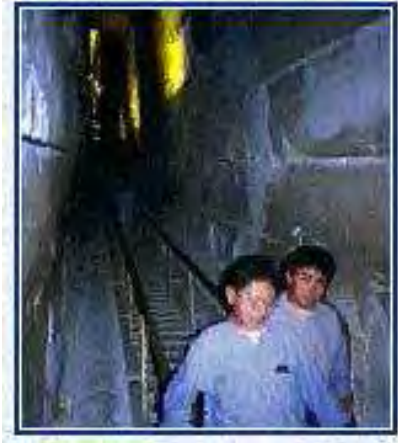
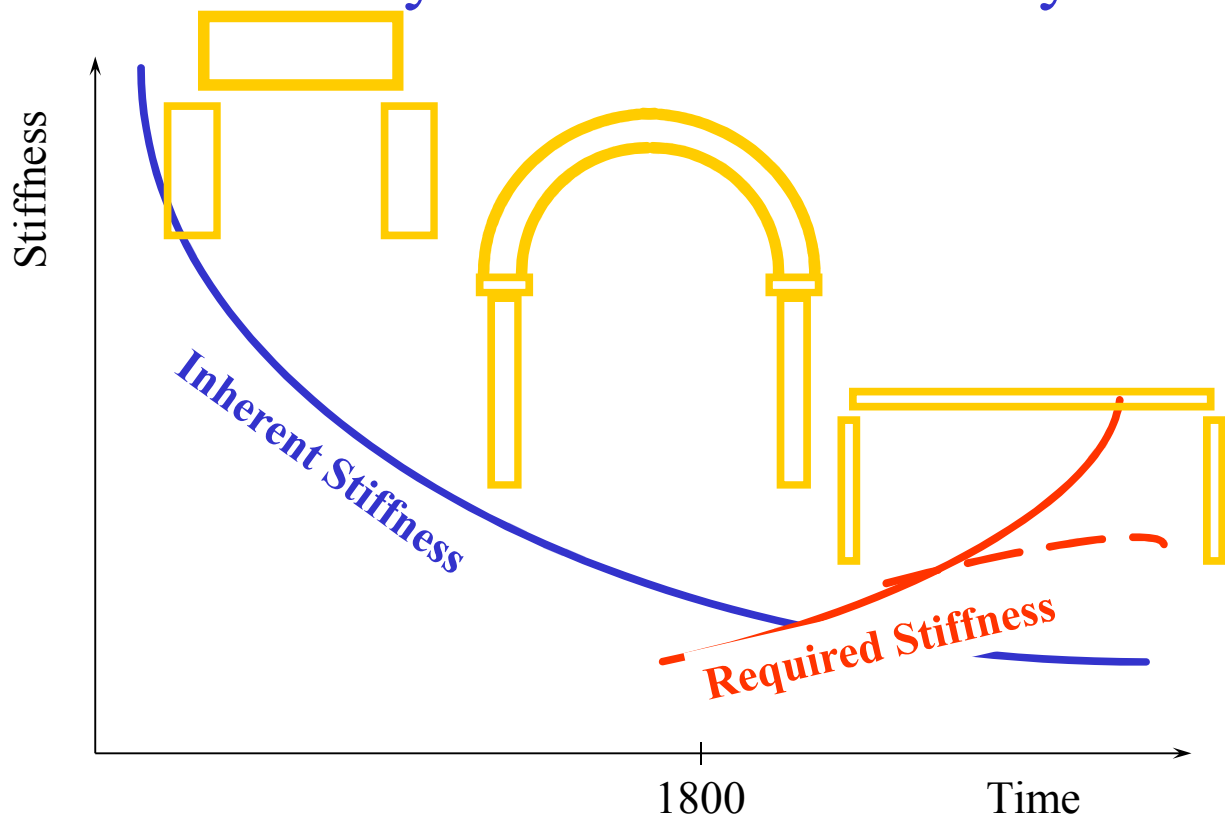


