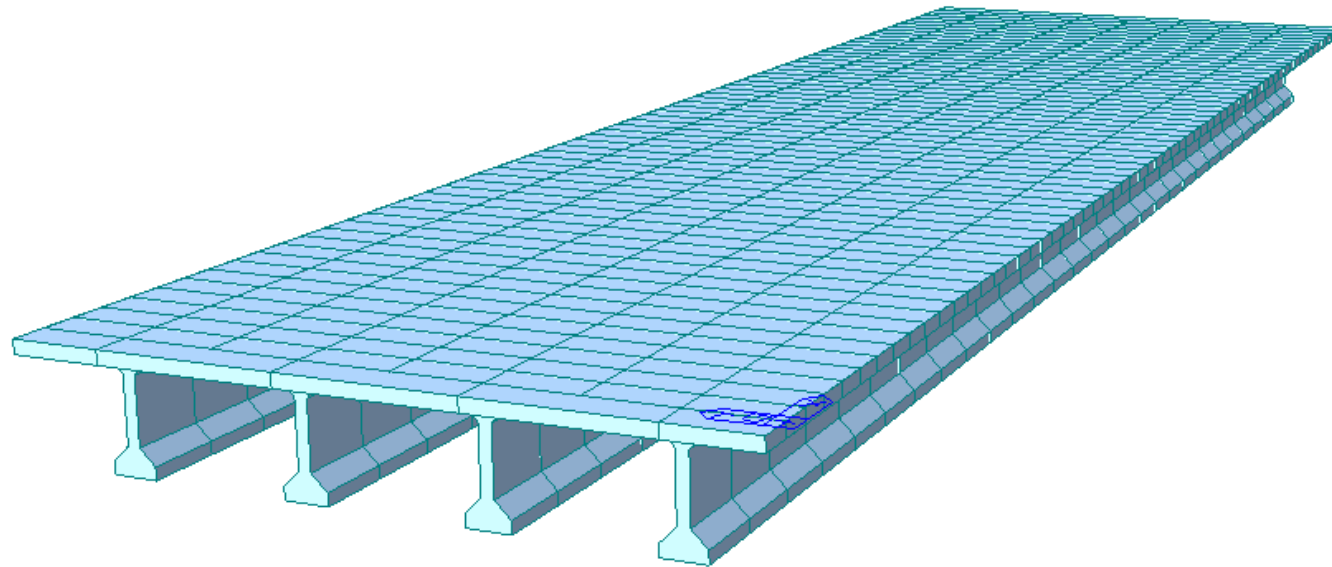


midas Civil Learning

Season 1

Episode 5

Don't Be Bound To The Wizard



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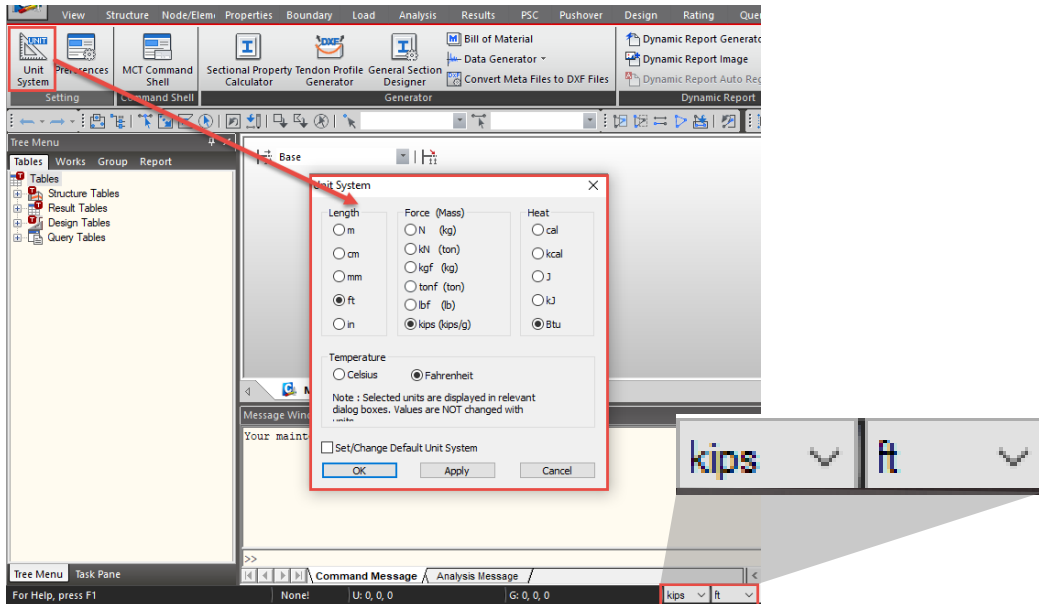


Why is it important to know the manual way to create a bridge when various wizards are available?

