



تعلیم برنامہ

اعداد : صفاء جاسم

مہندس مدنی و مہرچ

About Author



Safaa Jassim
**Civil Engineer
&
Software
developer**

Engineering skills

- **AutoCAD**
- **Revit**
- **SAP2000**
- **SAFE**
- **ETABS**
- **MS PROJECT**
- **EXCEL**
- **ACCESS**

Programming skills

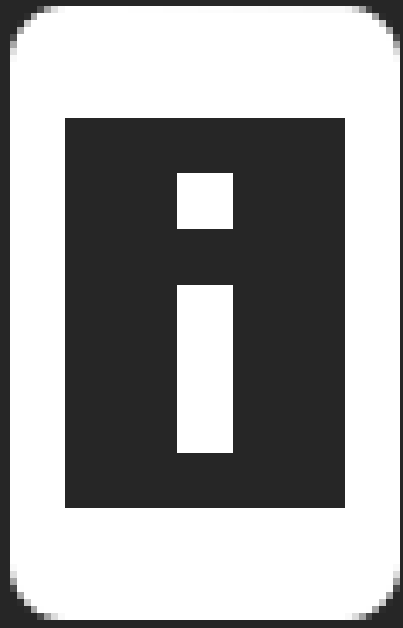
- **VB.NET**
- **C#**
- **C++**
- **Kotlin**
- **JavaScript**
- **SQL**
- **HTML**
- **CSS**

ماذا يتضمن هذا الكتاب؟

يحتوي الكتاب على شرح
لأساسيات التعامل مع
البرنامج من خلال تطبيق
موديل حقيقي

يحتوي الكتاب على شرح مرئي لكل خطوة





ما هو برنامج السيف CSI SAFE

هو احد منتجات شركة CSI الامريكية والبرنامج مختص بتحليل وتصميم البلاطات والاسس وتتمم خطوات التحليل والتصميم بسلاسة وسهولة مقارنة ببرامج التحليل الأخرى من ذات الشركة



خطوات العمل الأساسية

- Begin a New Model
- Define Properties
- Define Static Load Patterns
- Define Load Cases
- Draw Objects
- Add Design Strips
- Set Display Options
- Assign Loads
- Run the Analysis and Design
- Graphically Review the Analysis Results
- Design Display
- Run Detailing
- Create Report



واجهة المستخدم

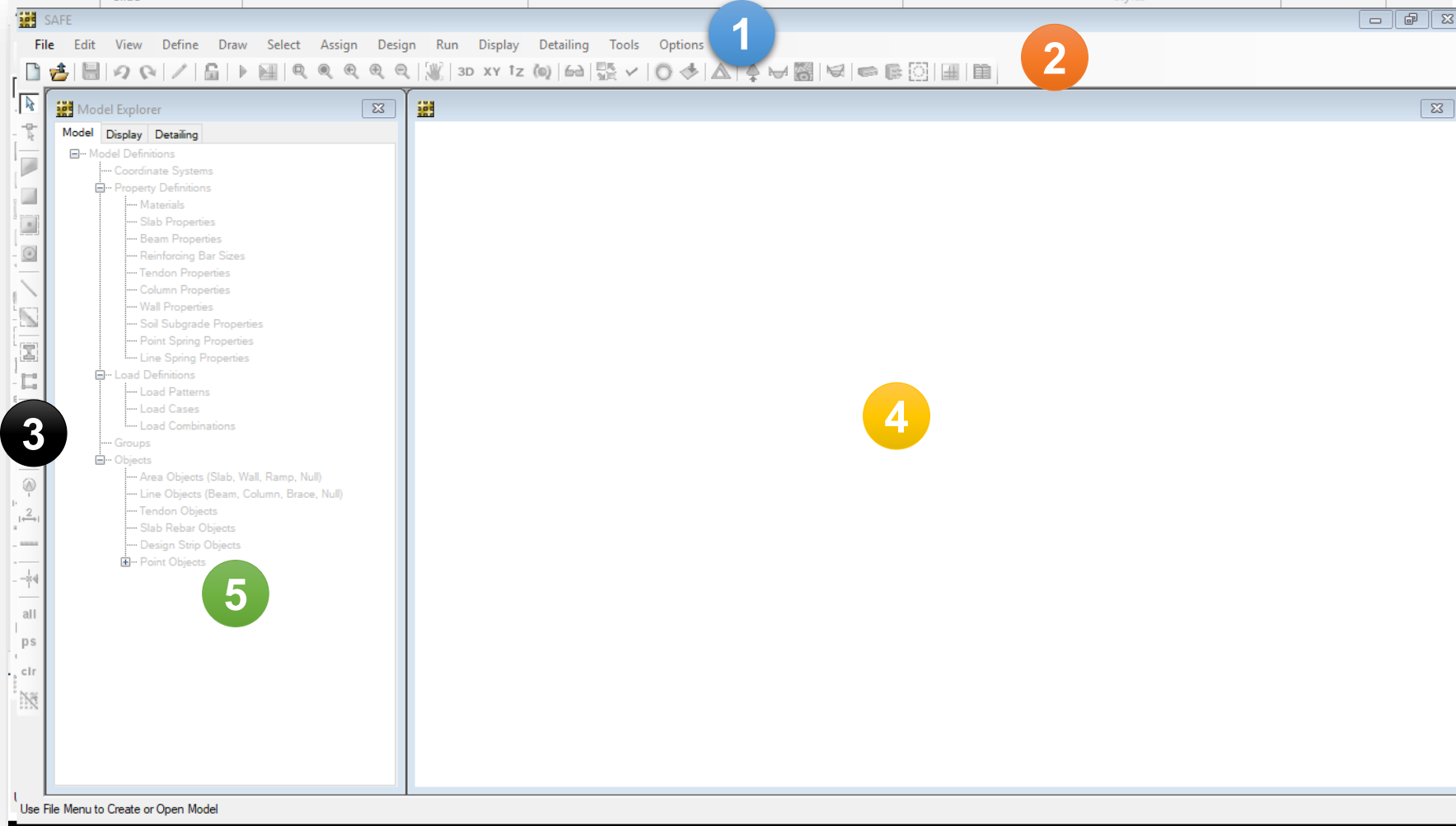
① القوائم الرئيسية

② شريط الأدوات

③ شريط أدوات الرسم

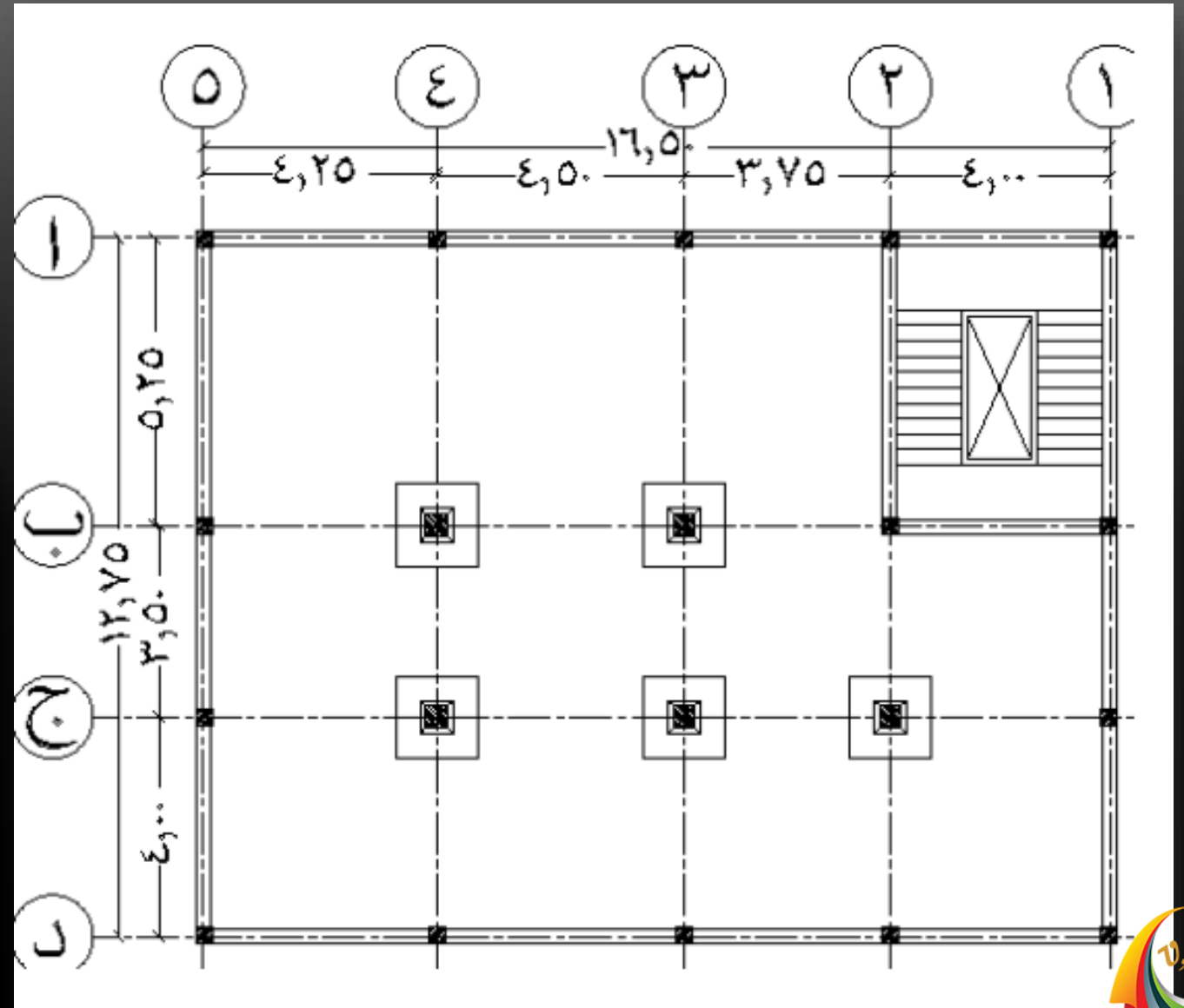
④ مساحة العمل

⑤ متصفح المشروع



المثال التطبيقي

- Slab, $t=20\text{cm}$
- Drop, $t=20\text{cm}$
- Beam, $w=25, d=60$
- EXTCOL, $30*30$
- INTCOL, $40*40$
- DL=20 kN
- LV=60 kN



