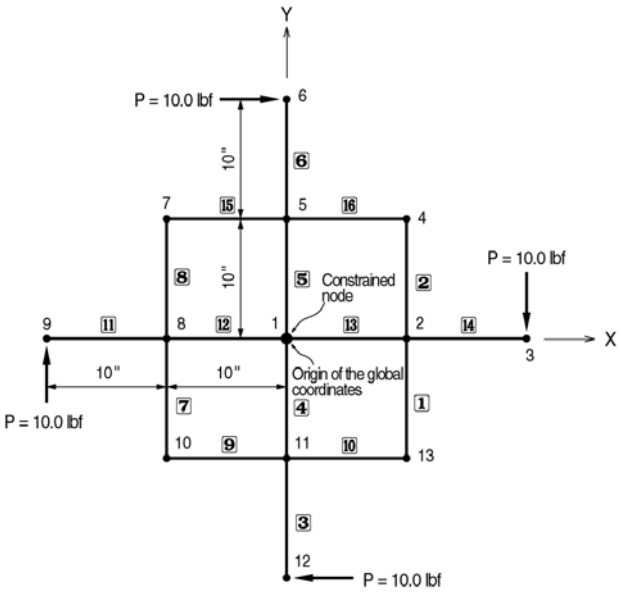
Static-5

Title

Symmetric frame structure subjected to rotational forces

Description

Determine the displacements of a symmetric frame structure subjected to rotational forces.



Structural geometry and analysis model

Model

Analysis Type

2-D static analysis (X-Y plane)

Unit System

in, lbf

Dimension

Width × Height = 40.0 in × 40.0 in

Element

Beam element

Material

Modulus of elasticity $E = 1.2 \times 10^{7}$ psi

Section Property

Area $A = 1.0$ in^2

Moment of inertia $I_{yy} = 8.33 \times 10^{-2}$ in^4

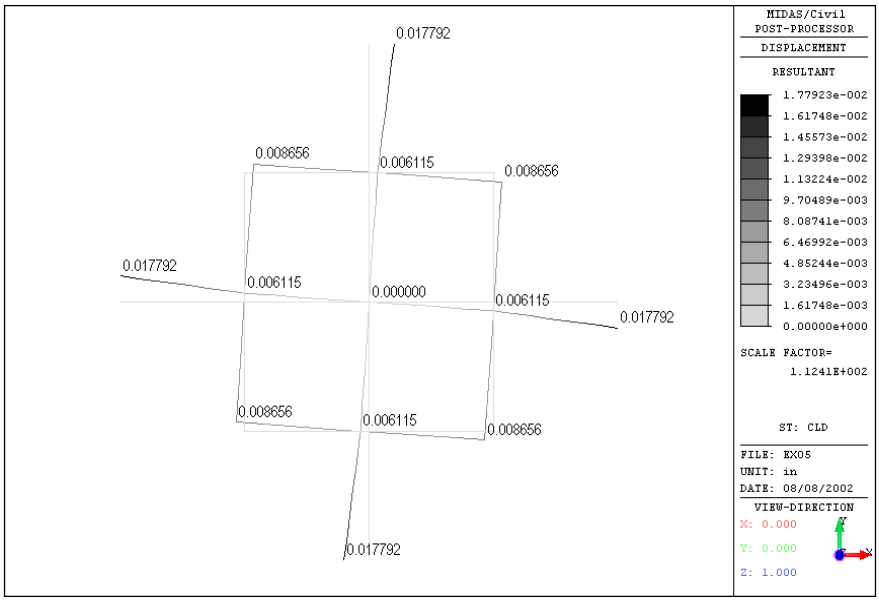
Boundary Condition

Node 1 ; Constrain all DOFs

Load Case

A concentrated load, 10.0 lbf each is applied to the nodes 3 in the -Y direction, 9 in the Y direction, 6 in the X direction and 12 in the -X direction.

Results



Displacements of the structure

Comparison of Results

Unit : in

Displacement (Node)	ADINA	NISA II	MIDAS/Civil
δ_Y (3)	-0.017790	-0.017792	-0.017792

References

"*ADINA Verification Manual - Linear Problems*", ADINA R&D, Inc., Example A. 40.

"NISA II, Verification Manual", Version 91.0, Engineering Mechanics Research Corporation, 1991.