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

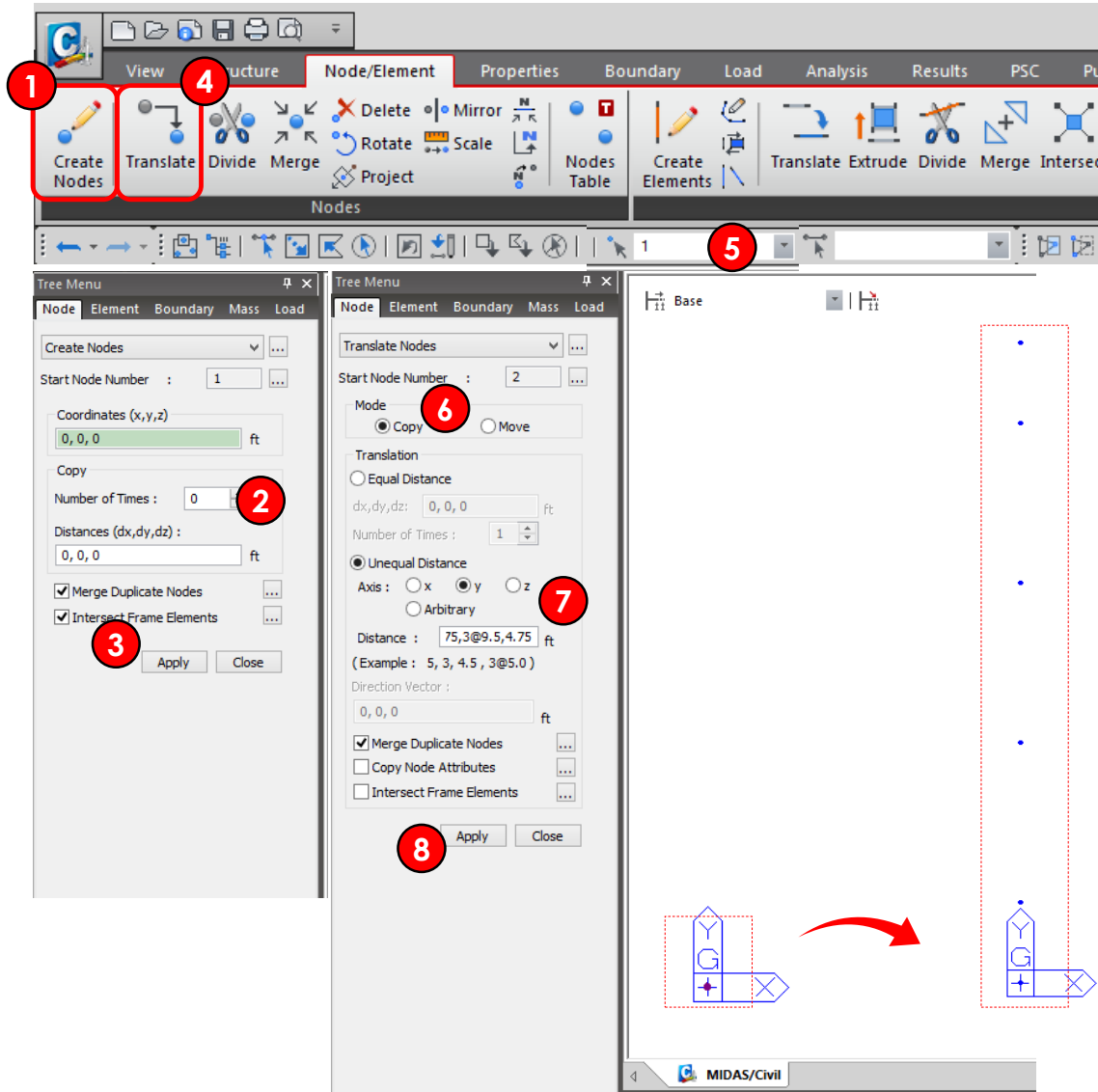
Of course, you can combine multiple different ways to build a model, like using a wizard and graphic interface together. You can create a model that looks similar to the bridge using wizards, and then you can modify nodes/elements for minor differences. Today, we will practice creating a bridge model 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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The screenshot shows the MIDAS/Civil software interface. The 'Node/Element' menu is active, and the 'Extrude' button in the 'Elements' group is highlighted with a red circle and the number 1. The 'Extrude Elements' dialog box is open, showing the following settings:

- Extrude Type: Node -> Line Element (2)
- Element Attribute: Element Type: Beam (3)
- Material: 1: Precast Girder (3)
- Section: 2: Precast Girder (3)
- Generation Type: Translate (5)
- Translation: Equal Distance (5)
- dx,dy,dz: 4, 0, 0 ft (5)
- Number of Times: 30 (5)

The main workspace shows a vertical line of nodes, with the first node highlighted by a red circle and the number 4. The 'Apply' button at the bottom of the dialog box is highlighted with a red circle and the number 6. A message window at the bottom of the interface displays the text: "The project will be saved by the auto-save feature."

