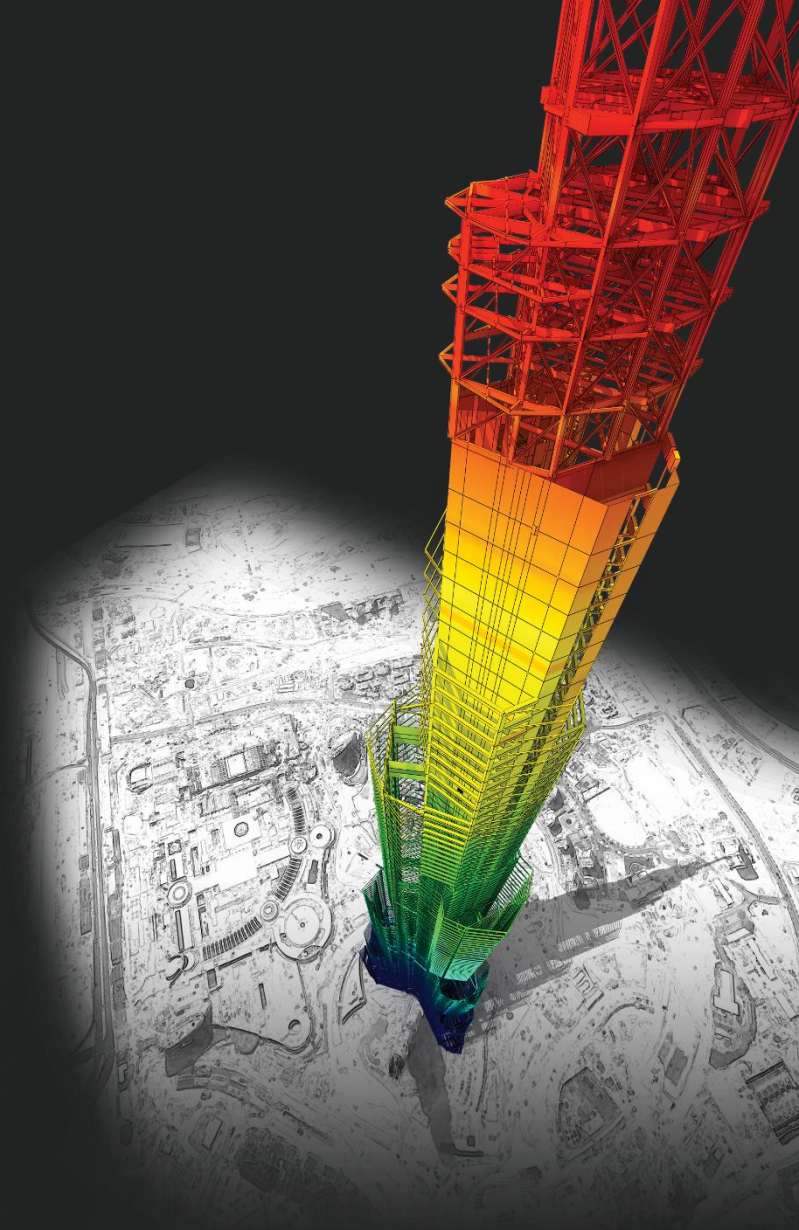




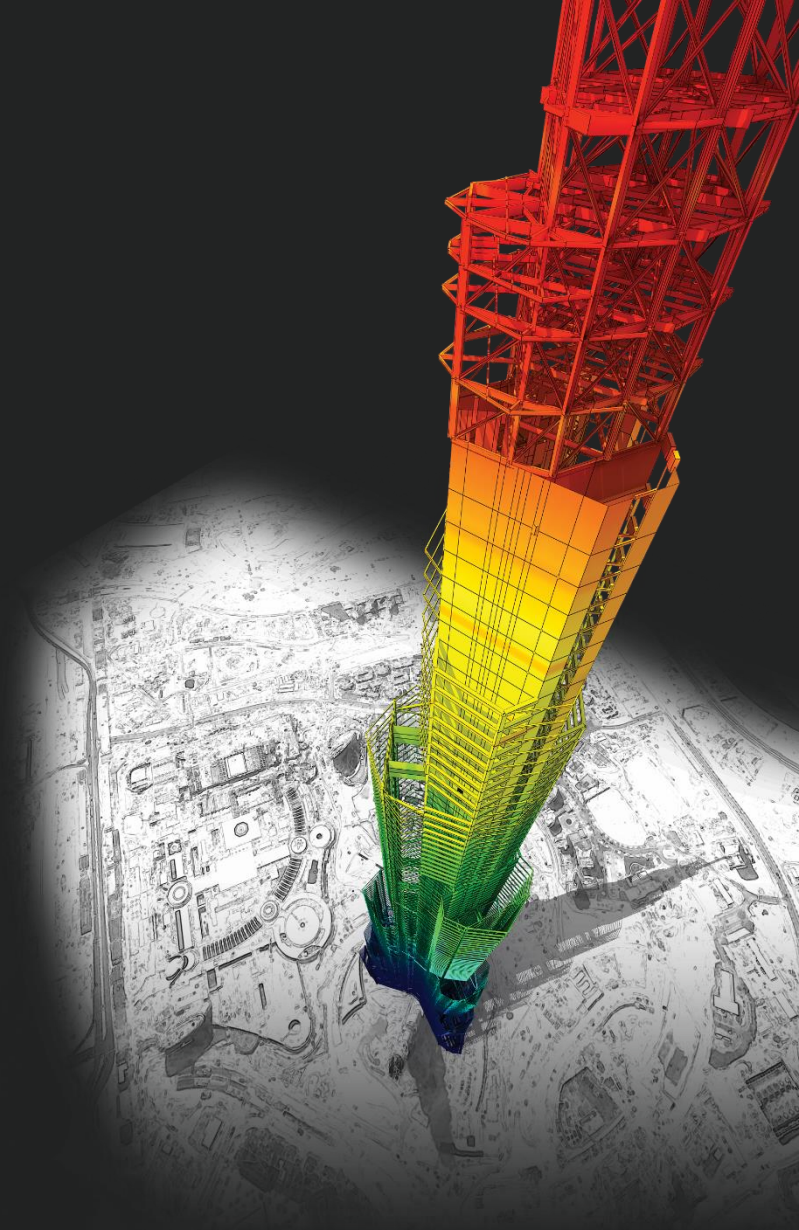
Cable Element Modelling