Serviceability



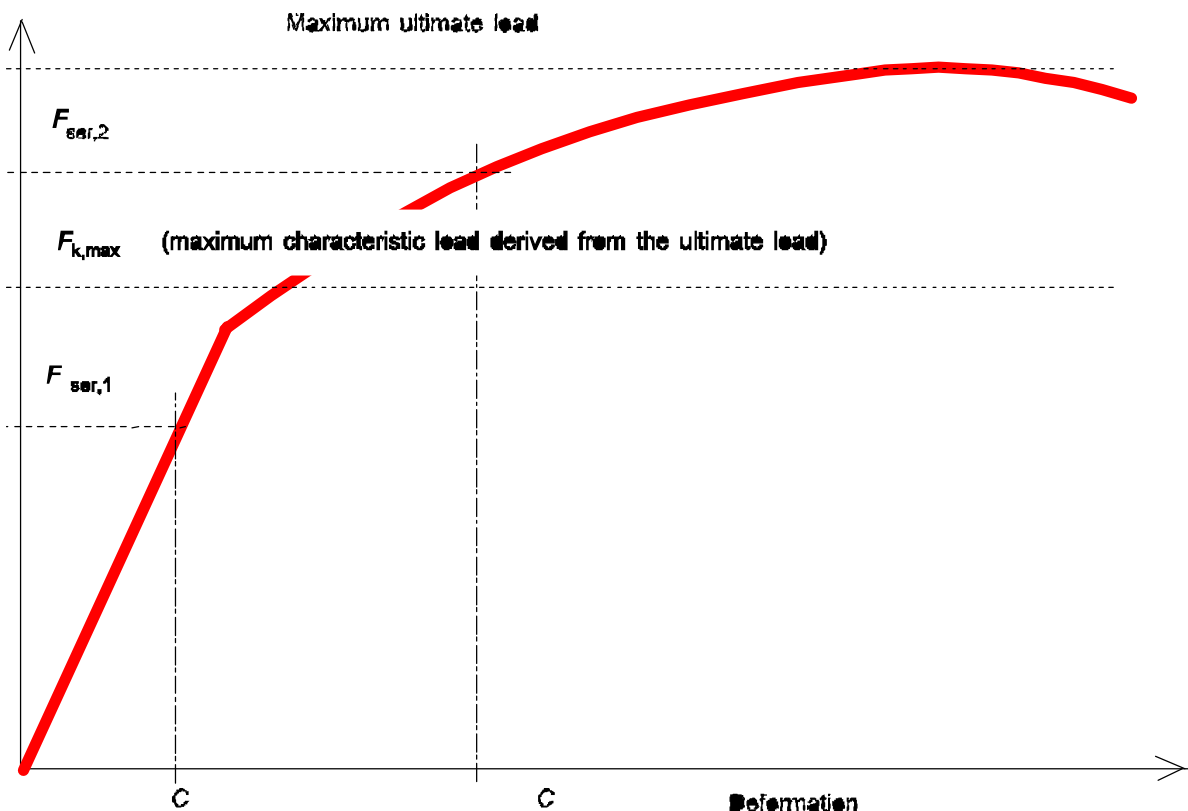
Serviceability Limit States – study case



Historical notes

Thomas Tredgold 1789-1839	<i>L/480</i>
cracking of plasters, vibration	
Frank E. Kidder, 1885	<i>L/360</i>
experience, service load	
USA, JIAC, 1961, plaster	<i>L/360</i>
panels	<i>L/240</i>
plain surface	<i>L/180</i>
CEN, 1994 roofs generally	δ_{\max} <i>L/200</i> δ_2 <i>L/300</i>
floors generally	<i>L/250</i> <i>L/300</i>
floors sup.plaster partit.	<i>L/250</i> <i>L/350</i>
floors sup.columns	<i>L/400</i> <i>L/500</i>
CEN, 2005 deflection of hor. comp.	<i>L/250</i> <i>L/500</i>

