

BE4E – PLPAK

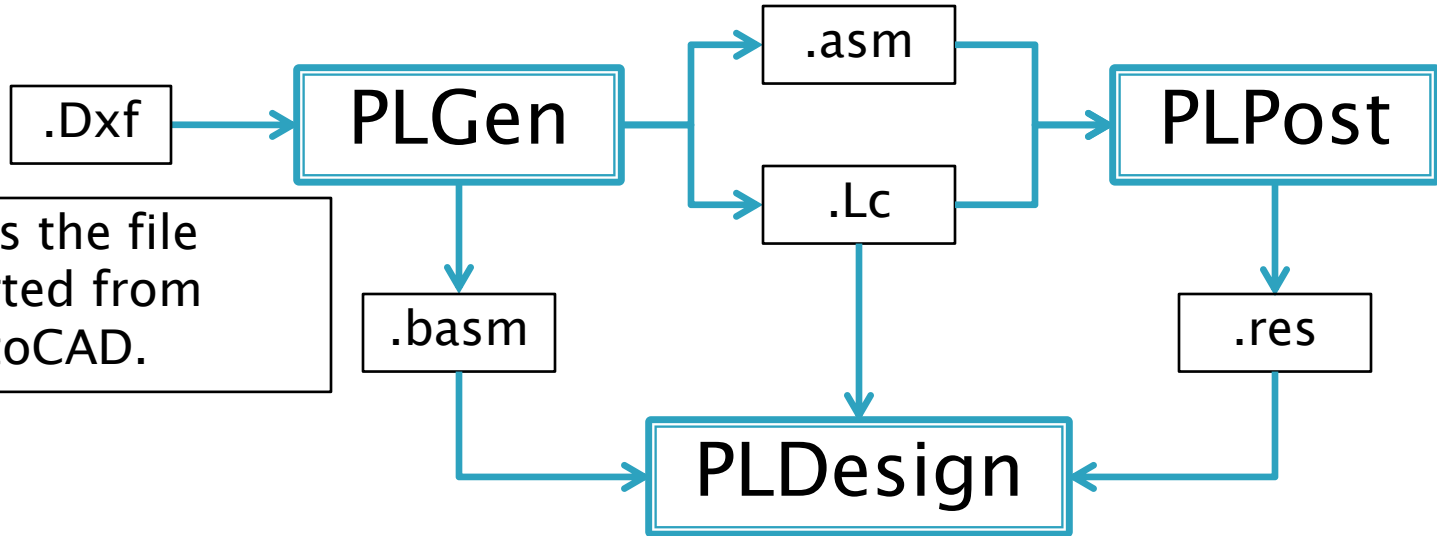
Towards more realistic structural modeling

Revision on Main Package



- Revision.
 - PLPAK Package Diagram.
 - Modeling in PLPAK.
 - Support elements.
 - Load elements.
 - Choice of boundary elements nodes.
- Website.
 - BE4E Website
 - How can the user link with customer support?
 - What happen if there is a problem in PLPAK?
 - If the user have a question about boundary element methodology.
 - Newsletters.
 - Our Greetings.

PLPAK Package Diagram



.asm is the file Export from PLGen and imported from PLPost to show the reaction of Assemblies.

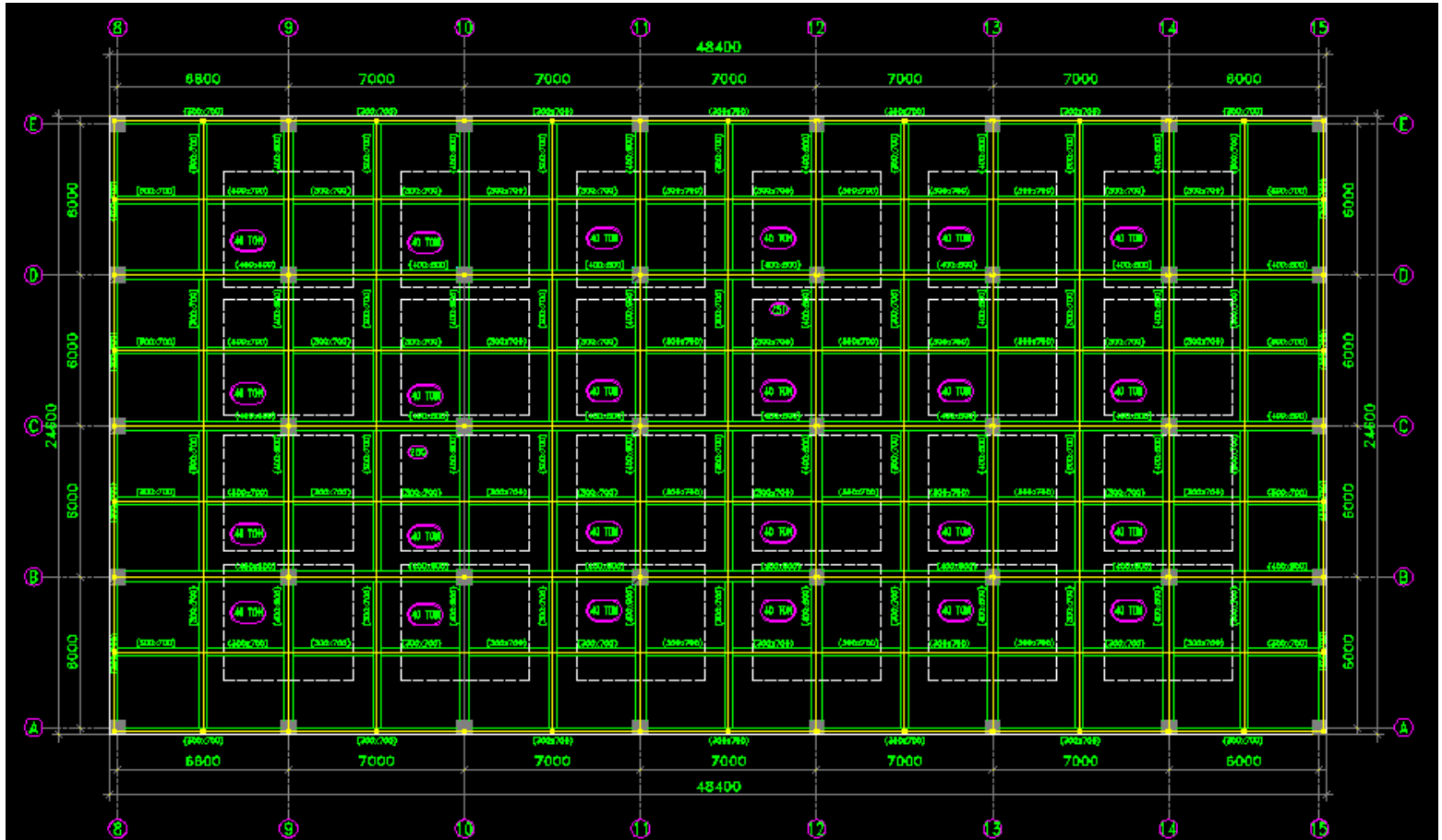
.Lc is the load case file Exported from PLGen and Imported from both PLPost to show the Straining action in Structural elements and PLDesign to Design the structural elements according to selected codes.

.basm is the file Export from PLGen and imported from PLDesign for beam designing.

.res is the file exported from PLPost and Imported from PLDesign for slab designing.

