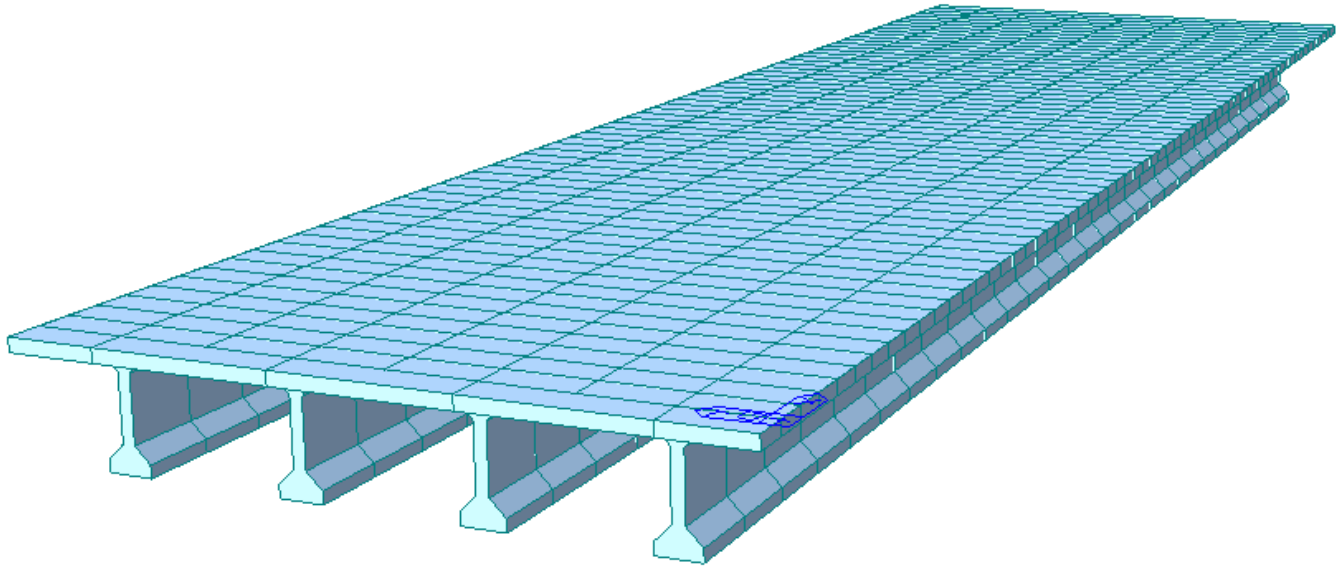
midas Civil Learning

Season 1

Episode 5

Don’t Be Bound To The Wizard



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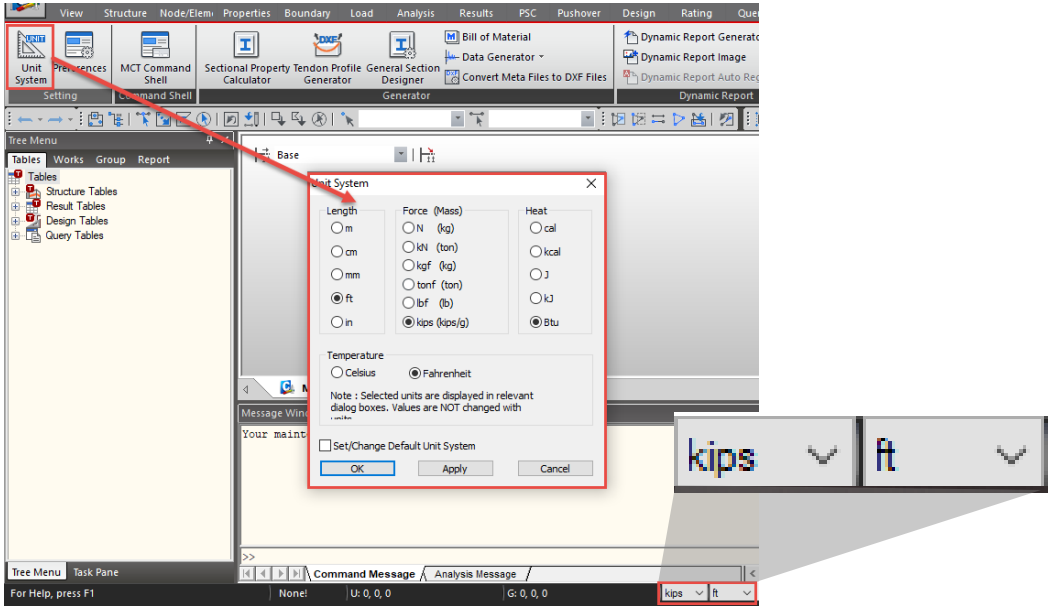
Why is it important to know the manual way to create a bridge when various wizards are available?