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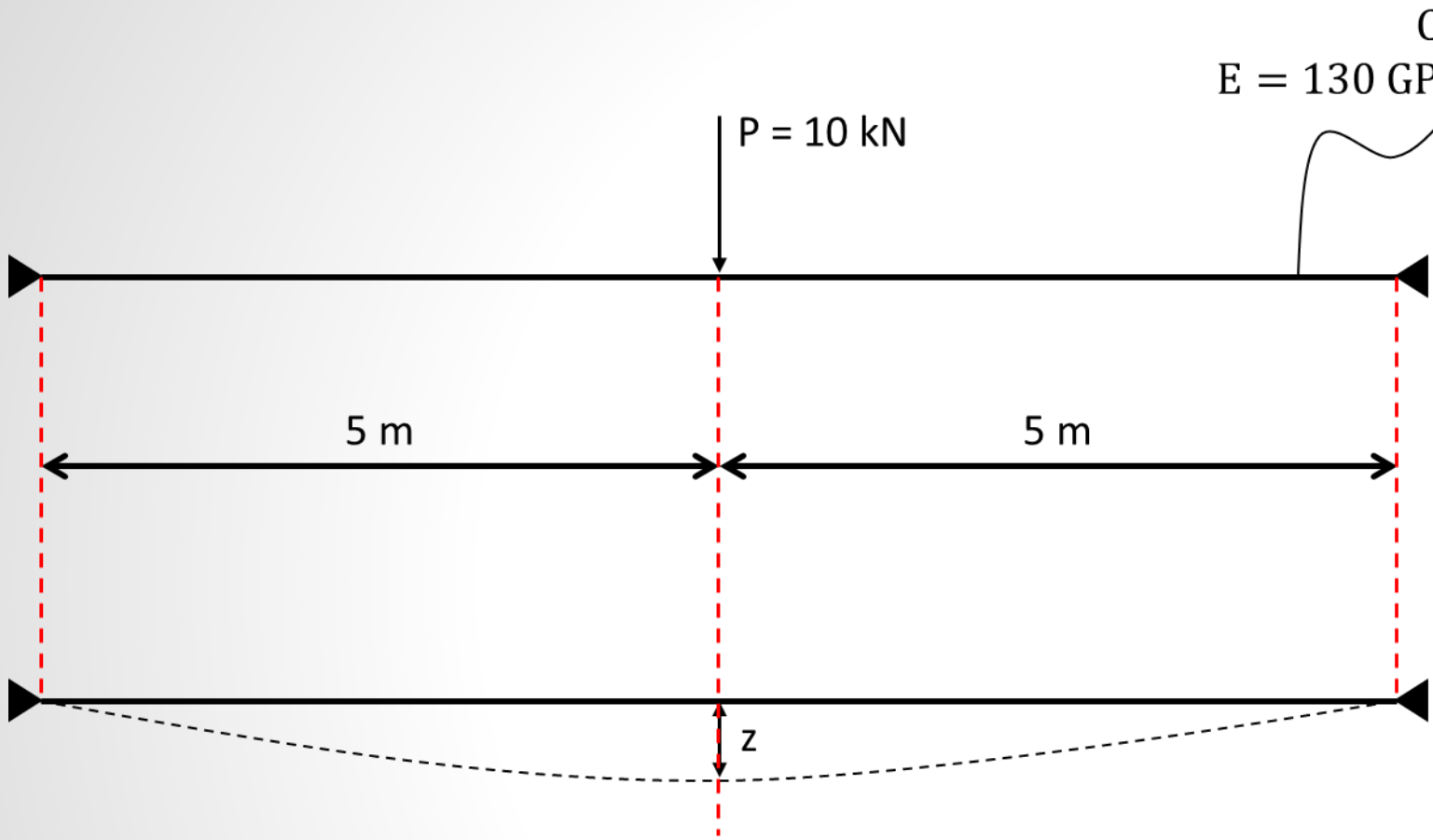
Cable Element 的問題