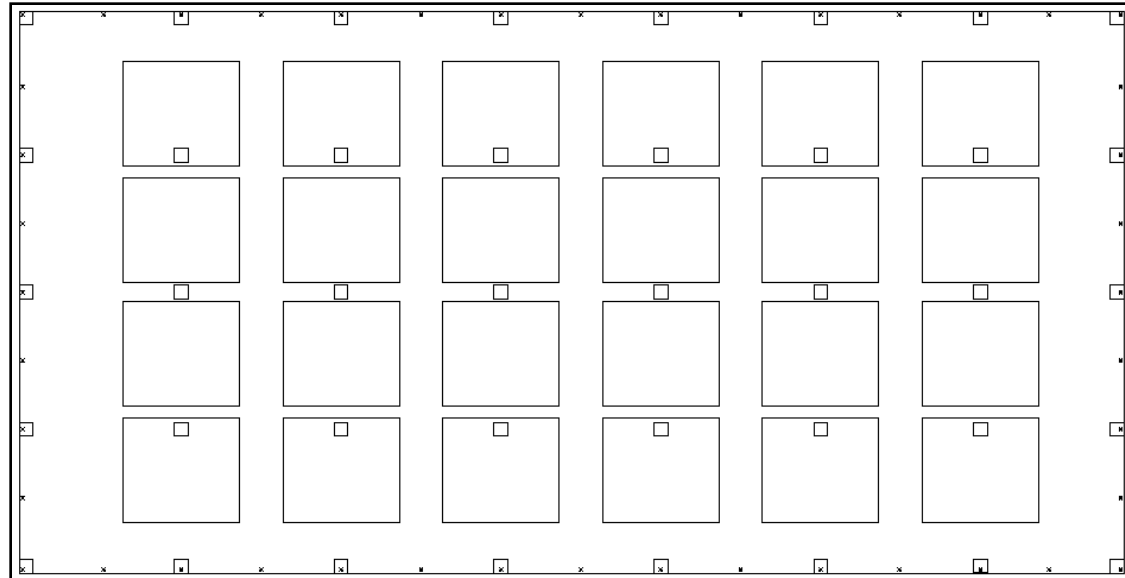
Modeling in PLPAK

We are going to review quickly how can we make a model in PLPAK through this example which contains a slab with beams and additional thickness.

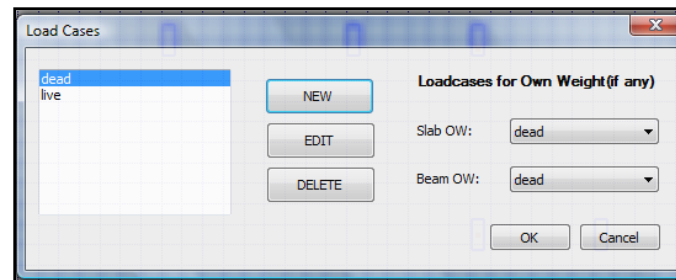
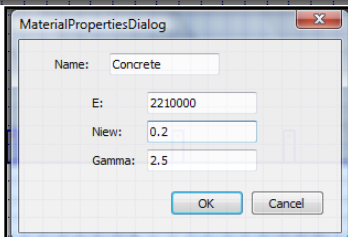
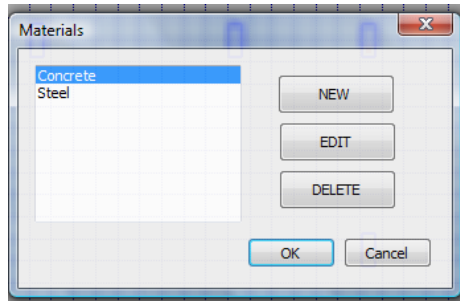
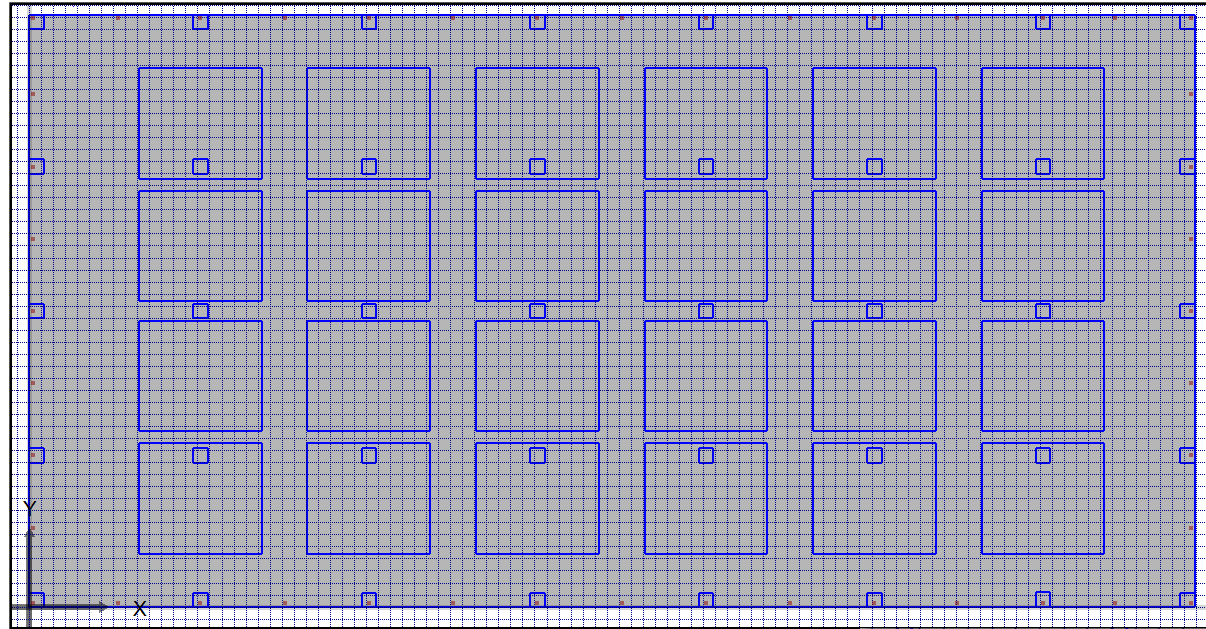


Slab Borders in AutoCAD

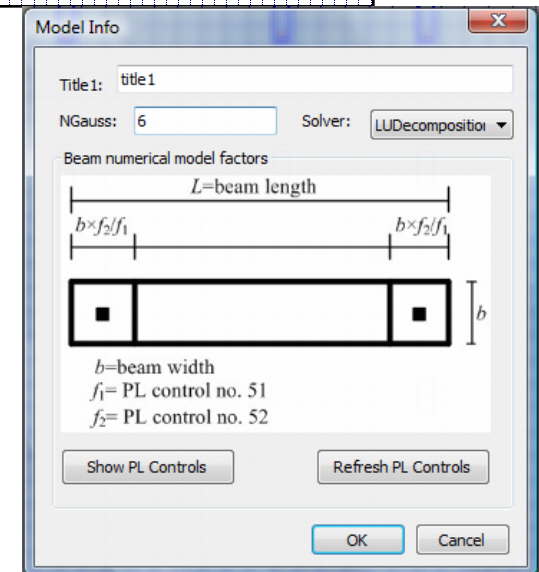
Columns & Start/End
of beams & the Drop
Panel.