Various wizards will give you quick, easy, and simple guides/templates to model bridges. However, not every bridge fits into the wizards' template. In that case, you need to use other available options that midas Civil provides:

1. Graphic Interface (creating nodes & elements)
2. Importing CAD Files (dxf files)
3. Table Format
4. Text Format

Of course, you can combine multiple different ways to build a model, like using a wizard and graphic interface together. You can create a model that looks similar to the bridge using wizards, and then you can modify nodes/elements for minor differences. Today, we will practice creating a bridge model using the graphics, so you can manually build or modify your model using midas Civil's interface.



Did you know?

Not only you can change units using the main menu (Tools > Unit systems), but there is a shortcut to change units in the bottom right corner. Use this tip to save your time!

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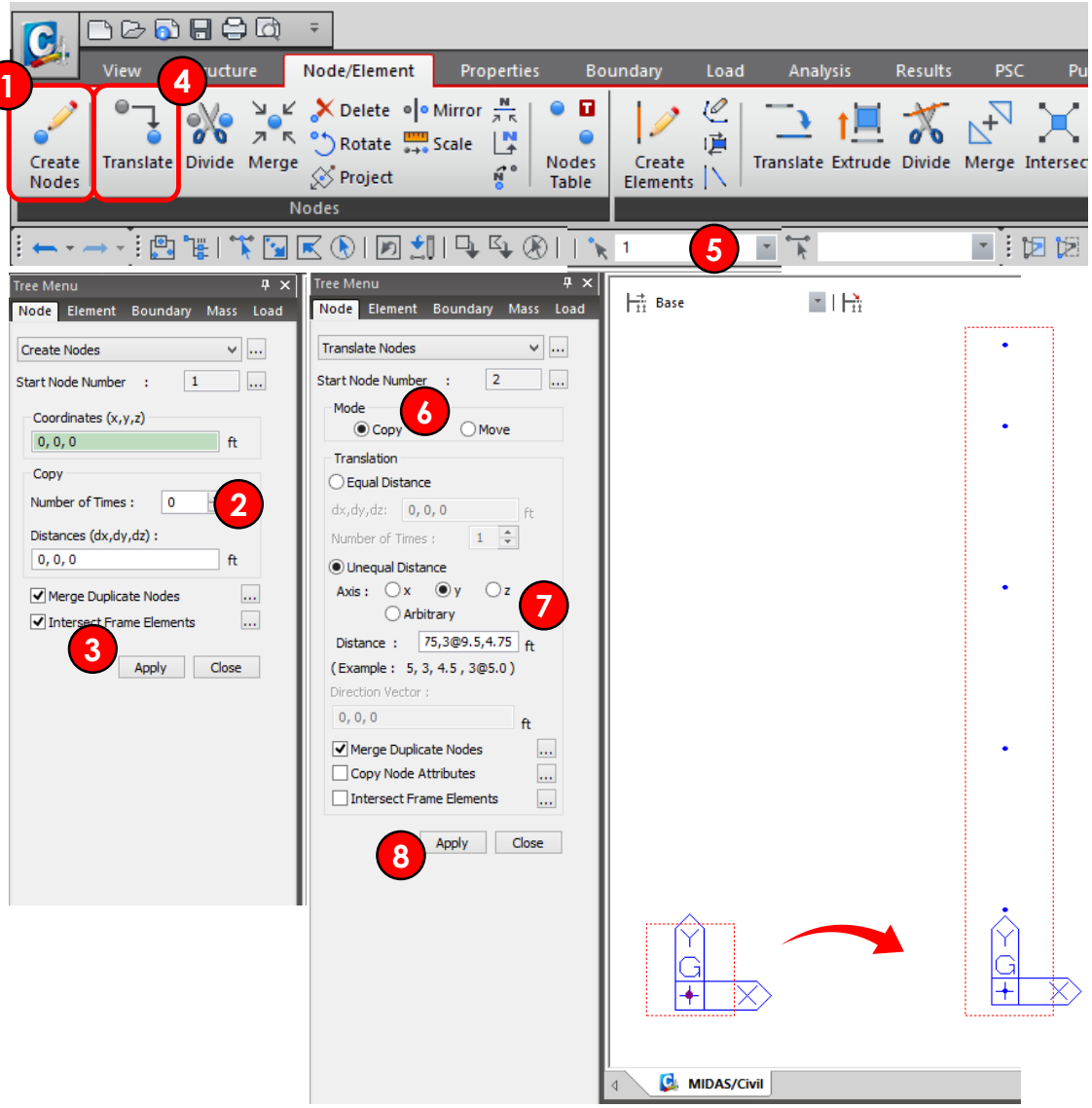

