Anchorage/lap strength of bars in RC structures in case of low concrete cover thickness

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Abstract

In recent years the assessment of existing structures has become a topic of huge interest all over the world due to environmental, economic and socio-political assets. However, the approach to the assessment of existing structures is in many aspects different from that used for the design of a new structure. This is why there is a necessity to develop new formulations for old materials and products that are consistent with the requirements and the reliability-based approach of current codes of practice. In this scenario, this article analyses a topic very common in existing RC structures, namely the effect of low concrete cover thickness on the anchorage/lap strength of bars. The main aim of the article is to give practical formulations that can be included in future codes of practice. To this aim a novel formulation recently proposed is firstly analysed and then validated against a database of tests taken from the literature.

Keywords: Existing structure; RC structure; anchorage; laps.

1 Introduction

Extending the life of existing structural assets is a key challenge for structure owners worldwide. Investment in accurately assessing the resistance of structures can deliver substantial environmental, economic and socio-political benefits. In order to fully realise these benefits, it is often necessary in assessment to go beyond the conservative methods typically used for design of new constructions so that reliability can be more accurately assessed. With reference to RC structures, current design codes include many detailing rules that are often the result of practical and/or well consolidated approaches that lead to a high level of conservatism and, hence, need to be revised when the final aim is the assessment of an existing structure.

In this scenario, this article analyses a topic very common in existing R.C. structures due to the past

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