



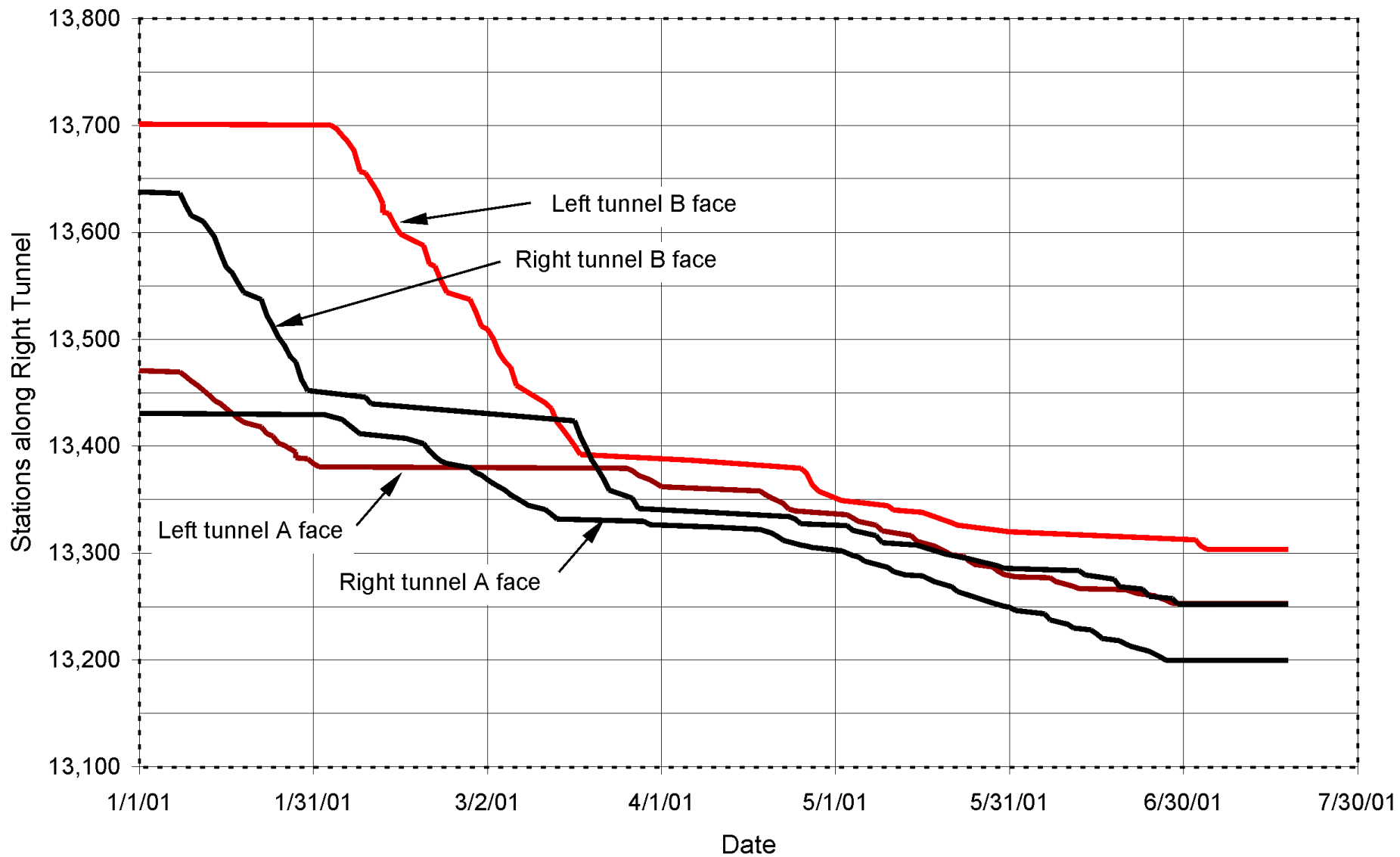
Kallidromo drive from the south portal



Spalling of shotcrete in the sidewall of one of the tunnels driven from the north portal of Kallidromo