فتح موديل جديد

1 ننشئ موديل جديد

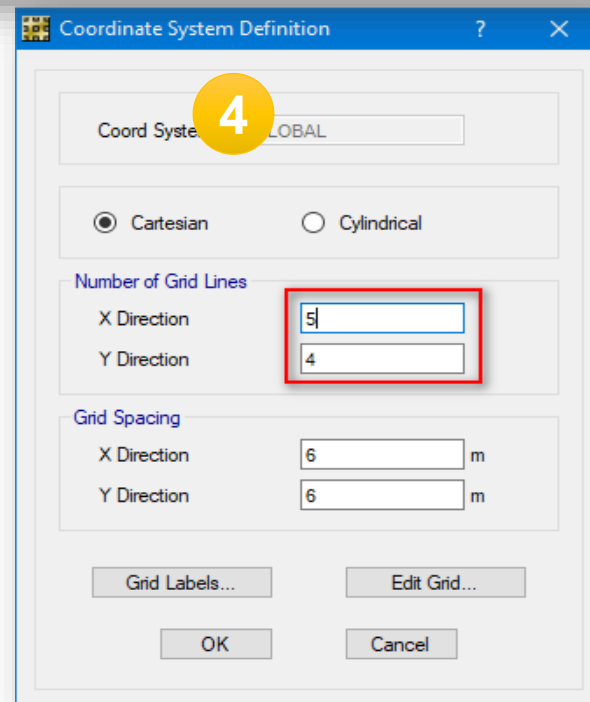
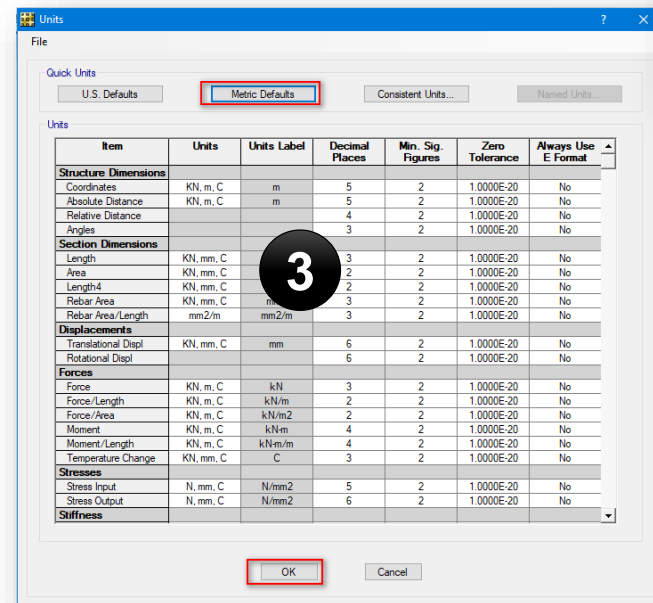
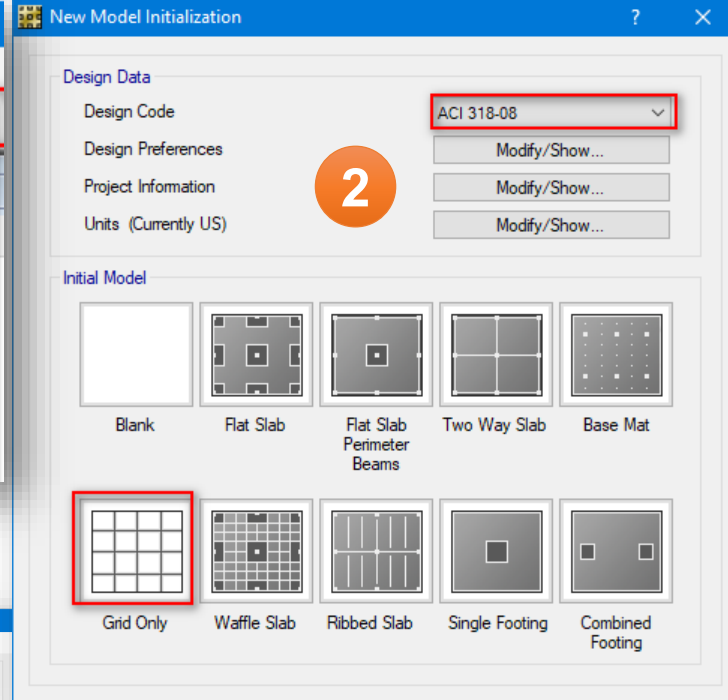
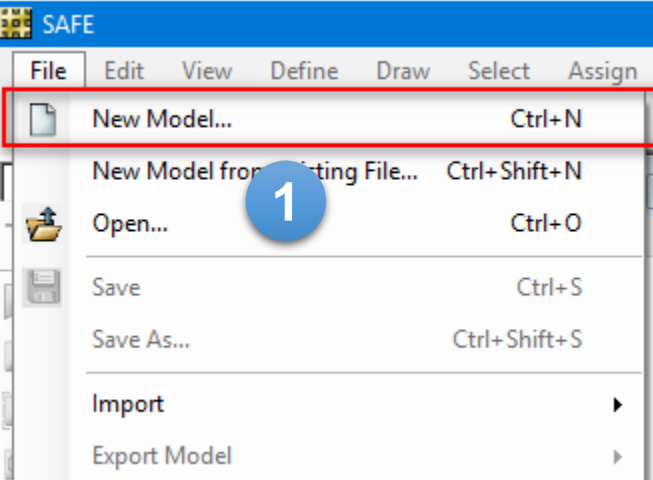
2 نضبط كل من كود التصميم

والوحدات واختيار موديل الشبكة

3 هنا نضبط الوحدات الى النظام

المتري

4 هنا نضبط اعدادات الشبكة

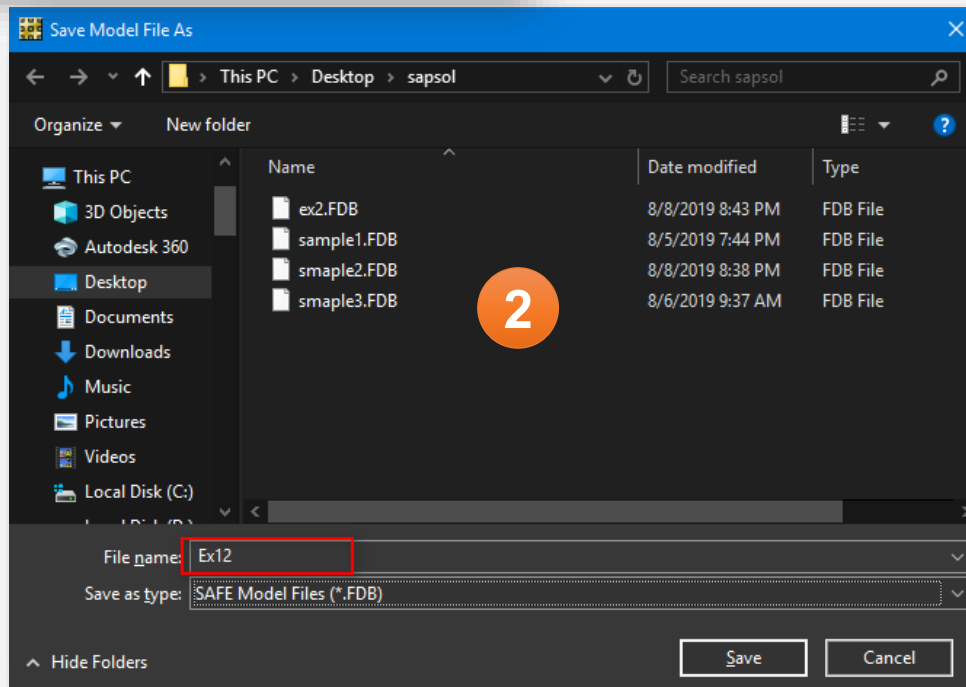
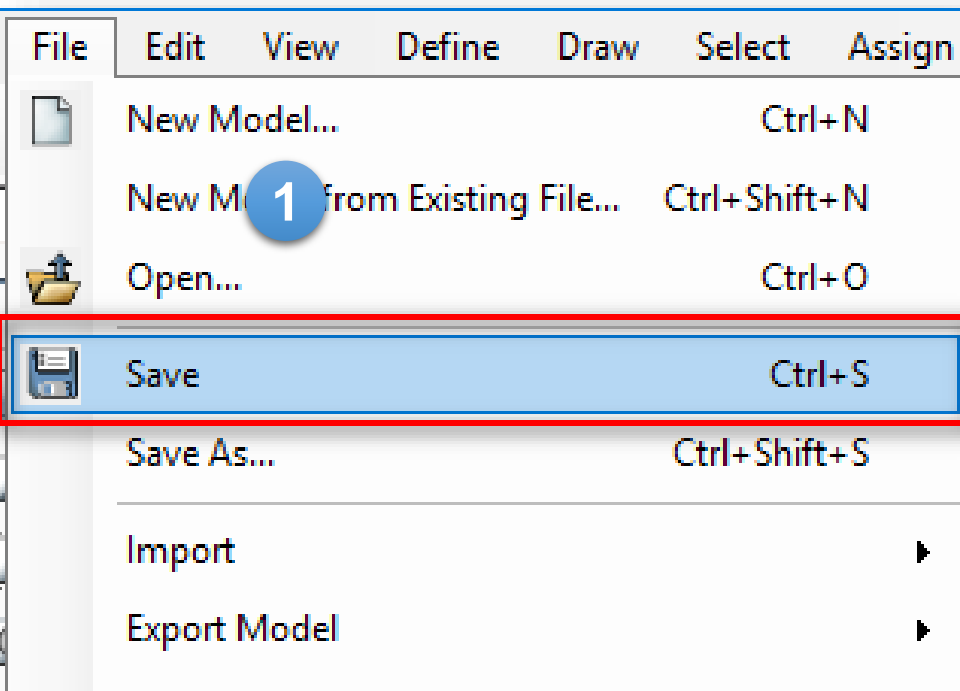


حفظ الموديل

حفظ الموديل ①

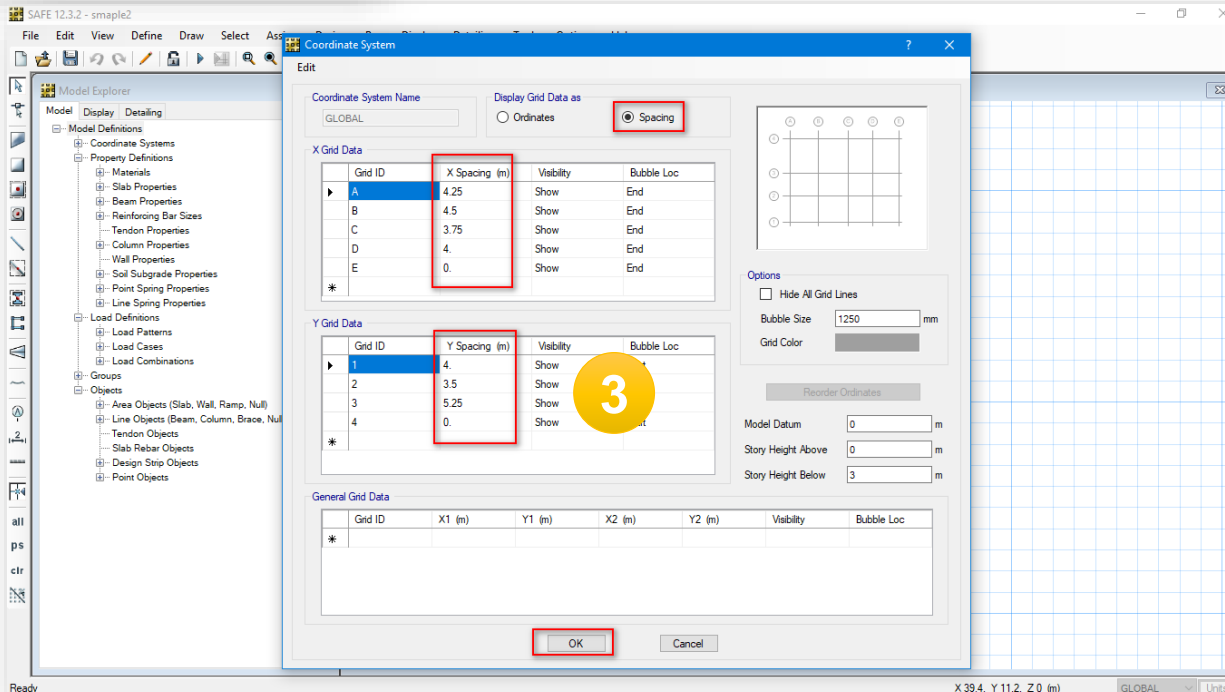
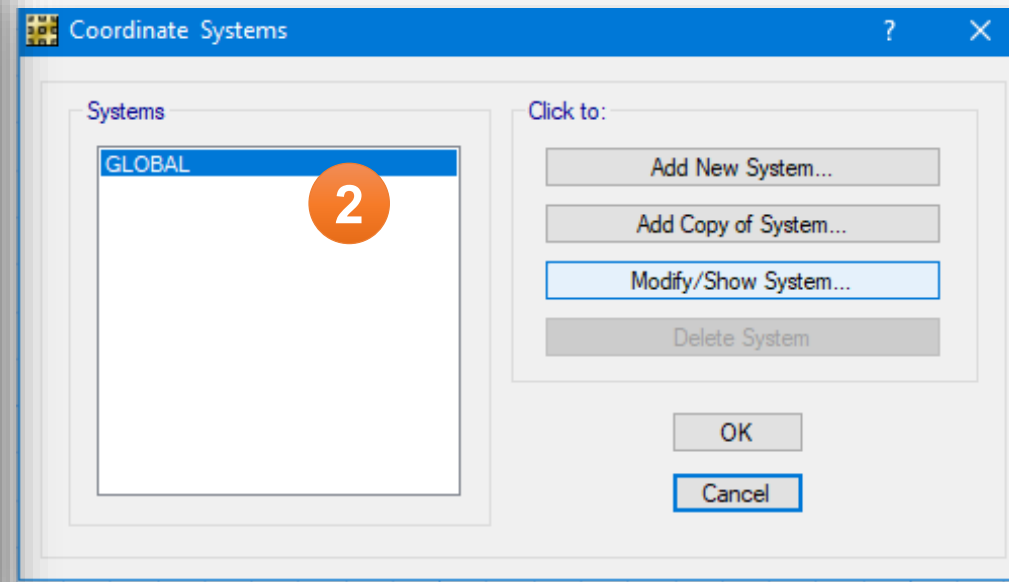
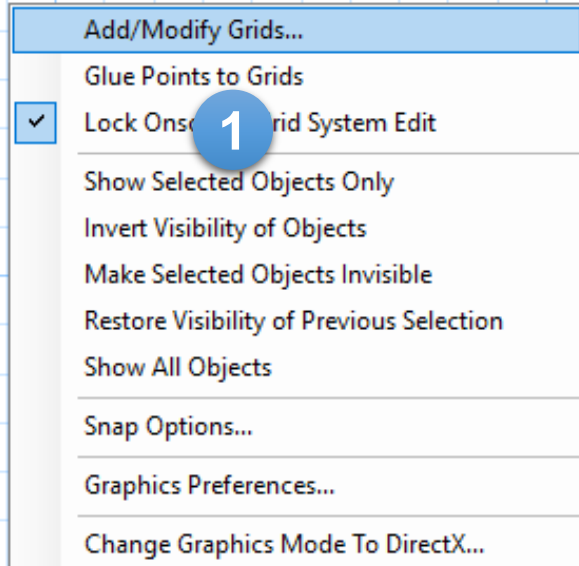
اختيار مكان الحفظ ②