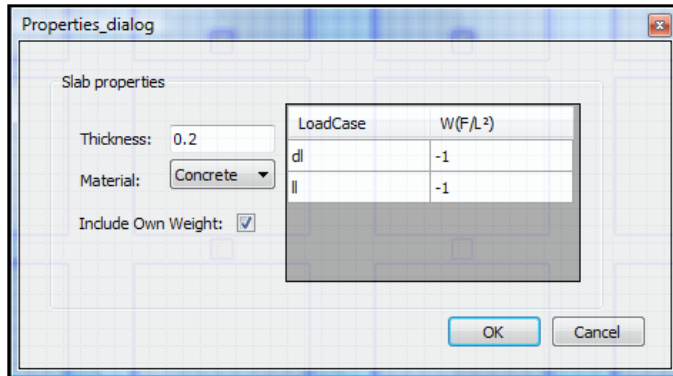
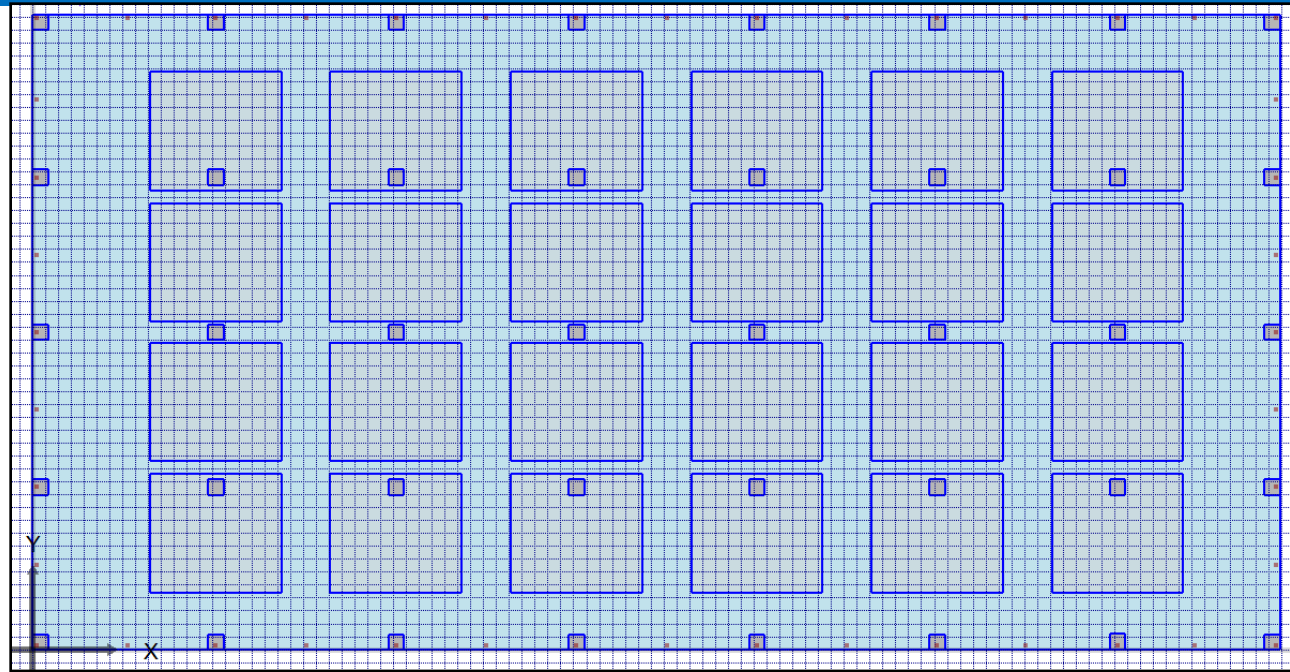
Saving file as (.Dxf)
then import file form
PLGen.



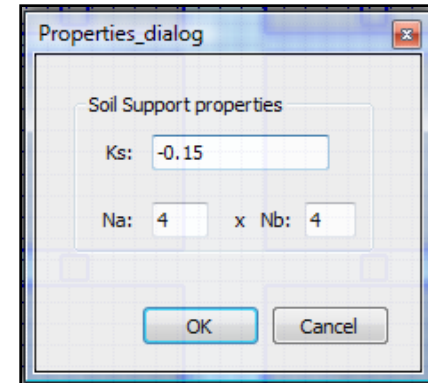
Adjusting Material properties, Load
cases & Model information.



Note: both Drop panel and EHS model use the stiffness of soil support as –ve value but the Drop panel thickness must not be greater than 5 times thickness while the EHS must be greater than 10 times slab thickness.

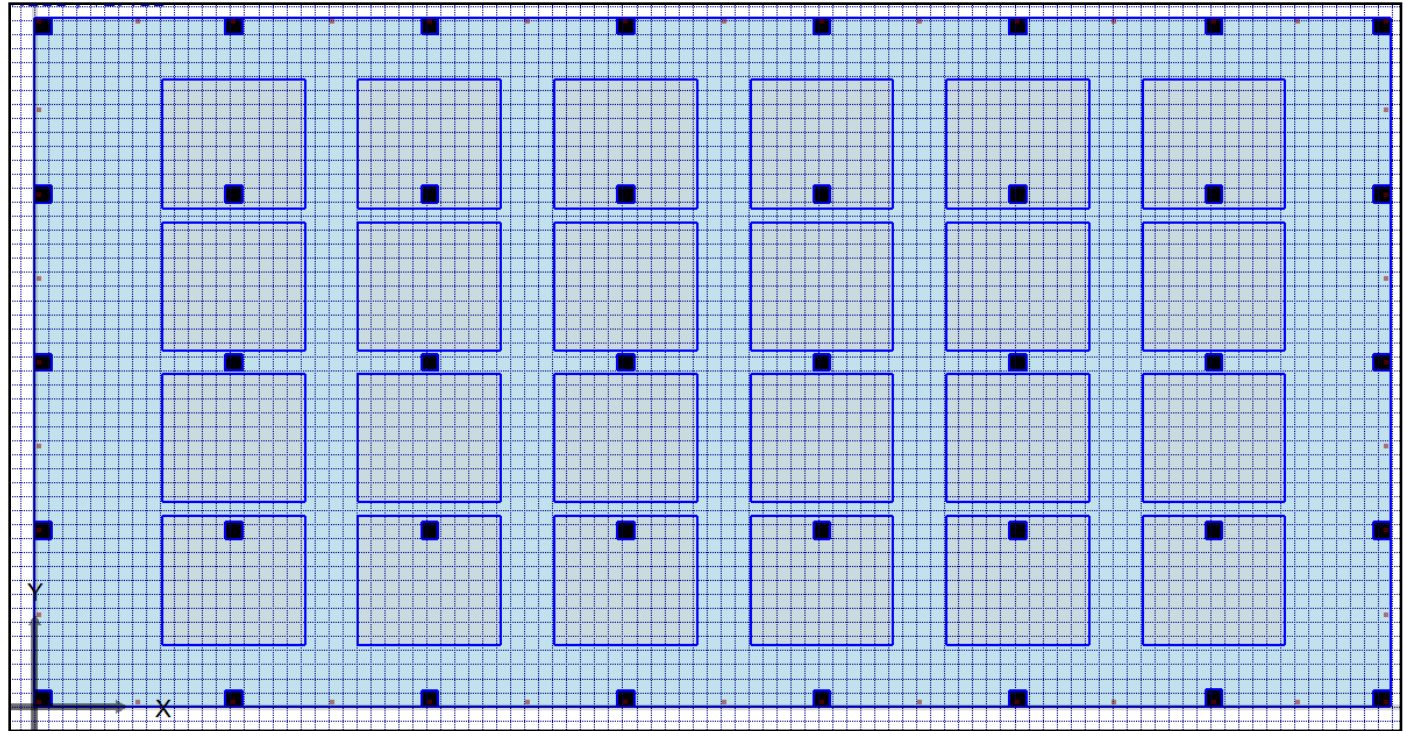


Define Slab Properties



Define the additional thickness.

