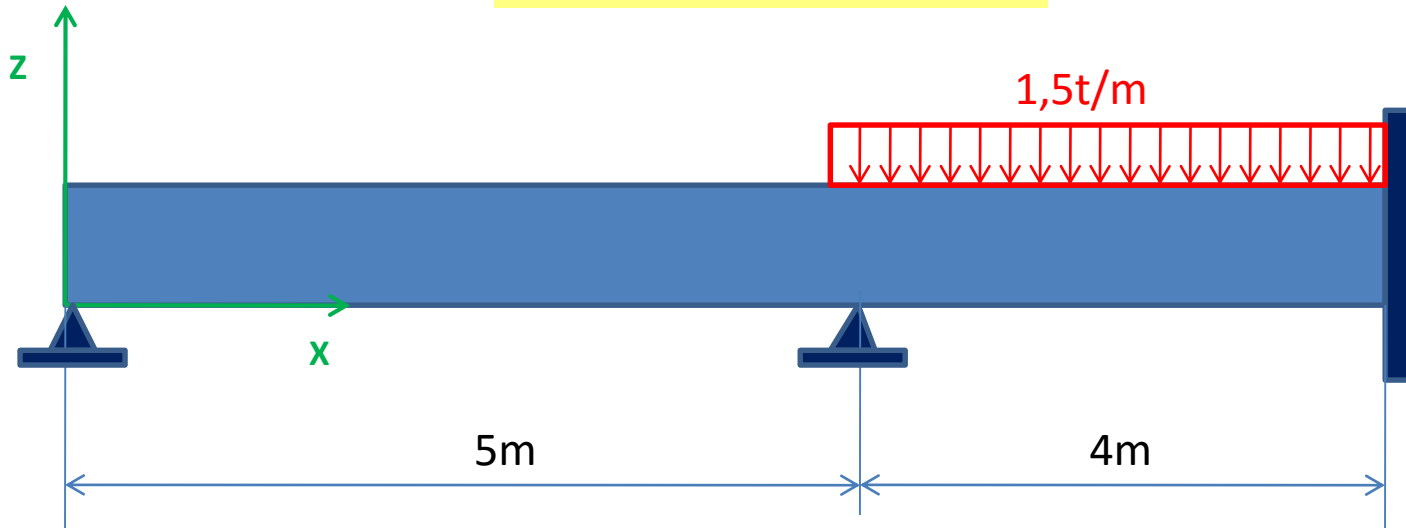
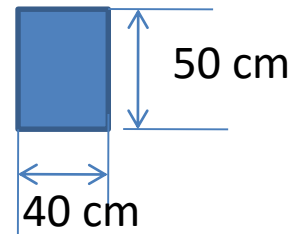