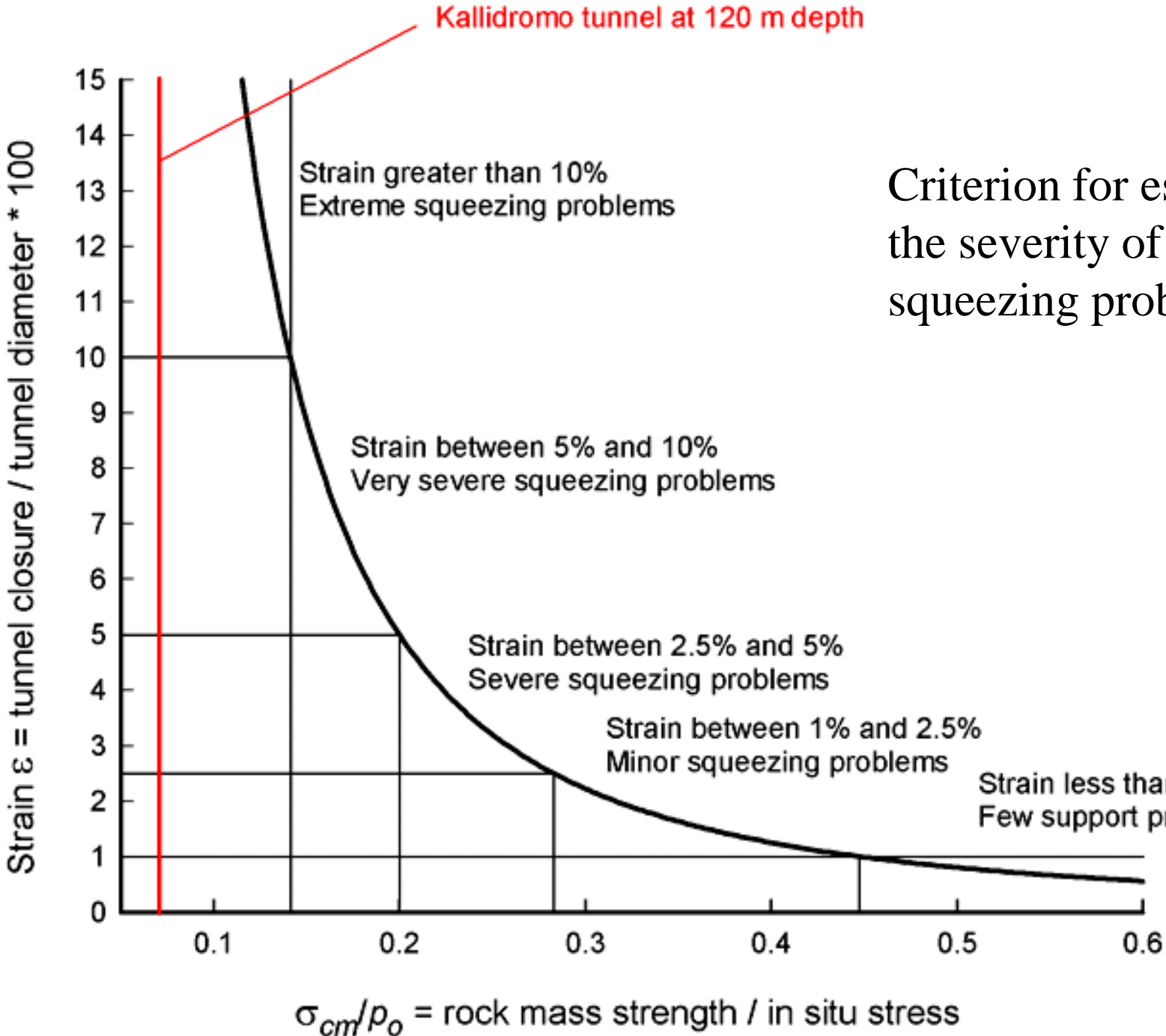


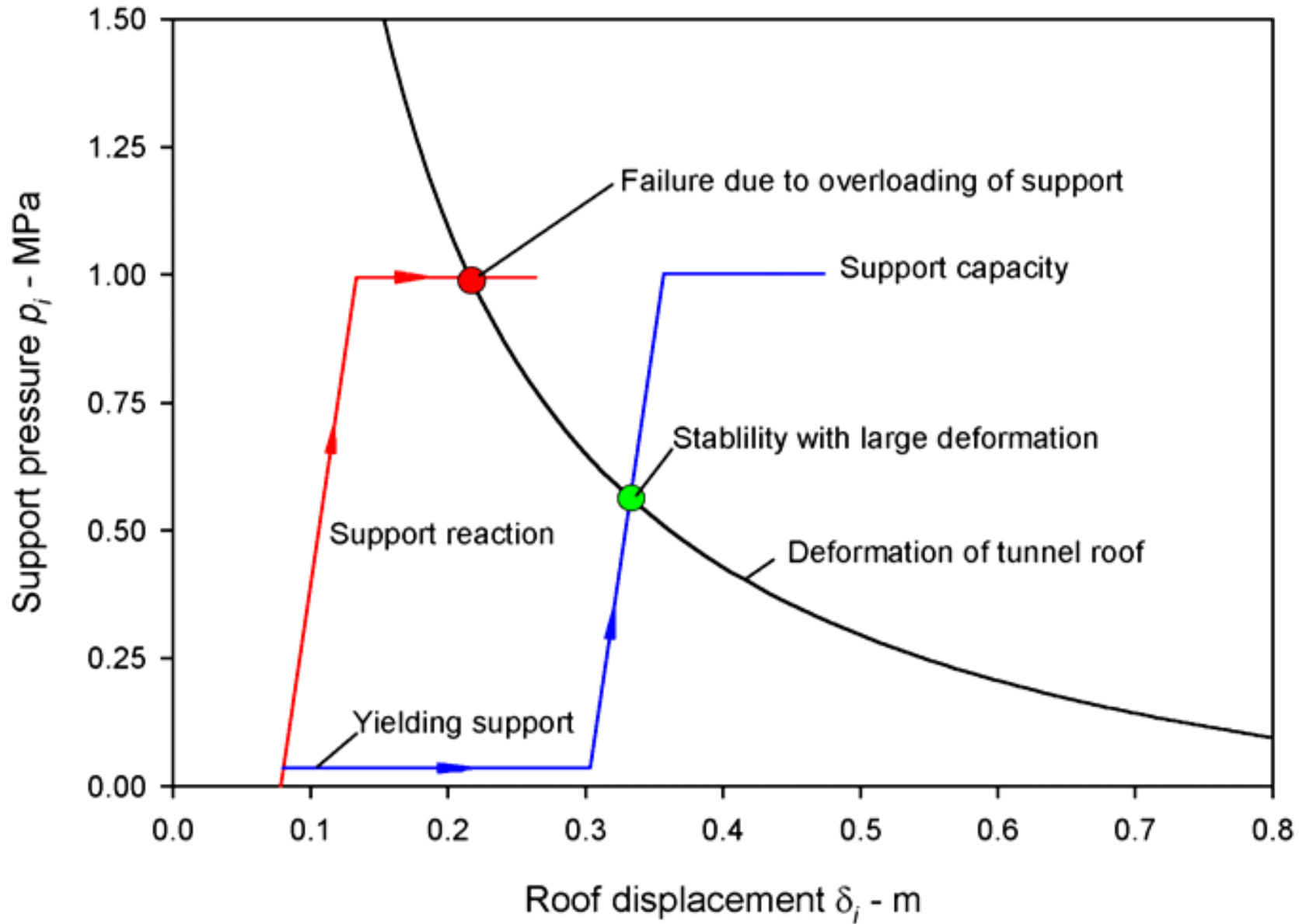
Buckling of steel sets in one of the north