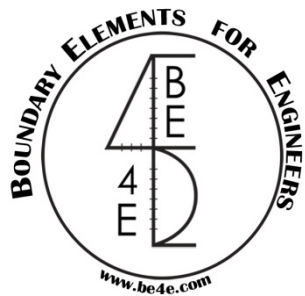
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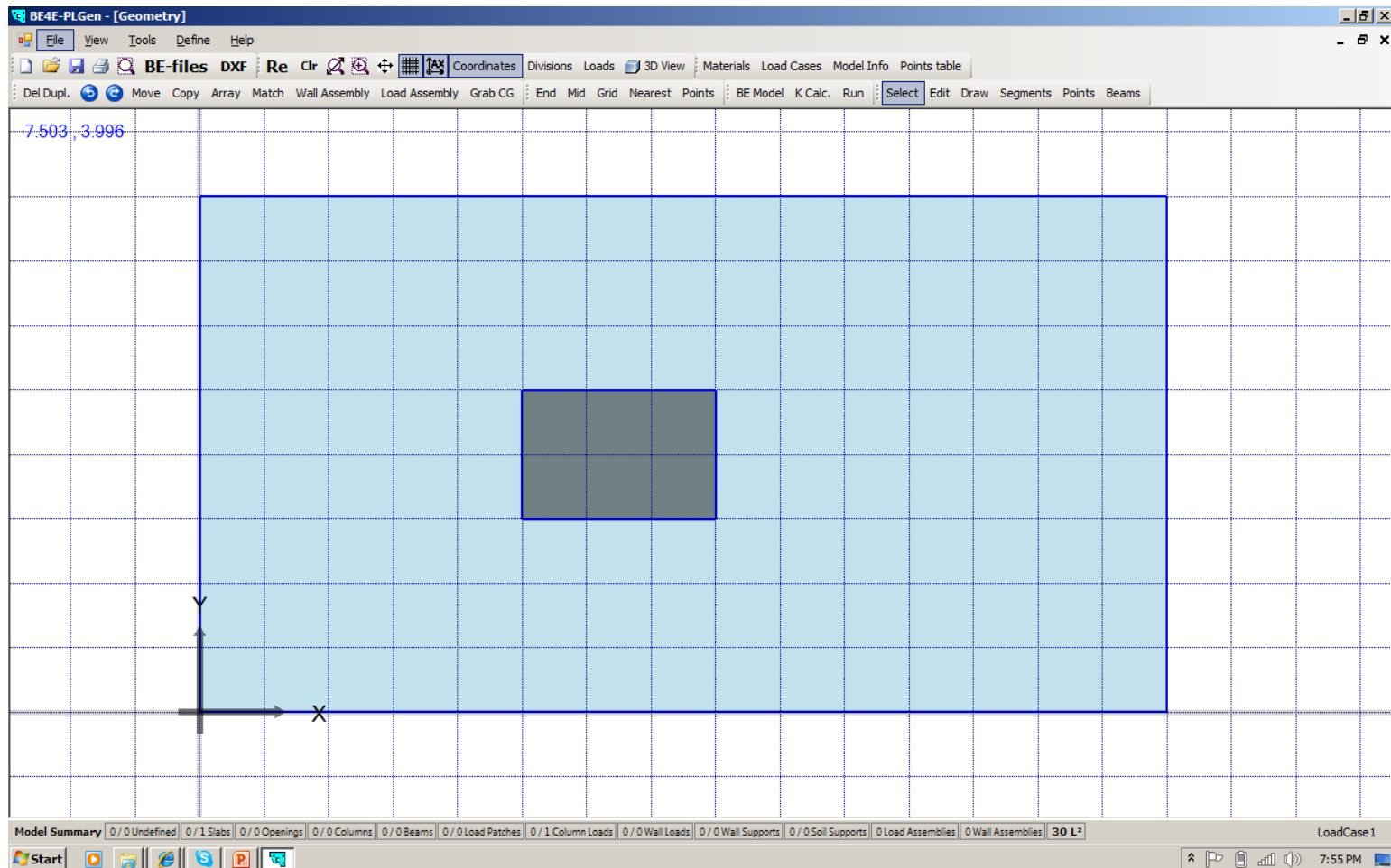
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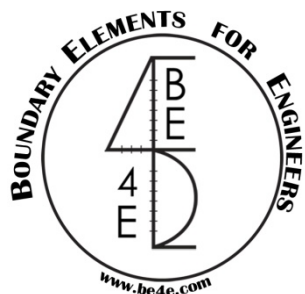
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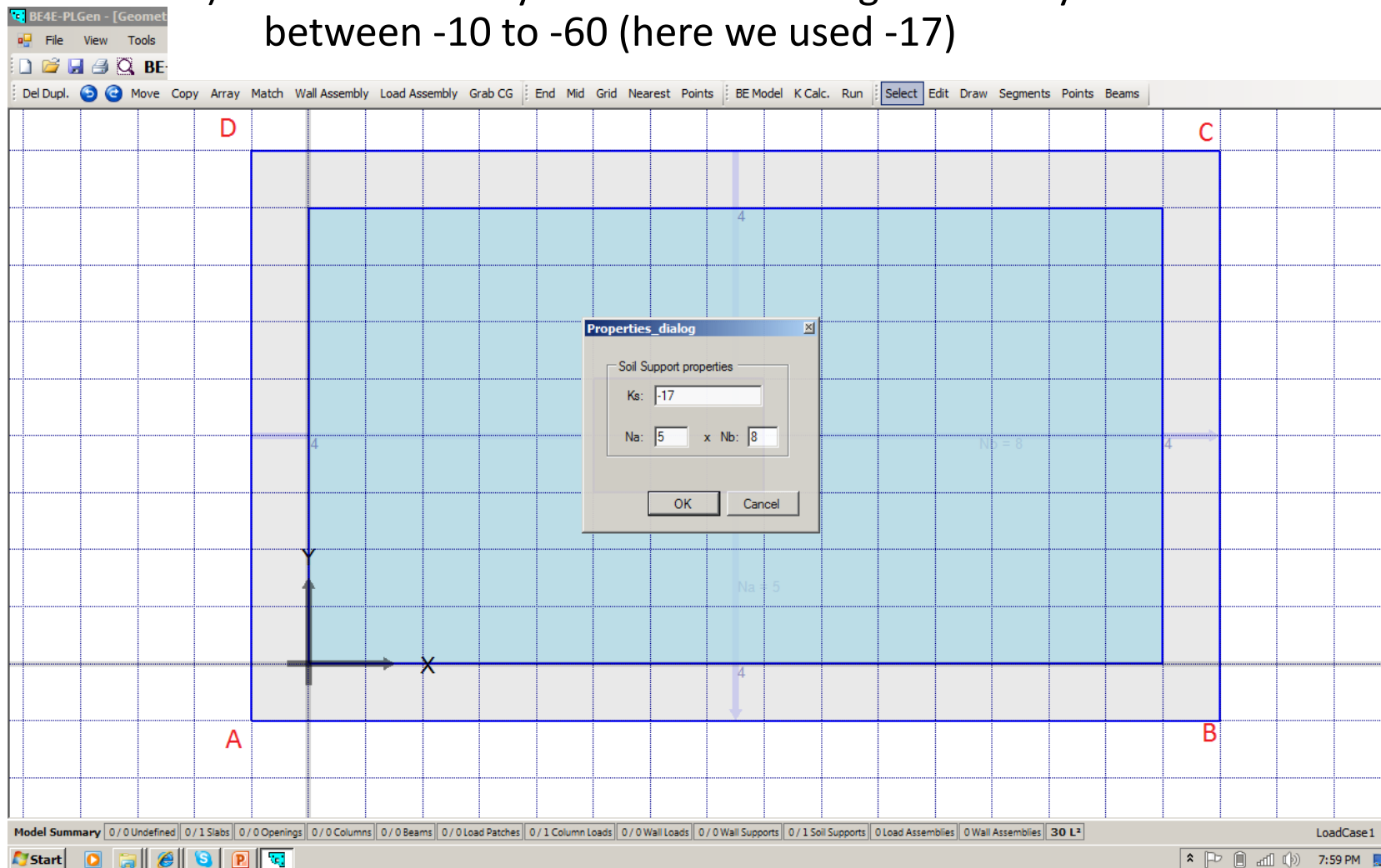
Our problem is 7.5X4 m raft with one centered column on two layered elastic half space. The first step is to model the raft on the PLGen as shown below.

