

Behaviour of Reinforced Polymer Modified High Strength Concrete Slabs under Low Velocity Impact

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ABSTRACT

In this

This research investigates the impact resistance of reinforced high strength concrete slabs with steel meshes (BRC) modified by styrene butadiene rubber (SBR) with different weight ratios of polymer to cement as follows: 3%, 5% and 7%. Reference mix was produced for comparison of results.

For all selected mixes, cubes (100×100×100mm) were made for compressive strength test at (365) days. In conducting low-velocity impact test, method of repeated falling mass was used: 1400gm steel ball falling freely from height of 2400mm on reinforced panels of (50×50×800 mm) reinforced with one layer of (BRC).

The number of blows causing first crack and final perforation (failure) were calculated, according to the former results, the energy of each case was found.

Results showed an improvement in compressive strength of polymer modified high strength concrete (PMHSC) over reference mix; the maximum increase being of it were (3.93%- 11.96%) at age of (365) days.

There is significant improvement in low-velocity impact resistance of all polymer modified mixes over reference mix. Results illustrated that polymer modified mix of (3%) give the its higher impact resistance than others, the increase of its impact resistance at failure over reference mix was (154.76%) while, for polymer modified mix (5%) it was (30.95%) and it was (14.28%) for polymer modified mix of (7%).