

Characterization studies on the reinforced concrete dome of the former General Market of Verona, built in 1929

Elena Stievanin¹, Francesca da Porto², Claudio Modena³, Michele Secco⁴, Gilberto Artioli⁵

Abstract After the 2nd world war, due to the shortage of steel, the development of Reinforced Concrete (RC) saw new momentum. Concrete could be easily shaped, thus giving rise to a whole new concept of structural forms. This paper focuses on the characterization studies performed on the roof's shell of the former General Market of Verona (Italy), built in 1929. It is one of the early concrete shell roofs designed by Italian engineers. The membrane roof covers an area of about 490 m² and it is composed of a shell 0.08-m thin ribbed by 16 reinforced concrete beams. Non-destructive and medium destructive tests were performed, using local scarifications, magnetic scanner and sclerometer, in order to extrapolate information about mechanical properties of materials. Furthermore, concrete samples were analyzed through a multi-analytical approach of chemical, petrographic, mineralogical and microstructural analyses. Lastly, some first consideration about structural behaviour of the dome was performed.

Keywords reinforced concrete, investigation, degradation

¹ Elena Stievanin, CIRCe, Univ. of Padova, Italy, stievanin@dic.unipd.it

² Francesca da Porto, CIRCe, Univ. of Padova, Italy, daporto@dic.unipd.it

³ Claudio Modena, CIRCe, Univ. of Padova, Italy, modena@dic.unipd.it

⁴ Michele Secco, CIRCe, Univ. of Padova, Italy, michele.secco@unipd.it

⁵ Gilberto Artioli, CIRCe, Univ. of Padova, Italy, gilberto.artioli@unipd.it