Kallidromo drives



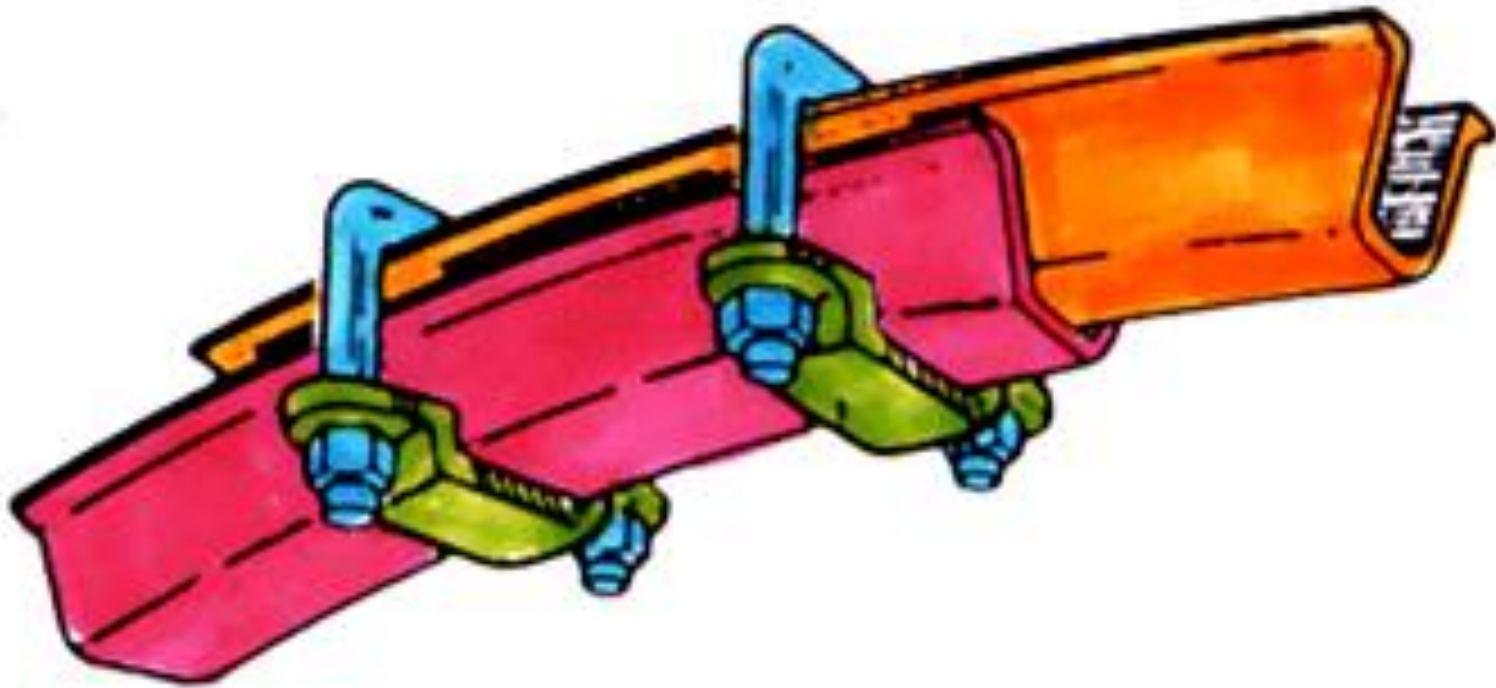
Advance of different headings in the Kallidromo north drive