Define the
supporting elements



Properties_dialog

Column properties

Condition: Below_Only

Height: 3

Material: Concrete

User Defined CG: ☐ CG Cooriantes : 0.3,24.3

☐ User Defined Stiffness

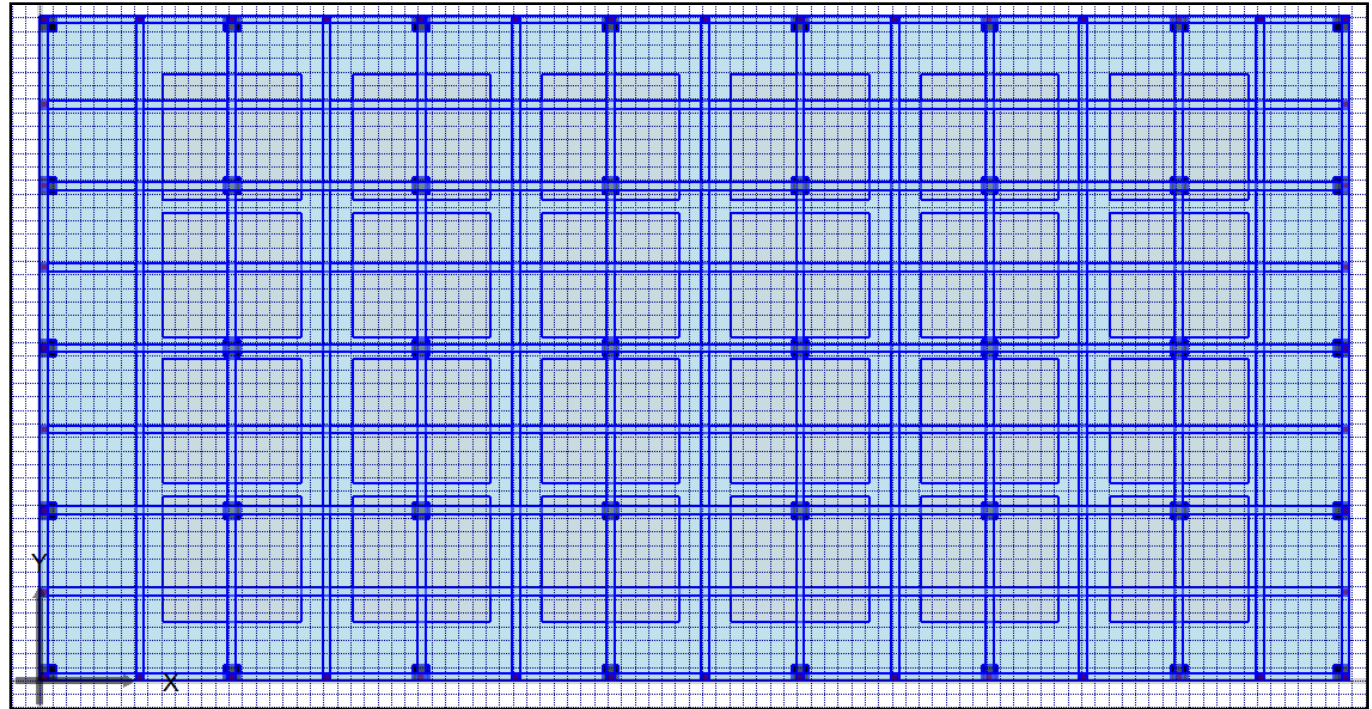
K3: 265200.156

Kx: 31824.06

Ky: 31824.02

OK Cancel

Define Columns Properties



Properties_dialog

Beam Properties

Condition: below ☐ User Defined Properties

Depth:

Width: I_y :

Start: J :

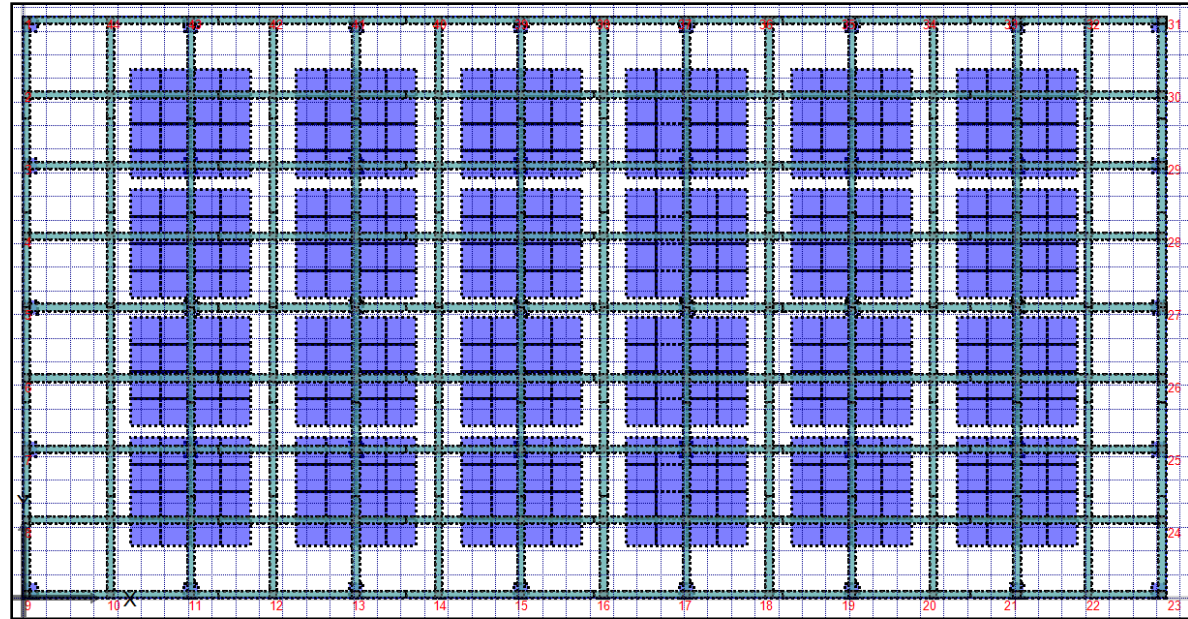
End: Material: Concrete

Include Stiffness: ☒ Divisions:

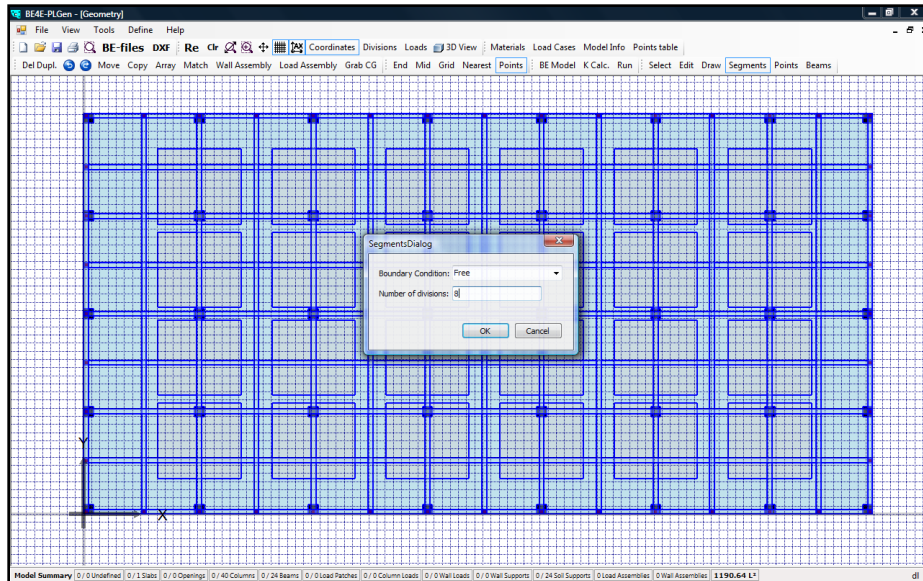
Include Own Weight: ☒ OW per unit Area:

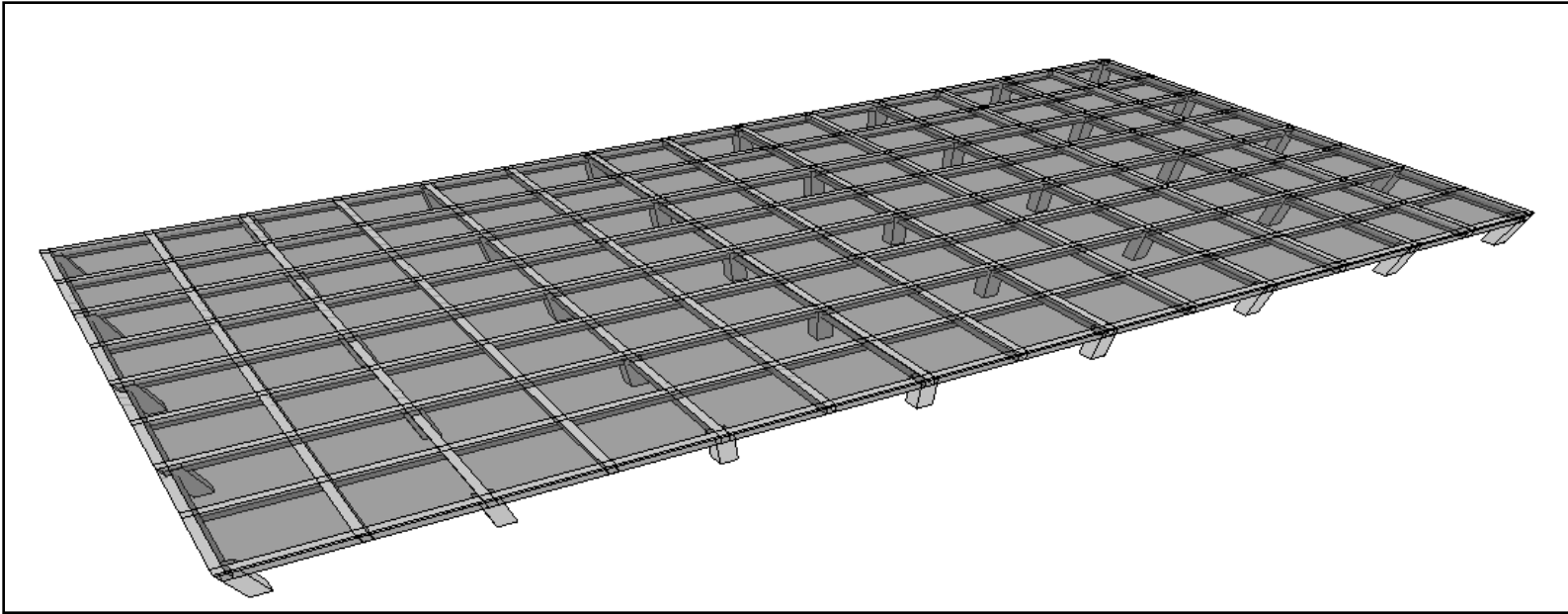
User Defined OW: ☐ OW per unit length:

Define Beam Properties



Adjusting number of segments in PLGen.



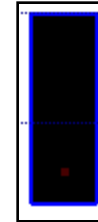


Showing 3D view

Then press on run tab to go through the PLCoreMan and the PLPost to view analysis.

Support elements

If we clicked right on a column element to show the properties, we will see that the columns contains 3 stiffness in all directions.



Properties_dialog

Column properties

Condition: Above_and_Below

Height: 3

Material: Concrete

User Defined Stiffness: ☐

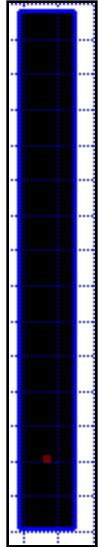
K3: 1473333.38

Kx: 491111.125

Ky: 491111.125

User Defined CG: ☐ CG Coordinates: 1.5, 5.5

OK Cancel



Properties_dialog

Wall properties

Condition: Above_and_Below

Height: 3

Material: Concrete

Ndivisions: 4

OK Cancel

While the wall element is consisting of a group of columns combining the stiffness together to form the wall.

In case of soil support we will see it contains 1 stiffness in z-direction only.



Properties_dialog

Soil Support properties

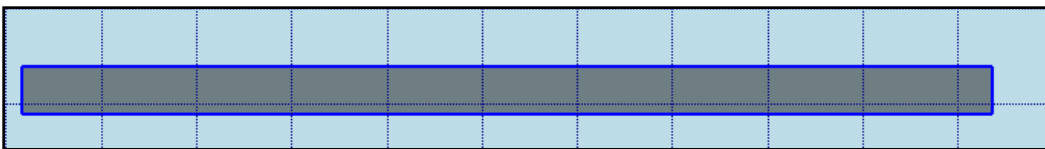
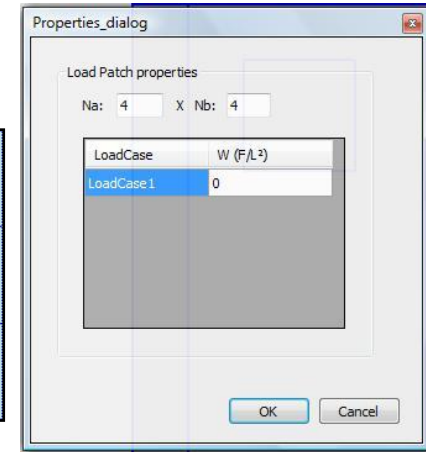
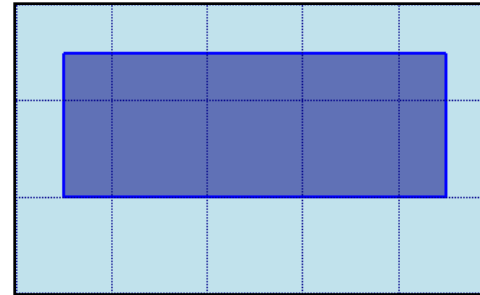
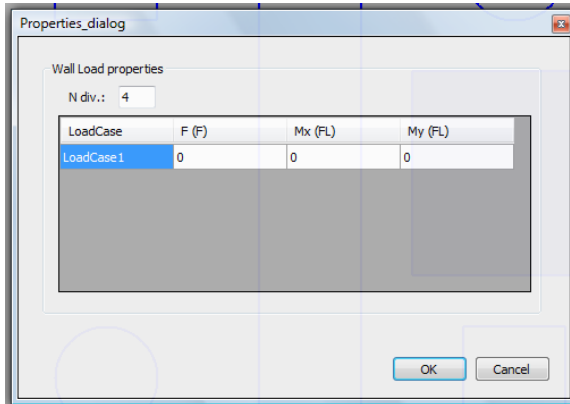
Ks: 1500

