

Z-shaped cantilever

REFERENCE Background to Finite Element Analysis of Geometric Non-linearity Benchmarks, Ref . R0065, NAFEMS, Glasgow, 1999

MODEL FILENAME Z shaped cantilever.nfx

Figure 1 shows a Z-shaped cantilever laid along the oblique line of 45° . The total load P at all the points on the free end D in the positive Z -direction is conservative (non-follower load). The cantilever structure is modeled using bar or quadrilateral shell elements. Tension stiffening and the change in sign of bending moment can be observed.

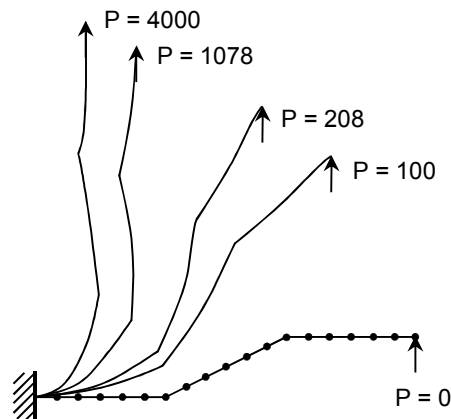
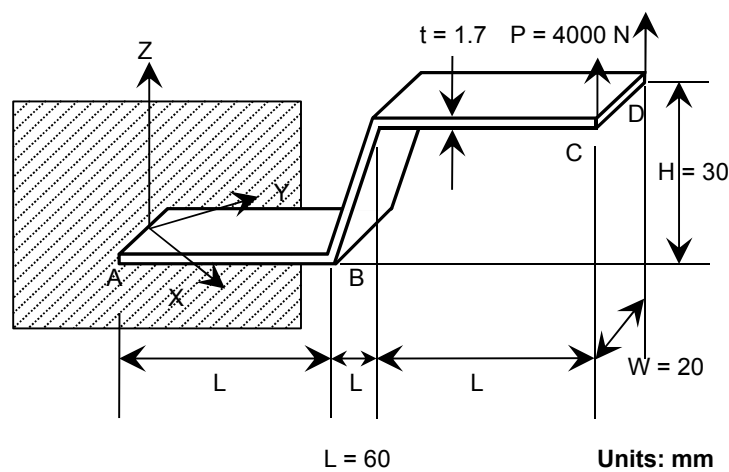


Figure 1. Z-shaped 3D cantilever model

Material data	Young's modulus	$E = 200 \times 10^3 \text{ N/mm}^2$
	Poisson's ratio	$\nu = 0.3$
Section property	Cross-sectional area	$b = 20 \text{ mm}$ $t = 1.7 \text{ mm}$

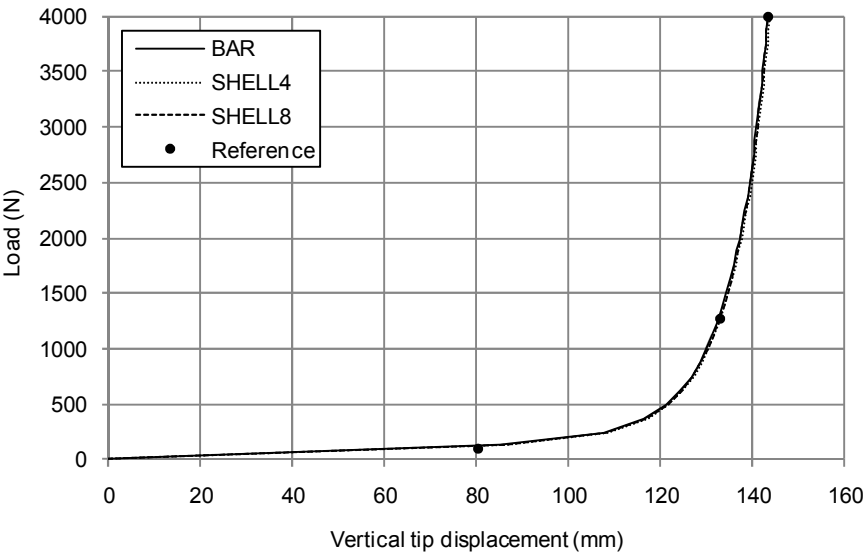
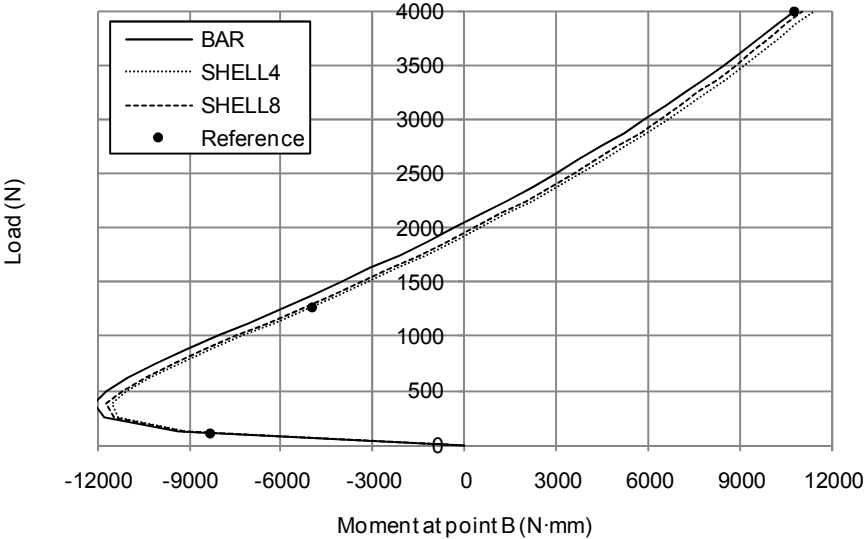


Figure 2. Solution for Z-shaped 3D cantilever model