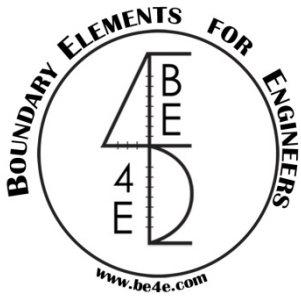




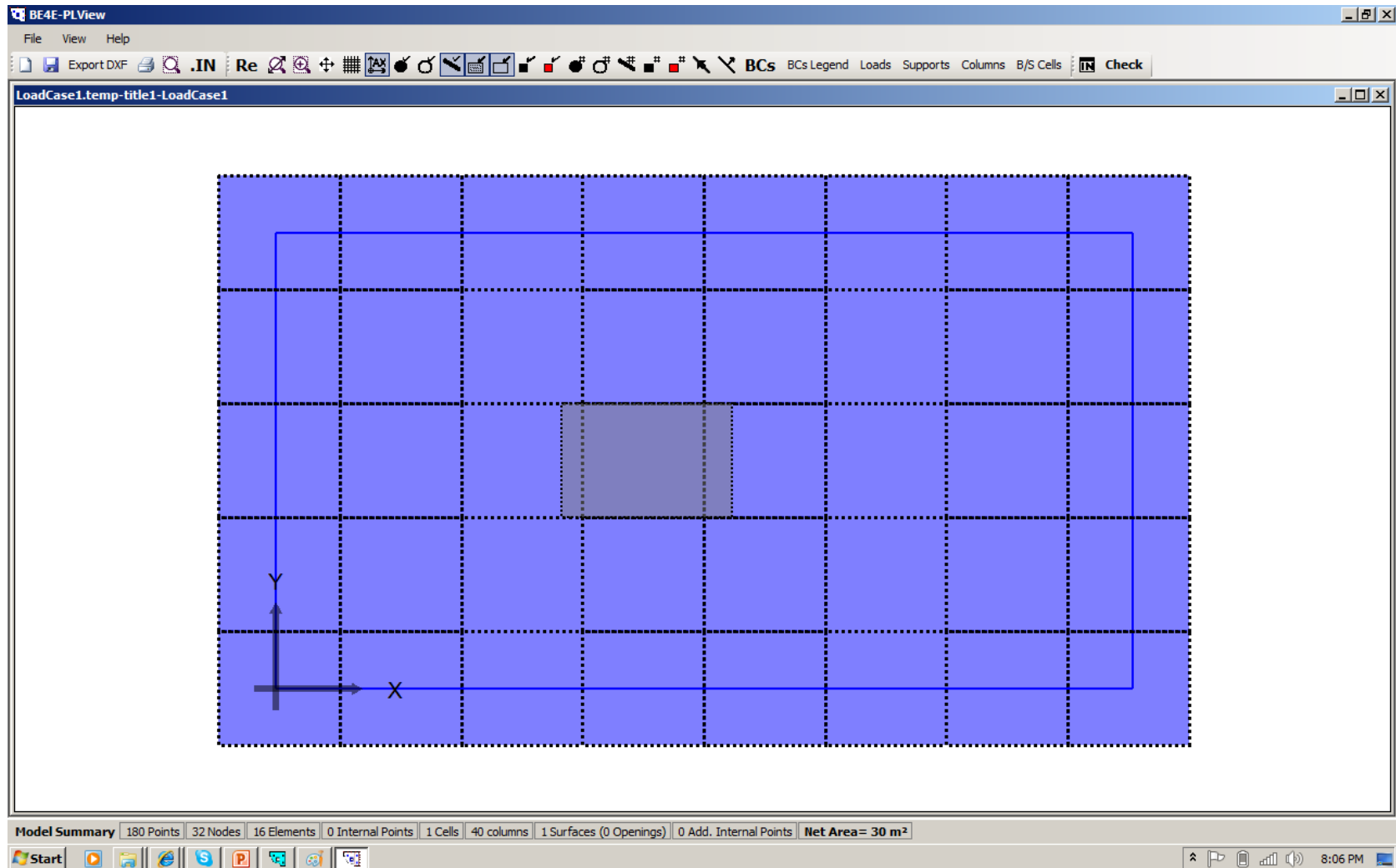
The second step is to draw a soil support around the raft; it should:

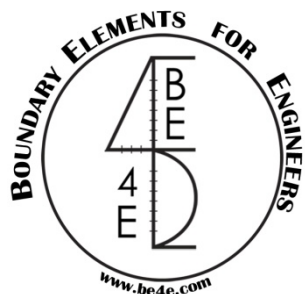
- 1) Contain all the raft
- 2) Rectangle
- 3) Start drawing from point A → B → C → D
- 4) Divide it to any numbers and assign Ks to any –ve value between -10 to -60 (here we used -17)



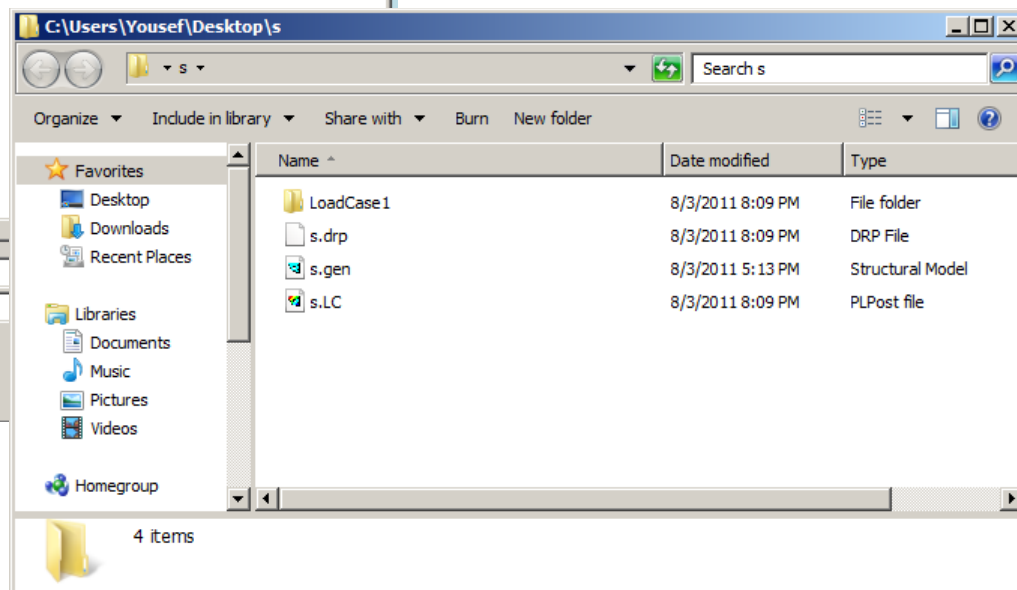
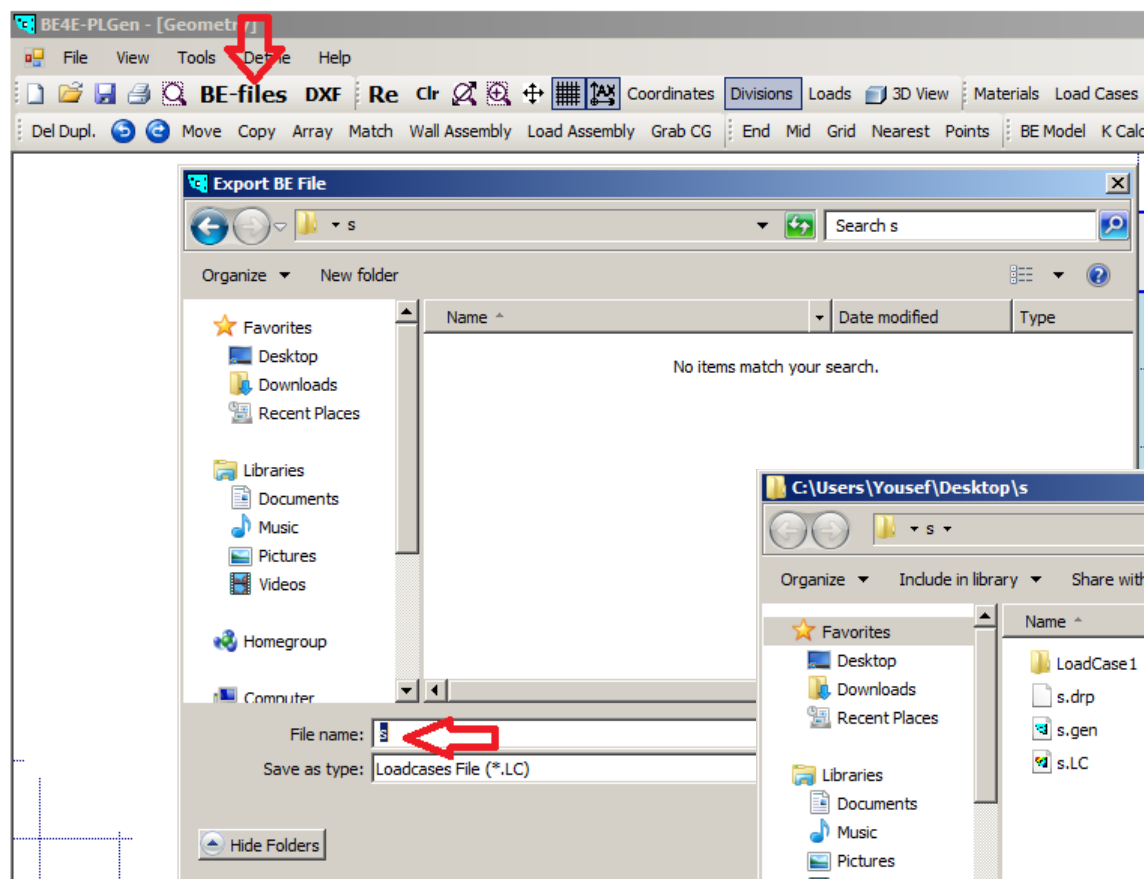


