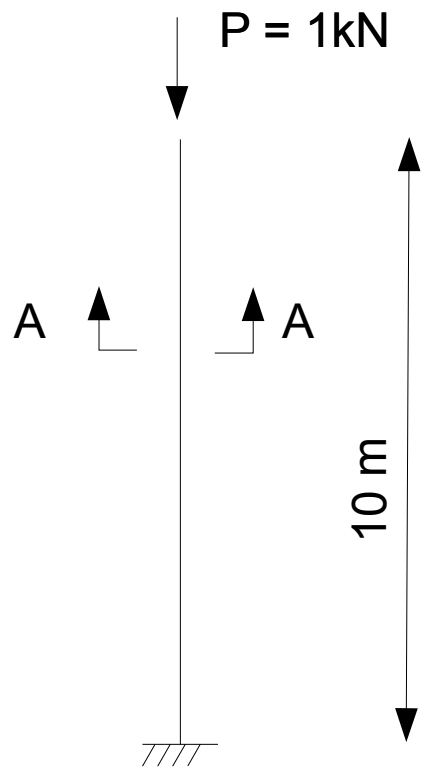


Interpreting Buckling Analysis Results for Different Initial Conditions (Stiffness to Use)

Purpose

- This purpose of this test problem is to illustrate how the results of buckling analysis are influenced using either stiffness for zero initial conditions or stiffness at the end of a nonlinear load case.

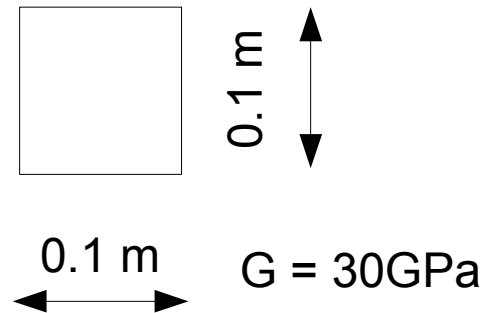
Model geometry



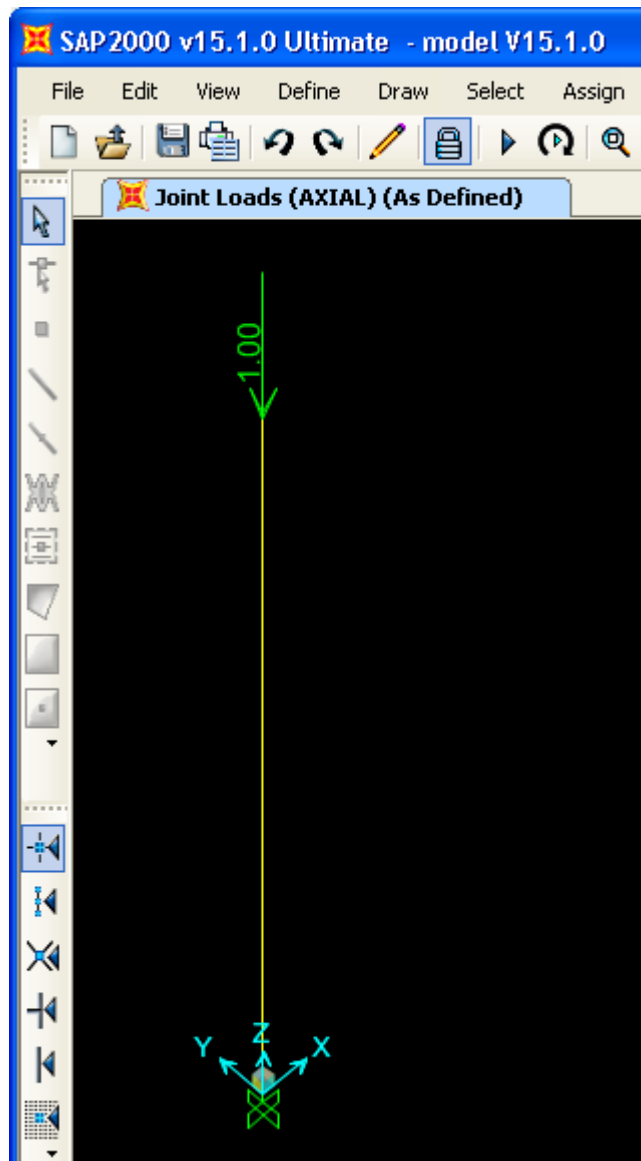
Elevation
(Not To Scale)