# Criterion for estimating the severity of tunnel squeezing problems





Ground response curve for Kallidromo north drive

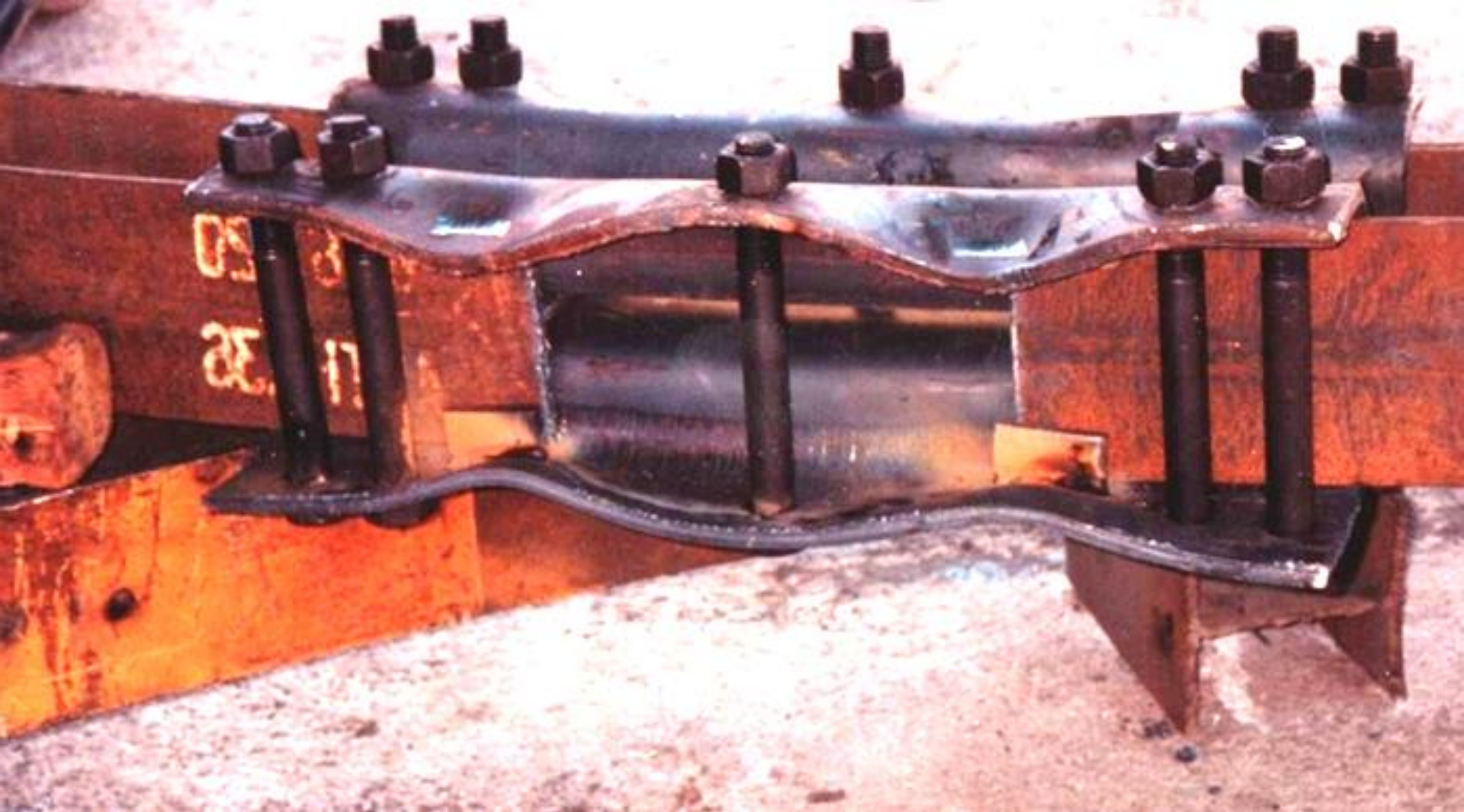


Toussaint-Heintzmann or Top Hat  
sliding joint

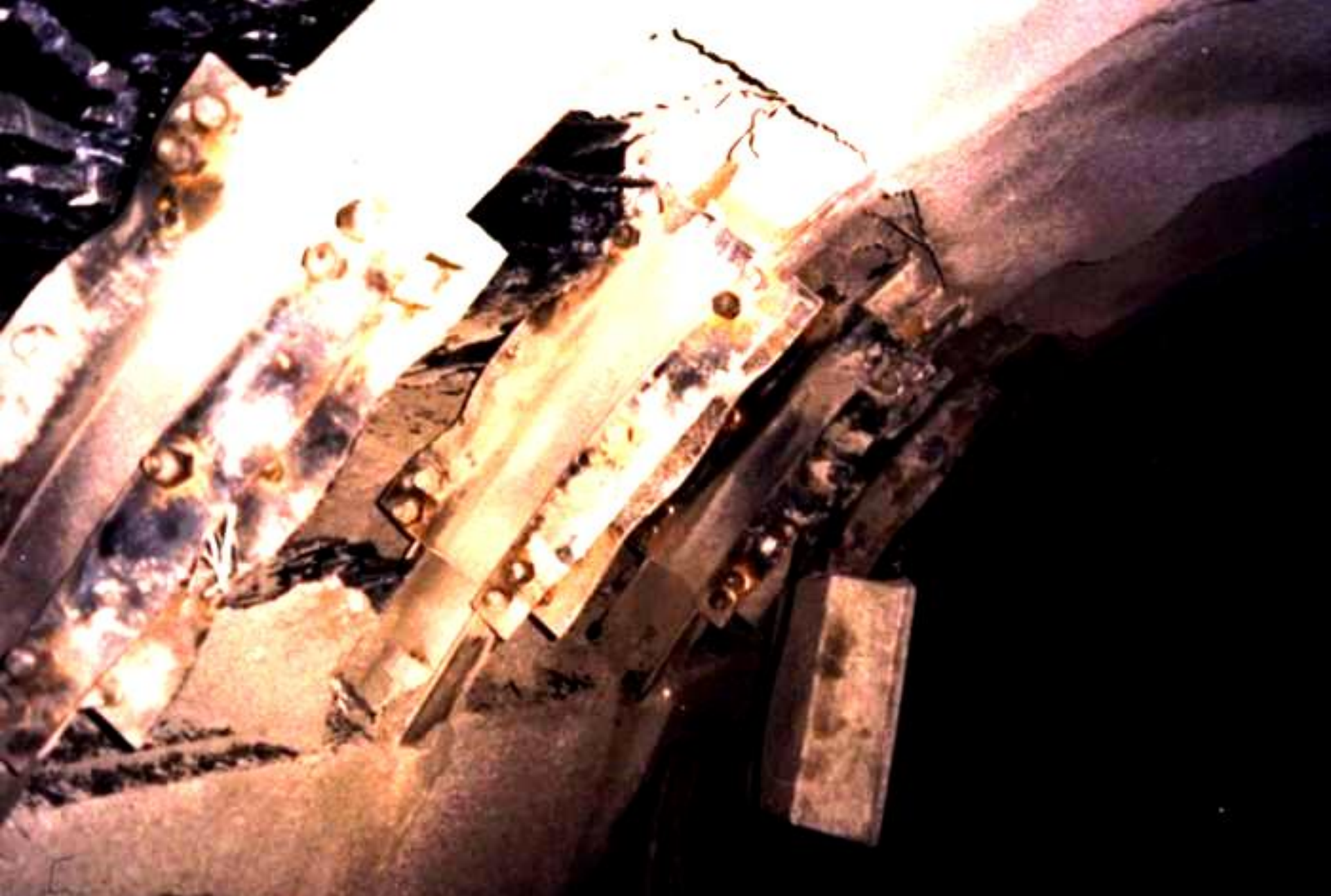