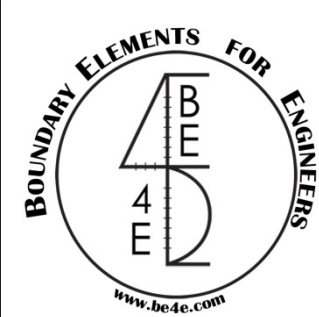
The BE model in the PLView should look like:
(please note the blue color; as still the PLPAK recognize the soil as individual not connected supports as the case of Winkler model)





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:

A red arrow points to the **EHSPAK** icon in the Windows Start menu. The **BE4E - EHSPAK** application window is open, showing the following interface:

Land plot properties

XL= Na=
 YL= Nb=
 Value of K3 ==> defined in PLGen

Solution mode

Theory:

Layers:

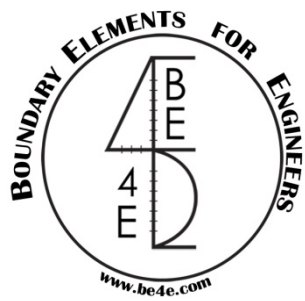
☒ Single layer
☐ Multi layer - Stavridis method
☐ Multi layer - Bowle's method
☐ Multi layer - Equivalent spring method

Open (*.LC) file
Run Analysis

☒ Show text Font size:
Open **Save** **Close**

The main window displays a grid with a blue boundary and a grey interior. The grid dimensions are labeled as **Nb** (vertical) and **Na** (horizontal). The grid is divided into four quadrants by a vertical line labeled **XL** and a horizontal line labeled **YL**.

	Depth	Poisson's ratio	Young's modulus
►*			



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.

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

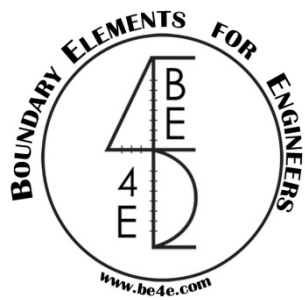
Layer no.1 - Depth=3
v=0.2
E=1000

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

☒ Show text Font size: 10

Open Save Close

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



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

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
	3	0.2	1000
	4	0.3	600
▶*			

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

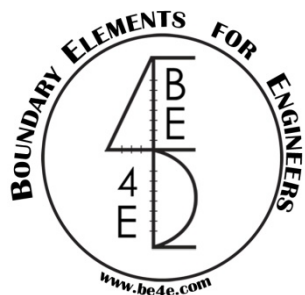
Layer no.2 - Depth=4
v=0.3
E=600

Open (*.LC) file

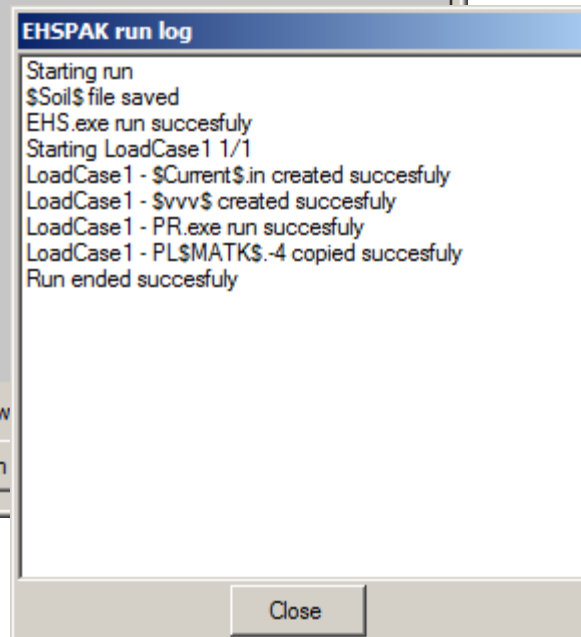
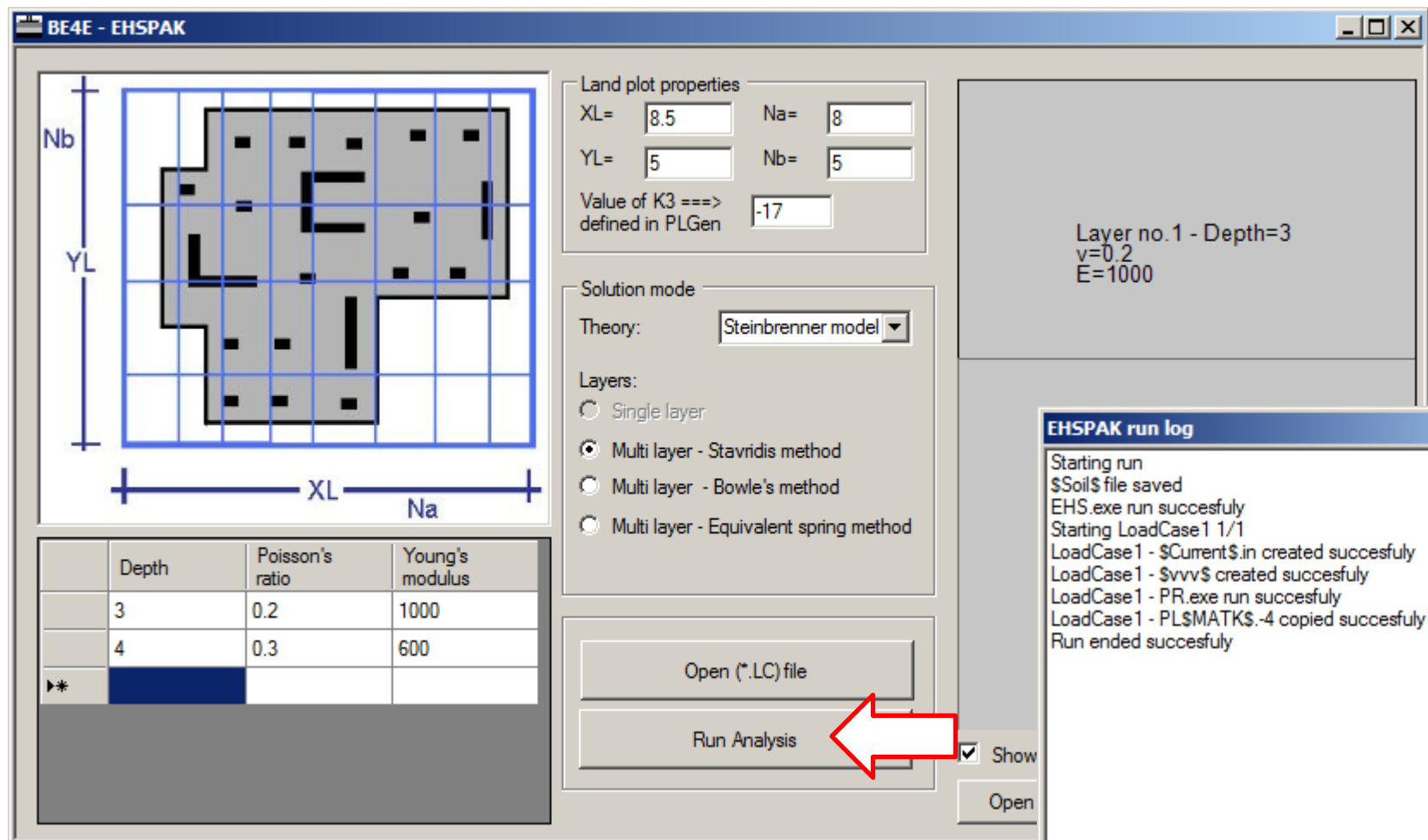
Run Analysis