Critical Euler buckling load:

$$P_{\text{cr}} = \pi^2 EI / (4L^2) = 6.168 \text{ kN}$$

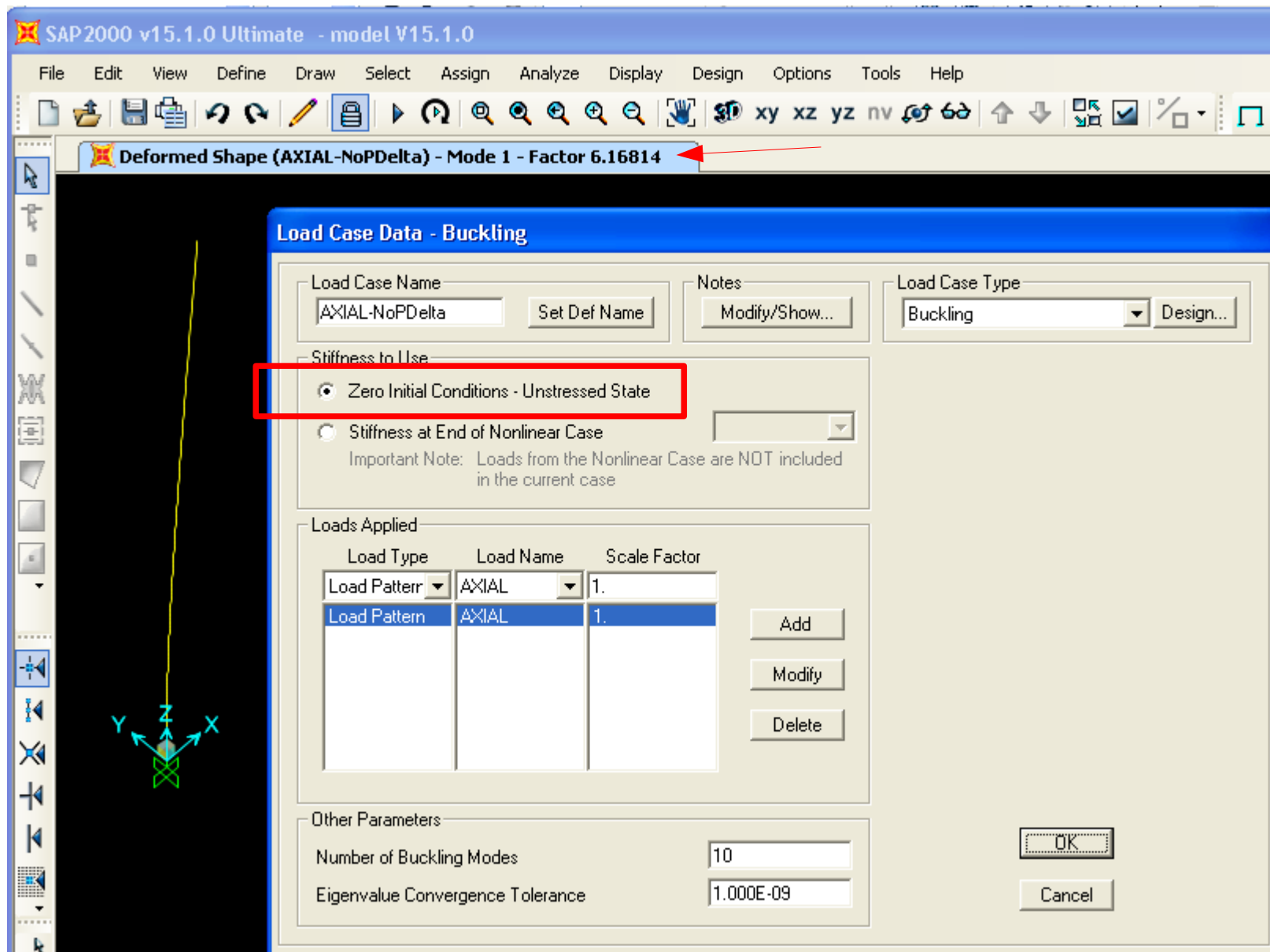


Section A-A
(Not To Scale)



