Stability of Shell Structures

The theoretical buckling load of shell structures can be easily computed by modern software. However, shell buckling can be very sensitive to imperfections like, material shrinkage, creep, residual stresses, eccentricities and support settlements. Therefore instability can occur at much smaller loads than the theoretical buckling load.



In this project several shells will be modelled with the finite element method. The ultimate load will be computed taking into account geometrical nonlinear behaviour. The sensitivity to a range of realistic imperfections will be studied. Reduced stiffness will be considered as a simple method of accounting for these imperfections. Analysis guidelines will be formulated for the safety margin of the theoretical buckling load.



Figures by the Ruhr-Universität Bochum, Bauingenieurwesen

Date: 21 February 2005

Professor: Supervisors: prof. ir. A.C.W.M. Vrouwenvelder ir. J.W. Welleman (CT 6.15) dr.ir. P.C.J. Hoogenboom (CT 5.24)