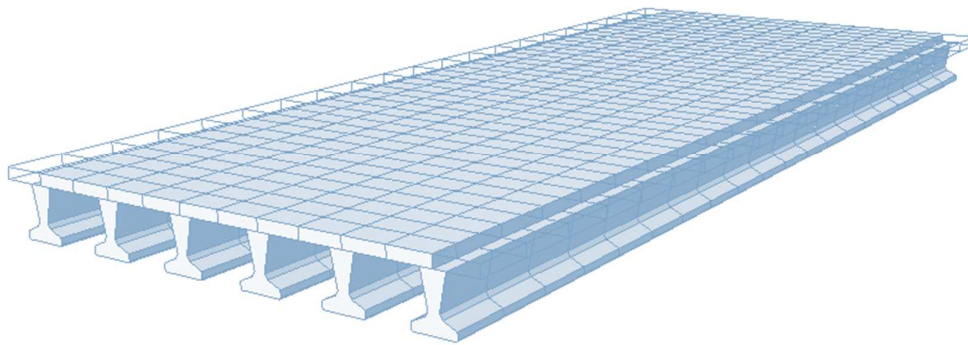


midas Civil

Basic Training Session

Training Session 1

Modeling A to Z

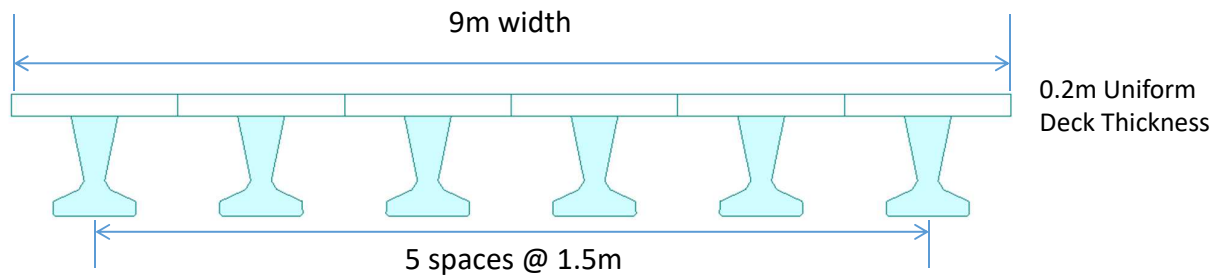


midas **Civil**

Contents

1. Span Information
2. General Modeling
 1. *Material property*
 2. *Section property*
 3. *Boundary condition*
3. Wizard Modeling

Span Information



Bridge Specifications

Span: 20m
Width: 9m
Girders: 6TY11 precast girders

Loads

Self-weight of structural elements
Prestressing of tendons
Moving load: Dual carriageway with
HA & HB loading as per
(BD37/01 Standard load)