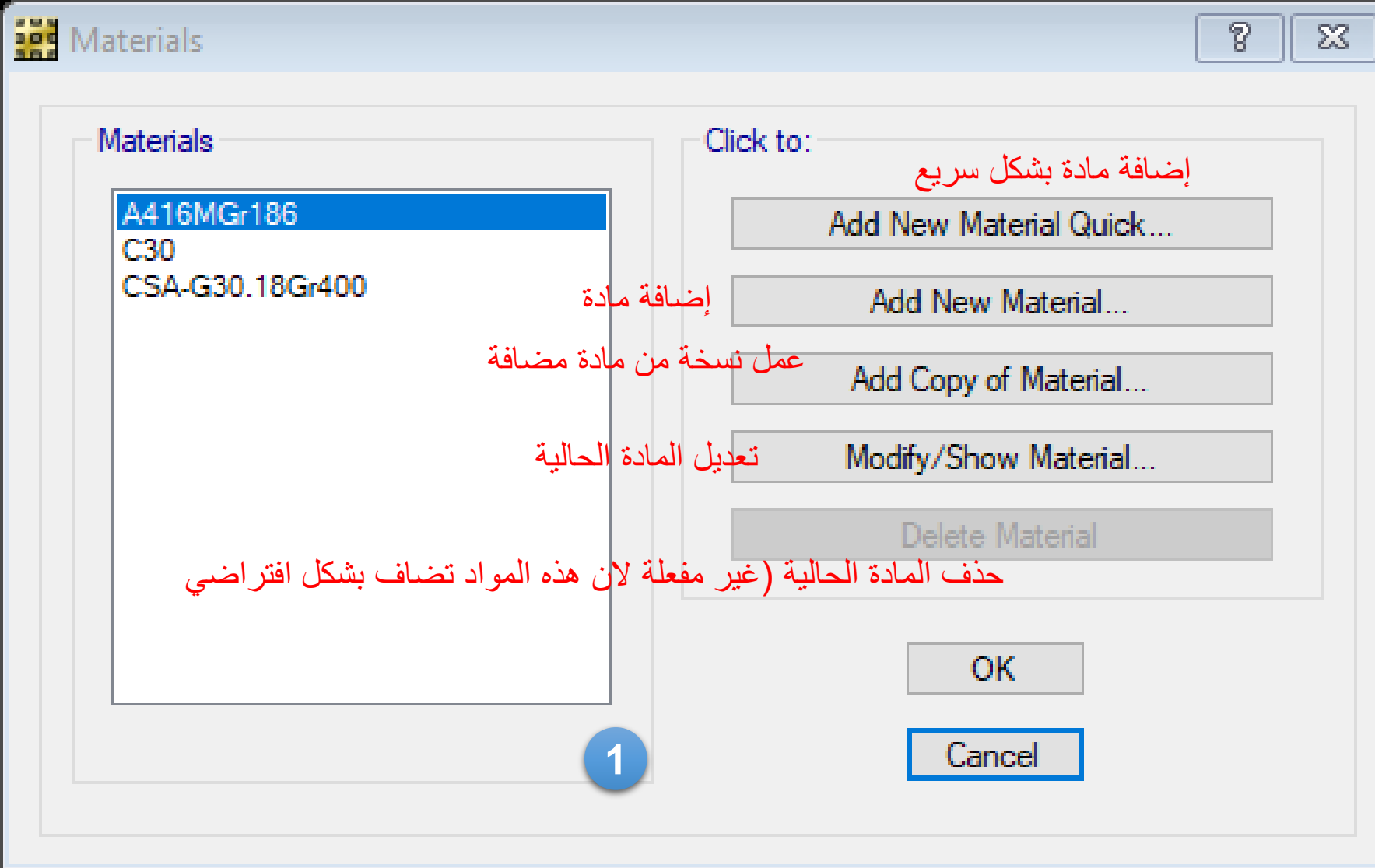
من المهم حفظ الموديل
داخل مجلد وذلك لان
عملية التحليل والتصميم
تنتج مجموعة من
الملفات



اعدادات الشبكة

- ① الدخول الى اعدادات الشبكة
- ② اختيار تعديل الشبكة
- ③ ضبط اعدادات الشبكة باستخدام المسافات





تعريف المواد

① من خلال قائمة Define نختار

Materials

البن وبشكل افتراضي البرنامج يضاف فيه ثلاث أنواع من المواد وخصائصها بمثل خصائص الكود المستخدم يمكن إضافة مادة جديدة او تعديل المادة المضافة من خلال خيارات الإضافة والتعديل أيضا يمكن عمل نسخة من مادة مضافة والتعديل عليها




Define > Slab Properties>Add

Slab Property Data

General Data

Property Name: SLAB1

Slab Material: C30

Display Color:  Change...

Property Notes: Modify/Show...

Analysis Property Data

Type: Slab

Thickness: 200 mm

تعريف قطاع البلاطة

Thick Plate Orthotropic

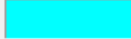
OK Cancel

Slab Property Data

General Data

Property Name: Drop

Slab Material: C30

Display Color:  Change...

Property Notes: Modify/Show...

Analysis Property Data

Type: Drop

Thickness: 200 mm

تعريف قطاع الـ Drop

Thick Plate Orthotropic

OK Cancel



تعريف قطاع البلاطة



Beam Property Data

General Data

Property Name: BEAM1

Beam Material: C30

Rebar Material: CSA-G30.18Gr400

Rebar Material Shear: CSA-G30.18Gr400

Display Color: Change...

Property Notes: Modify/Show...

Analysis Property Data

Beam Shape Type: Rectangular Beam

Web Width at Top: 250 mm

Web Width at Bottom: 250 mm

Depth: 600 mm

الأبعاد

Show Properties...

Design Property Data

Flange Dimensions from Analysis Property Data

Flange Dimensions Automatic from Slab Property

Flange Dimensions User Specified

Flange Width:

Slab Depth:

Cover Top (to Centroid): 75 mm

Cover Bottom (to Centroid): 75 mm

No Design

Analysis Property:

Design Property:

OK Cancel

Define > Beam Properties>Add

تعريف قطاع الـ Beam

تعريف قطاع الجسر



Define > Column Properties>Add

Column Property Data

General Data

Property Name: EXTCOL

Material: C30

Display Color: Yellow

Notes: Modify/Show Notes...

Column Section Dimensions

Column Shape: Rectangular

Parallel to 2-Axis: 300 mm

Parallel to 3-Axis: 300 mm

Include Automatic Rigid Zone Area Over Column

Show Properties...

Automatic Drop Panel Dimensions

Include Automatic Drop Panel Over Column

Parallel to 2-Axis: [] mm

Parallel to 3-Axis: [] mm

Slab Property: []

Automatic Column Capital (Drop Cap) Dimensions

Include Automatic Column Capital (Drop Cap)

Parallel to 2-Axis: [] mm

Parallel to 3-Axis: [] mm

Height: [] mm

OK

Cancel

الإعمدة الخارجية

Column Property Data

General Data

Property Name: INTCOL

Material: C30

Display Color: Green

Notes: Modify/Show Notes...

Column Section Dimensions

Column Shape: Rectangular

Parallel to 2-Axis: 400 mm

Parallel to 3-Axis: 400 mm

Include Automatic Rigid Zone Area Over Column

Show Properties...

Automatic Drop Panel Dimensions

Include Automatic Drop Panel Over Column

Parallel to 2-Axis: 1500 mm

Parallel to 3-Axis: 1500 mm

Slab Property: Drop

Automatic Column Capital (Drop Cap) Dimensions

Include Automatic Column Capital (Drop Cap)

