

# Behavior of Masonry Subject to Load Parallel to Bed Face

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## Abstract:

Concrete masonry construction comprises of concrete block units and mortar joints in horizontal and vertical directions known as bed and head joints, respectively. The faces or surfaces parallel to these joints are called bed and head faces, respectively. Cells of the blocks and other voids in load bearing masonry structural components are usually grouted. Traditionally, the compressive strength of masonry is determined by applying a monotonically increasing compressive load normal to the bed face on a small segment of a masonry assemblage, known as “prism”. However, compressive load in beams and lintels acts parallel to the bed face. It is believed that masonry is much weaker when load is applied parallel to the bed face. It is presumed that this strength is further reduced if the grout in the compression zone is interrupted by the webs of the blocks though no research data is available to support this presumption. Therefore, the Canadian standard recommends a strength reduction factor of 0.5 or 0.7 depending on whether or not there is an interruption in the grout continuity in the compression zone. It is argued that the reduction factors (0.5 and 0.7) suggested in the Canadian standard are overly conservative. Hence, a detailed research program using experimental tests on prism specimens with three levels of grout interruption was completed. The prism specimens were loaded in two different directions: parallel to the bed face and perpendicular to the bed face. The study found that the detrimental effect of interruption in grout continuity is not as severe as it is presumed and the strength parallel to the bed face is higher than the strength normal to the bed face. This paper presents the test specimens, test procedure, and test results obtained from this study.

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