1. Go to **Create Nodes**
2. Create initial node for generation of girder
   - Coordinate: **0, 0, 0**
   - Number of Times: **0**
   - Distances(dx, dy, dz): **0, 0, 0**
3. Click **Apply**
4. Go to Node/Element > Nodes > **Translate**
5. Select Node or Input Node Number 1 and **Enter**
6. Select Mode: **Copy**
7. Unequal Distance
   - Axis: **y**
   - Distance: **4.75,3@9.5,4.75**
8. Click **Apply**

What does @ means?

The symbol 'a@b' means 'a' number of nodes/elements will be placed with 'b' distance apart each. For example, 3@9 means the 3 different nodes will be placed at 9.5ft apart each.

This is a quick way to create nodes/elements with the same distances.

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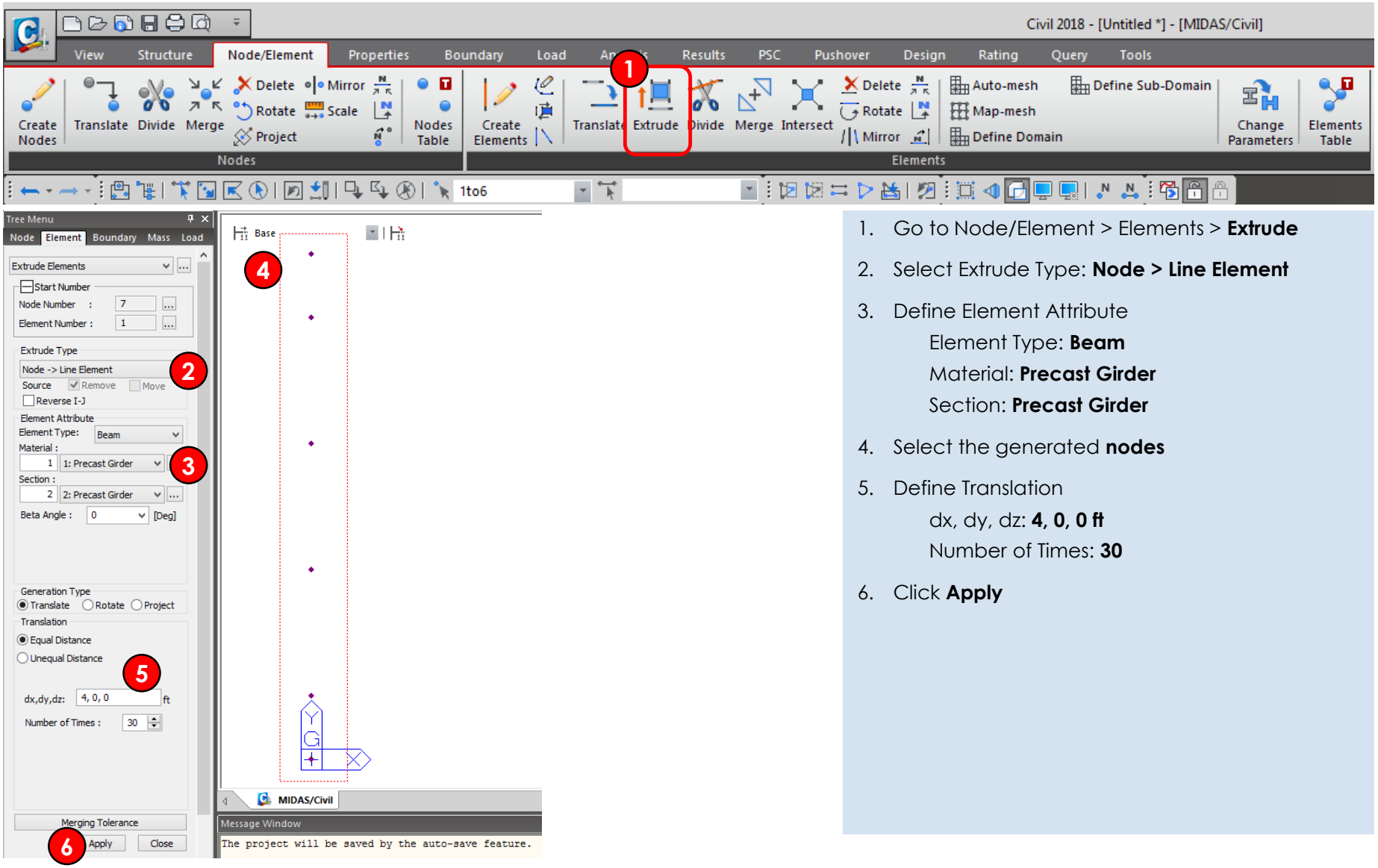