Parallel to 2-Axis: 600 mm

Parallel to 3-Axis: 600 mm

Height: 2000 mm

OK

Cancel

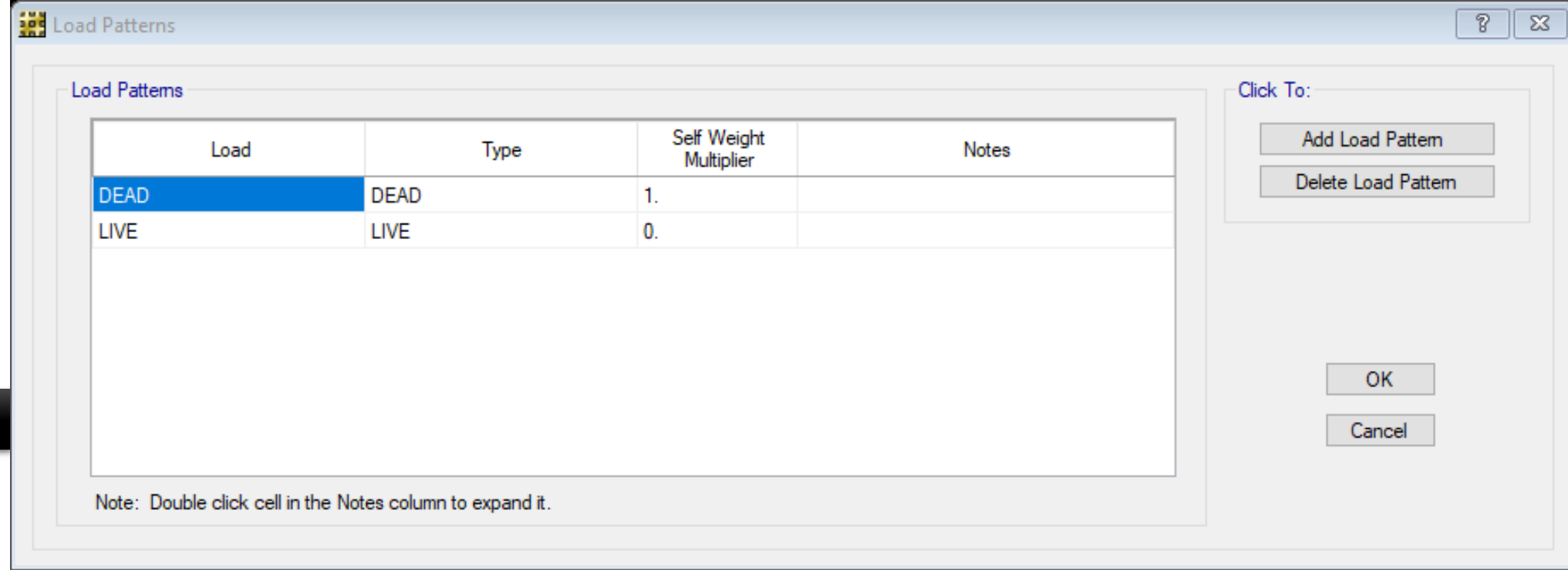
الإعمدة الداخلية



تعريف قطاع العمدة



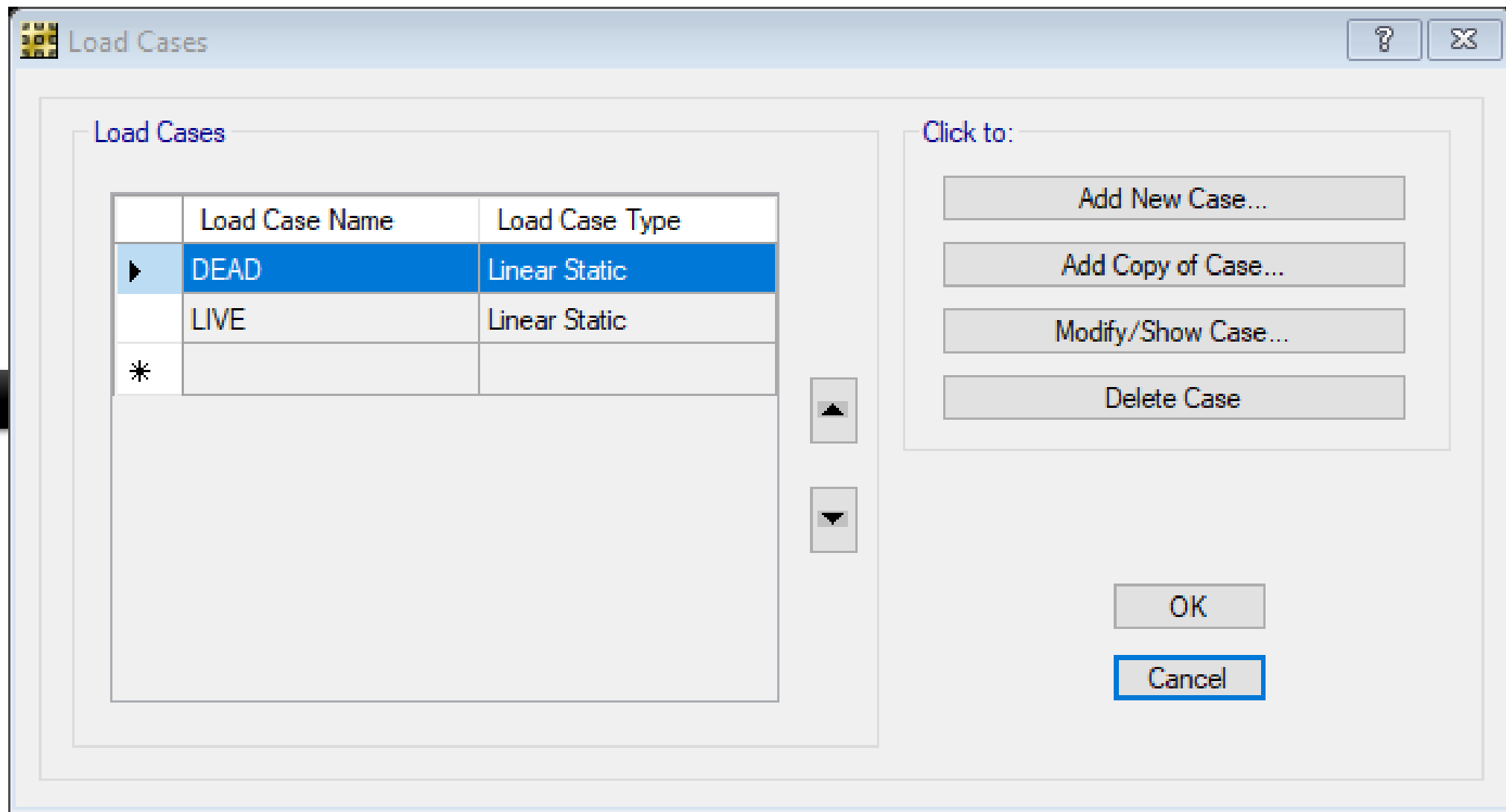
Define > Load Patterns



تعريف الحمل



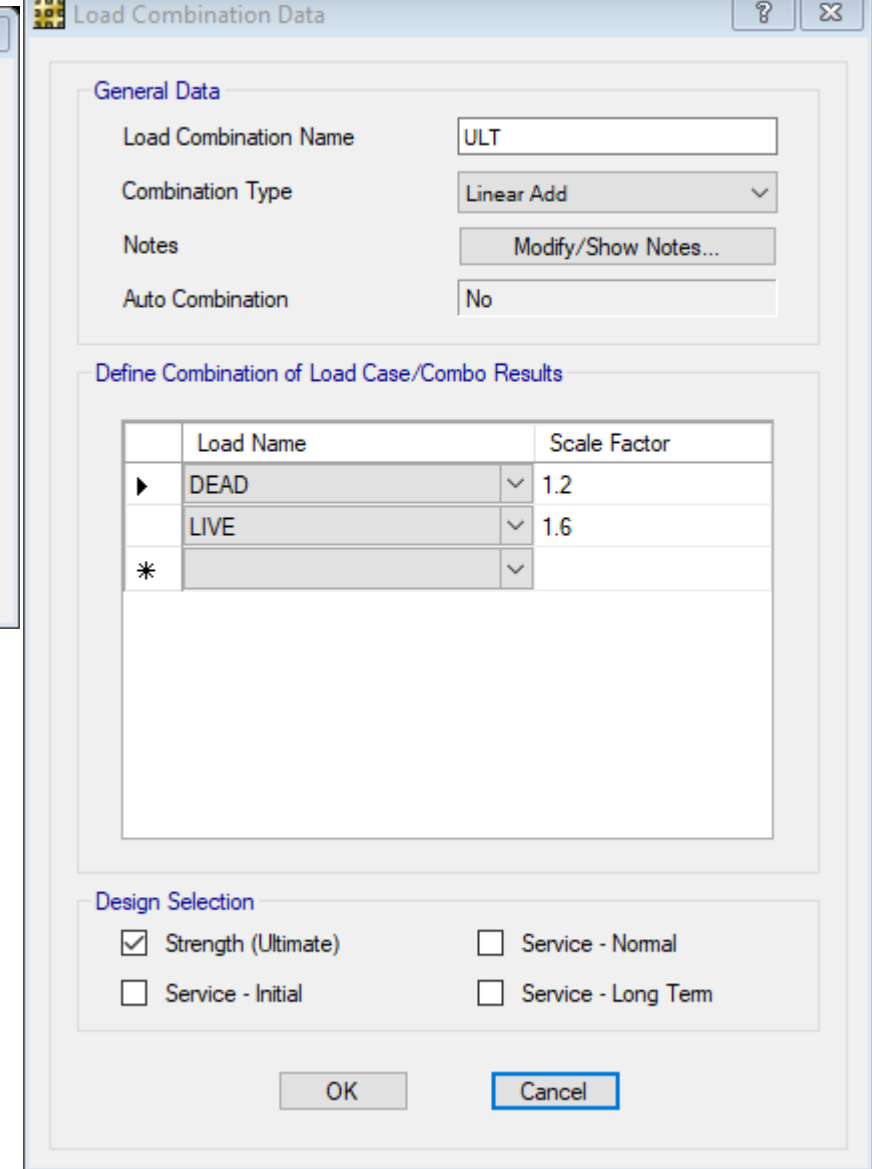
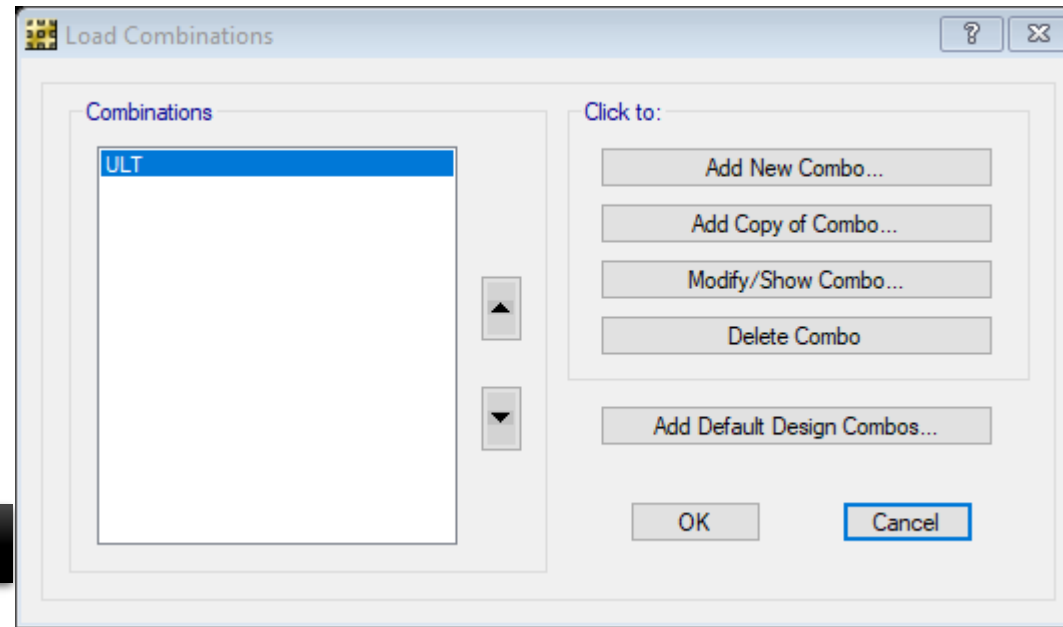
Define > Load Cases



