Interface Issue between Concrete-PCM: Enhancement of Bonding Strength and Numerical Modeling

Mahmudul Hasan Mizan

Polymer Cement Mortar (PCM) which is known as good repair material due to its higher bond strength, lower permeability and thinner construction thickness, largely used in strengthening Reinforced concrete (RC) structures. PCM overlaid/retrofitting method offers good compromise in cost and behavior than resin and normal cement-based material but Interface between substrate concrete and PCM is considered the weakest link in the structure and are susceptible to brittle debonding failures. So, this study aims to increase interface bonding strength between existing concrete and PCM.

OBJECTIVES of this Study:

- To strengthen interface bonding strength of overlaying construction method by using silica fume and surface penetrant at Member label.
- Numerical Modeling to predict the ultimate load carrying capacity and failure modes.

Experimental Plan

Material Level Test

To know the tensile and shear strength of the PCM composite specimen after inclusion of Silica Fume and Surface penetrant along with the bond stress-slip relation at the interface.

Member level test (Static Bending)

Numerical Analysis

FEM Analysis (DIANA 10.2) to predict the ultimate load carrying capacity and failure modes.