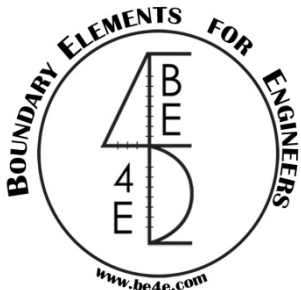
☒ Show text Font size:

Open Save Close



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





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.

The screenshot shows the BE4E-PLCoreMan application window on the left and a Windows Explorer window on the right. The BE4E-PLCoreMan window has a menu bar (File, View, Run, Help) and a list box containing 'LoadCase1' with a checkmark. Below the list box, there is a text area with the following content:

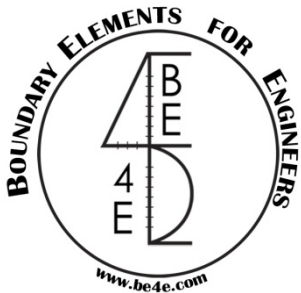
- Check previous solutions via the .STT files
- Ensure that IRUNFlags in all .RUN files are 1
- case 1: LoadCase1 IRUNFlag=1
- Checking the existence of the \$run\$. in each load case folder
- case 1: LoadCase1 has \$run\$.

The Windows Explorer window shows the directory 'C:\Users\Yousef\Desktop\s'. It contains a table of files:

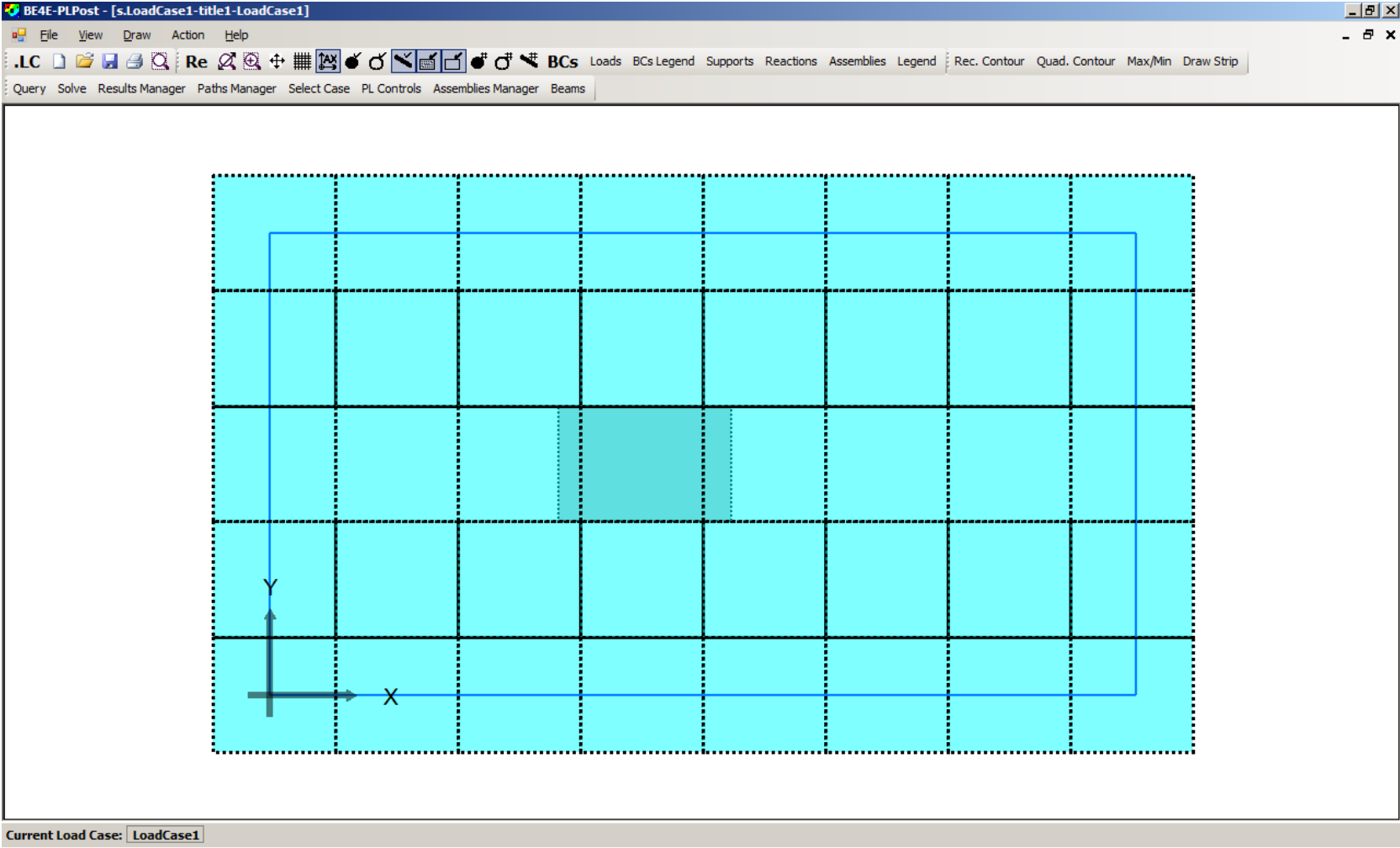
Name	Date m
LoadCase1	8/3/20:
PL\$MATK\$. -4	8/3/20:
s.drp	8/3/20:
s.gen	8/3/20:
s.LC	8/3/20:

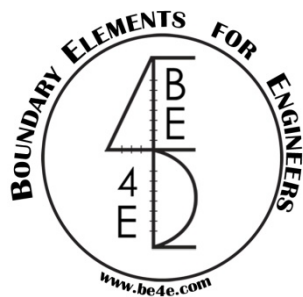
A red arrow points from the text box to the 'LoadCase1' folder in the Explorer window.

Please note: the following stiffness file is appeared

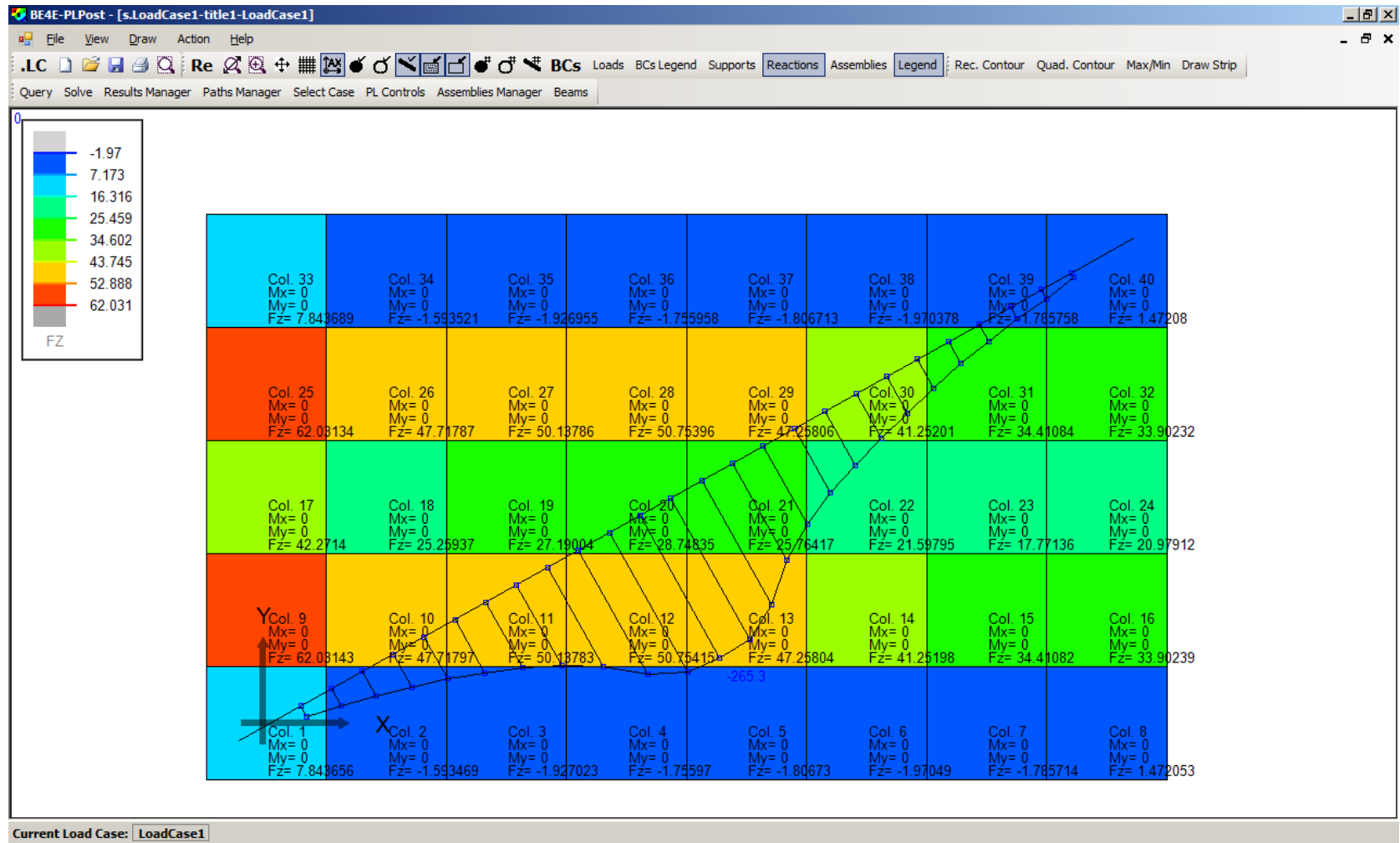


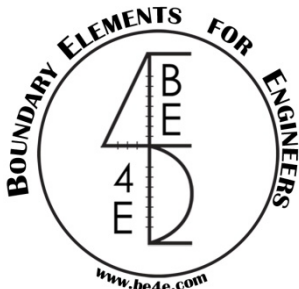
Once you loaded the PLPost you will see that the soil supports appear as beam (or stiffness) cells.