Na: 4 x Nb: 4

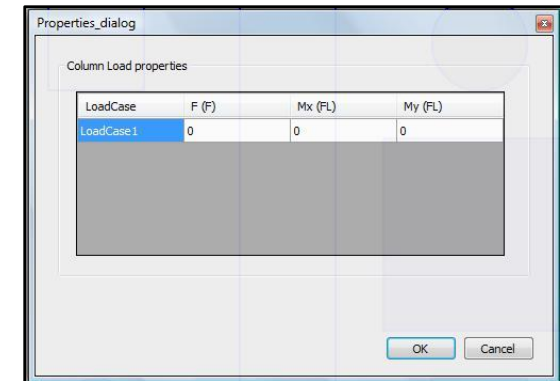
OK Cancel

Load elements

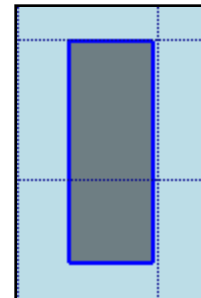
If we clicked right on load patch to show the properties, we will see that the load patch is per square length.



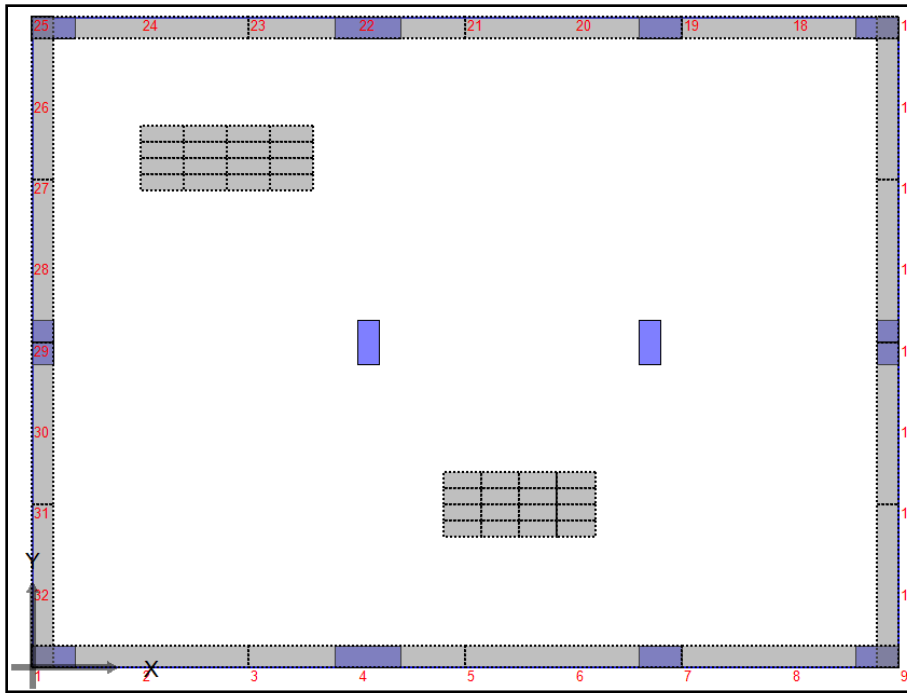
While the wall load is the load divided on a certain number of columns combined together.



In case of column load we will see it is load without any length dimensions and one unit.