1. Modeling A to Z - Material properties

1. Go to **Material Properties**

2. Click **Add**

3. Select **Standard** and **DB**:

4. Click **Apply**
Repeat 2 to 4 to add all the material properties

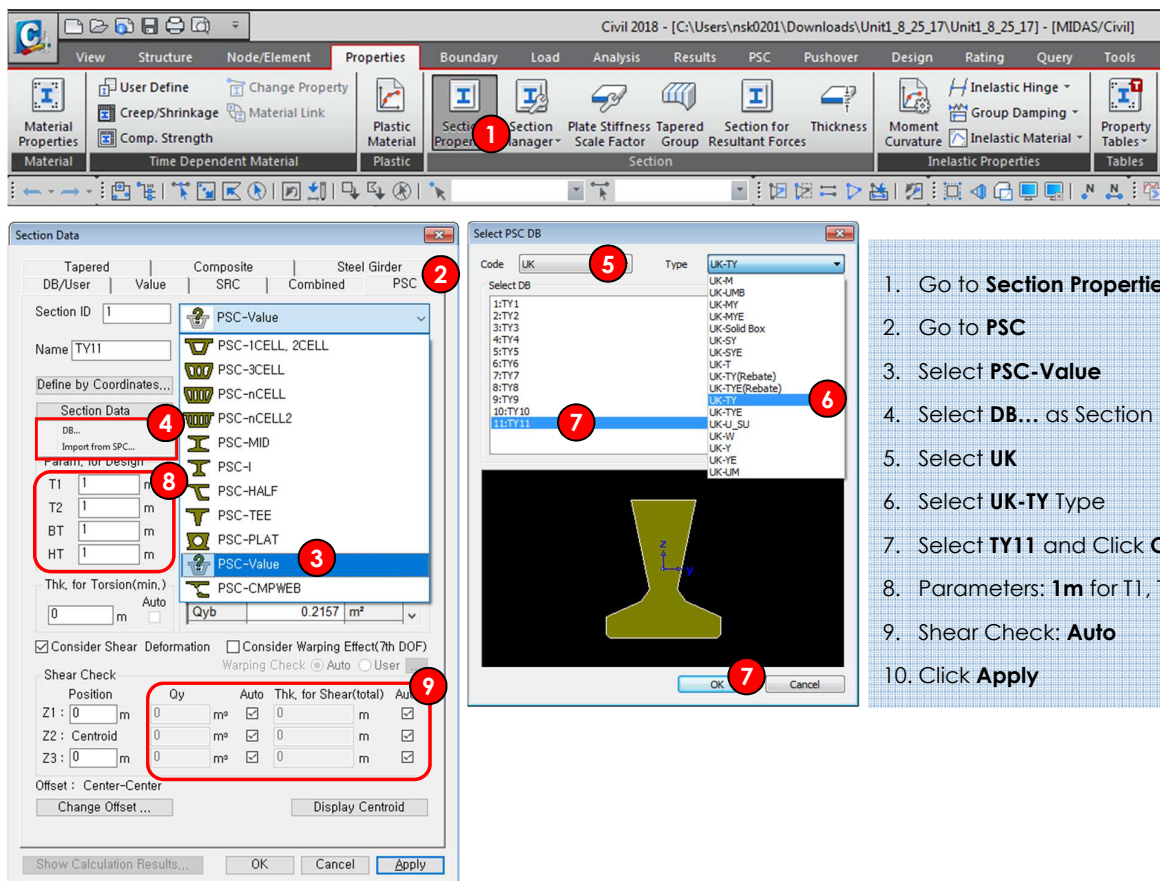
5. Click **OK**

Precast Girder: Concrete, BS(RC), C50

Cross Beam: Concrete, BS(RC), C35 and then
Select **None** as Standard
Input **0** as Weight Density