Schubert “collapsing can” yielding element

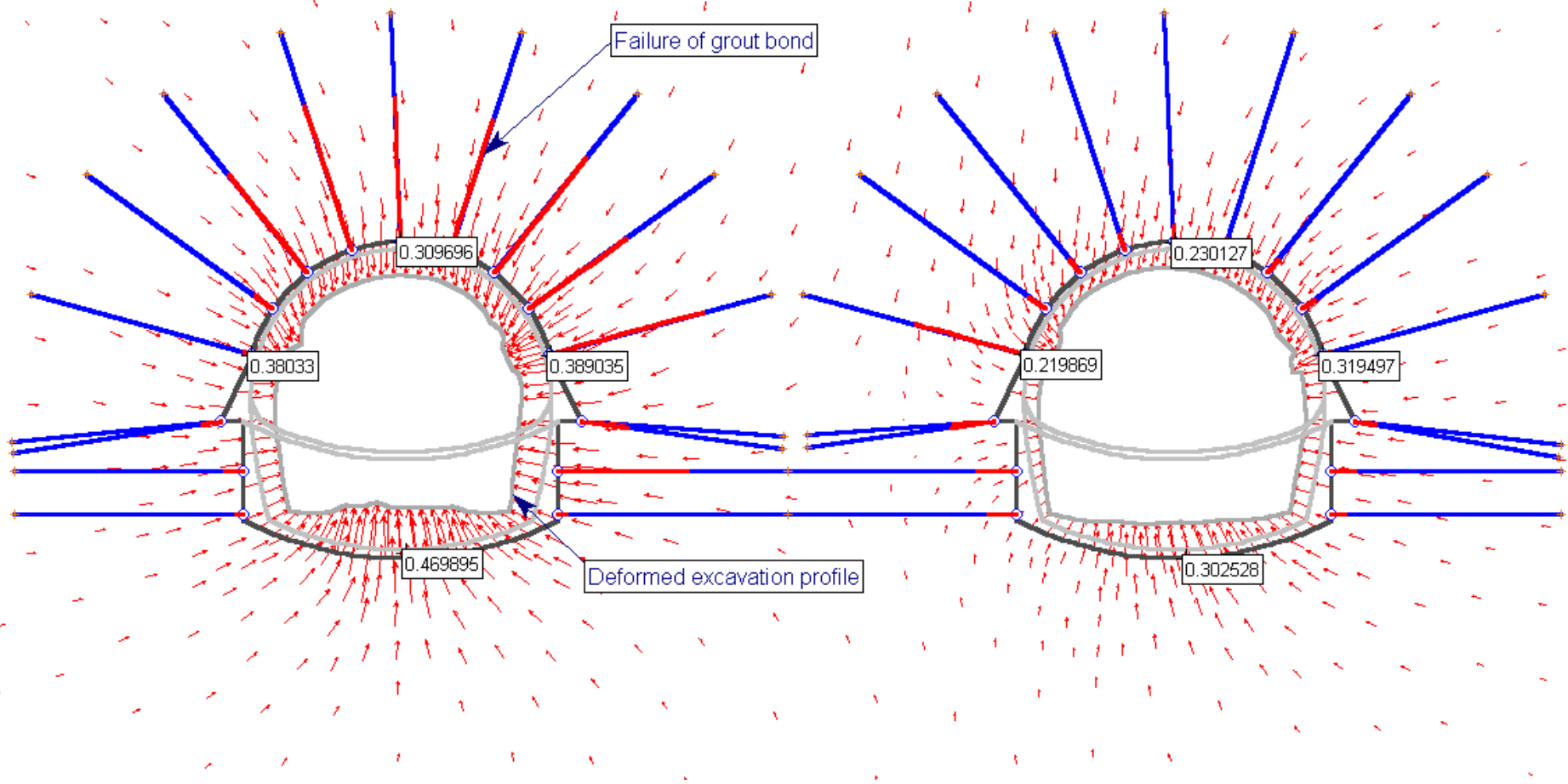




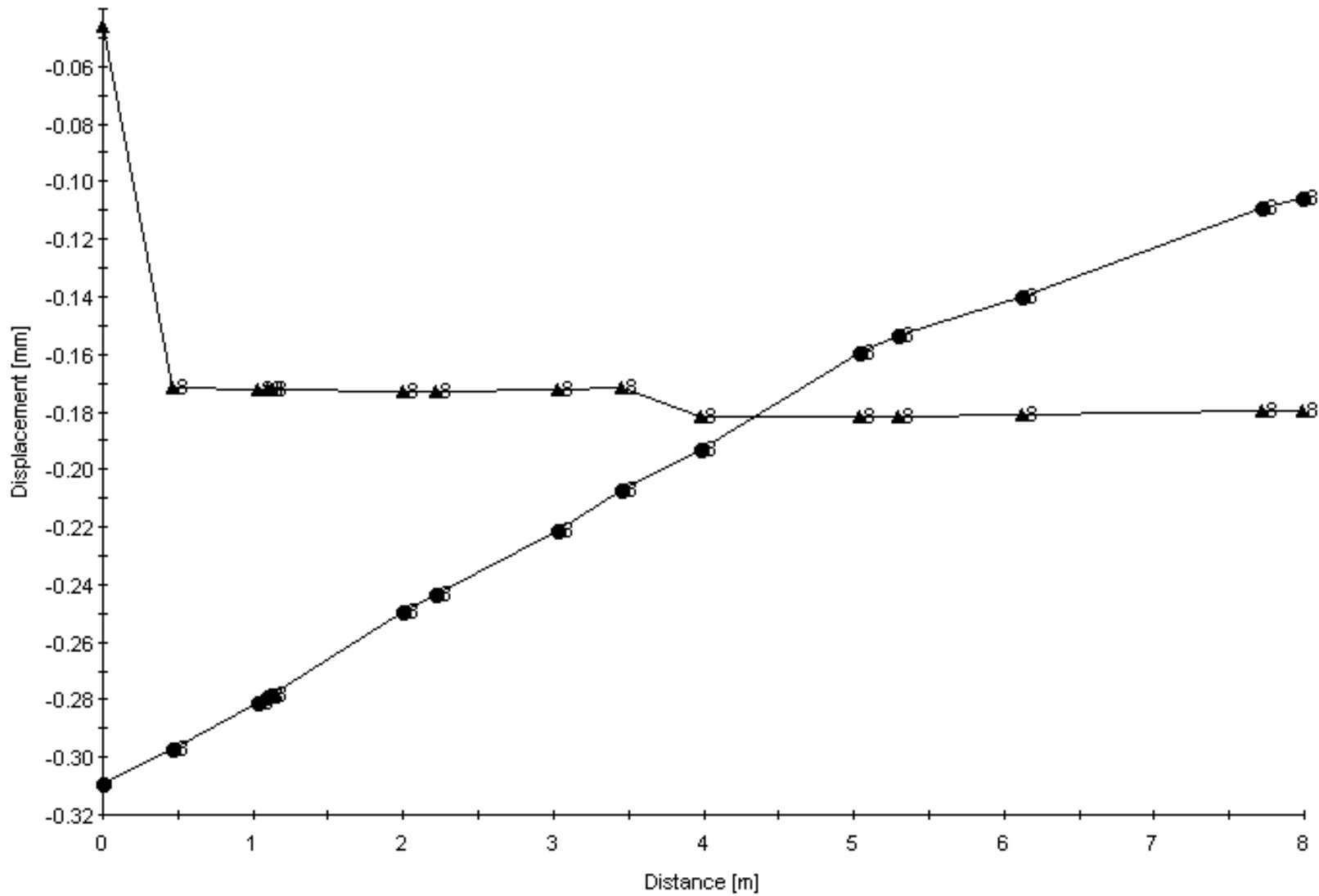
Home-made sliding joint in Venezuela