POUTRE EN BETON ARME



Section droite

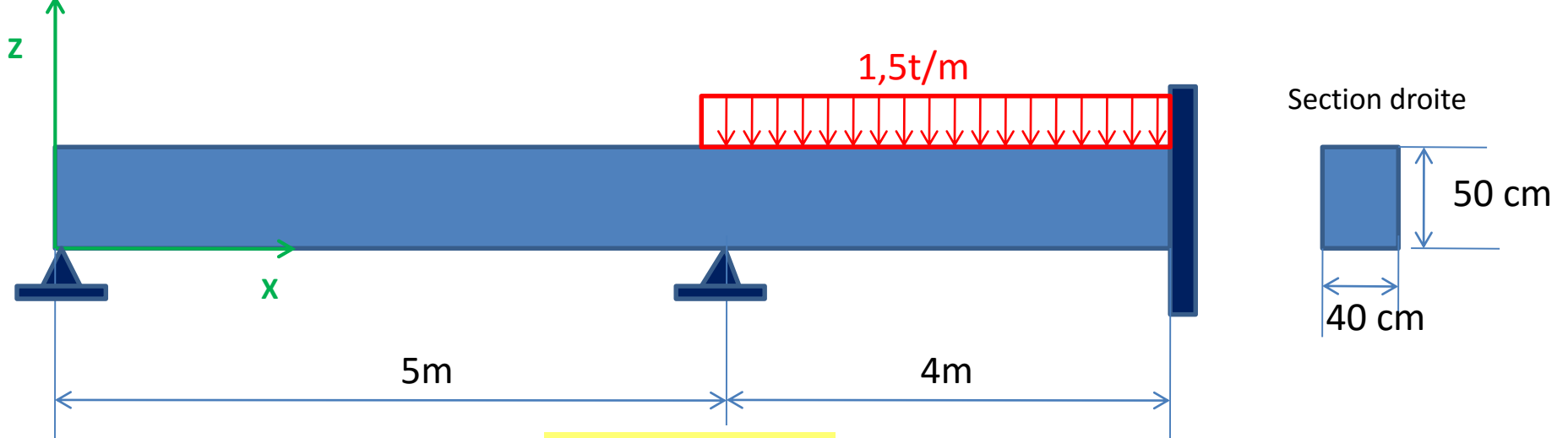


Matériau BA:

masse volumique: $\rho=25\text{KN/m}^3$

Module de Young: $E=3 \cdot 10^4 \text{ Mpa}$

Coefficient de Poisson: $\nu=0,2$



ETAPES A SUIVRE

1. Définition des lignes de construction
2. Définition des matériaux : Béton, Acier.....
3. Définition des sections: rectangulaire, **I**, **T**.....
4. Dessin des poteaux et poutres
5. Assignation des appuis: simple, double, Encastrement,.....
6. Assignation des charges: nodale, uniforme, dynamique....
7. Lancer le calcul
8. Exploitation des résultats: déplacements, moments.....

Matériau BA:

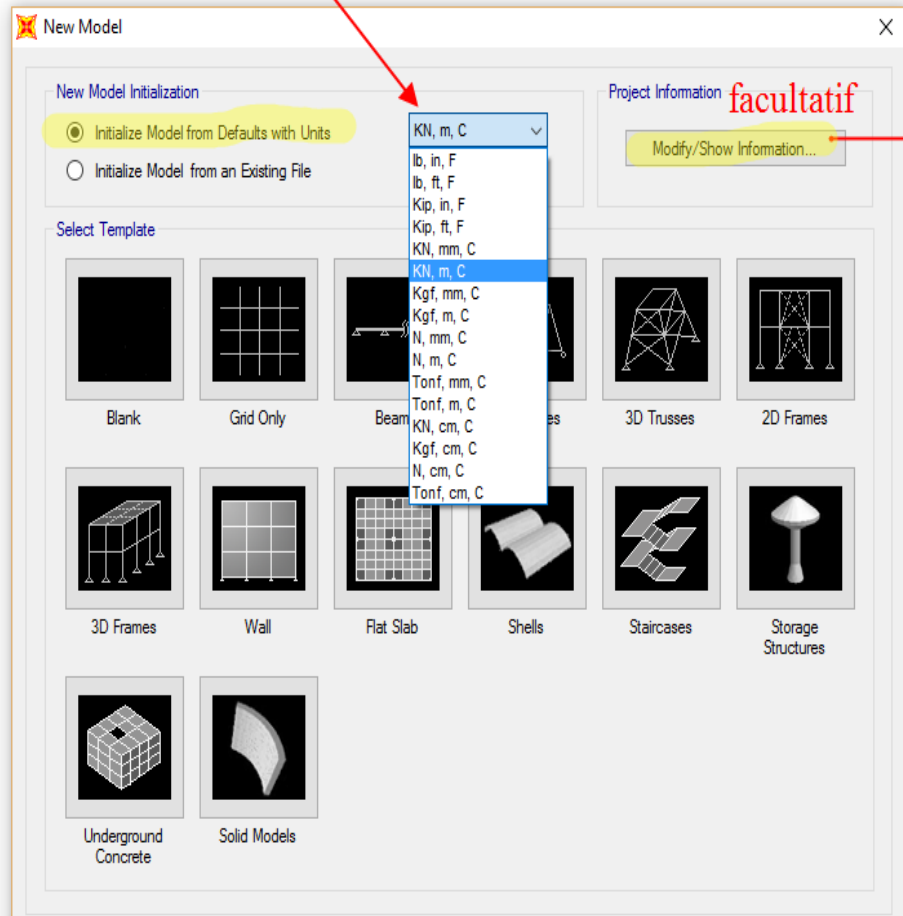
masse volumique: $\rho=25\text{KN/m}^3$
 Module de Young: $E=3 \cdot 10^4 \text{ Mpa}$
 Coefficient de Poisson: $\nu=0,2$