1. Go to Node/Element > Elements > **Extrude**
2. Select Extrude Type: **Node > Line Element**
3. Define Element Attribute
   Element Type: **Beam**
   Material: **Precast Girder**
   Section: **Precast Girder**
4. Select the generated **nodes**
5. Define Translation
   dx, dy, dz: **4, 0, 0 ft**
   Number of Times: **30**
6. Click **Apply**

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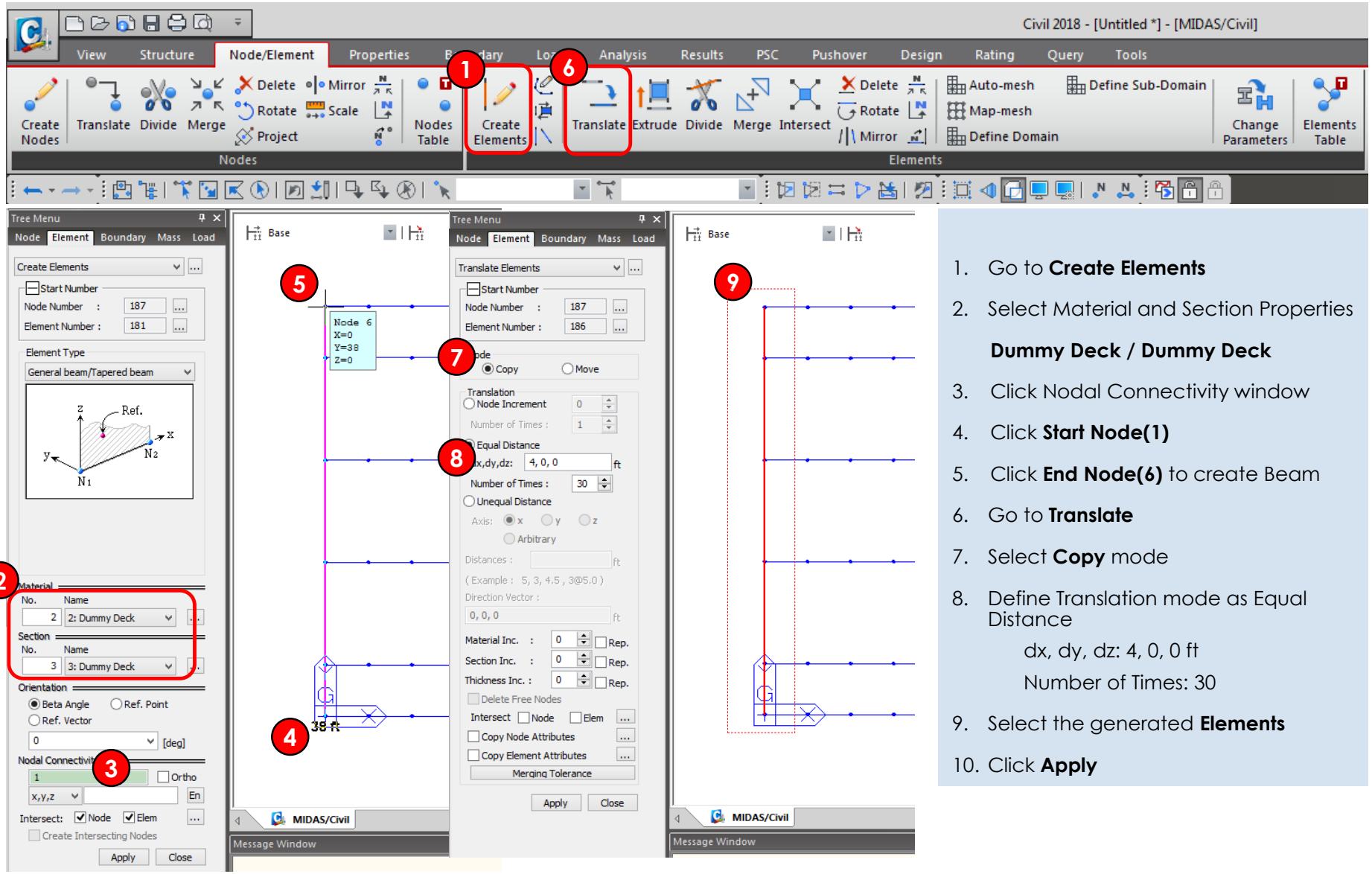