Limit states

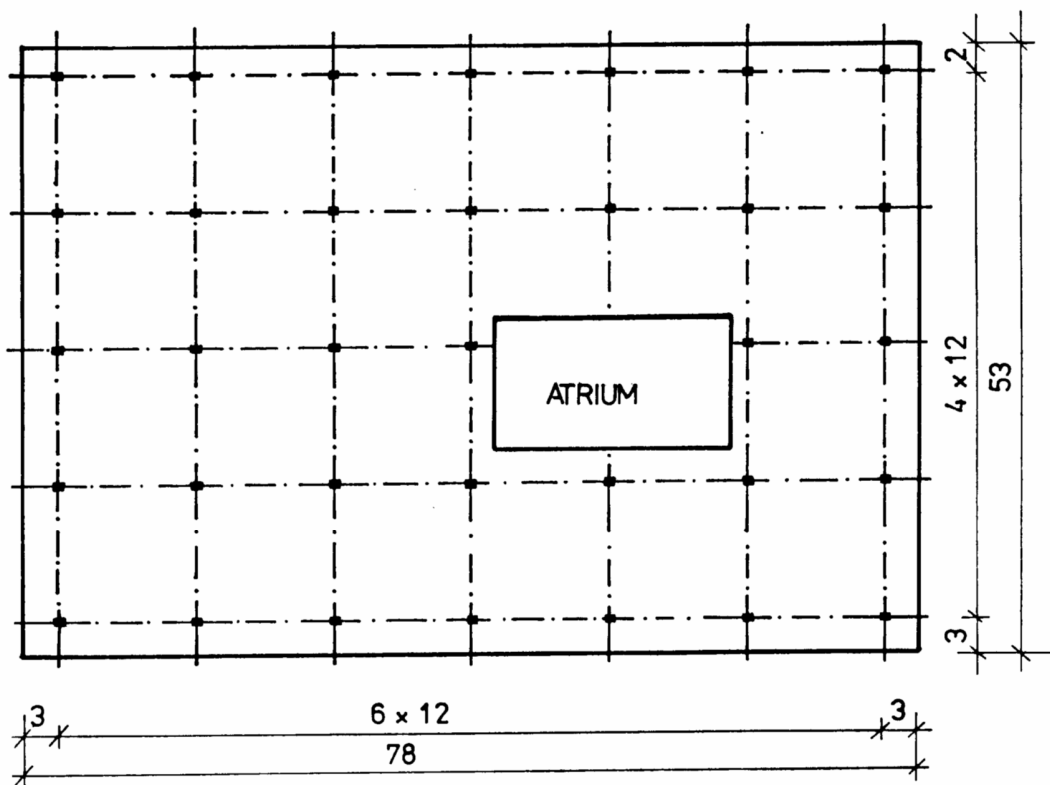


Department store in Prague

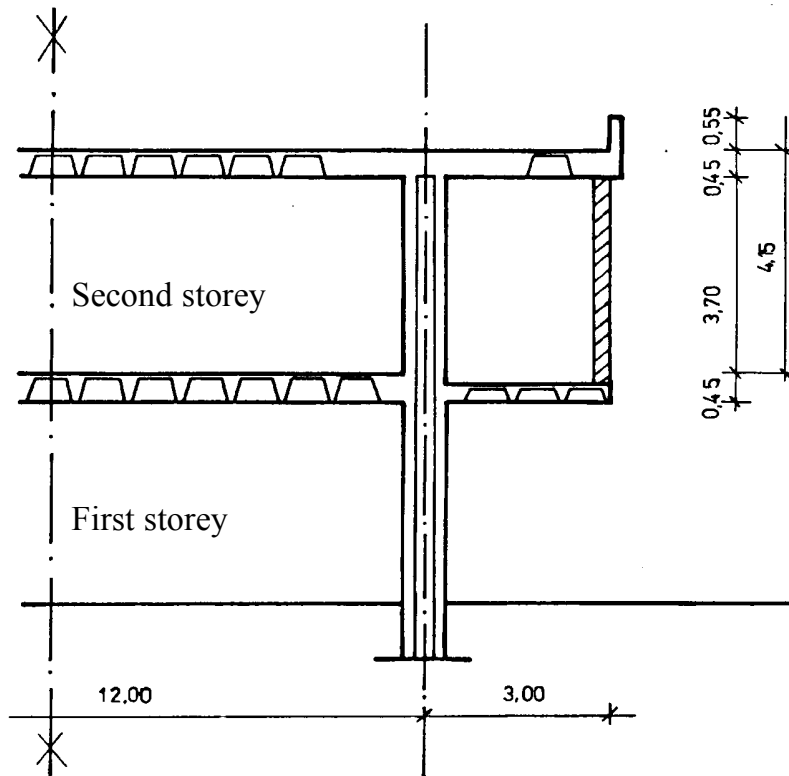
internal view



