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Predicting Durability of Self Compacting Concrete Using Artificial Neural Network

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Abstract : The aim of this study is to determine the influence of mix composition of concrete as the content of water and cement, water–binder ratio, and the replacement of fly ash on the durability of self compacting concrete (SCC) by using artificial neural networks (ANNs). To achieve this, an ANNs model is developed to predict the durability of self compacting concrete which is expressed in terms of chloride ions permeability in accordance with ASTM C1202-97 or AASHTO T277. Database gathered from the literature for the training and testing the model. A sensitivity analysis was also conducted using the trained and tested ANN model to investigate the effect of fly ash on the durability of SCC. The results indicate that the developed model is reliable and accurate. the durability of SCC expressed in terms of total charge passed over a 6-h period can be significantly improved by using at least 25% fly ash as replacement of cement. This study show that artificial neural network have strong potentialas a feasible tool for predicting accurately the durability of SCC containing fly ash.

Keywords : artificial neural networks, durability, chloride ions permeability, self compacting concrete
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