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問題



Cable Property :
 $L = 10 \text{ m}$
 $S_0 = 10 \text{ m}$
 $P = 10 \text{ kN}$

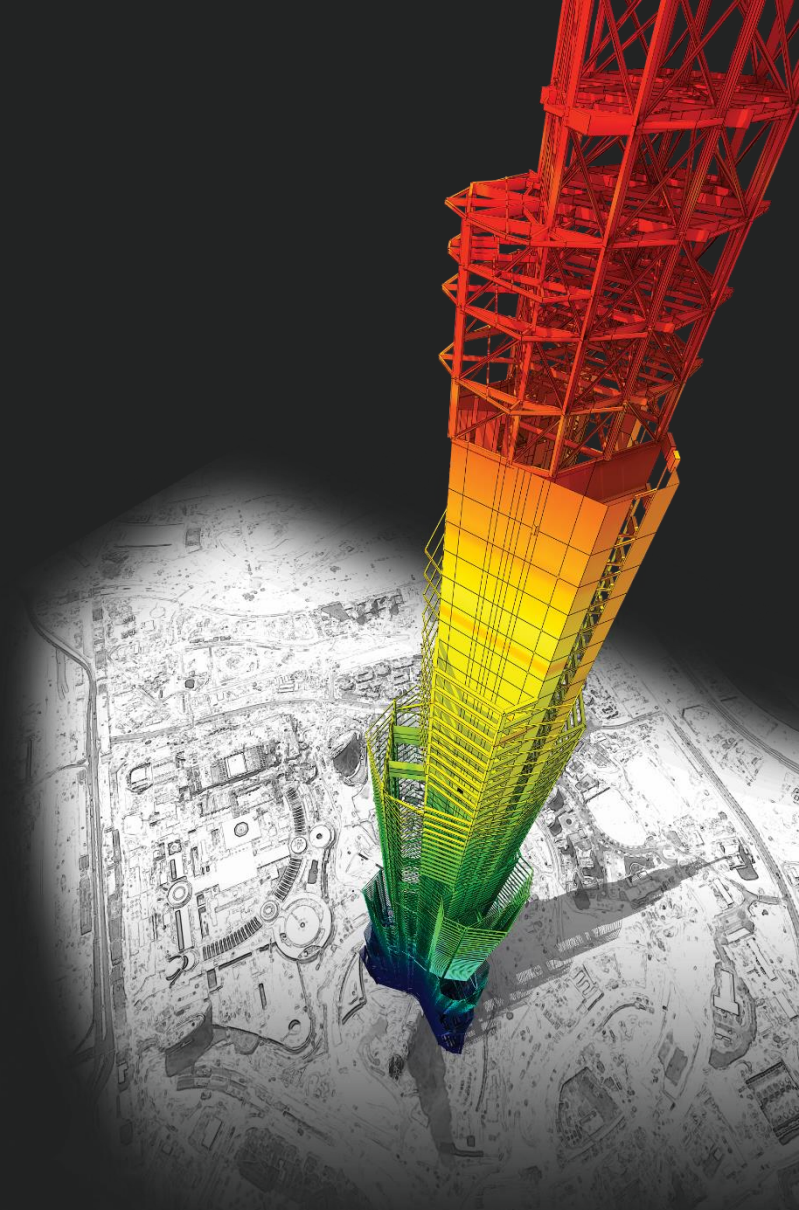
手算 :