تعريف حالات الحمل

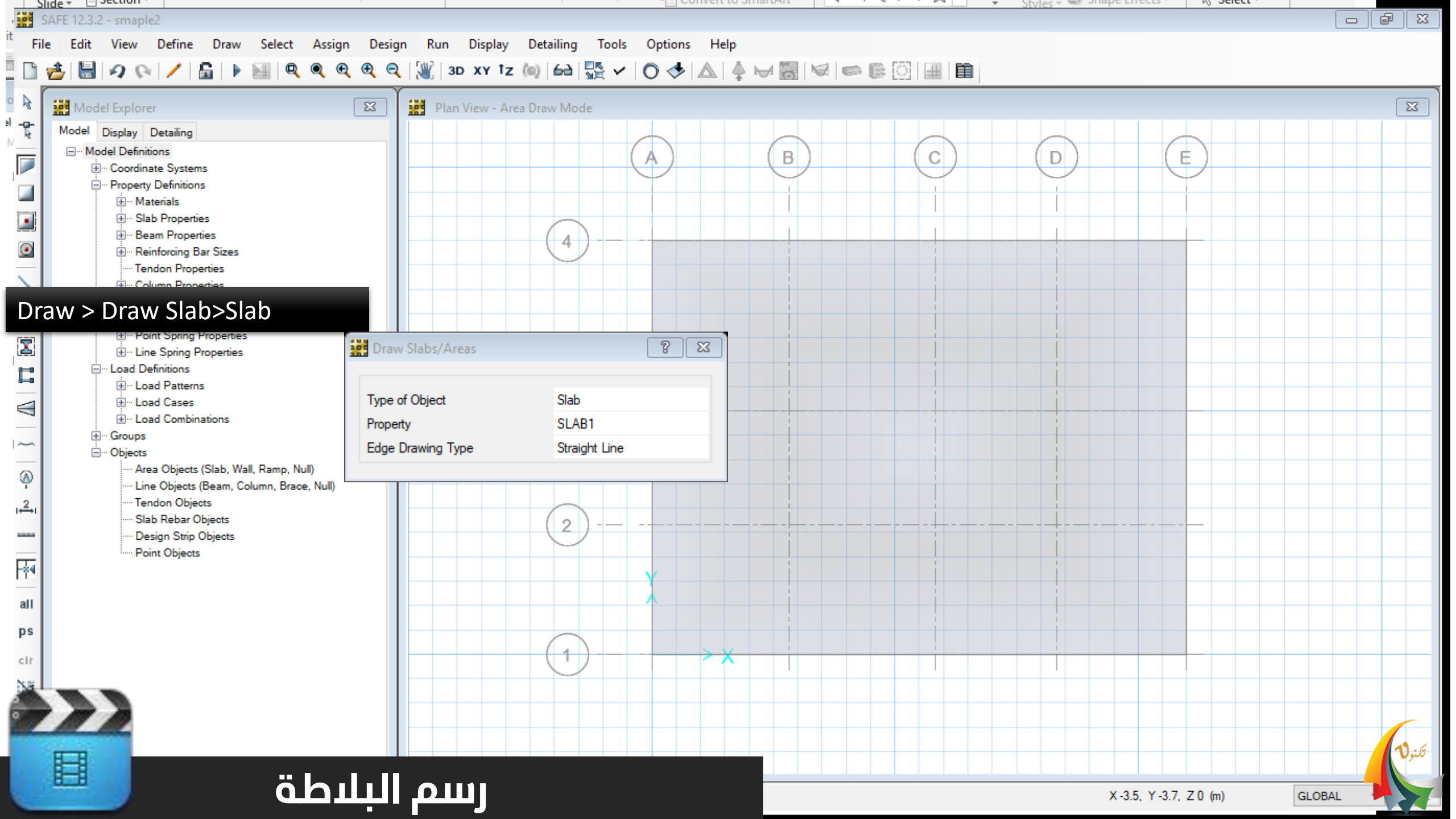


Define > Load Combinations



تعريف حمل التصميم





Draw > Draw Slab>Slab

Draw Slabs/Areas

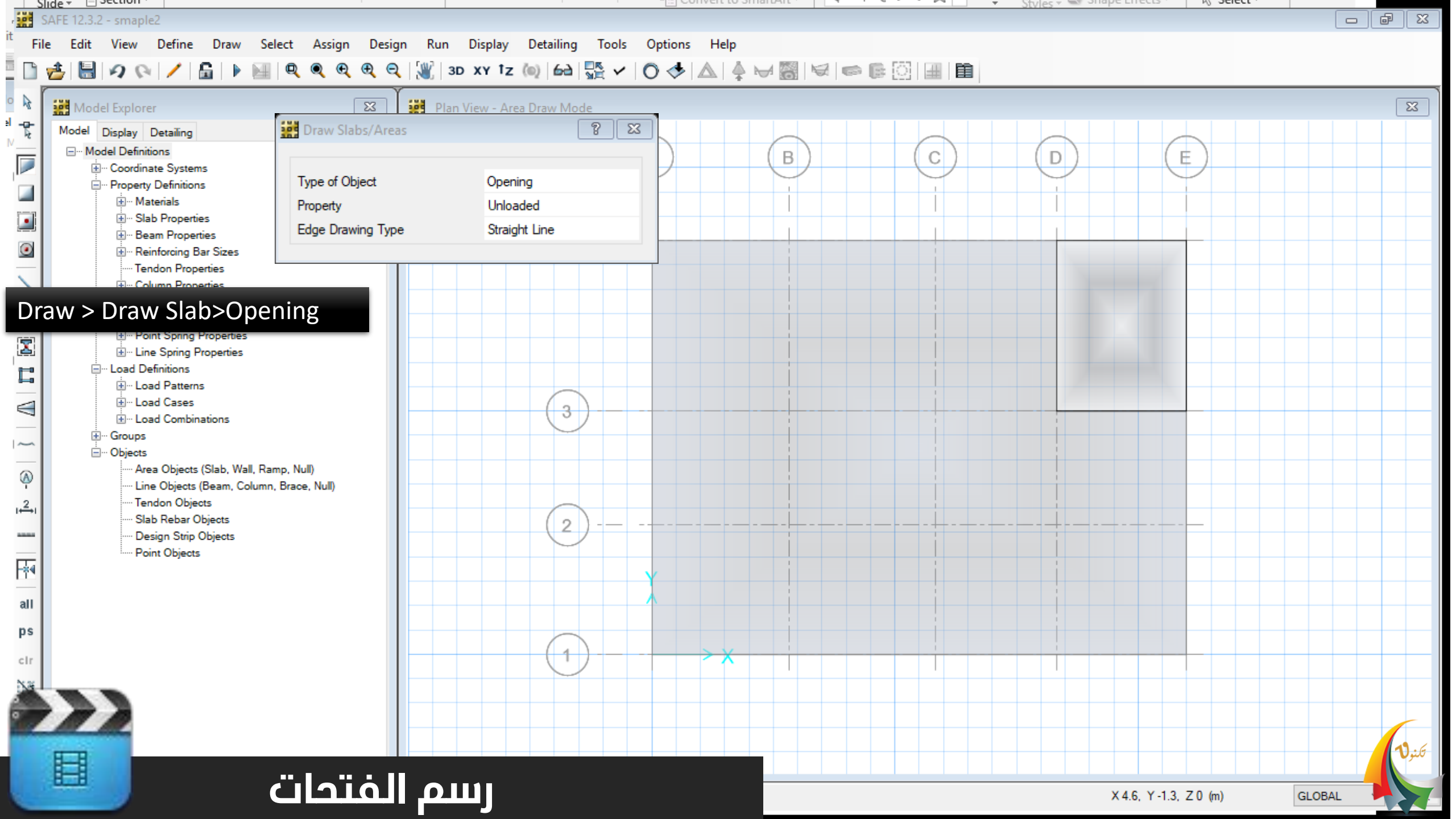
Type of Object	Slab
Property	SLAB1
Edge Drawing Type	Straight Line

رسم البلاطة

X-3.5, Y-3.7, Z 0 (m)

GLOBAL





Draw Slabs/Areas

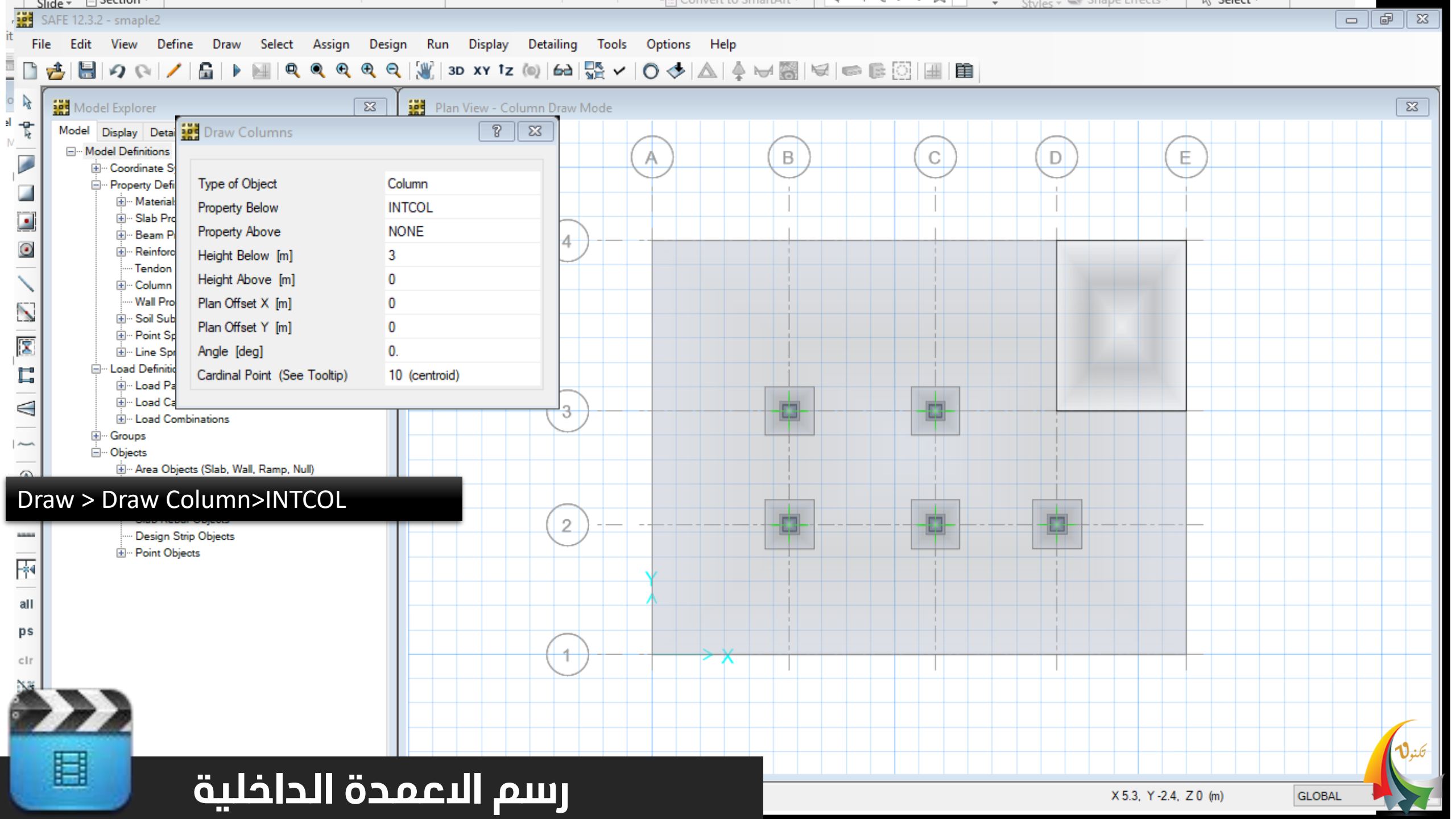
Type of Object	Opening
Property	Unloaded
Edge Drawing Type	Straight Line

Draw > Draw Slab>Opening

- Model Explorer
 - Model
 - Display
 - Detailing
 - Model Definitions
 - Coordinate Systems
 - Property Definitions
 - Materials
 - Slab Properties
 - Beam Properties
 - Reinforcing Bar Sizes
 - Tendon Properties
 - Column Properties
 - Load Definitions
 - Load Patterns
 - Load Cases
 - Load Combinations
 - Groups
 - Objects
 - Area Objects (Slab, Wall, Ramp, Null)
 - Line Objects (Beam, Column, Brace, Null)
 - Tendon Objects
 - Slab Rebar Objects
 - Design Strip Objects
 - Point Objects

رسم الفتحات





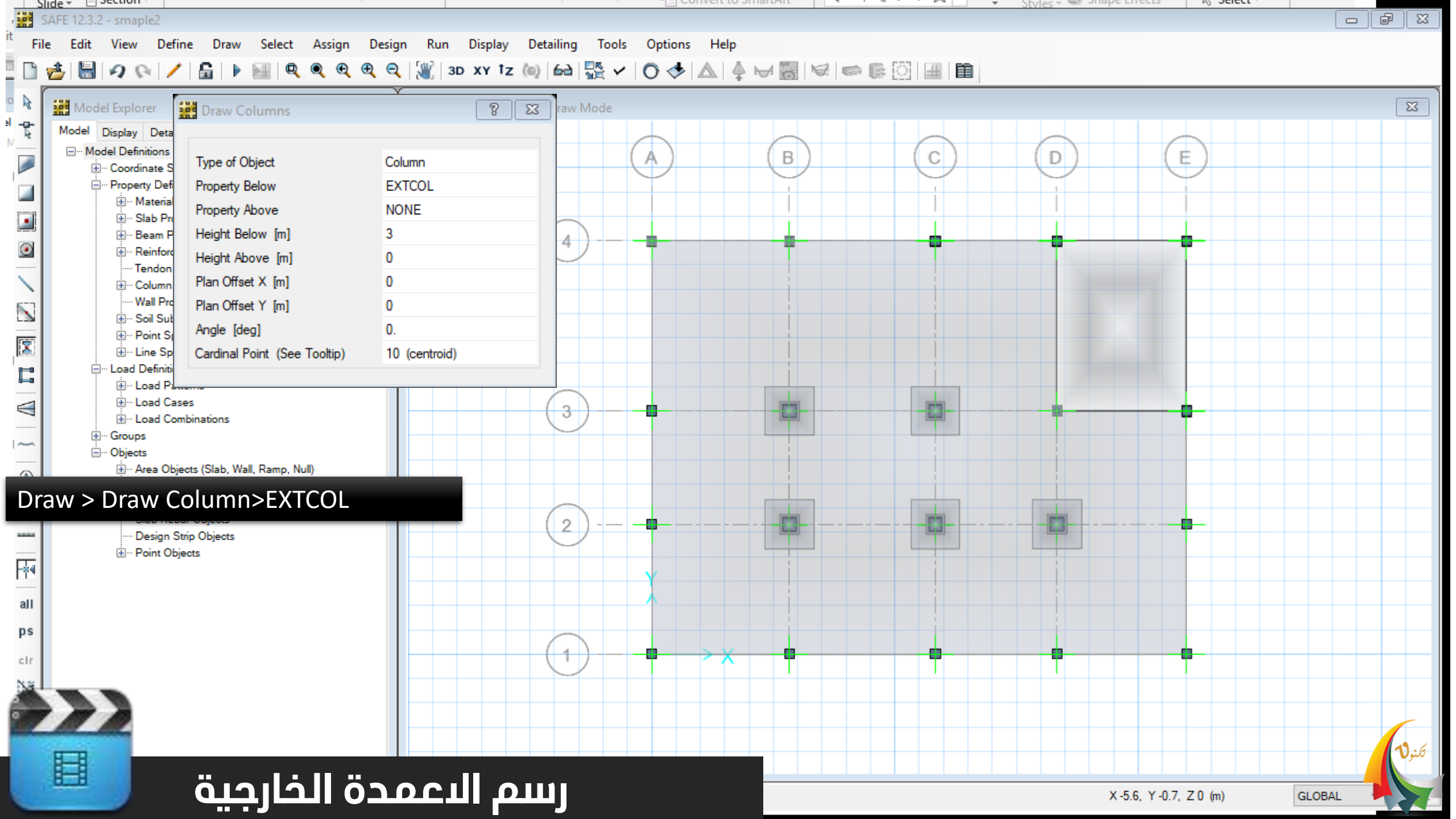
Draw Columns

Type of Object	Column
Property Below	INTCOL
Property Above	NONE
Height Below [m]	3
Height Above [m]	0
Plan Offset X [m]	0
Plan Offset Y [m]	0
Angle [deg]	0.
Cardinal Point (See Tooltip)	10 (centroid)