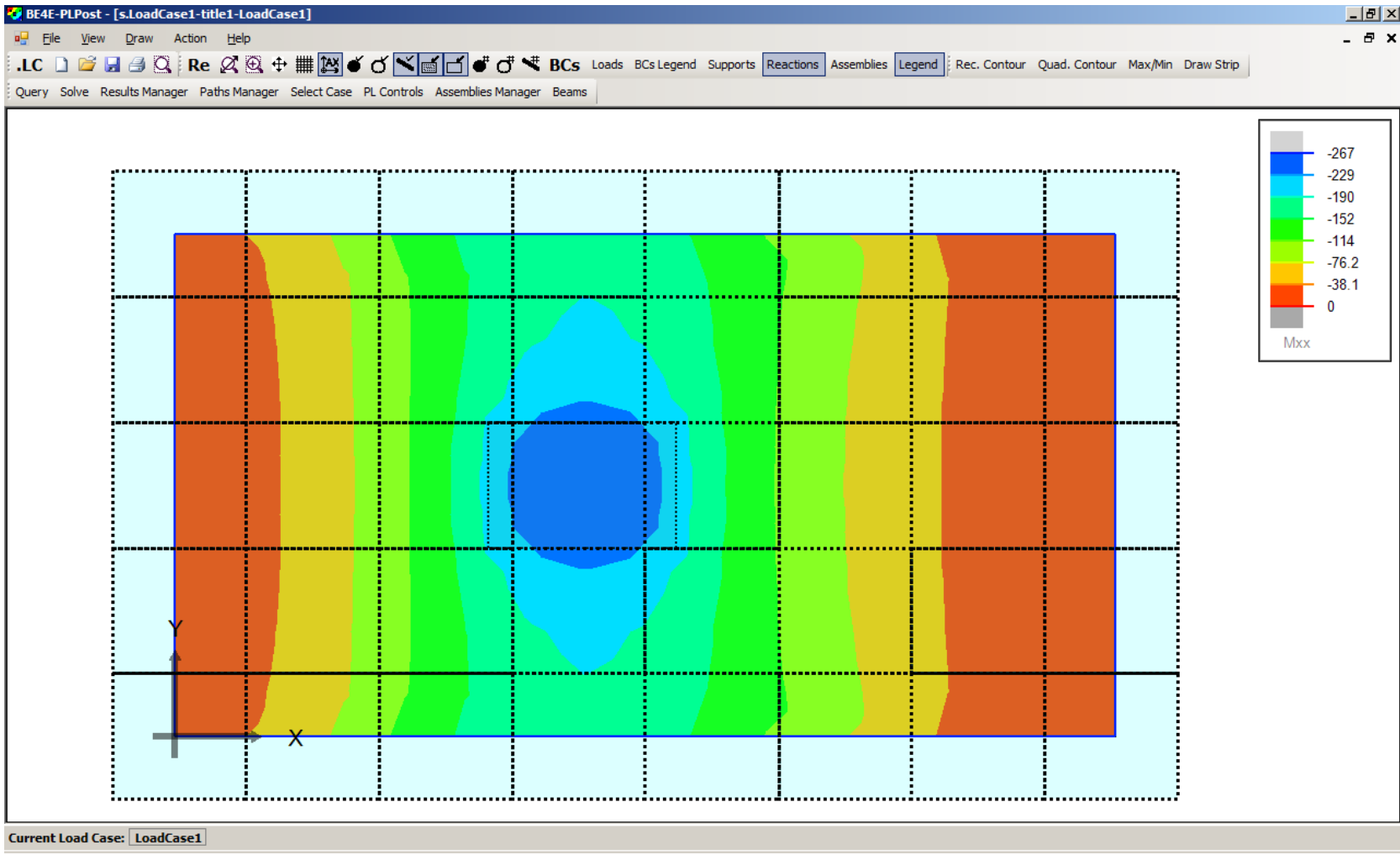


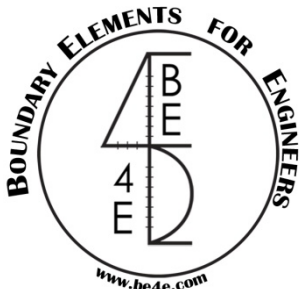
See your results in normal way.





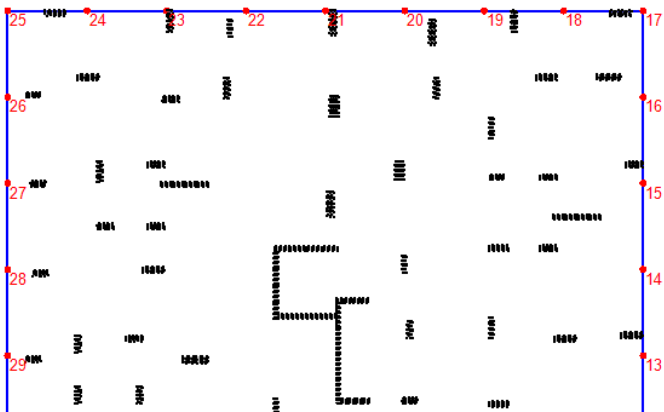
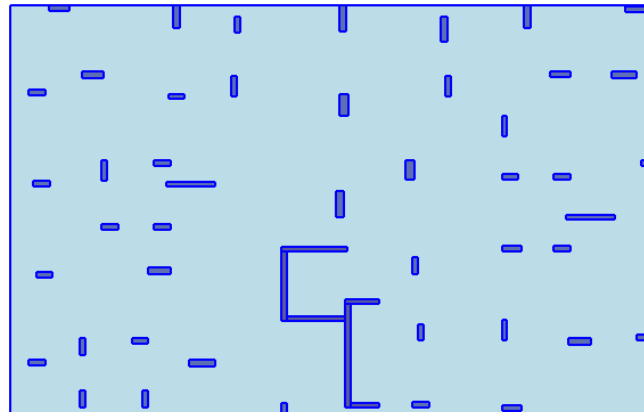
Or as contour lines





Using PLPAK – EHSPAK for practical raft in one step.