$$P = 2AE \left(\frac{2z}{L} \right) \left[\frac{L}{S_0} - \frac{1}{\sqrt{1 + \left(\frac{2z}{L} \right)^2}} \right]$$



Find(z) = 249.8 mm = 0.25 m

Midas Gen Modelling



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Modelling

Node/Element > Create Element

Node | Element | Boundary | Mass | Load

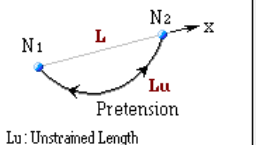
Create Elements

Start Number

Node Number : 12

Element Number : 11

Element Type
Tension only/Hook/Cable



Lu: Unstrained Length

Truss Hook Cable

Lu: 1000 mm

Material
No. 1 Name 1: Cable

Section
No. 1 Name 1: Cable

Orientation
 Beta Angle Ref. Point
 Ref. Vector
0 [deg]

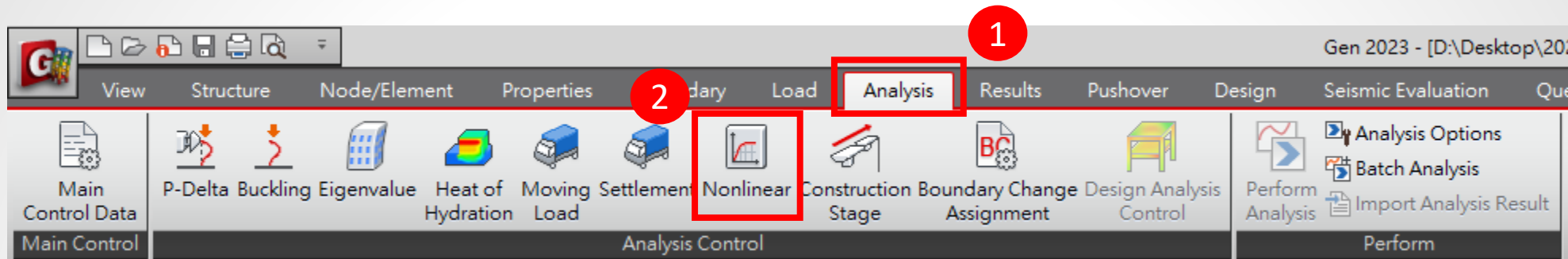
Nodal Connectivity
 Ortho
x,y,z En

Intersect: Node Elem
 Create Intersecting Nodes

Apply Close



設定 Non-Linear Analysis



3 Nonlinear Analysis Control 勾选 Geometry Nonlinear

The dialog box for Nonlinear Analysis Control is shown. The 'Nonlinear Type' section has 'Geometry Nonlinear' checked and 'Material Nonlinear' unchecked. The 'Iteration Method' section has 'Newton-Raphson' selected, with 'Number of Load Steps' set to 1 and 'Maximum Number of Iterations/Load Step' set to 30. The 'Convergence Criteria' section has 'Displacement Norm' checked and set to 0.001, while 'Energy Norm' and 'Force Norm' are unchecked. The 'Load Case Specific Nonlinear Analysis Control Data' section is empty. At the bottom, there are buttons for 'Remove Nonlinear Analysis Control Data', 'OK', and 'Cancel'.