Draw > Draw Column>INTCOL

رسم العمدة الداخلية

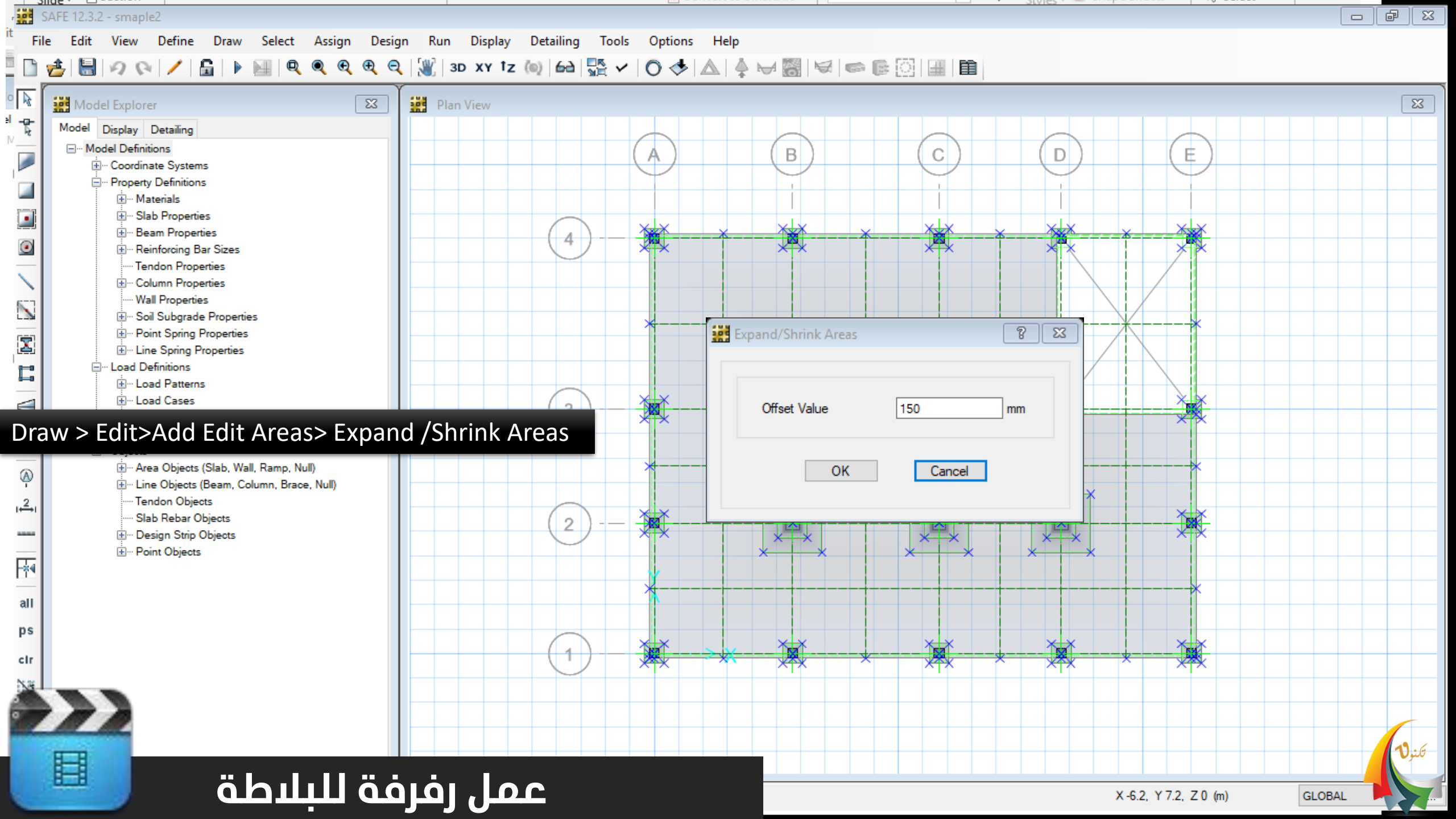




Draw > Draw Column>EXTCOL

رسم الاعمدة الخارجية





Draw > Edit > Add Edit Areas > Expand /Shrink Areas

- Area Objects (Slab, Wall, Ramp, Null)
- Line Objects (Beam, Column, Brace, Null)
- Tendon Objects
- Slab Rebar Objects
- Design Strip Objects
- Point Objects

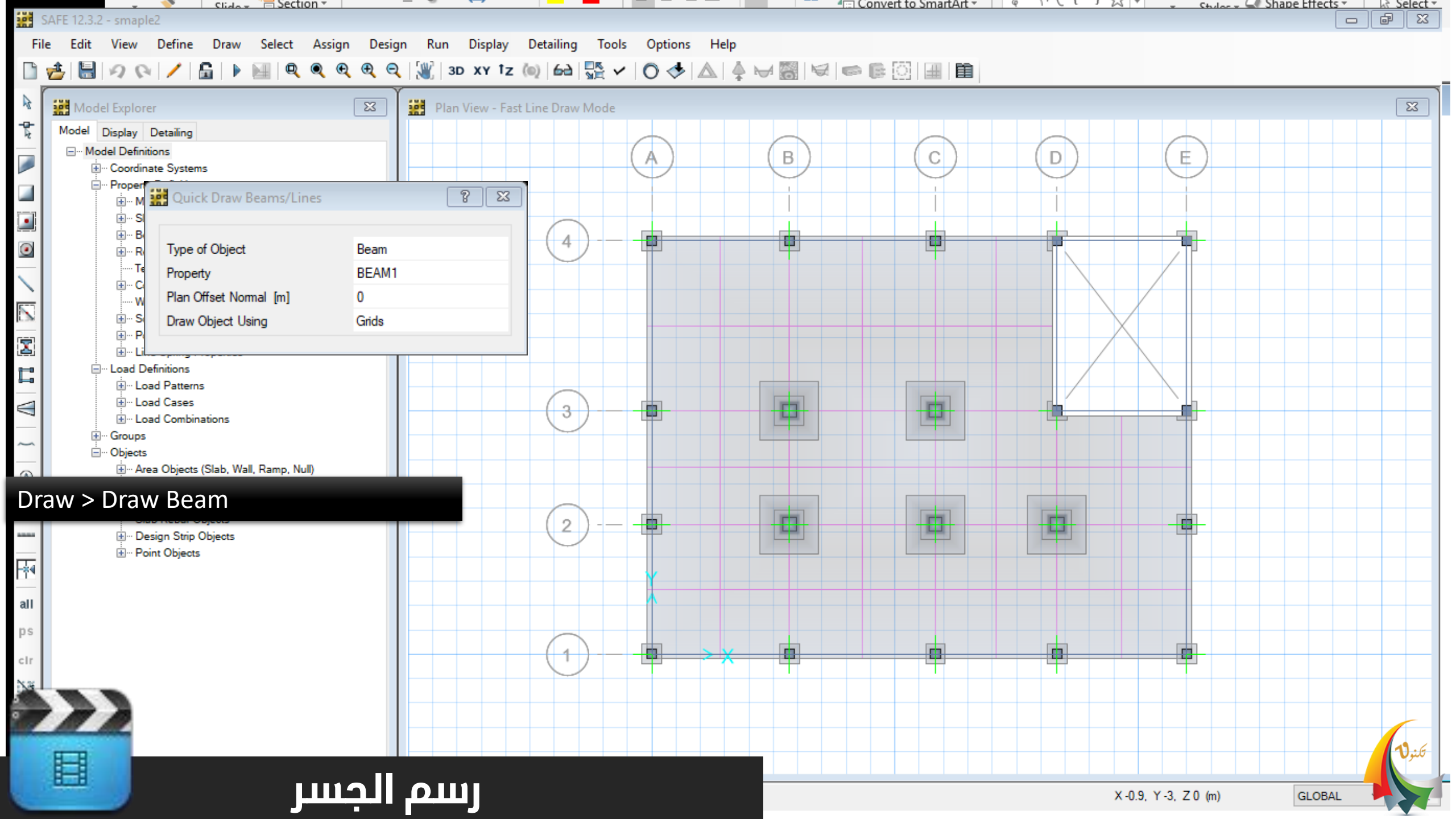


عمل رفرقة للبلاطة

X-6.2, Y 7.2, Z 0 (m)

GLOBAL





Model Explorer

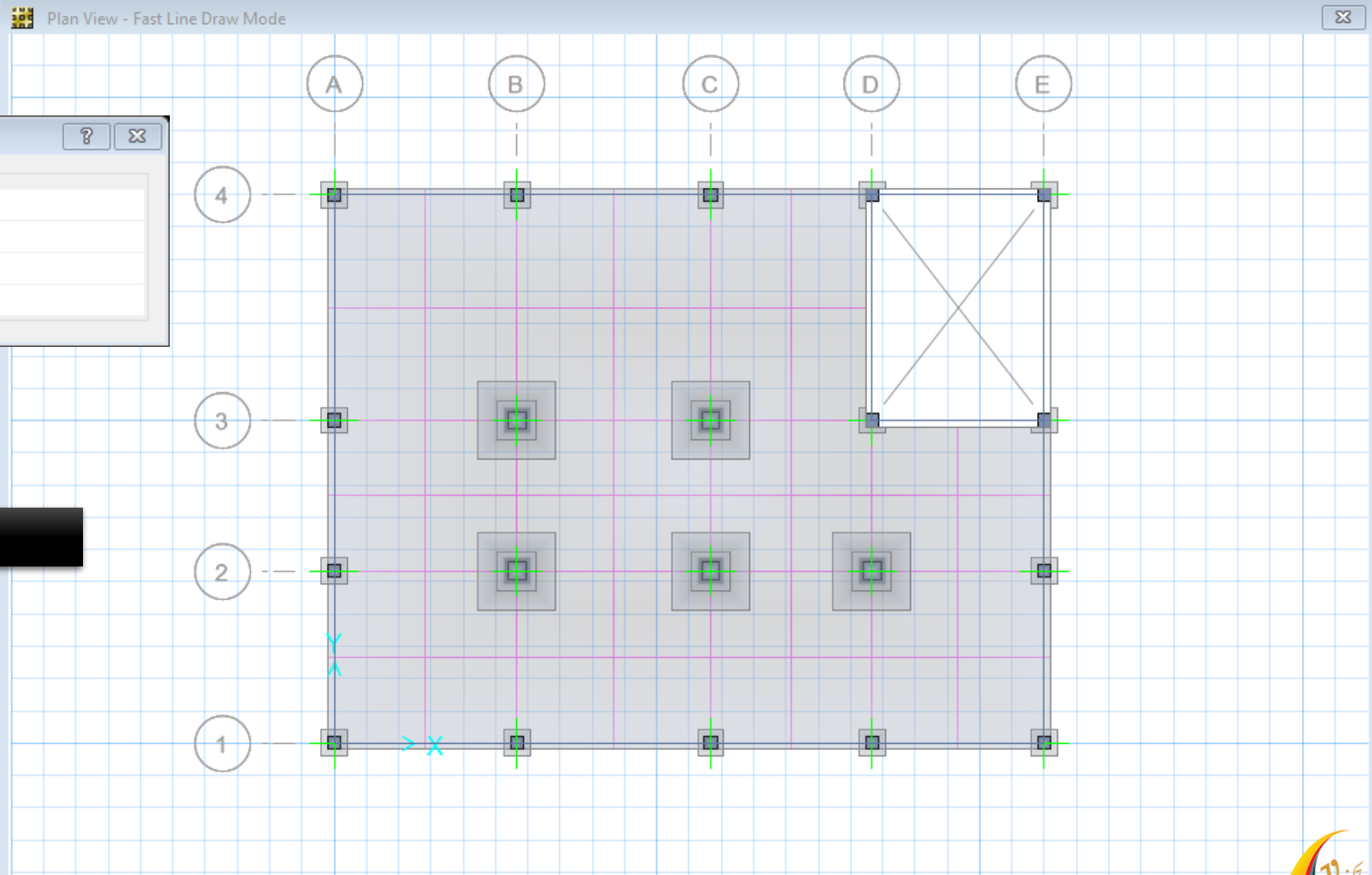
Model Display Detailing

- Model Definitions
 - Coordinate Systems
 - Properties
 - M
 - S
 - B
 - R
 - T
 - C
 - W
 - S
 - P
 - L
- Load Definitions
 - Load Patterns
 - Load Cases
 - Load Combinations
- Groups
- Objects
 - Area Objects (Slab, Wall, Ramp, Null)
 - Slab Rebar Objects
 - Design Strip Objects
 - Point Objects

all
ps
ctr

Quick Draw Beams/Lines

Type of Object	Beam
Property	BEAM1
Plan Offset Normal [m]	0
Draw Object Using	Grids



Draw > Draw Beam



رسم الجسر



Edit>Add Edit Design strip>Add Design Strip

Add Design Strips

Options

Add Design Strips Along Cartesian Grid Lines

Include Middle Strips

Parameters

Coordinate System: GLOBAL

Grid Direction: X

Strip Layer: A

Strip Width

Fixed

Auto

OK Cancel

Add Design Strips

Options

Add Design Strips Along Cartesian Grid Lines

Include Middle Strips

Parameters

Coordinate System: GLOBAL

Grid Direction: Y

Strip Layer: B

Strip Width

Fixed

Auto

OK Cancel

Edit>Align Point .. Lines

Align Points/Lines/Edges

Edit Options for Selected Objects

Align Points to X-Ordinate in Current Coord. System

Align Points to Y-Ordinate in Current Coord. System

Align Points to Nearest Selected Line/Edge

Trim Line/Edge/Tendon/Strip Objects

Extend Line/Edge/Tendon/Strip Objects

Max. Move

OK Cancel



تقسيم البلاطة الى وحدات



Surface Loads

Load Pattern Name
Name: LIVE

Load Direction
Direction: Gravity

Uniform Loads
Uniform Load: 60 kN/m²

Nonuniform Loads
 $w(x, y) = Ax + By + C = \text{Load at Pt } (x, y); x, y \text{ in Global}$
 A: 0E+00 kN/m³
 B: 0E+00 kN/m³
 C: 0 kN/m²