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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The screenshot displays the MIDAS/Civil software interface. The top menu bar includes View, Structure, Node/Element, Properties, Boundary, Load, Analysis, Results, PSC, Pushover, Design, Rating, Query, and Tools. The Node/Element menu is active, showing options like Create Elements and Translate. The 'Create Elements' dialog box is open, showing 'Start Number' 187, 'Element Number' 181, and 'Element Type' 'General beam/Tapered beam'. The 'Material' and 'Section' properties are set to '2: Dummy Deck' and '3: Dummy Deck' respectively. The 'Translate Elements' dialog box is also open, showing 'Start Number' 187, 'Element Number' 186, and 'Translation' mode set to 'Equal Distance' with 'dx,dy,dz' values of 4, 0, 0 ft and 'Number of Times' set to 30. The 3D model view shows a vertical beam structure with nodes and elements. Red circles and boxes highlight the 'Create Elements' button, the 'Material' and 'Section' dropdowns, the 'Nodal Connectivity' window, the 'Start Node(1)', the 'End Node(6)', the 'Translate' button, the 'Copy' mode, the 'Equal Distance' translation mode, and the generated elements.

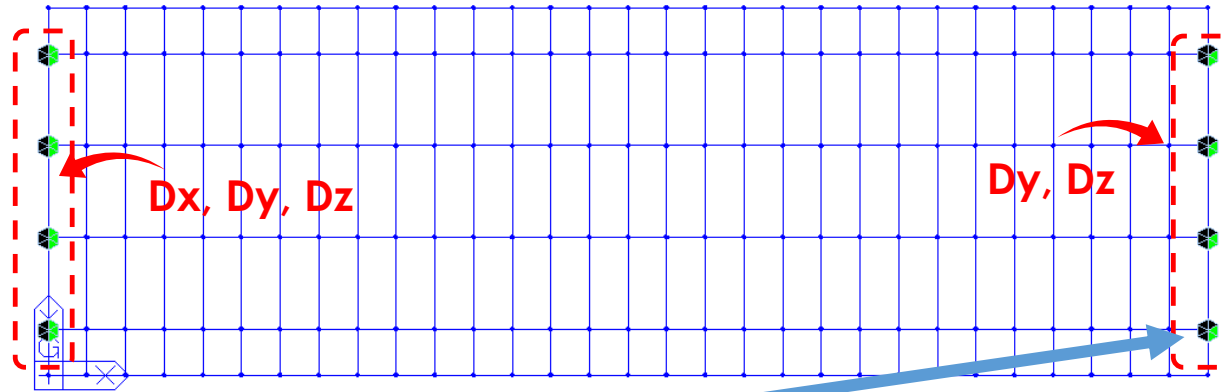
1. Go to **Create Elements**
2. Select Material and Section Properties
Dummy Deck / Dummy Deck
3. Click Nodal Connectivity window
4. Click **Start Node(1)**
5. Click **End Node(6)** to create Beam
6. Go to **Translate**
7. Select **Copy** mode
8. Define Translation mode as Equal Distance
 $dx, dy, dz: 4, 0, 0$ ft
Number of Times: 30
9. Select the generated **Elements**
10. Click **Apply**

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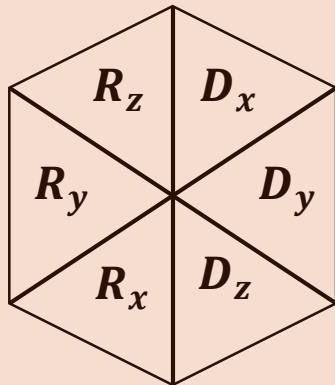
The screenshot displays the midas Civil software interface. The top menu bar includes View, Structure, Node/Element, Properties, Boundary, Load, Analysis, Results, PSC, Pushover, Design, Rating, Query, and Tools. The Boundary menu is active, showing options like Define Support, Point Spring, Surface Spring, Integral Bridge, Elastic Link, Rigid Link, General Link, Beam End Release, Beam End Offsets, Plate End Release, Linear Constraints, Effective Width, Panel Zone Effects, Define Label Dir, Node Local Axis, and Boundary Tables. The Tree Menu on the left shows the Boundary tab selected. The Support Type (Local Direction) dialog box is open, showing a 3D coordinate system with X, Y, and Z axes. The dialog has checkboxes for D-ALL (checked), R-ALL, and individual components Dx, Dy, Dz, Rx, Ry, Rz, and Rw. Red circles with numbers 1, 2, 3, and 4 highlight the Define Support button, the D-ALL checkbox, the selection of nodes on the left side of the grid, and the Apply button, respectively. The grid model shows a rectangular structure with nodes A and B at the corners. Red dashed boxes and arrows indicate the selection of nodes for support A (left side) and support B (right side). Red text labels 'Dx, Dy, Dz' and 'Dy, Dz' are placed near the respective support areas.

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**

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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.