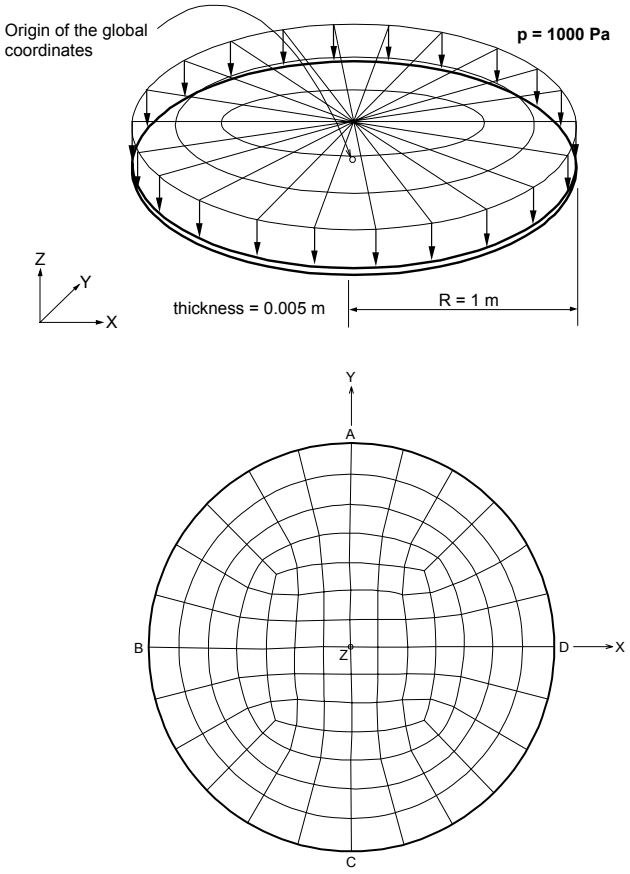
Static-41

Title

A circular slab subjected to a pressure load

Description

A circular slab is subjected to a pressure load.
Determine the vertical displacement at the origin point.



Structural geometry and analysis model

MODEL

Analysis Type

3-D static analysis

Unit System

m, N

Dimension

Radius 1 m

Element

Plate element

Material

Modulus of elasticity $E = 2.1 \times 10^{11}$ Pa
Poisson's ratio $\nu = 0.3$

Sectional Property

Thickness 0.005 m

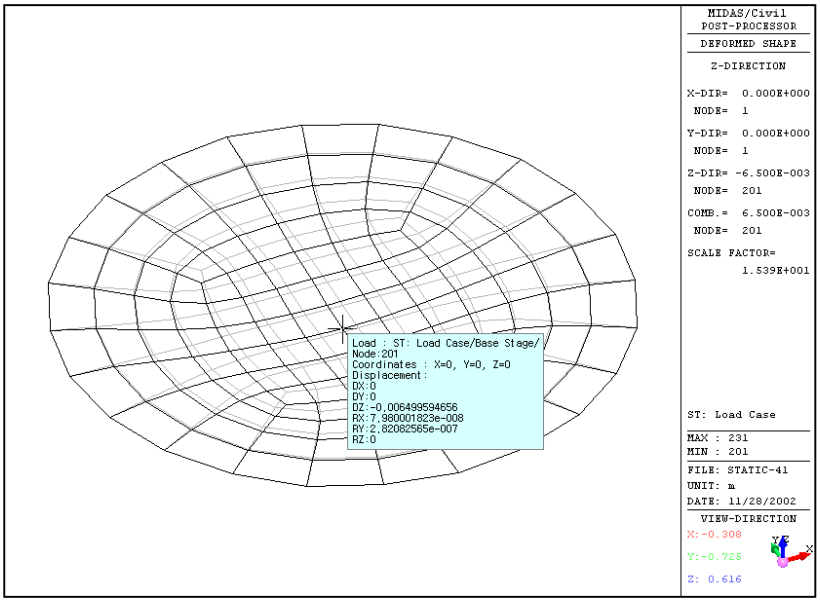
Boundary Condition

Node A~B~C~D: Constrain all DOFs

Load Case

A pressure load, p = 1000 Pa is applied to the slab in the -Z direction.

Results



Z-displacement (δ_Z) at the center of a circular slab

Comparison of Results

Unit: m

Result	Theoretical	MIDAS/Civil
Displacement (δ_Z)	-0.0065	-0.0065

Reference

S. Timoshenko, "*Résistance des matériaux*", t. 2, Oaris, Librairie Polytechnique Béranger, 1949