Options
 Add to Existing Loads
 Replace Existing Loads
 Delete Existing Loads

OK
Cancel

Surface Loads

Load Pattern Name
Name: LIVE

Load Direction
Direction: Gravity

Uniform Loads
Uniform Load: 20 kN/m²

Nonuniform Loads
 $w(x, y) = Ax + By + C = \text{Load at Pt } (x, y); x, y \text{ in Global}$
 A: 0E+00 kN/m³
 B: 0E+00 kN/m³
 C: 0 kN/m²

Options
 Add to Existing Loads
 Replace Existing Loads
 Delete Existing Loads

OK
Cancel

Assign > Load Data > Surface load



وضع الحمل

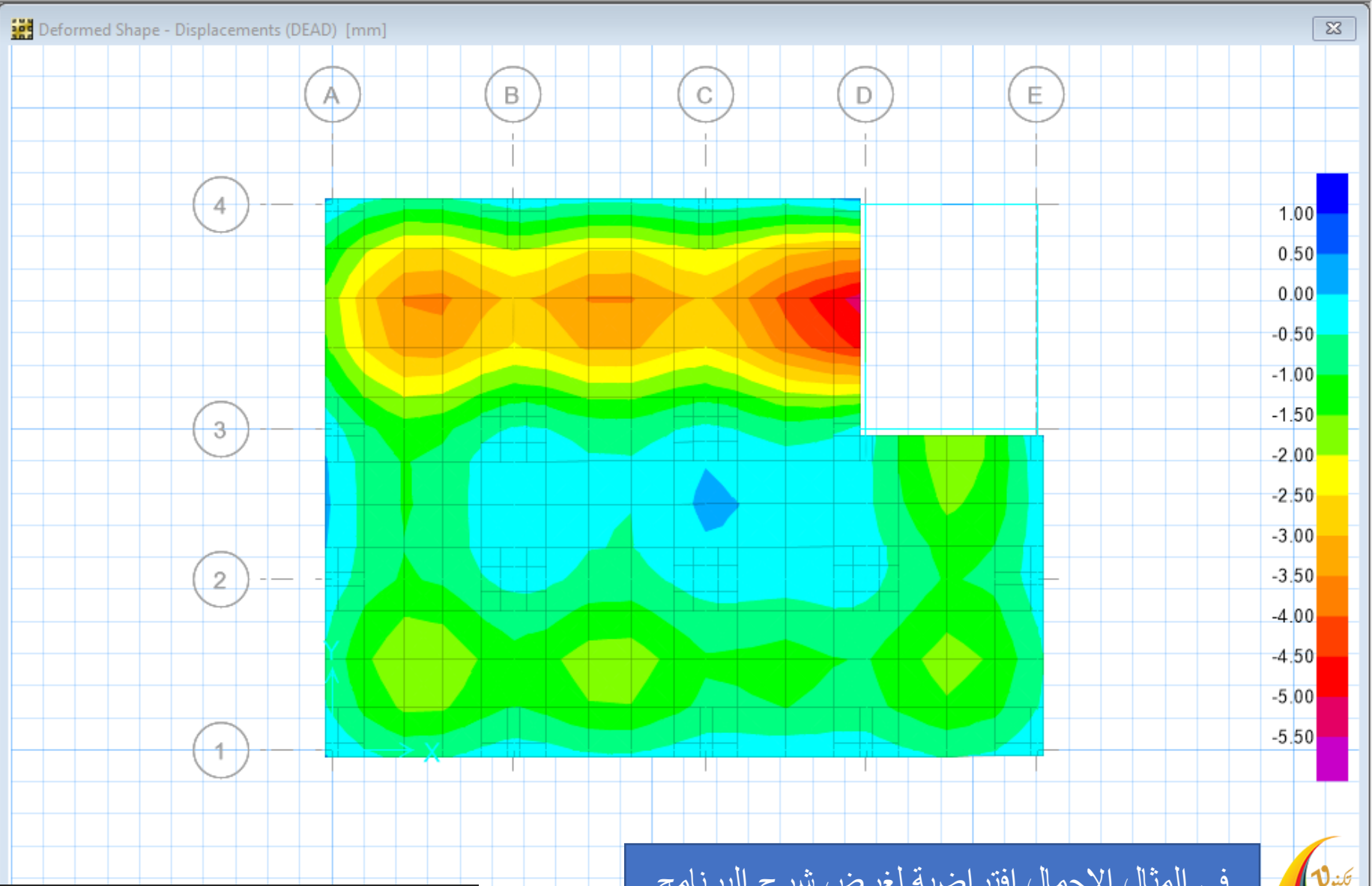
في المثال الاحمال افتراضية لغرض شرح البرنامج





Model Explorer

- Model
 - Display
 - Detailing
- Model Definitions
 - Coordinate Systems
 - Property Definitions
 - Materials
 - Slab Properties
 - Beam Properties
 - Reinforcing Bar Sizes
 - Tendon Properties
 - Column Properties
 - Wall Properties
 - Soil Subgrade Properties
 - Point Spring Properties
 - Line Spring Properties
 - Load Definitions
 - Load Patterns
 - Load Cases
 - Load Combinations
 - Groups
 - Objects
 - Area Objects (Slab, Wall, Ramp, Null)
 - Line Objects (Beam, Column, Brace, Null)
 - Tendon Objects
 - Slab Rebar Objects
 - Design Strip Objects



Run>run analysis

all
ps
ctr



اجراء التحليل

في المثال الاحمال افتراضية لغرض شرح البرنامج



Display >show Reactions forces

Reactions

Load Case/Load Combination

Load Case

Load Combination **ULT**

Type of Reactions

Point Reactions

Integrated Wall Reactions

Soil Pressures

Plot Type

Arrows

Tabulated Reset Tabulation Location

Fx Mx

Fy My

Fz Mz

Apply Close

Display >show stresses

Beam Forces/Stresses

Load Case/Load Combination

Load Case

Load Combination **ULT**

Component

Axial Force Torsion Top Stress

Major Shear Minor Moment Bottom Stress

Minor Shear Major Moment Shear Stress

Scaling

Automatic

User Defined Scale Factor

Display Options

Fill Diagram

Show Values at Controlling Stations on Diagram

Apply Close

Display >show deformed shape

Deformed Shape

Load Case/Load Combination

Load Case

Load Combination **ULT**

Modal Load Case

Scaling

Automatic

User Defined Scale Factor

Contour Range

Minimum mm

Maximum mm

Draw Contours

Apply Close



اظهار نتائج التحليل

في المثال الاحمال افتراضية لغرض شرح البرنامج



Run > Run analysis & design

Display > show slab design

The screenshot displays the Bentley Slab Design software interface. The main window shows a 3D model of a slab design with a grid of columns and beams. The columns are labeled 1, 2, 3, and 4, and the beams are labeled A. The slab design is shown in red, with the reinforcing bars visible. The software interface includes a menu bar (File, Edit, View, Define, Draw, Select, Assign, Design, Run, Display, Detailing, Tools, Options, Help) and a toolbar with various icons for file operations, navigation, and design tools. On the left, there is a Model Explorer tree showing the project structure, including Model Definitions (Coordinate Systems, Property Definitions, Materials, Slab Properties, Beam Properties, Reinforcing Bar Sizes, Tendon Properties, Column Properties, Wall Properties, Soil Subgrade Properties, Point Spring Properties) and Objects (Load Cases, Load Combinations, Groups, Area Objects, Line Objects, Tendon Objects, Slab Rebar Objects, Design Strip Objects, Point Objects). A Slab Design dialog box is open in the foreground, showing various configuration options for the slab design. The dialog box has several sections: Choose Display Type (Design Basis: Strip Based, Display Type: Enveloping Flexural Reinforcement, Impose Minimum Reinforcing: unchecked), Choose Strip Direction (Layer A: checked, Layer B: checked, Layer Other: unchecked), Rebar Location Shown (Show Top Rebar: checked, Show Bottom Rebar: checked), Reinforcing Display Type (Show Rebar Intensity: unselected, Show Total Rebar Area for Strip: selected, Show Number of Bars of Size: unselected), Reinforcing Diagram (Show Reinforcing Envelope Diagram: checked, Show Reinforcing Extent: checked, Scale Factor: 1), and Typical Uniform Reinforcing (Define by Bar Size and Bar Spacing: selected, Define by Bar Area and Bar Spacing: unselected). The Typical Uniform Reinforcing section shows Bar Size 6 and Spacing 250 mm for both Top and Bottom. The dialog box has Apply and Close buttons.



تصميم البلاطة

في المثال الاحمال افتراضية لغرض شرح البرنامج

X -3.72286, Y -3.13239, Z 0 (m)

GLOBAL

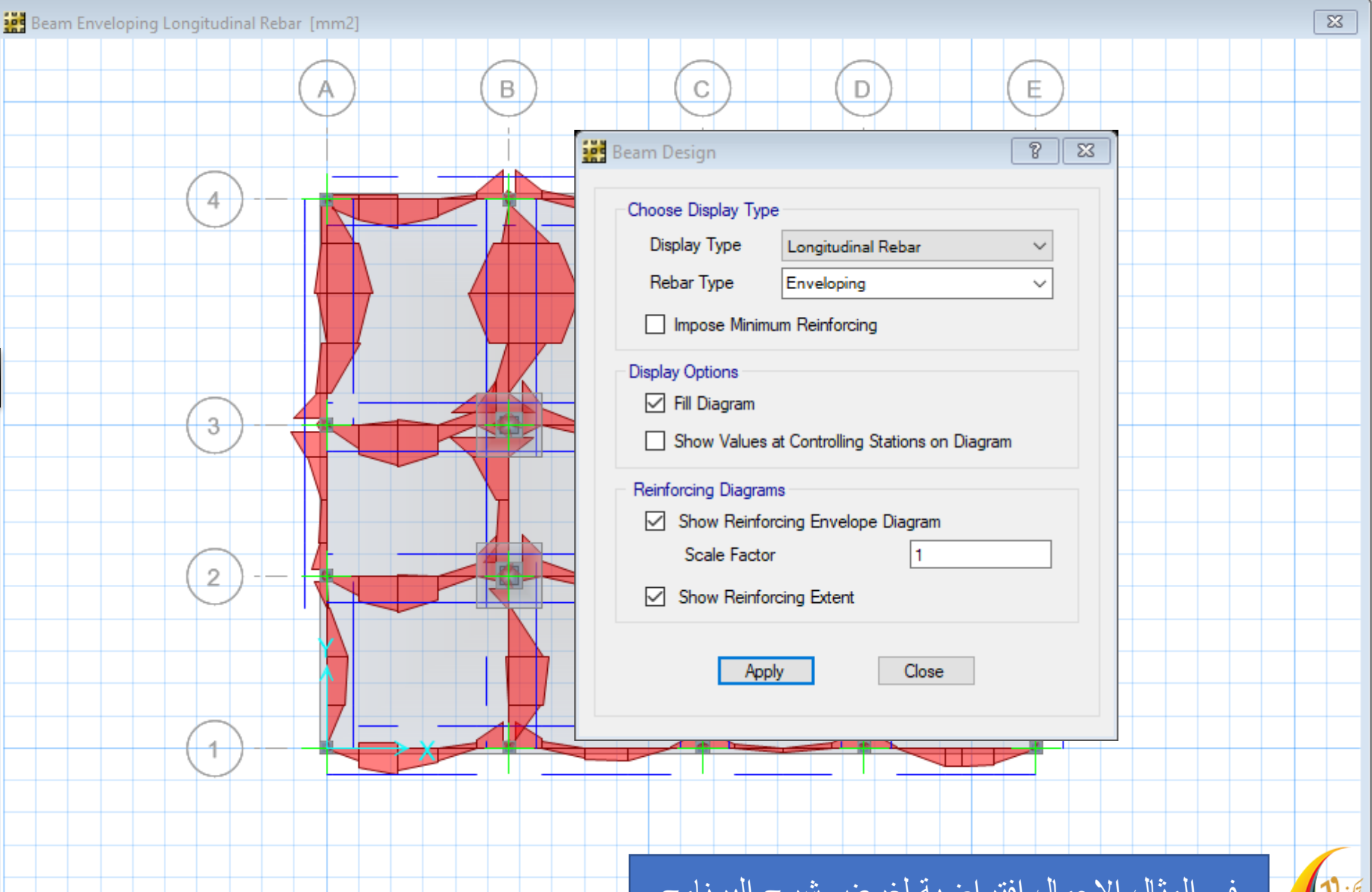


Model Explorer

- Model
 - Display
 - Detailing
- Model Definitions
 - Coordinate Systems
 - Property Definitions
 - Materials
 - Slab Properties
 - Beam Properties
 - Reinforcing Bar Sizes
 - Tendon Properties
 - Column Properties
 - Wall Properties
 - Soil Subgrade Properties
 - Point Spring Properties
 - Line Spring Properties