Plan view



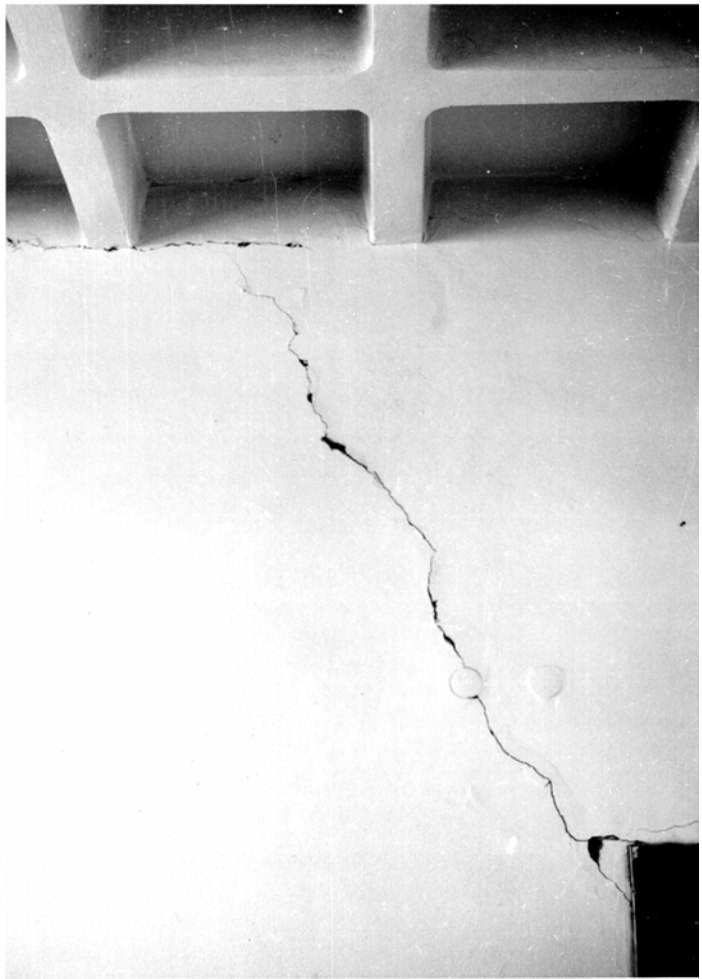
Cross section



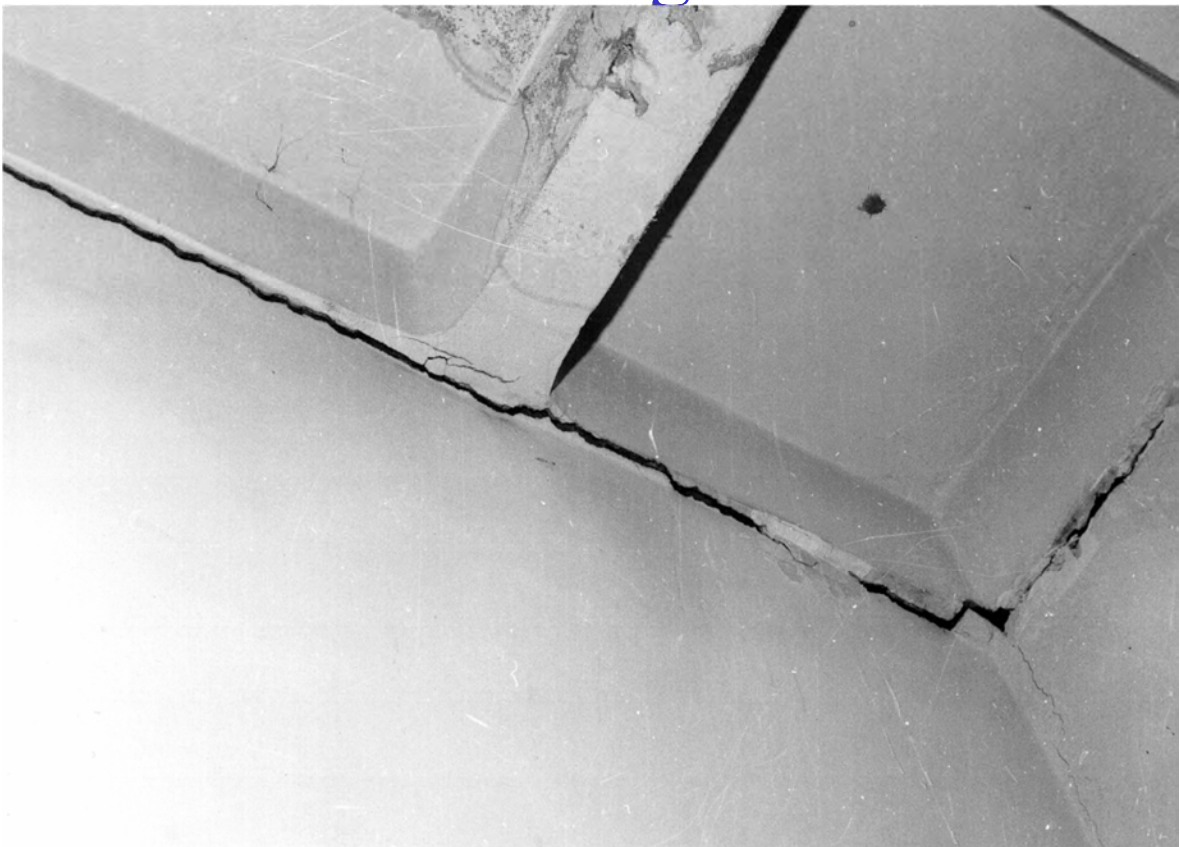
Cracks in
the facade
corner