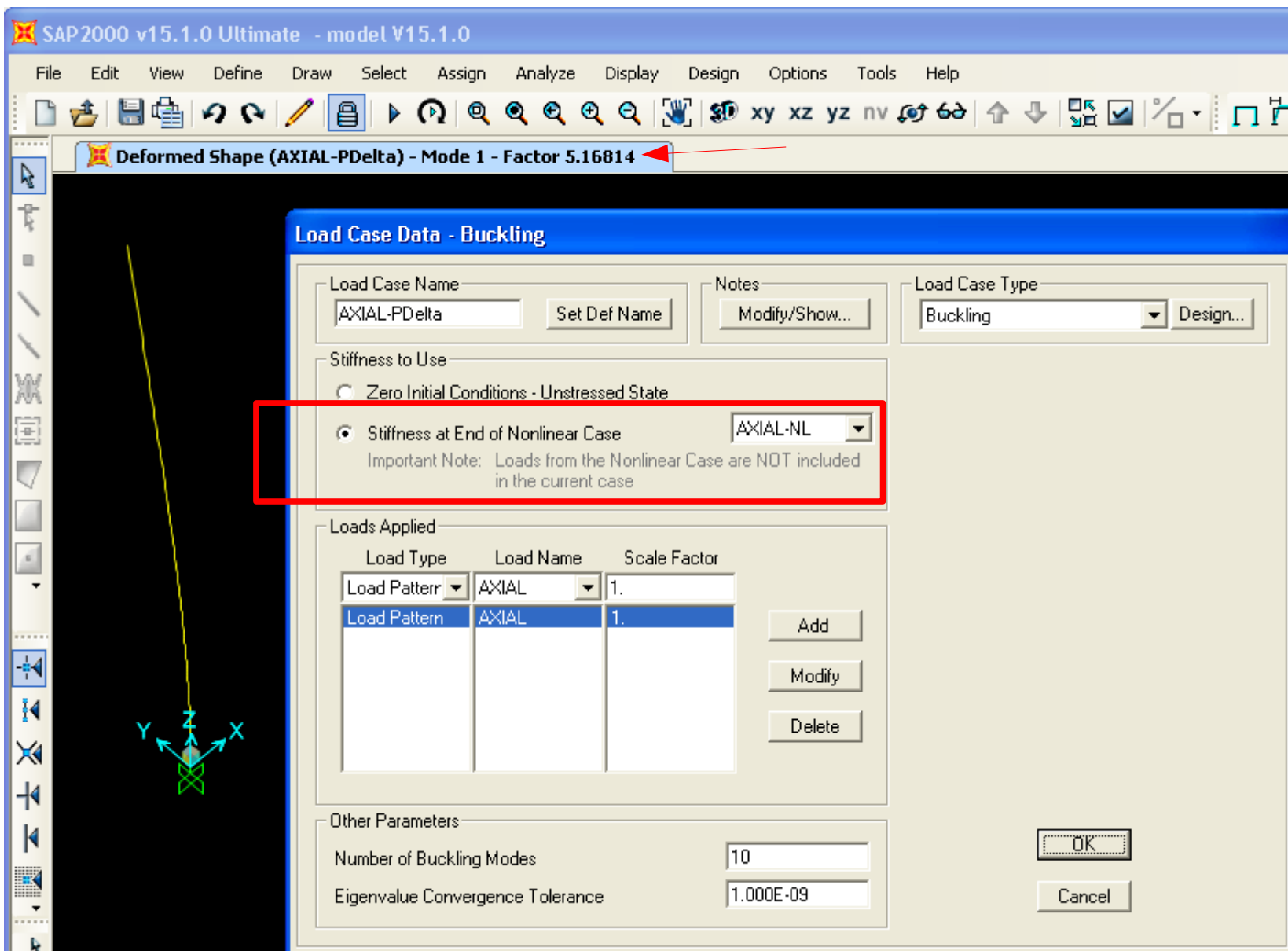
Loads applied in the "AXIAL" load pattern.

Results for Buckling Analysis Using Stiffness at Zero Initial Conditions



Critical buckling load =
(buckling factor) (axial load applied in buckling analysis) = (6.16814)(1kN) = 6.16814 kN
(this matches theoretical Euler buckling load calculated on page 3)

Results for Buckling Analysis Using Stiffness at the End of Nonlinear "AXIAL-NL" load case



Critical buckling load = (axial load applied in the "AXIAL-NL" load case) + (buckling factor) (axial load applied in buckling analysis) = 1kN + (5.16814)(1kN) = 6.16814 kN

(this again matches theoretical Euler buckling load calculated on page 3)