1. Go to **Create Elements**
2. Select Material and Section Properties

   Dummy Deck / Dummy Deck
3. Click Nodal Connectivity window
4. Click **Start Node(1)**
5. Click **End Node(6)** to create Beam
6. Go to **Translate**
7. Select **Copy** mode
8. Define Translation mode as Equal Distance

   dx, dy, dz: 4, 0, 0 ft

   Number of Times: 30
9. Select the generated **Elements**
10. Click **Apply**

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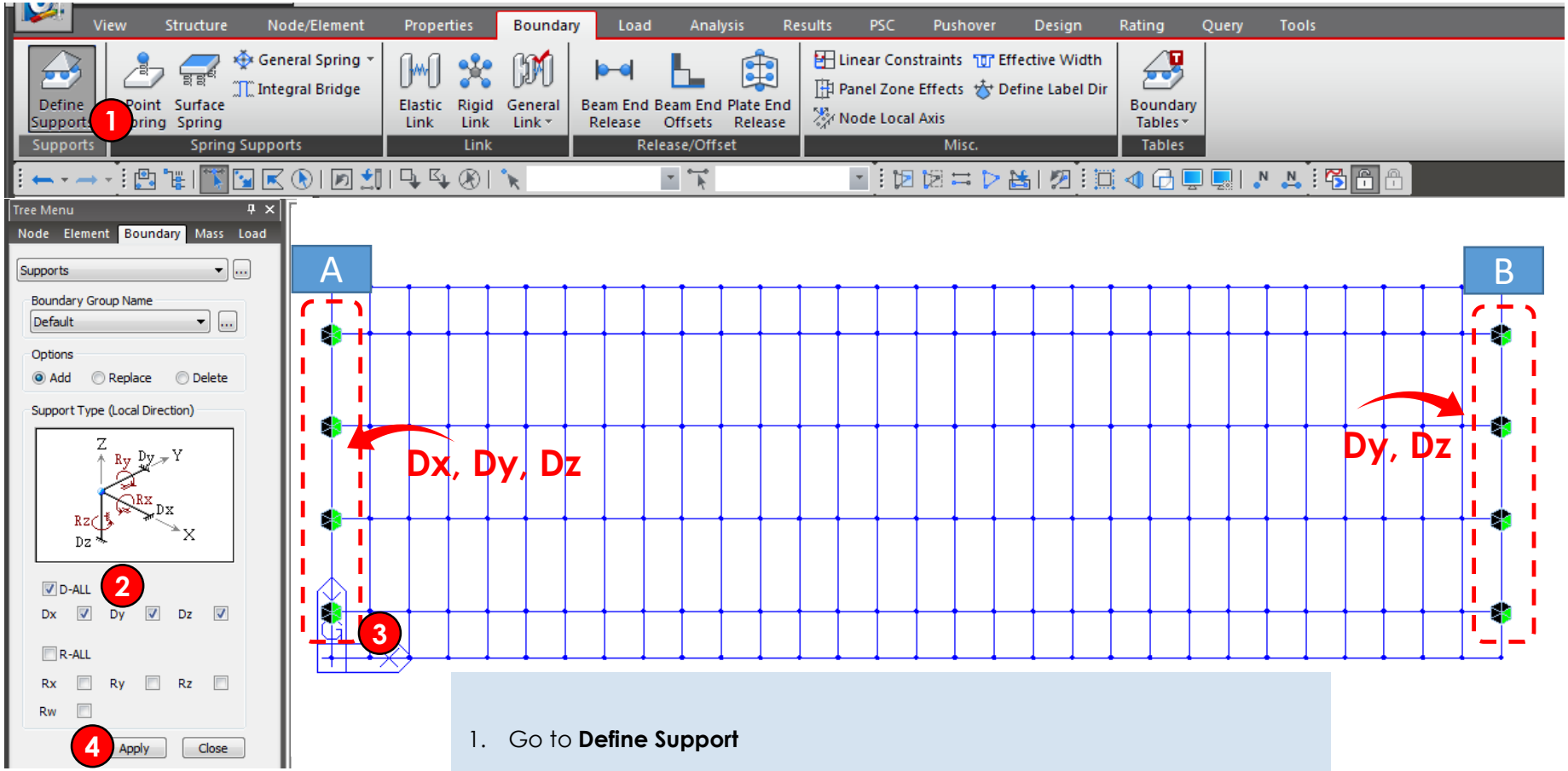
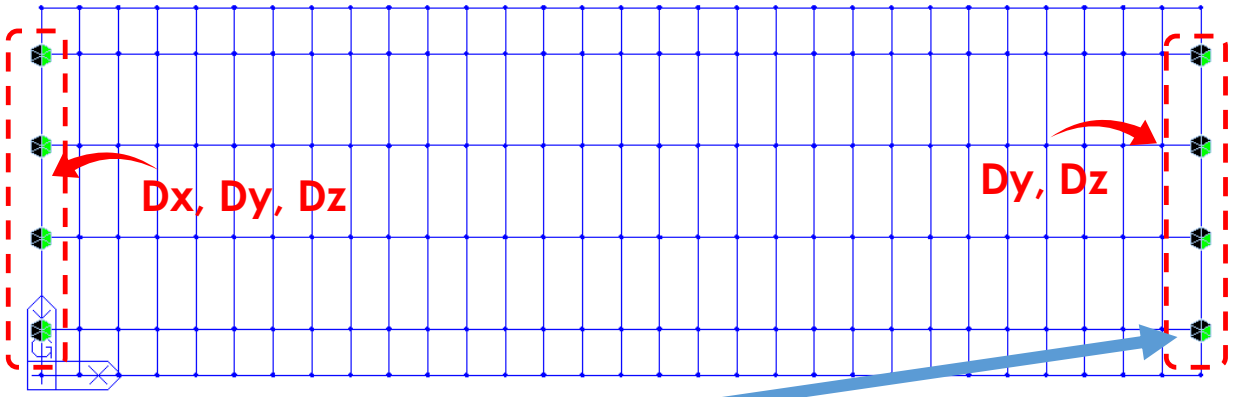
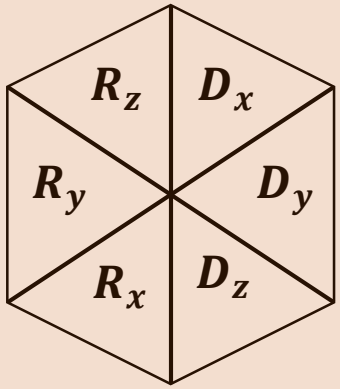


1. Go to **Define Support**
2. Select constraint components for Dx, Dy, and Dz
3. Select nodes that are shown under ‘A’
4. Click **Apply**
5. Select constraint components for Dy, and Dz
6. Select nodes that are shown under ‘B’
7. Click **Apply**



What does this hexagon mean?



Each triangle in hexagon means different:

- **Dx**: Displacement degree-of-freedom in GCS X-direction (Nodal local x-axis direction)
- **Dy**: Displacement degree-of-freedom in GCS Y-direction (Nodal local y-axis direction)
- **Dz**: Displacement degree-of-freedom in GCS Z-direction (Nodal local z-axis direction)

- **Rx**: Rotational degree-of-freedom about GCS X-axis (Nodal local x-axis)
- **Ry**: Rotational degree-of-freedom about GCS Y-axis (Nodal local y-axis)
- **Rz**: Rotational degree-of-freedom about GCS Z-axis (Nodal local z-axis)
- **Rw (not shown on hexagon)**: Warping degree-of-freedom about GCS X-axis (Node's local x-axis)

If a triangle is colored in green, it means the specific degree-of-freedom is restrained, whereas black color means no restrains.