Display > show beam design

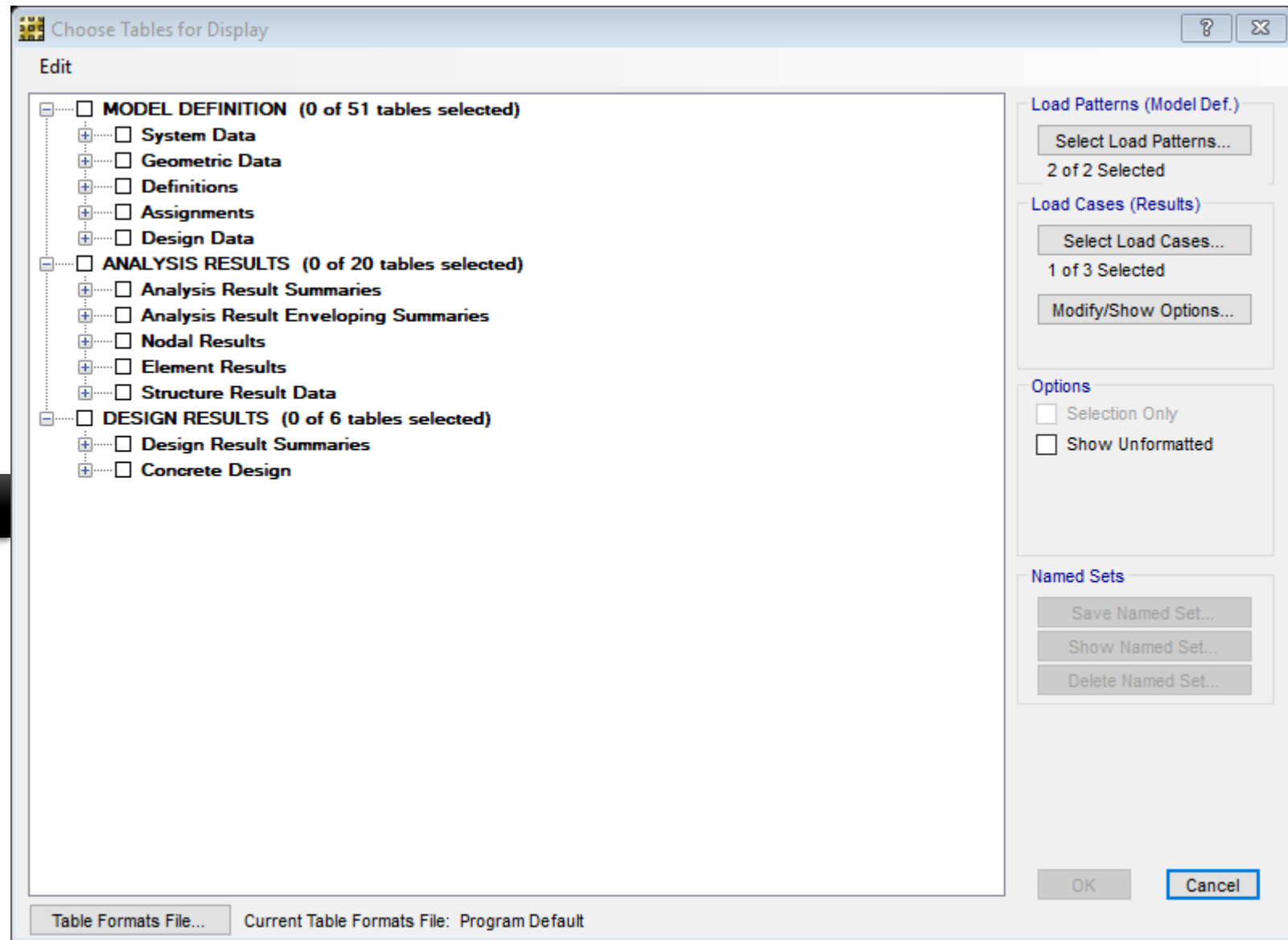
- Load Cases
- Load Combinations
- Groups
- Objects
 - Area Objects (Slab, Wall, Ramp, Null)
 - Line Objects (Beam, Column, Brace, Null)
 - Tendon Objects
 - Slab Rebar Objects
 - Design Strip Objects
 - Point Objects



تصميم الجسر

في المثال الاحمال افتراضية لغرض شرح البرنامج





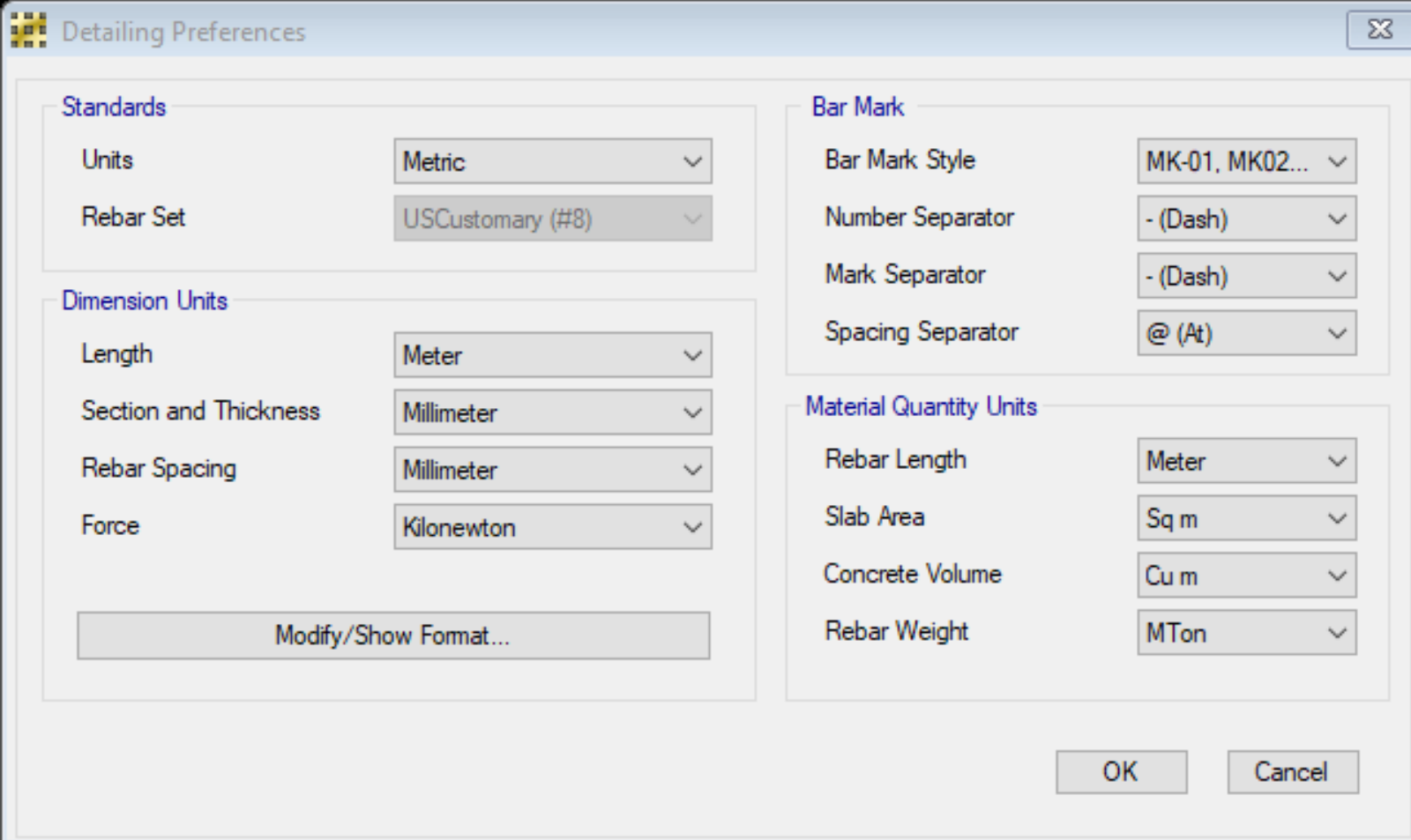
Display > show Table



الجدول

في المثال الاحمال افتراضية لغرض شرح البرنامج





Detailing > setting the all commands details



ضبط التفاصيل

في المثال الاحمال افتراضية لغرض شرح البرنامج



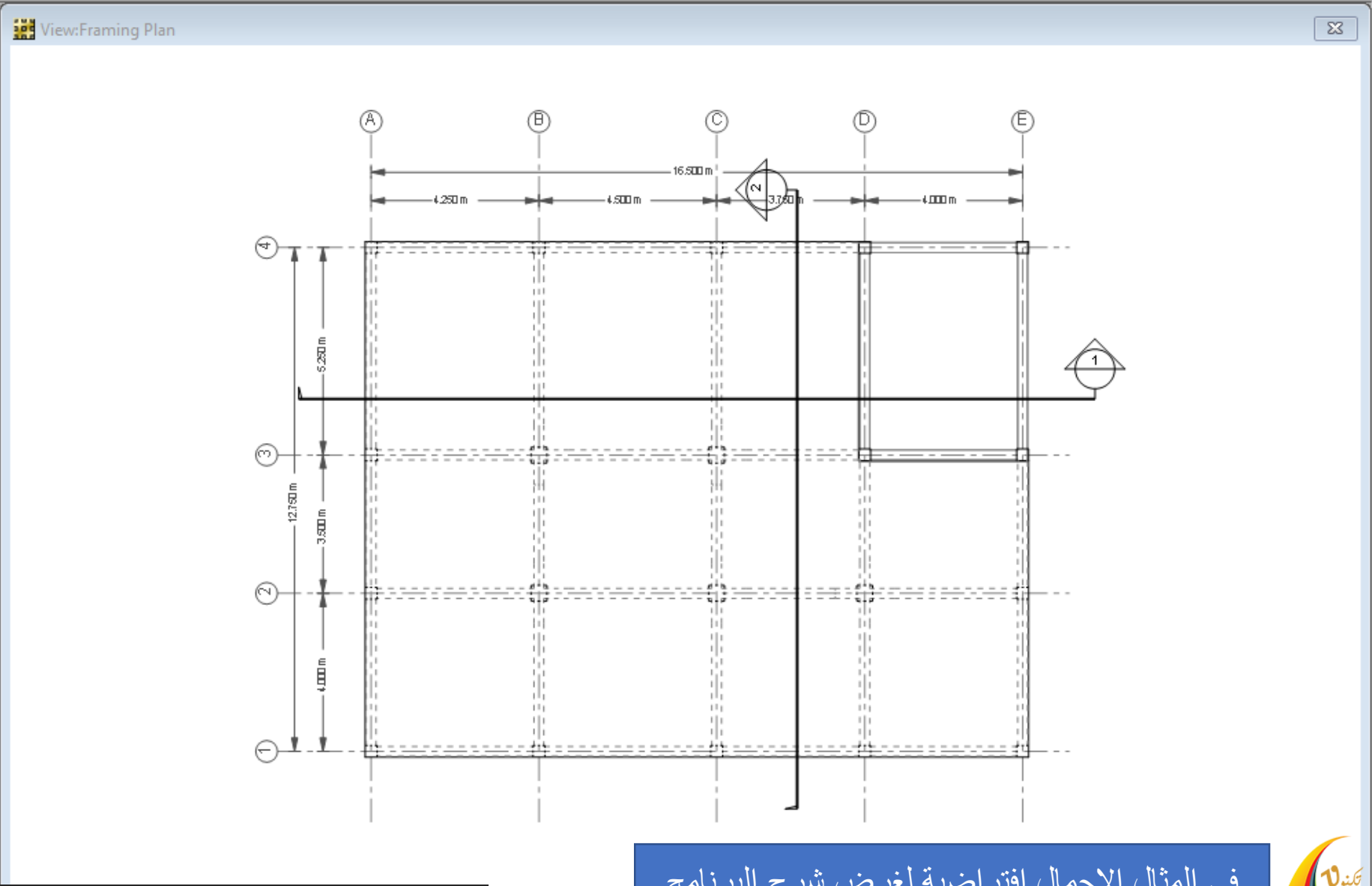
Run > Run detailing



Model Explorer

- Model
- Display
- Detailing
 - Drawing Component Views
 - Drawing Sheets

all
ps
clr



Detailing > show details



اظهار التفاصيل

في المثال الاحمال افتراضية لغرض شرح البرنامج



تابع أيضا دورات أخرى



AutoCAD



SAP2000



REVIT



EXCEL



MS Project

انقر على الايقونة للانتقال الى الدورة