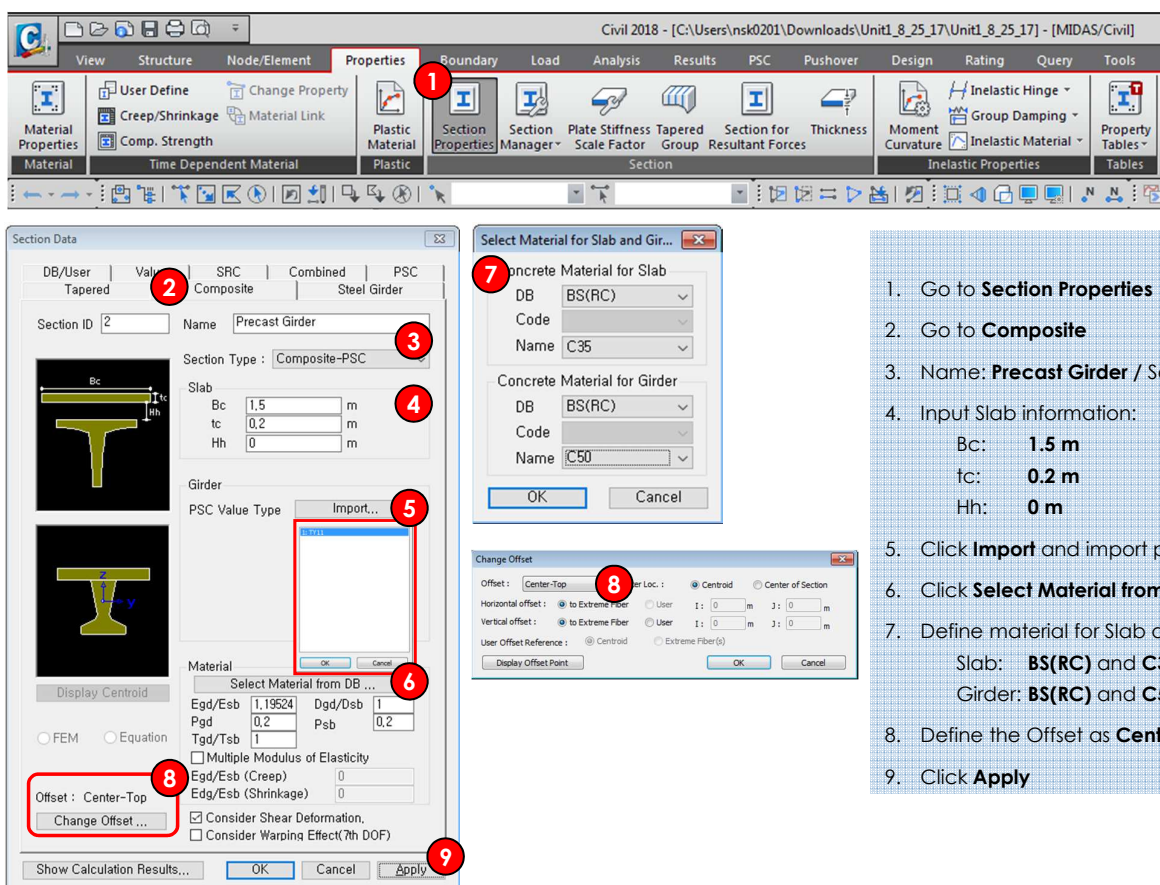
Tendon: Steel, BS04(S), S275

1. Modeling A to Z - Section properties: Precast girder



1. Go to **Section Properties**
2. Go to **PSC**
3. Select **PSC-Value**
4. Select **DB...** as Section Data
5. Select **UK**
6. Select **UK-TY** Type
7. Select **TY11** and Click **OK**
8. Parameters: **1m** for T1, T2, BT, HT
9. Shear Check: **Auto**
10. Click **Apply**

1. Modeling A to Z - Section properties: Precast girder



1. Go to **Section Properties**
2. Go to **Composite**
3. Name: **Precast Girder** / Select **Composite-PSC**
4. Input Slab information:
Bc: **1.5 m**
tc: **0.2 m**
Hh: **0 m**
5. Click **Import** and import precast girder section
6. Click **Select Material from DB**
7. Define material for Slab and Girder
Slab: **BS(RC)** and **C35**
Girder: **BS(RC)** and **C50**
8. Define the Offset as **Center-Top**
9. Click **Apply**

1. Modeling A to Z - Section properties: Cross Beam

Section Data

DB/User: SRC Combined PSC Tapered Composite Steel Girder

Section ID: 6

Name: Cross Beam_Int

Sect. Name: Solid Rectangle

Get Data from Single Angle

DB Name: AISC10(US)

Sect. Name:

H: 0.2 m

B: 1.0 m

Offset: Center-Top

Change Offset

Offset: Center-Top

Center Loc.: Centroid

Horizontal offset: to Extreme Fiber

Vertical offset: to Extreme Fiber

User Offset Reference: Centroid

Display Offset Point

Show Calculation Results... OK Cancel Apply

1. Go to **Properties > Section > Section Properties**
2. Go to **DB/User**
3. Select **Solid Rectangle**
4. Select **User / name: Cross Beam**
5. Define the geometry for Interior Cross Beam:
H: **0.2 m**
B: **1.0 m**
6. Define the Offset as **Center-Top**
7. Click **Apply**

1. Modeling A to Z - Section properties: Cross Beam

Section Data

DB/User: SRC Combined PSC Tapered Composite Steel Girder

Section ID: 4

Name: Cross Beam_Left

Sect. Name: Solid Rectangle

Get Data from Single Angle

DB Name: AISC10(US)

Sect. Name:

H: 0.2 m

B: 0.5 m

Offset: Left-Top

Change Offset

Offset: Left-Top

Center Loc.: Centroid

Horizontal offset: to Extreme Fiber

Vertical offset: to Extreme Fiber

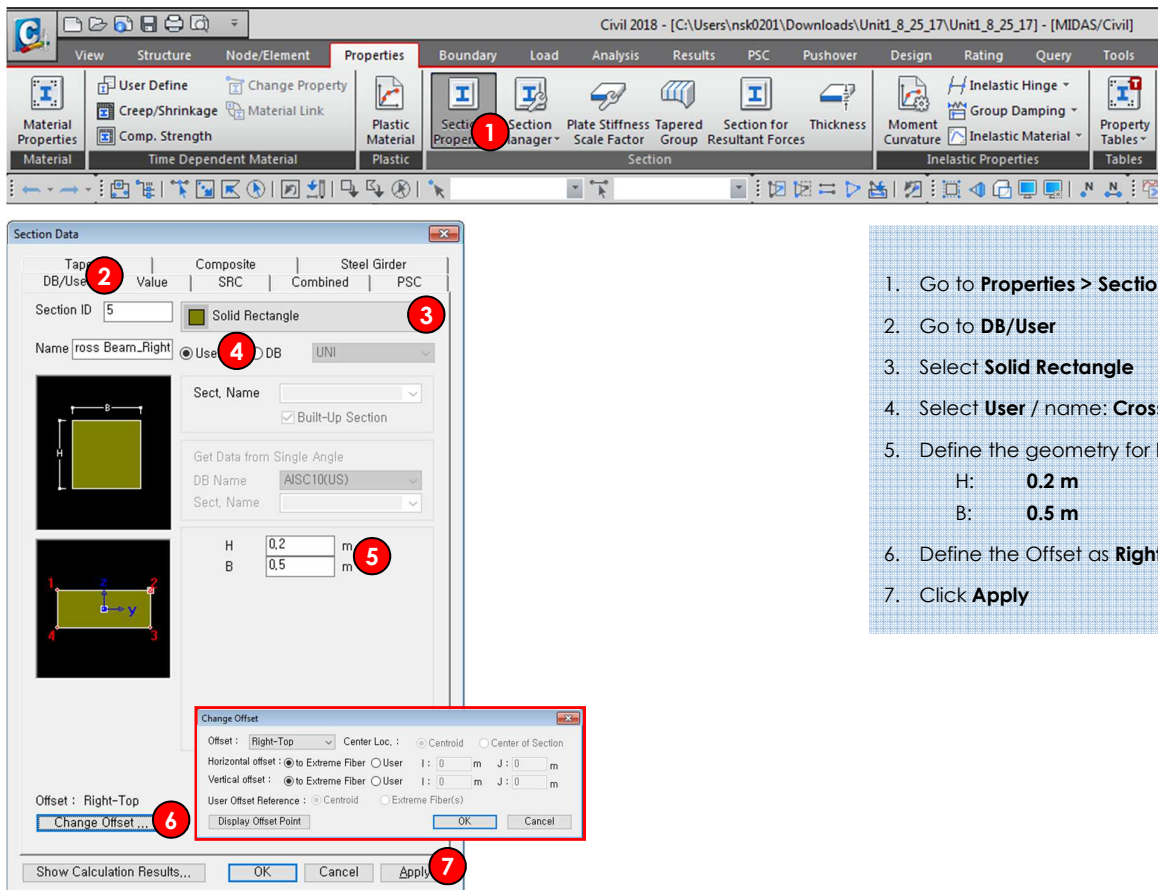
User Offset Reference: Centroid

Display Offset Point

Show Calculation Results... OK Cancel Apply

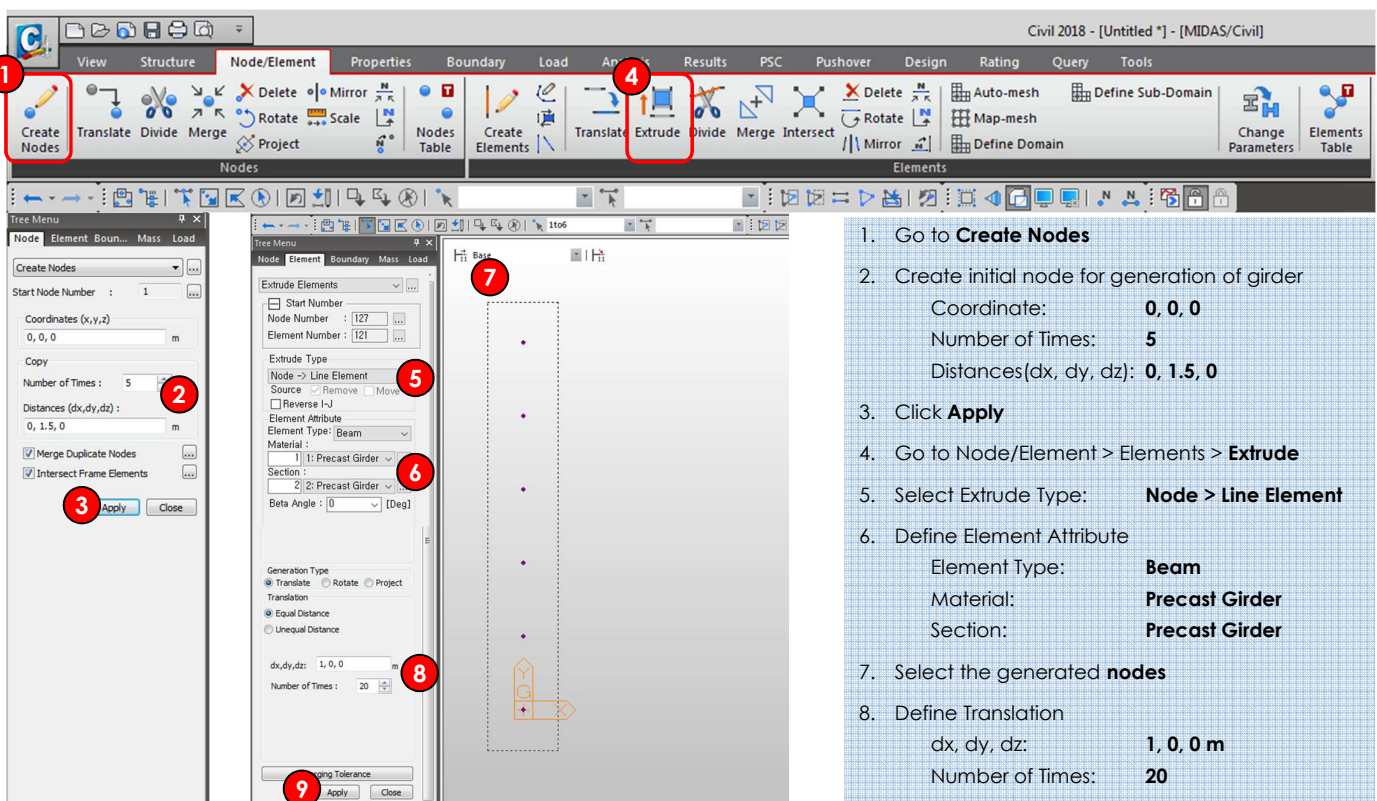
1. Go to **Properties > Section > Section Properties**
2. Go to **DB/User**
3. Select **Solid Rectangle**
4. Select **User / name: Cross Beam_Left**
5. Define the geometry for Interior Cross Beam:
H: **0.2 m**
B: **0.5 m**
6. Define the Offset as **Left-Top**
7. Click **Apply**

1. Modeling A to Z - Section properties: Cross Beam



1. Go to **Properties > Section > Section Properties**
2. Go to **DB/Use**
3. Select **Solid Rectangle**
4. Select **User / name: Cross Beam_Right**
5. Define the geometry for Interior Cross Beam:
H: **0.2 m**
B: **0.5 m**
6. Define the Offset as **Right-Top**
7. Click **Apply**

1. Modeling A to Z - Creating Geometry: Precast girder



1. Go to **Create Nodes**
2. Create initial node for generation of girder
Coordinate: **0, 0, 0**
Number of Times: **5**
Distances(dx, dy, dz): **0, 1.5, 0**
3. Click **Apply**
4. Go to **Node/Element > Elements > Extrude**
5. Select Extrude Type: **Node > Line Element**
6. Define Element Attribute
Element Type: **Beam**
Material: **Precast Girder**
Section: **Precast Girder**
7. Select the generated **nodes**
8. Define Translation
dx, dy, dz: **1, 0, 0 m**
Number of Times: **20**
9. Click **Apply**

