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Probabilistic evaluation of stressed skin diaphragm design methods

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SUMMARY

The purpose of this paper is to evaluate shear diaphragm design methods according to Schardt/Strehl and Bryan/Davies by means of probabilistic procedures. The analysis was made on a simple shear diaphragm. Statistical data and the relevant probability distributions of basic variables for resistance were partly taken form literature and partly from our own research. The reliability analysis was performed by applying modern reliability methods where the formulation of limit states was consistent with the design criteria of individual methods. Safety indices for different failure modes were compared. Safety indices were found to be uneven and, in some cases, below the design values. Furthermore, based on this initial research, a proposal is given to extend the activities in order to define and comply with the Eurocode recommendation on "recognized methods" and achive a uniform safety degree with other structural elements.