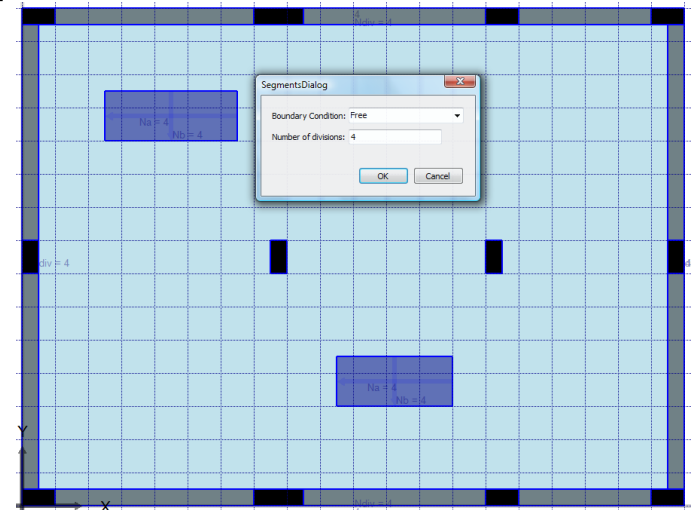
Choice of boundary element nodes

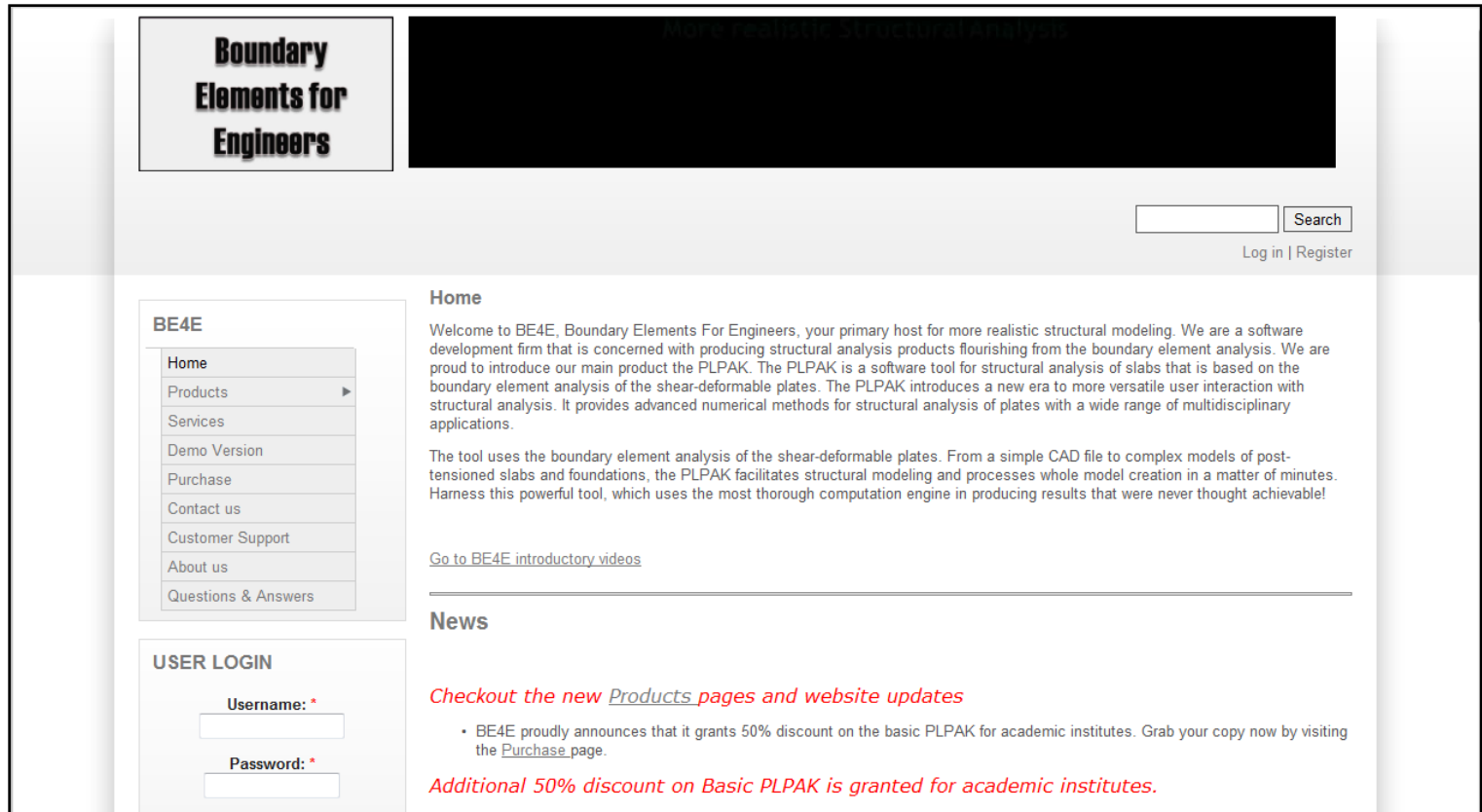


If two node numbers above each other the model will be unable to run.

The default number of nodes is 4,
The user can determine the suitable number of nodes which is the number of inflection of BMD curve.

Select Edit Draw Segments Points Beams





Boundary Elements for Engineers

More realistic Structural Analysis

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USER LOGIN

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Password: *

Home

Welcome to BE4E, Boundary Elements For Engineers, your primary host for more realistic structural modeling. We are a software development firm that is concerned with producing structural analysis products flourishing from the boundary element analysis. We are proud to introduce our main product the PLPAK. The PLPAK is a software tool for structural analysis of slabs that is based on the boundary element analysis of the shear-deformable plates. The PLPAK introduces a new era to more versatile user interaction with structural analysis. It provides advanced numerical methods for structural analysis of plates with a wide range of multidisciplinary applications.

The tool uses the boundary element analysis of the shear-deformable plates. From a simple CAD file to complex models of post-tensioned slabs and foundations, the PLPAK facilitates structural modeling and processes whole model creation in a matter of minutes. Harness this powerful tool, which uses the most thorough computation engine in producing results that were never thought achievable!

[Go to BE4E introductory videos](#)

News

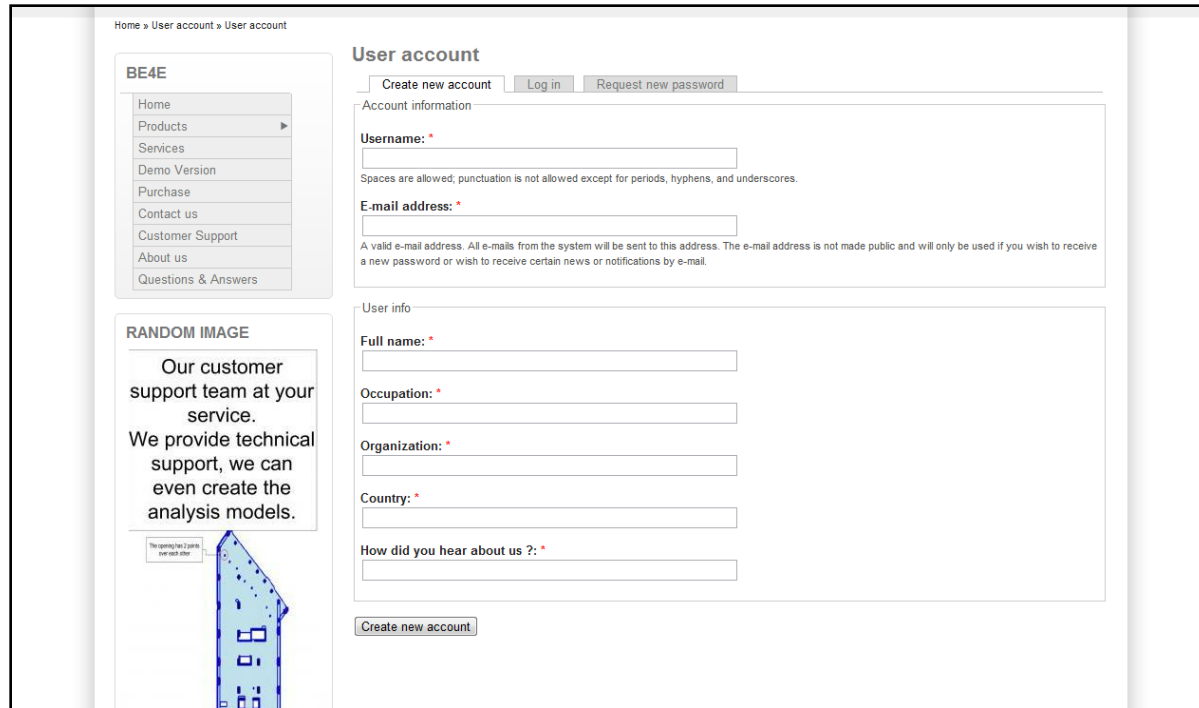
Checkout the new [Products](#) pages and website updates

- BE4E proudly announces that it grants 50% discount on the basic PLPAK for academic institutes. Grab your copy now by visiting the [Purchase](#) page.

Additional 50% discount on Basic PLPAK is granted for academic institutes.

- www.be4e.com is the website that link between the PLPAK users and the customer support.
- From the website, the users can see the video tutorials for the PLPAK and can ask any questions about the boundary element or about the PLPAK Package.
- In the website, the users see the latest newsletters and the latest products and can join us on face book, Wikipedia and LinkedIn.

How can the user link with the customer support?



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RANDOM IMAGE

Our customer support team at your service.
We provide technical support, we can even create the analysis models.

The opening has 2 parts over each other

User account

Create new account Log in Request new password

Account information

Username: *

Spaces are allowed; punctuation is not allowed except for periods, hyphens, and underscores.

E-mail address: *

A valid e-mail address. All e-mails from the system will be sent to this address. The e-mail address is not made public and will only be used if you wish to receive a new password or wish to receive certain news or notifications by e-mail.

User info

Full name: *

Occupation: *

Organization: *

Country: *

How did you hear about us ? : *

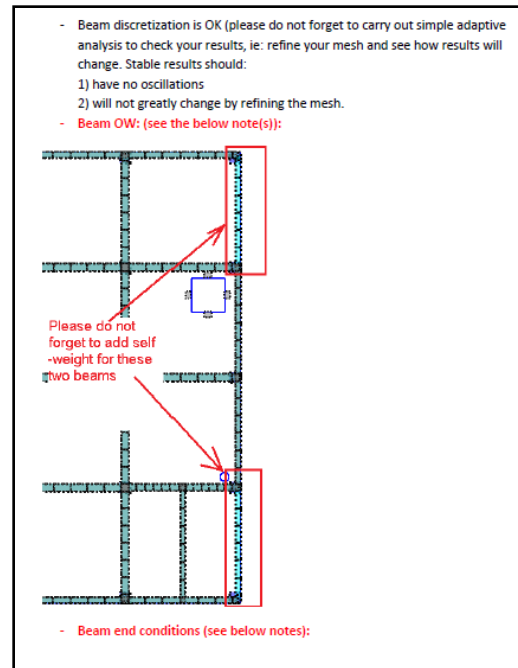
Create new account

- All PLPAK users should register in the website to be able to contact with us.
- It's very important to answer the question clearly to be able to confirm your account.