1-Create the analysis model using PLGen



2-Check the BE model

BE4E - EHSPAK

Nb

YL

XL

Na

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

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

Open (*.LC) file

Run Analysis

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

☒ Show text

Font size: 10

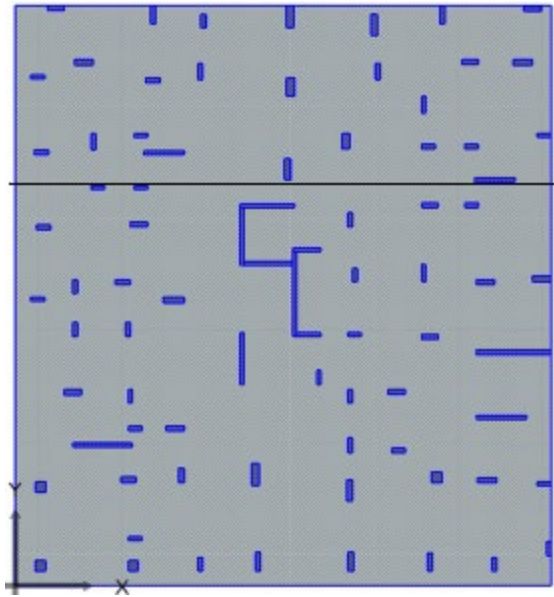
Open

Save

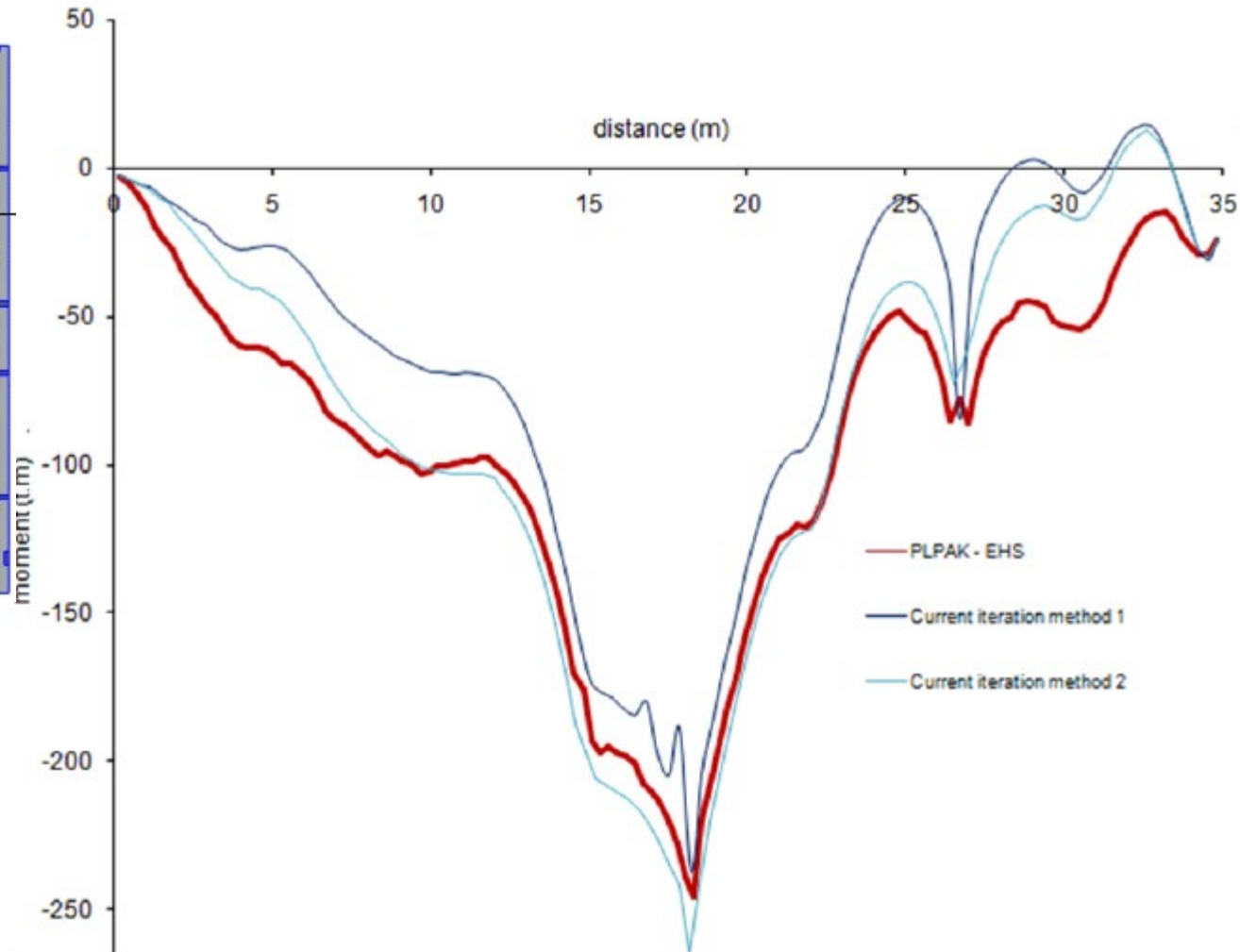
Close

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





For additional help please visit:

<https://www.plpak.com>

or send e-mail to:

plpak@be4e.com