Démarrage

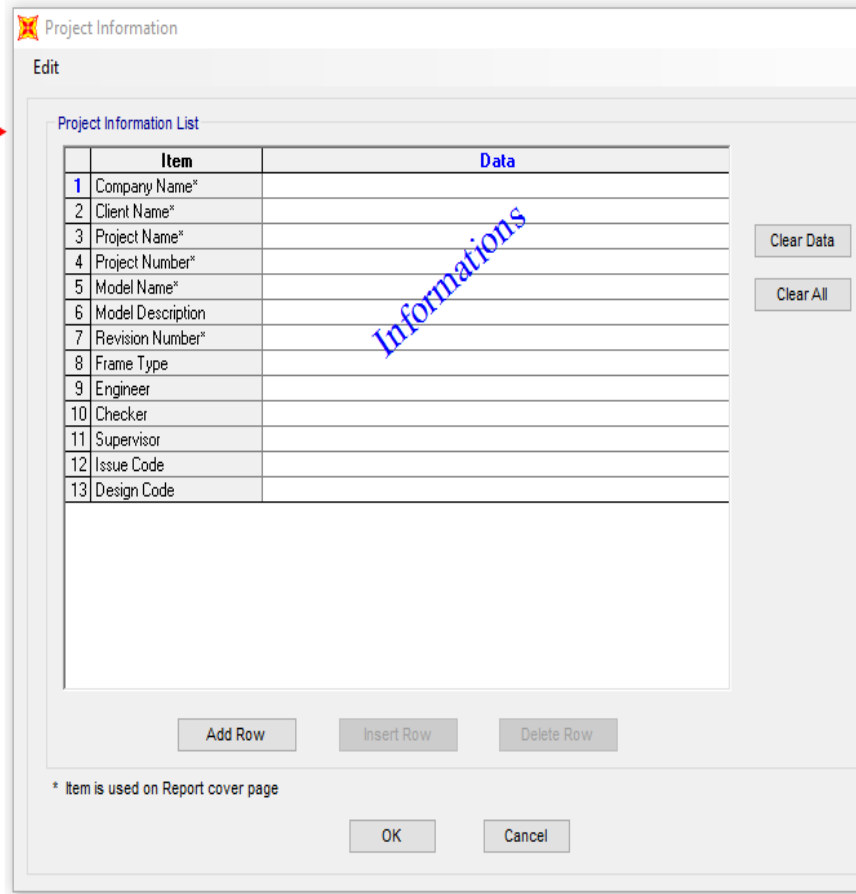
1. Nouveau fichier



2. Definition des Unités



3. Remplir les information du projet





New Model Initialization

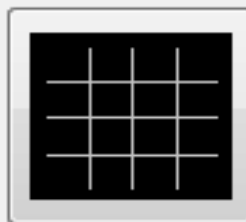
- Initialize Model from Defaults with Units
- Initialize Model from an Existing File

très important

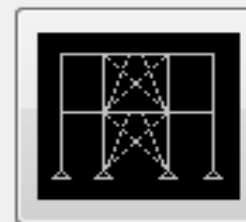
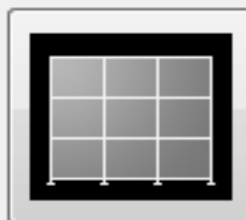
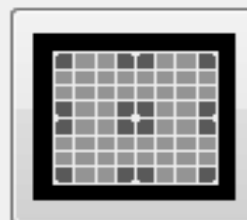
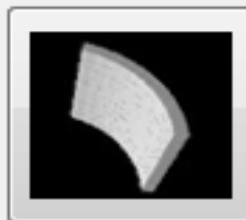
KN, m, C

Unité SIProject Information **Information du
Projet**

Modify/Show Information...