1. Modeling A to Z - Creating Geometry: Cross Beam_1

1. Go to **Create Elements**

2. Select Material and Section Properties

Cross Beam / Cross Beam

3. Click Nodal Connectivity window

4. Click **Start Node(1)**

5. Click **End Node(7)** to create Beam

6. Go to **Translate**

7. Select **Copy** mode

8. Define Translation mode as Equal Distance

dx, dy, dz: 1, 0, 0 m

Number of Times: 20

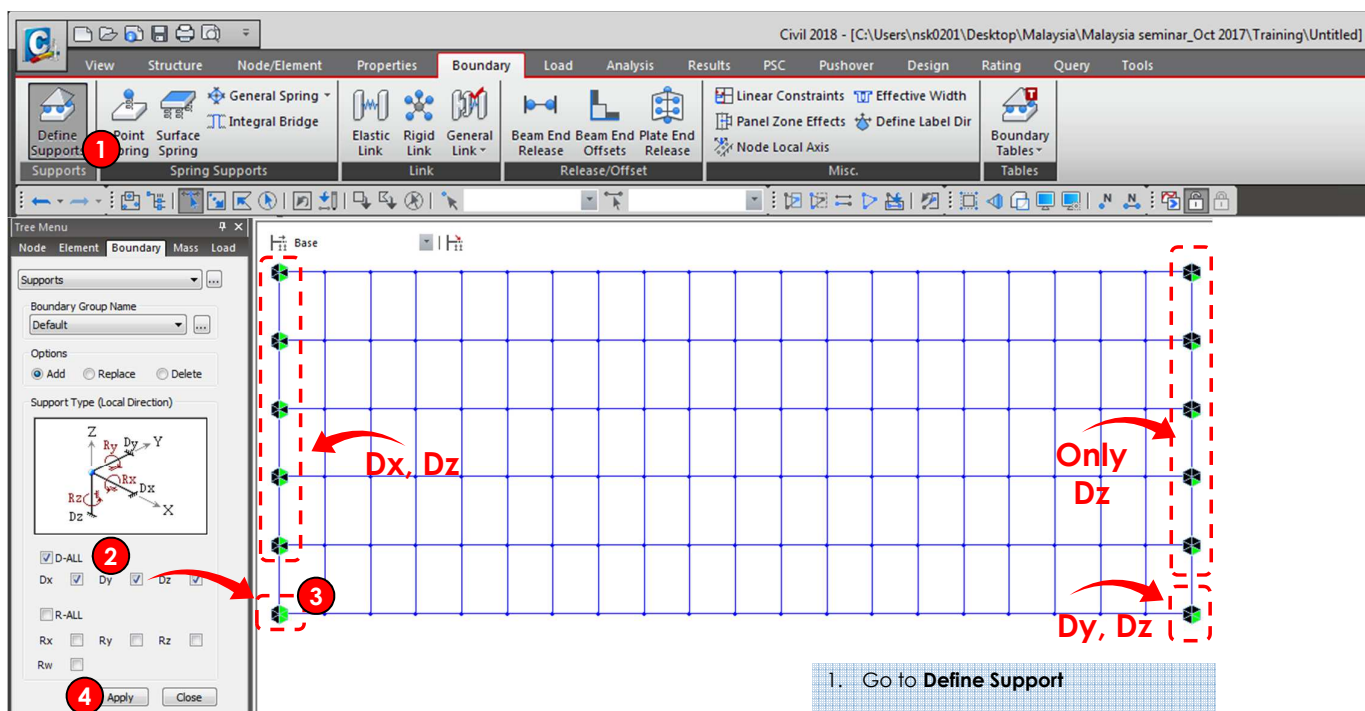
9. Click **Apply**

1. Modeling A to Z - Creating Geometry: Cross Beam_2

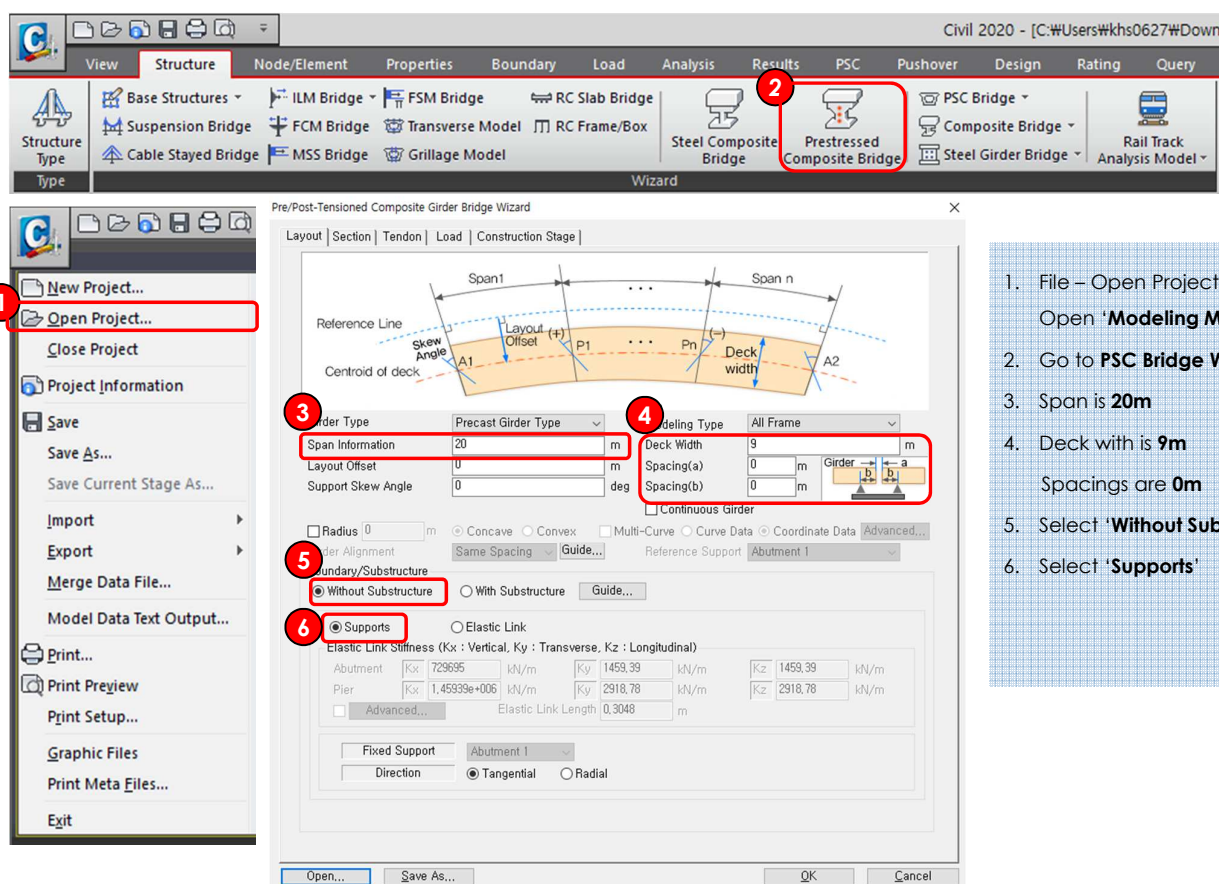
Drag & Drop

5 : Cross Beam_Right

1. Modeling A to Z - Boundary Condition



1. Modeling A to Z - Wizard Modeling



1. Modeling A to Z - Wizard Modeling

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View Structure Node/Element Properties Boundary Load Analysis Results PSC Pushover Design Rating Query

Structure Type: Base Structures, Suspension Bridge, Cable Stayed Bridge, ILM Bridge, FCM Bridge, MSS Bridge, FSM Bridge, Transverse Model, RC Slab Bridge, RC Frame/Box, Grillage Model, Steel Composite Bridge, **Prestressed Composite Bridge**, PSC Bridge, Composite Bridge, Steel Girder Bridge, Rail Track Analysis Model

Pre/Post-Tensioned Composite Girder Bridge Wizard

Layout Section Tendon Load Construction Stage

1 Deck Thickness: 0.2 m

2 Material: Deck: 2: Cross Beam, Girder: 1: Precast Girder, Diaphragm: 1: Precast Girder

3 ☐ Diaphragm

4 Number of Girders: 6, Apply, Guide...

5 Transverse Deck Element Spacing: 1 m, Angle type: Perpendicular

6 No. of Divisions: 1, Apply, Guide...

7

No.	Name	Start (m)	End (m)
1	2: Precast Girder	0	20

Define Diaphragm Section...

Diaphragm	Name	Divisions per Span
End Support	1: TY11	
Pier Support	1: TY11	
Intermediate	1: TY11	2

Girder Information

Span 1

Define Girder Section...