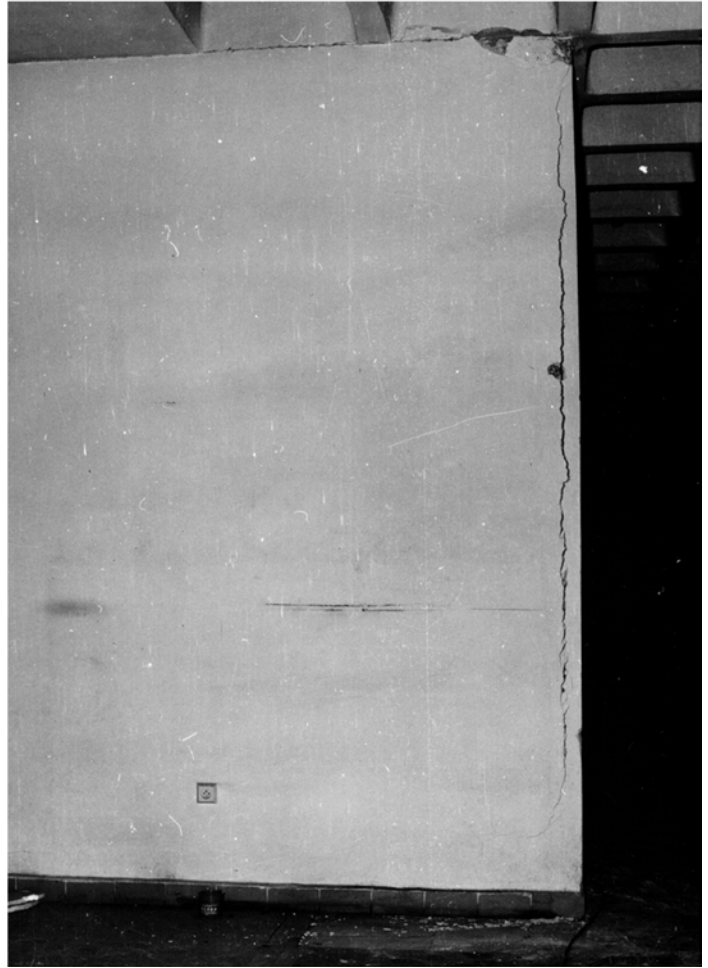
Cracks in
a partition wall



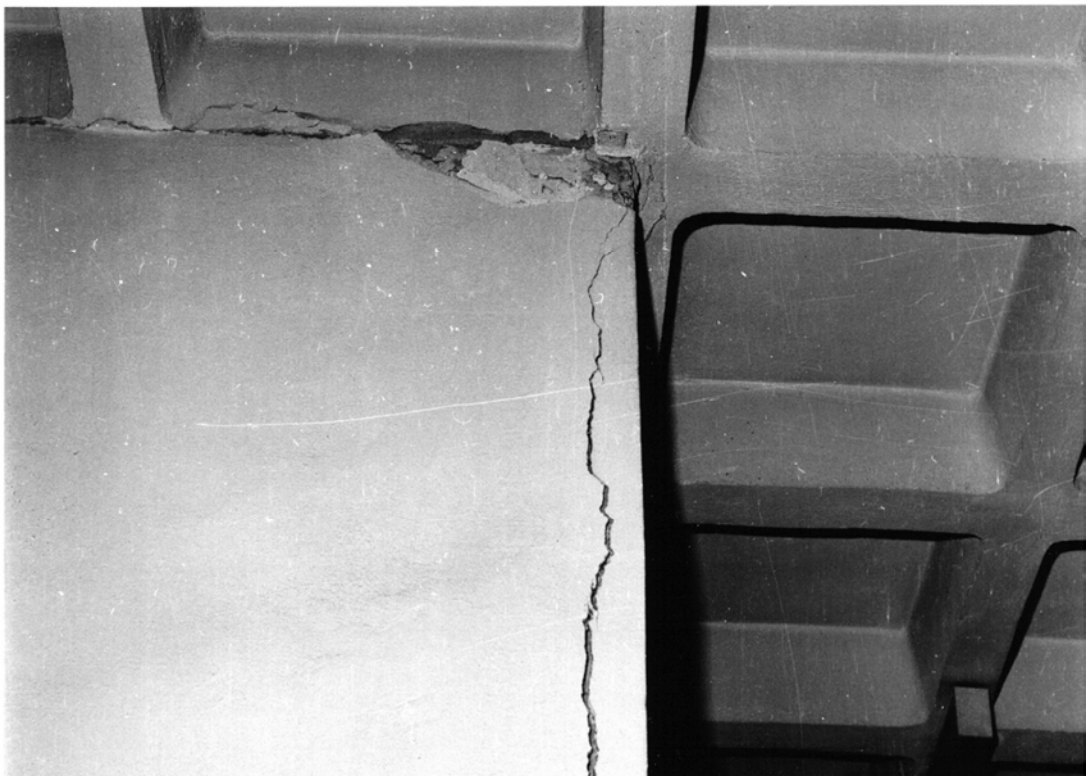
Separation of partition walls from
ceiling



