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Advances in design optimization of reinforced concrete structural designs

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Title:	ADVANCES IN DESIGN OPTIMIZATION OF REINFORCED CONCRETE STRUCTURAL DESIGNS
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Abstract:	<p>In this work a number of design approaches for 3D reinforced concrete (RC) buildings are formulated in the framework of structural optimization problems and they are assessed in terms of structural performance under earthquake loading. In particular this chapter consists of two distinctive parts. In the first part the European seismic design is assessed with reference to the behavioral factor q. For each optimum design, achieved for the various values of the behavioral factor, fragility curves are developed in four damage states. The optimum designs are compared based on limit state probabilities of exceedance encountered for the design earthquake. In the second part three design approaches for RC buildings are considered aiming at improving the torsional response of RC buildings. It is shown that the optimized designs obtained according to the minimum eccentricity of the rigidity centre behave better in frequent (50/50 hazard level) earthquakes, while the designs obtained according to the minimum eccentricity of the strength centre formulation was found better in rare (2/50) hazard level events.</p>