Select Template **Selection du modèle**Blank
VideGrid Only
CadrillageBeam
Poutre2D Trusses
Ferme ou treillis 2D 3D

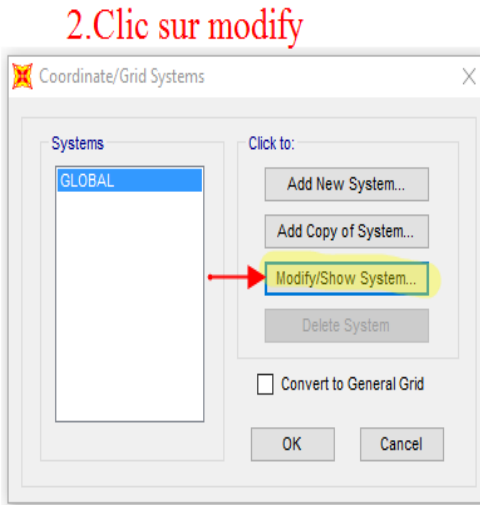
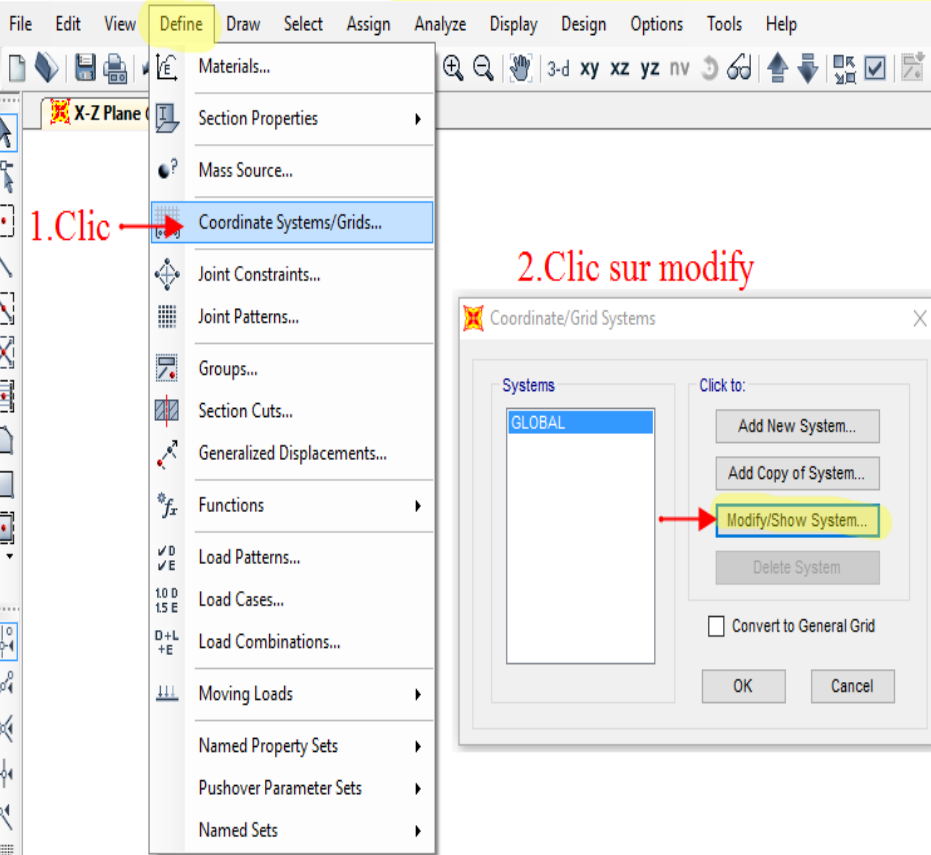
3D Trusses