勾选 Displacement Norm → 輸入 0.001。

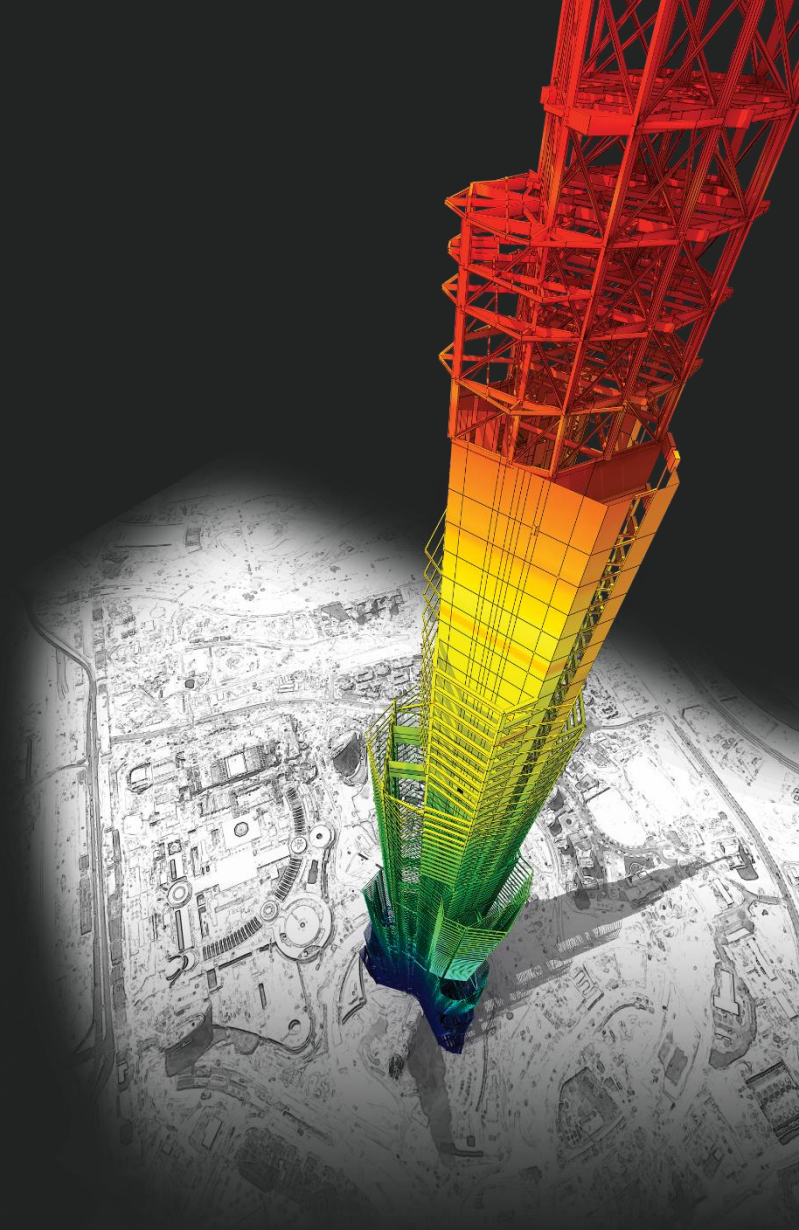
Midas Gen 結果

The screenshot shows the Midas Gen software interface. The 'Results' menu is highlighted with a red box and labeled '1'. The 'Displacement Contour' option is selected in the 'Deformations' sub-menu, labeled '2'. The 'Displacement Contour' dialog box is open, showing 'Load Cases/Combinations' set to 'ST: P' and 'Step' set to 'NL Step: 1'. The 'Components' section has 'DZ' selected. The 'Type of Display' section has 'Contour', 'Deform', 'Values', and 'Legend' checked. The 3D model shows a cable structure with displacement values ranging from 0.000 to -2.49883e-01. A red box highlights the value 0.25 on the model. A red arrow points from the text 'Midas Gen 結果 = 0.25 m' to the highlighted value.

Midas Gen 結果 = 0.25 m

手算結果跟 midas Gen 的是一樣 (0.25 m)。

Thank You



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