

Reliability Assessment Using Full Probabilistic Modelling for Carbonation and Chloride Exposures, Including Initiation and Propagation Periods

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Abstract : Fib's model code 2020 has four approaches for design life verification. Historically 'deemed to satisfy provisions have been the principal approach, but this has limited options for materials and covers. The use of an equation in fib's model code for service life design to predict time to corrosion initiation has become increasingly popular to justify further options, but in some cases, the analysis approaches are incorrect. Even when the equations are computed using full probabilistic analysis, there are common mistakes. This paper reviews the work of recent fib commissions on implementing the service life model to assess the reliability of durability designs, including initiation and propagation periods. The paper goes on to consider the assessment of deemed to satisfy requirements in national codes and considers the influence of various options, including different steel types, various cement systems, quality of concrete and cover, on reliability achieved. As modelling is based on achieving agreed target reliability, consideration is given to how a project might determine appropriate target reliability.

Keywords : chlorides, marine, exposure, design life, reliability, modelling

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