2D Frames
Portique 2D3D Frames
Portique 3DWall
Mur ou voileFlat Slab
Dalle plateShells
CoqueStaircases
EscalierStorage
Structures
**Structures
de Stockage**Underground
Concrete**Beton sous terre**

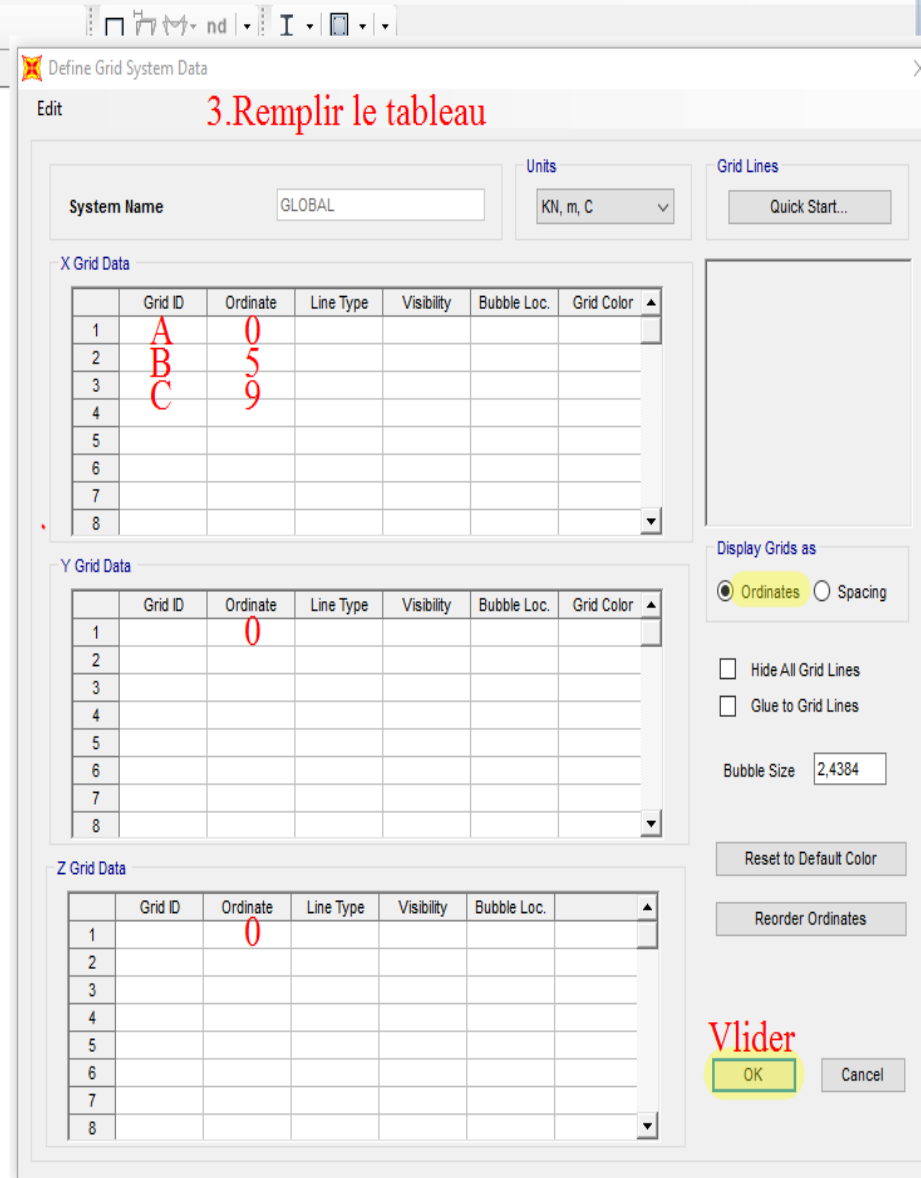
Solid Models

Solide

1. Définition de lignes de construction



Define → Cordinate system → Modify



1. Clic Material

2. Définition du matériau

File Edit View Define Draw Select Assign Analyze Display Design Options Tools Help

