

# MASONRY VENEER WALLS SUBJECTED TO EARTHQUAKE LOADING

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## ABSTRACT

Masonry veneer systems are widely used as enclosure of both low- and high-rise buildings. The masonry veneer is supported in the vertical direction by either the main structural components of the building, as typical in Norway, where it supported at the base of the building, or on steel shelves attached to these structural components. Horizontal ties are used between the veneer and the supporting stiffening system at regular intervals to resist lateral loading. Various design codes specify prescriptive brick veneer construction requirements for the use of metal ties, such as minimum tie dimensions and maximum tie spacing. The presentation deals with one of the consequences of implementing Eurocode 6 and Eurocode 8 in Norway, namely the capacity of anchorage veneer ties in earthquake situations. Analyses have been done, both with Diana and UDEC, which is based on a Discrete Element Method (DEM). After comparing the results obtained by 2D FEM model, against available experimental tests, Diana has been used in seismic analysis of veneer walls. Earthquake loading, wherever applicable according to Eurocode 8, is considered the design load for anchorage ties in veneer walls. 4 ties/m<sup>2</sup>, which is usually taken as sufficient with respect to wind loading, seems inadequate in earthquake situations. The load distribution in the ties is not uniformly distributed when subjected to earthquake loading. Higher stresses are produced in the ties at ground floor level. The failure of anchorage ties are governed by the pull-out capacity from the masonry mortar. Wooden backup walls, as supporting walls for veneer walls, are preferable in earthquake situations.