

Assessment of Chloride Penetration into Fiber Reinforced Concrete under Loading^{*}

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Abstract: Concrete structure at the service time is always subjected to loading due to its nature as a load bearing element. In this condition also, it is subjected to aggressive environmental condition such as chloride penetration that would eventually cause corrosion on the reinforcement. To have a better precision on the prediction of service life time of structure against chloride penetration, more study should be performed for chloride penetration into concrete under loading condition. The experimental study in this research was conducted by modifying chloride migration test to include axial stress on the specimen at the testing period. Fiber reinforced concrete (FRC) can significantly alter crack development in the concrete under loading. This condition could change the durability performance of FRC under loading. Three types of polypropylene fiber were used to make FRC and they were tested against chloride penetration under compressive and tensile loading. The results from the experiment showed that the polypropylene fiber reinforced concrete have a better performance against chloride penetration, with the shorter fiber giving better performance. It was also shown that when concrete subjected to tensile loading, there is a significance decrease of the resistance against chloride penetration. The relation of chloride penetration to the microcracks measurement also showed that there is a relation between the increase of microcracks and the increase of chloride penetration.

Keywords: chloride penetration; loading, stress effect; polypropylene fiber; microcracks

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