

The Appraisal of Reinforced Concrete Heritage Structures

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Reinforced concrete structures present significant challenges as a result of degradation with time, due to the inherent material properties, structural systems and factors related to the external environment. The conservation strategies for historic reinforced concrete structures are based on the outcomes of appraisal of materials and structures. The paper presents a framework for the appraisal of reinforced concrete historic structures to support informed conservation strategies.

In the conservation of heritage structures in concrete, the understanding of the structure and the degradation mechanisms in the particular environment are crucial and an effective approach for intervention requires a structured methodology for the appraisal of materials and structure leading to a thorough appreciation of the historic concrete structure.

The assessment of structures is based on preliminary and detailed investigations including documentation; field inspection and condition surveys; sampling and material testing; documentation with respect to design, materials, construction and service history. The evaluation is required to cover the structure and its components, geometry, materials, structure, rehabilitation options including alternatives and cost. Inspections of structures are required for the identification, classification and mapping of degradation. These are supported through additional investigations including non-destructive, non-invasive methods and destructive tests, especially when deterioration is observed.

The framework for appraisal is based on Records and Documentation, Classification and Mapping of Degradation, Materials Assessment, Structural Assessment and Environmental Assessment. The framework presents a structural approach leading to effective conservation strategies for reinforced concrete heritage structures. The investigation of the Historic Reinforced Concrete Water Tower at the Public Abattoir in Malta was carried out with reference to the framework for appraisal presented. The appraisal provided documentation, materials and structural performance and environmental data for the definition of a conservation strategy for the historic structure.