

METHOD FOR ASSESSMENT OF MECHANICAL BEHAVIOUR OF STRUCTURES MADE OF RECYCLED CONCRETE

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Application of recycled materials to everyday construction is hindered by the issues related to their often reduced mechanical properties, which the designers are very much aware of. Therefore, in the Czech Republic, most of the recycled materials are considered as good enough for use in backfills, road bases, occasionally roads and runways, and seldom for horizontal reinforced concrete structures, such as mere industrial floors. Vertical structural members are, as of now, out of question, which is also caused by the legislation, which does not favour use of recycled materials convincingly enough. However, the main reason is the limited knowledge about properties of the recycled materials and their effect on ultimate performance of a structure, long-term behaviour, and most importantly on the economic feasibility, which is difficult to assess due to the scarce data. The proposed paper describes a method for structural analysis of reinforced concrete structures made of concrete with recycled aggregate. The limited data on the material parameters used in the modelling are expressed by fuzzy sets, which yield results also in the form of fuzzy sets, which then serve as input data for fuzzy-logic-based assessment of feasibility of the structure. This method is suitable for the preliminary design stage when it is decided whether or not a given project is worth pursuing. It is believed that such tools can help convince the designers about possible applicability of recycled building materials for structures of more than one floor, and quantify possible consequences. The method is illustrated in examples.