



Rehabilitation and strengthening procedures used for RC structures in Bulgaria

Marina Traykova

University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria

Contact: marina5261@abv.bg

Abstract

The paper deals with three intervention techniques implemented for the rehabilitation and strengthening of reinforced concrete (RC) structures in the Bulgarian construction practice. Some of the main details of the conceptual design are presented: 1) identification of vulnerabilities and evaluation of deficiencies; 2) understanding the performance of the existing structures; 3) determining the level of intervention; 4) analysis of possible intervention materials; 5) assessing available information, documents, historical context, etc.; 6) preparing individual strategies for interventions.

The analyzed examples give the basic of different procedures for improvement the performance of three classic reinforced concrete structures. The analysis aims (1) to discover the problems in the design of interventions in the specific cases, (2) to discuss the question for interventions, (3) to show how interventions on existing structures can be reached successfully under current conditions and restrictions.

Based on the presented case studies some general recommendations for the realization of the strengthening procedures in buildings are given.

Keywords: RC structures, existing structures, intervention techniques, rehabilitation, strengthening.

1 Introduction

The contemporary trends in the construction sector include the increasing rate of adaptation and modernization of existing structures compared with construction of new structures. Finding the potential for future development of existing structures is an important task of contemporary construction. The understanding of the performance of the structure and the estimation of the actual conditions is basic for the decision making for the final solutions for rehabilitation and strengthening. A major problem in the design process is the seismic activity of the site. Older

design concepts are mostly focused on the effects of gravity loads and they do not dedicate enough attention to provide the lateral resistance and ductility. Most of the existing buildings provide limited ductility when subjected to seismic action.

The building stock of Bulgaria has a great variety of structures. According to the contemporary Bulgarian statistic, the following type of structures for existing buildings (residential, administrative, industrial, etc.) could be presented:

1. Monolithic reinforced concrete (cast in situ) with reinforced concrete slabs on beams and columns