☒ Generate 10th points elements

Open... Save As... OK Cancel

1. Deck Thickness: **2m**
2. Deck Material: **2: Cross Beam**
Girder: **1: Precast Girder**
Diaphragm: **Anything**
3. Diaphragm: **Check off**
4. Girder Number: **6** and **Apply**
Enter: **-3.75 / -2.25 / -0.75**
0.75 / 2.25 / 3.75
5. Spacing for Grillage: **1m**
6. Girder No is **1** and **Apply**
7. Select girder section:
2: Precast Girder

1. Modeling A to Z - Wizard Modeling

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View Structure Node/Element Properties Boundary Load Analysis Results PSC Pushover Design Rating Query

Structure Type: Base Structures, Suspension Bridge, Cable Stayed Bridge, ILM Bridge, FCM Bridge, MSS Bridge, FSM Bridge, Transverse Model, RC Slab Bridge, RC Frame/Box, Grillage Model, Steel Composite Bridge, **Prestressed Composite Bridge**, PSC Bridge, Composite Bridge, Steel Girder Bridge, Rail Track Analysis Model

Pre/Post-Tensioned Composite Girder Bridge Wizard

Layout Section Tendon **Load** Construction Stage

Pavement and Barrier

1 b1: 0.5 m, b2: 3.5 m, b3: 1 m, b4: 3.5 m, b5: 0.5 m

2

Dead Loads

Equally to All Girder

☒ DC (Before Composite) ☐ DC (After Composite) ☐ DW (After Composite)

Before Composite

☒ Self Weight ☒ Wet Con'c

Weight Density: 23.563126 kN/m³

Thickness: 0.2438 m

☐ Form Work 0 kN/m²

☐ S.L.P forms

After Composite

☒ Barrier 2.0431 kN/m ☒ Wearing Surface

☒ Median Strip 2.6269 kN/m

Weight Density: 21.992251 kN/m³

Thickness: 0.0792 m

☐ Additional Load 0 kN/m

Positions (P1): 0 m

Positions (P2): 0 m

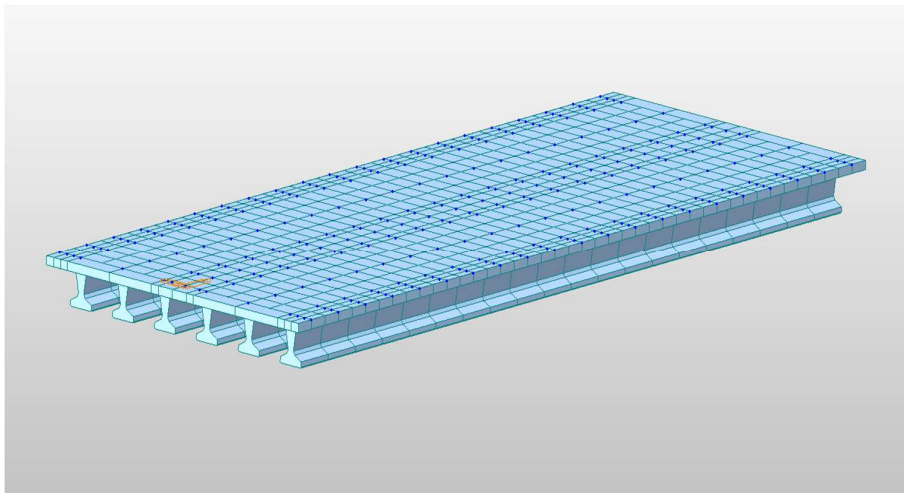
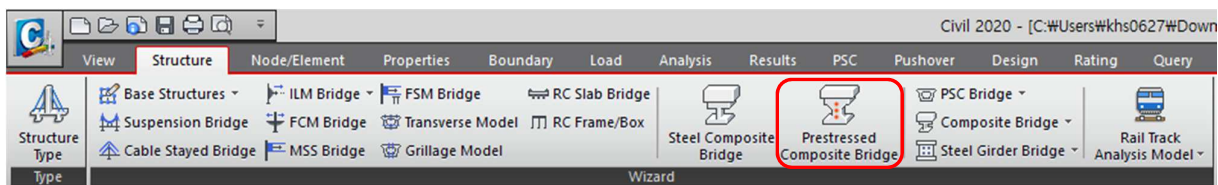
☐ Live Loads

Define Moving Load Case... Define Traffic Lanes... Define Vehicles...

Open... Save As... **OK** Cancel

1. Set Deck
0.5m / 3.5m / 1m / 3.5m / 0.5m
2. Check on: **Self Weight / Wet Con'c**
3. Check on: **Barrier / Median Strip / Wearing Surface**
4. Click **OK**

1. Modeling A to Z - Wizard Modeling



1. Check model information
 - Material, Section
 - Boundary Support Condition
 - Static Loads
 - Construction Stages

1. Modeling A to Z - Change Cross Beam