- Materials...
- Section Properties
- Mass Source...
- Coordinate Systems/Grids...
- Joint Constraints...
- Joint Patterns...
- Groups...
- Section Cuts...
- Generalized Displacements...
- Functions
- Load Patterns...
- Load Cases...
- Load Combinations...
- Moving Loads
- Named Property Sets
- Pushover Parameter Sets
- Named Sets

2. Selectionne et modifie

Define Materials

Materials

- 4000Psi
- A992Fy50

Click to:

- Add New Material...
- Add Copy of Material...
- Modify/Show Material...
- Delete Material

Show Advanced Properties

OK Cancel

Material Property Data

3. Change le nom et les valeurs

General Data

Material Name and Display Color: 4000Psi **Beton**

Material Type: Concrete

Material Notes: Modify/Show Notes...

Weight and Mass

Weight per Unit Volume: **25** 23,5631

Mass per Unit Volume: 2,4028

Units: KN, m, C

Isotropic Property Data

Modulus of Elasticity, E: **30000000** 24855578

Poisson: 0,2

Coefficient of Thermal Expansion, A: 9,900E-06

Shear Modulus, G: 10356491

Other Properties for Concrete Materials

Specified Concrete Compressive Strength, f_c: 27579,032

Lightweight Concrete

Shear Strength Reduction Factor:

Switch To Advanced Property Display

OK Cancel

Valider



3. Définition de la section

1. Section properties

2. Clic Frame sections

3. Clic Add New property

4. Choix du materiau

5. Choix de la section

6. Remplir les informations

Section Name: FSEC1 **Nom**

Section Notes: Modify/Show Notes...

Dimensions

Depth (t3) **Hauteur**: 0,4572

Width (t2) **Largeur**: 0,254

Material: **Beton**

Property Modifiers: Set Modifiers...

Concrete Reinforcement...

OK **Valider** Cancel

Section Properties...
Time Dependent Properties...

Section Properties

Click to:

Import New Property

Add New Property.

Add Copy of Property

Modify/Show Property

Delete Property

OK Cancel

Select Property Type

Frame Section Property Type

Click to Add a Concrete Section

Rectangular

Circular

Pipe

Tube

Trapezoidal

Precast I

Precast U

Define -> Section properties -> Frame Sections -> Add new property -> Concrete -> Rectangular

4. Dessin des poutres

SAP2000 v17.2.0 Ultimate - (Untitled)