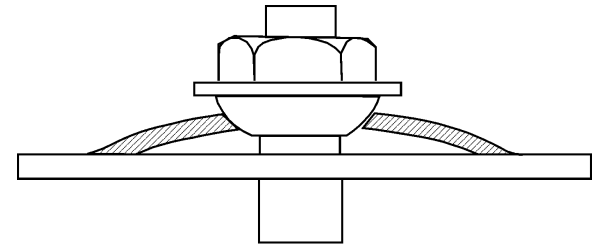
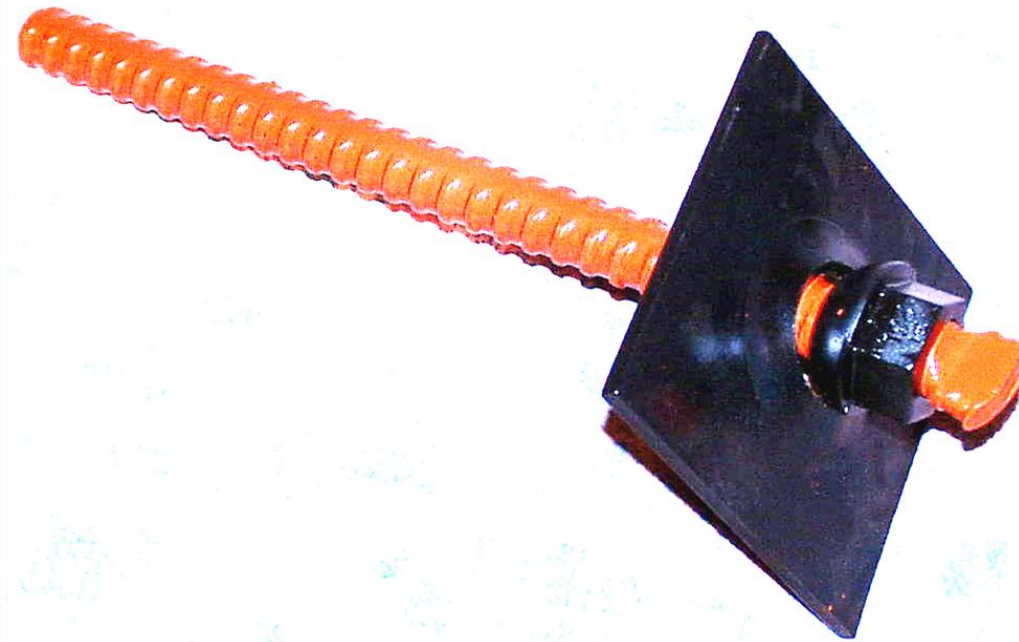
Sliding joints in shotcrete window



