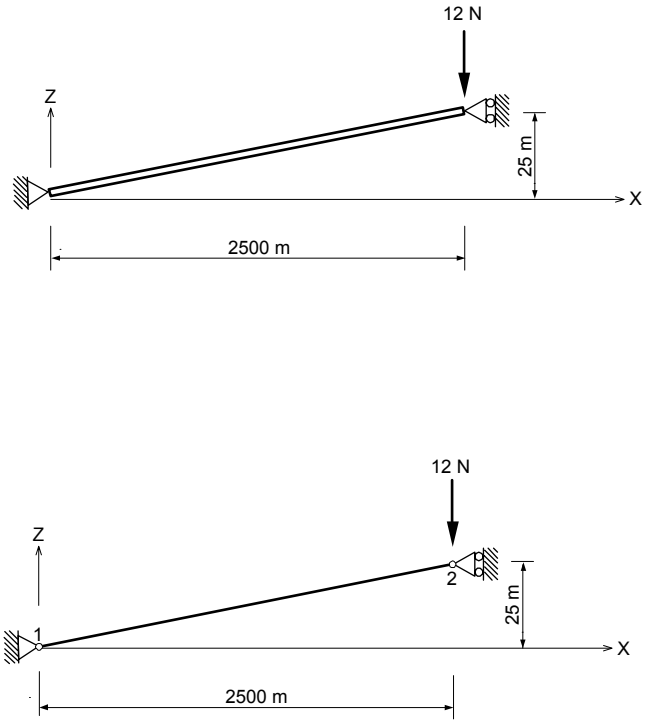
GNL-5

Title

Snap-through

Description

A truss element is subjected to a vertical load at the node 2.
Draw the load-displacement graph.



Structural geometry and analysis model

MODEL

Analysis Type

2-D geometrical nonlinear analysis

Unit System

m, N

Dimension

Length 2500 m Height 25 m

Element

Truss element

Material

Modulus of elasticity $E = 5.0 \times 10^7$ N/m^2
Poisson's ratio $\nu = 0.0$

Sectional Property

Area: 1 m^2

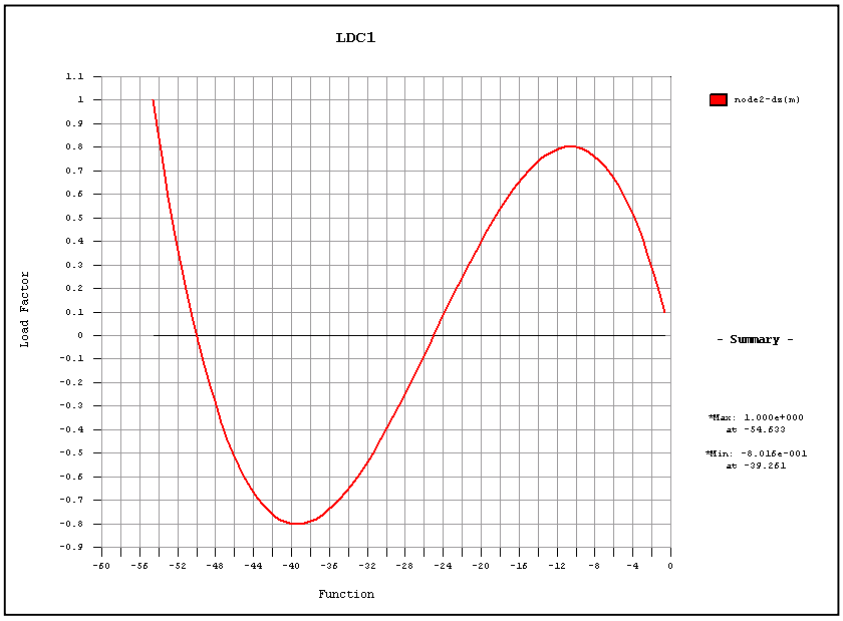
Boundary Condition

Node 1: Constrain D_X and D_Z
Node 2: Constrain D_X

Load Case

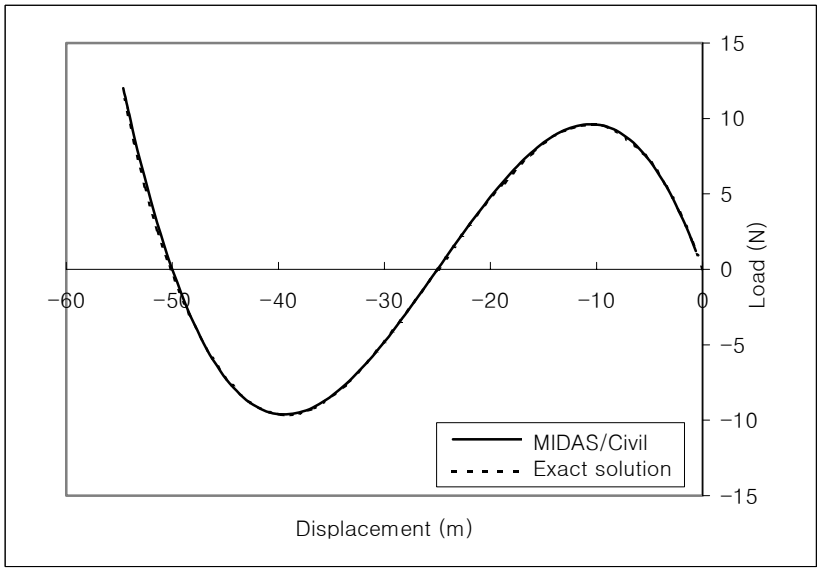
A concentrated load, P = 12 N is applied at the node 2 in the -Z direction.

Results



Stage/Step graph

Comparison of Results



Reference

M. A. Crisfield, "*Non-linear Finite Element Analysis of Solids and Structures*", Volume 1:Advanced Topics, 1991