

On Strengthening Program of Sixty Years Old Dome Using Carbon Fiber

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Abstract : A reinforced concrete dome-built 60 years ago- of circular shape of diameter of 30 m was in distressed conditions due to adverse weathering effects, such as high temperature, wind, and poor maintenance. It was decided to restore the dome to its full strength for future use. A full material strength and durability check including petrography test were conducted. It was observed that the concrete strength was in acceptable range, while bars were corroded more than 40% to their original configurations. Widespread cracks were almost in every meter square. A strengthening program with filling the cracks by injection method, and carbon fiber layup and wrap was considered. Ultra Sound Pulse Velocity (UPV) test was conducted to observe crack depth. Ground Penetration Radar (GPR) test was conducted to observe internal bar conditions and internal cracks. Finally, a load test was conducted to certify the carbon fiber effectiveness, injection method procedure and overall behavior of dome.

Keywords : dome, strengthening program, carbon fiber, load test

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