1. Clic sur l'icone quick frame

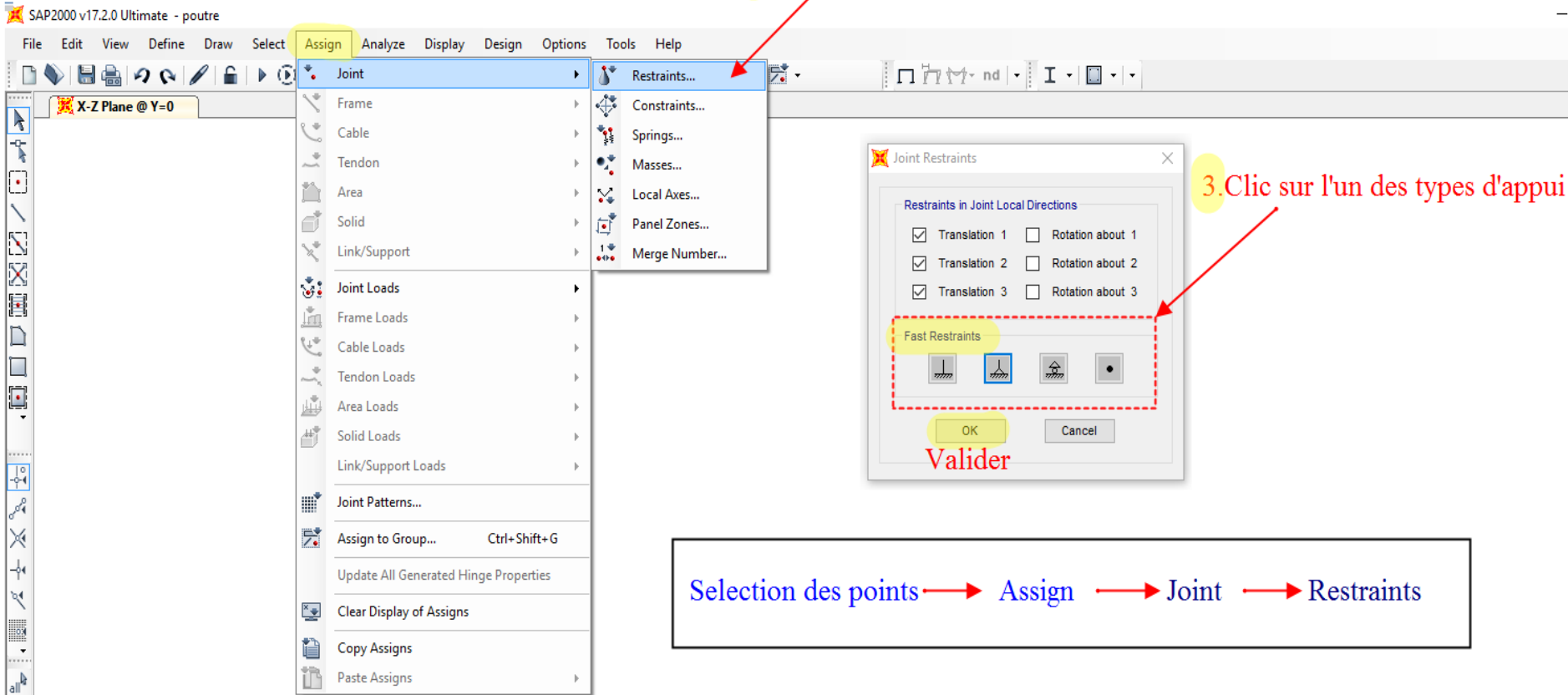
2. Choisis la section de la poutre ou poteau

3. Dessine en cliquant sur chaque ligne ou en selectionnant une zone

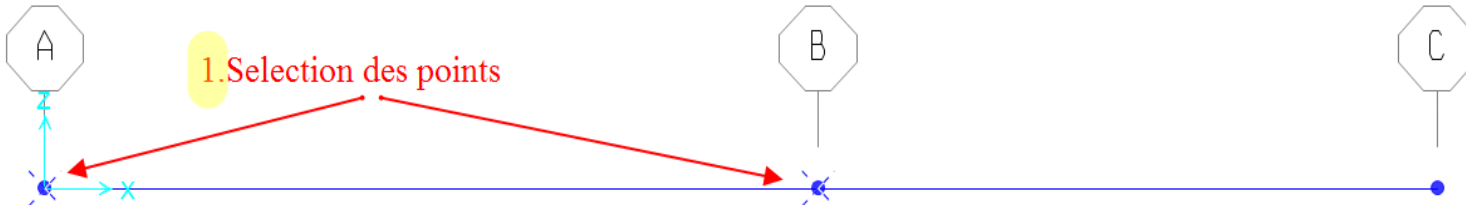
Properties of Object	
Line Object Type	Straight Frame
Section	poutre30x40
Moment Releases	poutre30x40
XY Plane Offset Normal	None