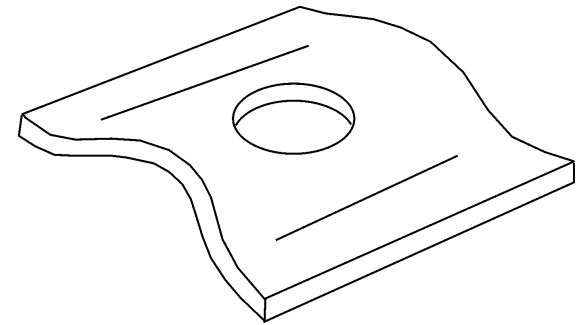
Numerical analysis of deformation in the Kallidromo north drive



Grouted rockbolt behaviour in very weak yielding rock

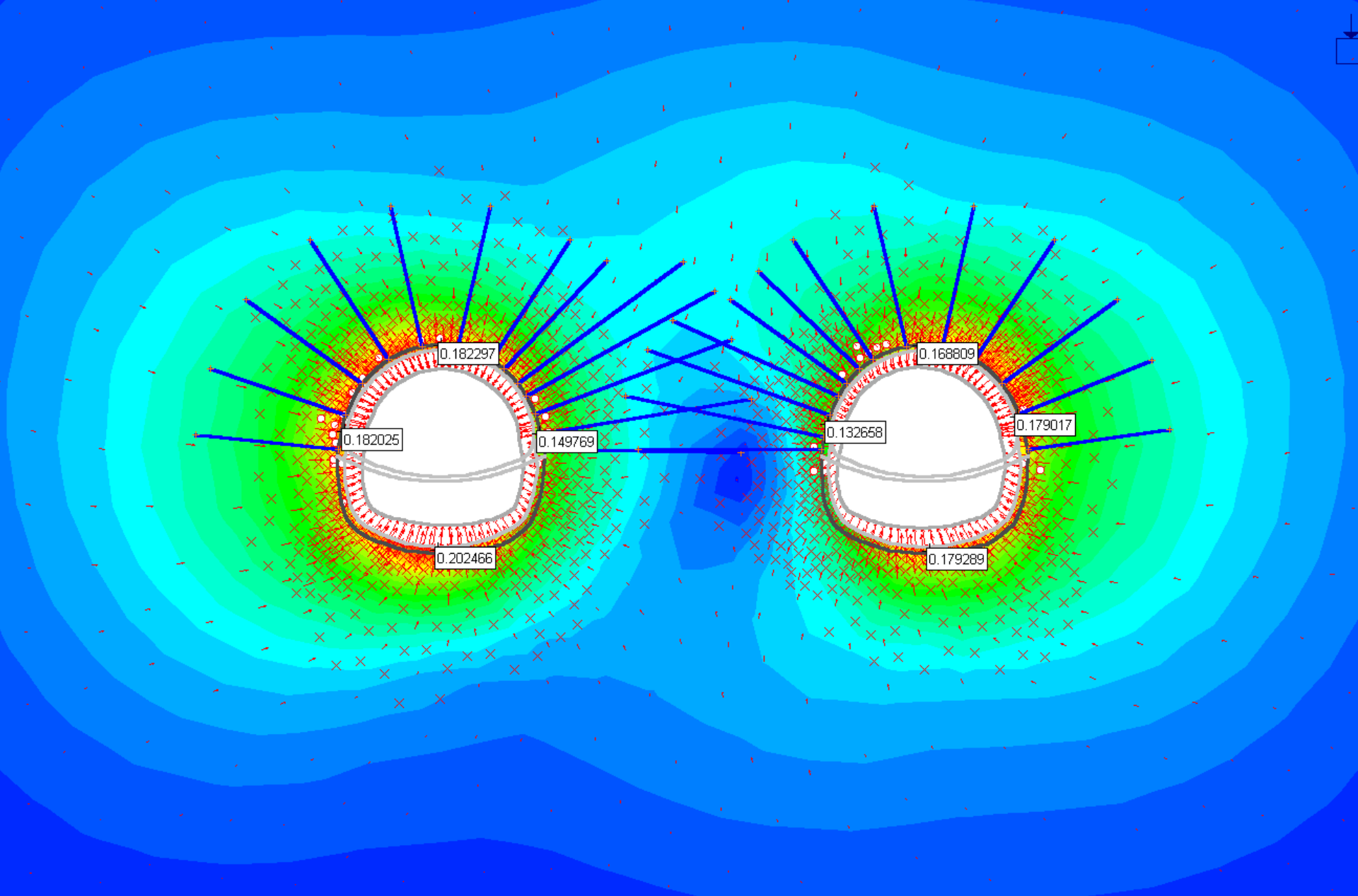


Domed washer



Deformed plate

Deformable face plates to control rockbolt head failure



Proposed design for Kallidromo north drive