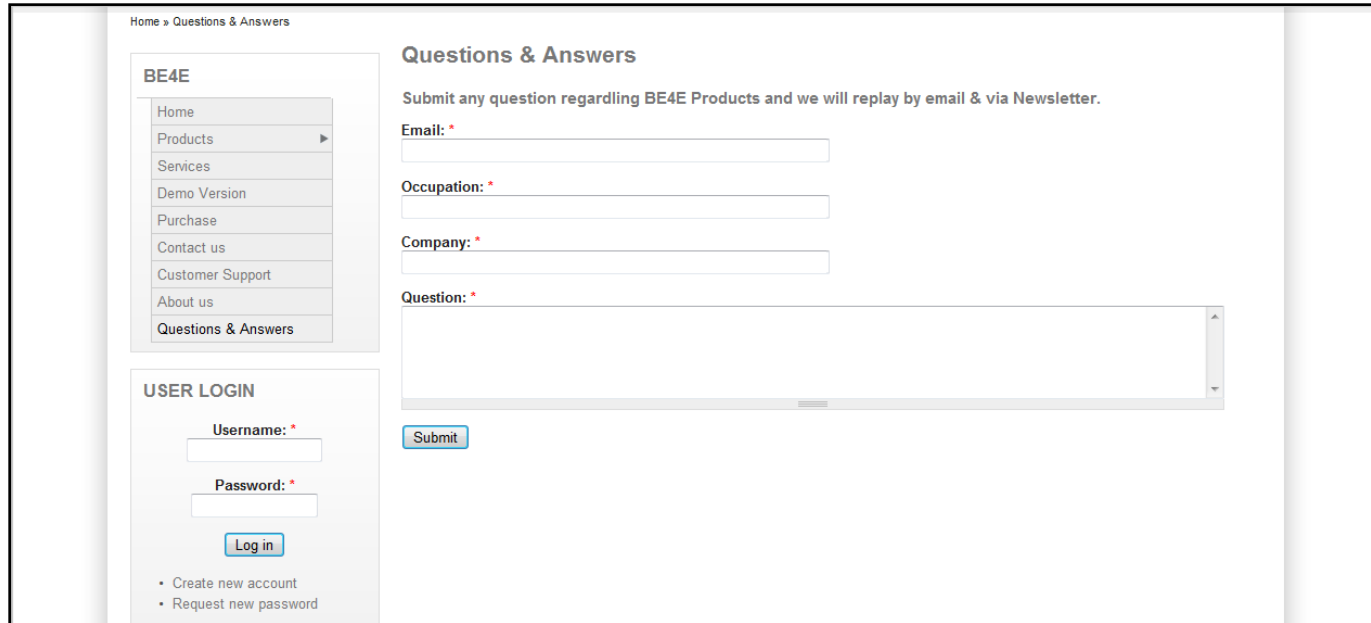
What happen if there is a problem in PLPAK?

The user should send email to support@be4e.com, this email should contain the Gen file and description of the problem and it will be better to send a print screen for the problem.

Once the user send the email, the PLPAK group will see the problem and solve it then the user will receive an email showing the solve of the problem.



If the user have any question about the Boundary elements methodology.



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- Request new password

Questions & Answers

Submit any question regarding BE4E Products and we will replay by email & via Newsletter.

Email: *

Occupation: *

Company: *

Question: *

[Submit](#)

After registration the user can send any question about the methodology of the boundary elements and it will be answered and send to the user by email .

Once the registration is confirmed, the user will be able to receive every month a news letter from the PLPAK this news letter containing information about PLPAK Packages.

NEWSLETTER VOL.1, NO.1

PLPAK NEWS

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BOUNDARY ELEMENTS FOR ENGINEERS

PUBLISHED PAPERS
Based on the PLPAK
Engineering Structures - Vol. 33, Issue 10, JULY 2011, Pages 2919-2930
A PROBABILISTIC BOUNDARY ELEMENT METHOD APPLIED TO PILE DISLOCATION PROBLEM
Samer Sabry F. Mahany, Samah S. F. Mahany, Youssef F. Rashed

Abstract
In this paper a probabilistic approach is presented where the boundary element method is efficiently used to study the effect of a random load of a given pile within a particular pile cap from an irregular position - the so-called pile-dislocation problem - on actual design parameters such as pile loads and bending moments in the pile cap. A more complete internal content is developed to simulate the true geometric modeling of pile. The boundary element method for the shear-deflection (slack) pile theory is employed to analyze the pile cap. The plate-pile interaction forces are considered to have constant variation over the circular pile domain. The probabilistic approach presented herein incorporates a Monte Carlo simulation technique for generating random loads in the original position of a given pre-designed pile. The procedure has been applied to some regular pile caps with given pile layouts typically adopted in bridge construction. The results demonstrate that the random distribution of pile loads practical responses/values are consistently encountered for example in pile cap moment to bridge applications will cause limited variations in the design design parameters investigated.

PRACTICAL APPLICATIONS GALLERY
Benefits of piled raft analysis using the PLPAK:
- Piles could be placed at any place of the model within the soil and with their real geometry.
- No internal modeling adjustment is required.
- Model generated in a matter of seconds.
- Collaborative multiple environment multiple inputs by many users for the same model.
- Simple report of results.
Basically, what takes the FEM days to model, is done in mere minutes with the PLPAK.

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Customer support:
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DEVELOPMENT
The PLPAK software is in constant development to meet the needs of industrial and research purposes. Updates to the software will be posted monthly.
EDITORS
Ahmed A. Torky
Youssef F. Rashed

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PLPAK NEWSLETTER

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BOUNDARY ELEMENTS FOR ENGINEERS

Thirty-Minute Practical Example

In 30 minutes a practical model was analysed, designed and detailed using the PLPAK & PLDesign

One of the most profound aspects of the PLPAK is the speed of achieving reliable results. A whole floor could be generated, analysed and designed within a matter of minutes. The following project is a partition on an industrial building. The reinforced concrete floor was processed in less than 30 minutes using both the PLPAK and PLDesign (Automated reinforced concrete design module).

The structural elements (beams and slabs) are designed using the PLDesign, with the possibility of exporting reinforcement details to any CAD program. Complete calculation sheets are available and easily exported.

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Youssef F. Rashed

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Newsletter VOL.1 No.3

PLPAK NEWSLETTER

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BOUNDARY ELEMENTS FOR ENGINEERS

Distinction of PLPAK Geometrical Modeling

The frontier in geometrical accuracy

Proper modeling of continuum is required to evaluate the stresses produced, especially if there are uncertainties around the software results and an "as-built" model is required. Accurate and rapid geometrical modeling of concrete members is possible with the PLPAK, contrary to what finite element software forces users to do, hence detailing is more rapid when using design software like the PLDesign. The PLPAK cares for the tiniest details introduced to the system, whether they were complete structural supporting members, irregular patch loads, or even small openings (this is due to the benefits of choosing the boundary element method). Demonstrated is some of the crucial advantages of accurate geometry modeling available only through the PLPAK.

1) Structural elements connected precisely as required Below are views from the PLPAK

2) Piles with actual dimensions
Piles are placed easily at any location with different diameters.

3) No more center-line modeling
Easy and accurate reinforcement detailing and lengths.

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PLPAK Package & BE4E

Towards more realistic structures

Professor Dr. Youssef F. Rashed
Principal of BE4E