Separation
of steel
profile
from a
partition
wall



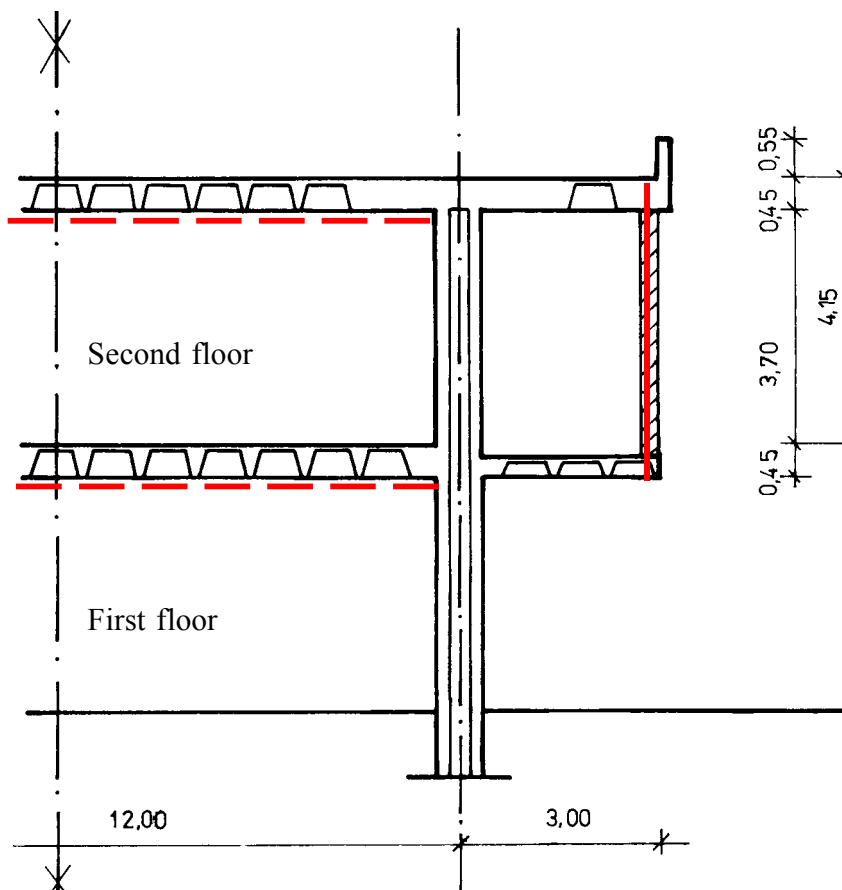
Cracks in a partition wall



Department
store in
Prague
cracks in
a cladding wall
nearby both
ways
cantilivered
corner



Repair of the structure



Conclusions from the study case of the department store in Prague

- The structures was strong enough but not serviceable
 - Lack of considerartion of deformations in design
 - large internal spans (12 x 12 m)
 - large cantiliveres (3 m)
 - differential deflections
 - effects of creep, shrinkage and temperature
 - Construction errors:
 - unencouraged cantilivere ties
 - excessive permanet load of the roof
 - Errors in use:
 - overloaded storaged spaces