5. Assignment des appuis

2. Clic sur Restraints



1. Selection des points



6. Assignment of the uniform load

SAP2000 v17.2.0 Ultimate - poutre

2. Clic sur Distributed

3. Saisir la valeur de charge

Selection de la poutre → Assign → Frame Load → Distributed

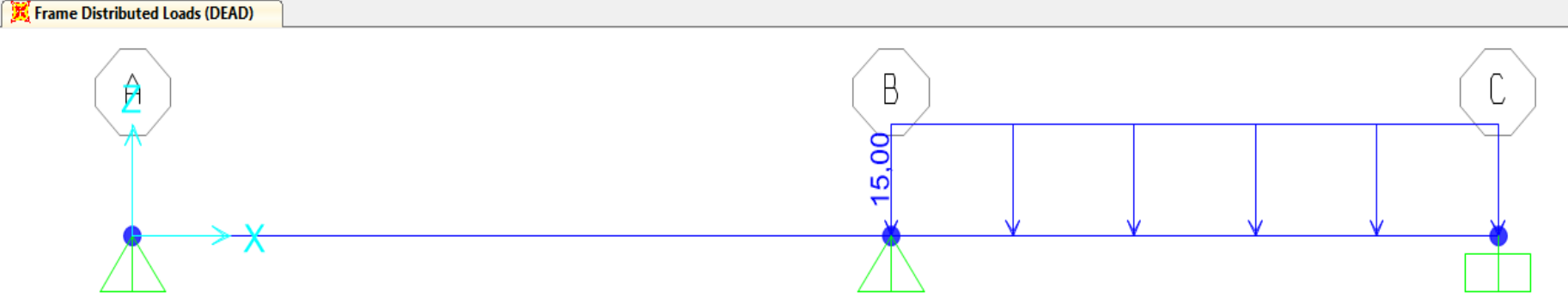
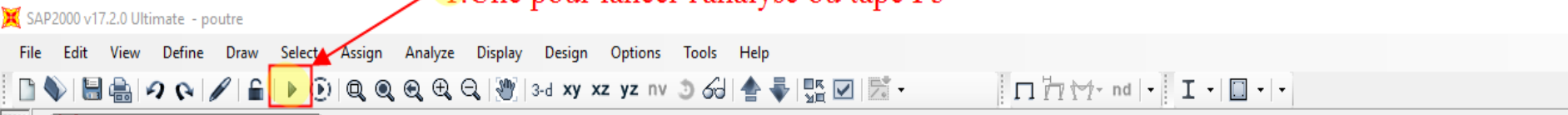
1. Selection de la poutre

Uniform Load
Load 0, valeur

OK Cancel

7. Lancer le calcul

1. Clic pour lancer l'analyse ou tape F5



Set Load Cases to Run

Case Name	Type	Status	Action
DEAD	Linear Static	Not Run	Run
MODAL	Modal	Not Run	Run

Click to:

- Run/Do Not Run Case
- Show Case...
- Delete Results for Case
- Run/Do Not Run All
- Delete All Results
- Show Load Case Tree...

Analysis Monitor Options

- Always Show
- Never Show
- Show After seconds

Model-Alive

Run Now

OK Cancel

2. Selectionne Modal et désactiver

3. Executer

valider

8. Exploitation des résultats

Clic pour visualiser les résultats

Reactions d'appuis
Clic pour visualiser les efforts internes

SAP2000 v17.2.0 Ultimate - poutre

The screenshot displays the SAP2000 interface with a 'Shear Force 2-2 Diagram (DEAD)' and a 'Member Force/Stress Diagram for Frames' dialog box. The dialog box is open to the 'Component' section, where 'Shear 2-2' is selected. The 'Type' section has 'Force' selected. The 'Scaling' section has 'Scale Factor' set to -0,02. The 'Options' section has 'Show Values on Diagram' selected. The 'OK' button is highlighted with a yellow box and labeled 'Valider'.

The Shear Force Diagram shows a beam with a vertical axis 'Z'. The shear force starts at 4,52 at the left support, crosses the zero line, reaches a minimum of 10,482,61, and ends at 39,39 at the right support. The Member Force/Stress Diagram shows the same beam with internal forces. The axial force is 3,41, the shear force is -14,89, and the moment is 14,33 at the right support. The end moment is -28,46.