

Heritage buildings rehabilitation using concrete systems

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- ▶ Date of submission: (11.10.2007)
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Summary

This present study wishes to tackle the problems of structural repair of patrimony buildings. As the orthodox churches are the majority as well as the oldest buildings of Romanian national patrimony, that monument category represents the object of this present study. The churches represent one well-defined category, characterized by a particular structural typology. This particular typology associated with some special constructive materials and techniques, and in relationship with the climatic-mechanic environment determines a specific behavior.

The orthodox churches represent a specific pathology that claims one certain type of a structural intervention methodology. Starting from the knowledge given by the historical analysis, it proposes an arrangement of the orthodox cult buildings based on specific structural sensibilities. Three main types of orthodox buildings are being identified. According to the shape of the sketch, they could be divided in: club sketch churches, rectangular sketch churches, registered Greek cross sketch churches. These structural types are presented in a synthetic way and their



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historical evolution is illustrated by representative examples. For all these typological categories, specific structural sensibilities are being contoured.

For all structural elements, they have been distinguished specific mechanisms of local degradation due to vertical and horizontal activities, which united in an assembly lead to defining the term of global degradation mechanism. This spatial damage mechanism control consists in assembly severance into an bigger or smaller number of “blocks” that tends to function independently. Proportional with the “blocks” number, the cinematic chain formed in this way, defines the degree to which extend the assembly is vulnerable. In this study, a series of general principles is being formulated. On this basis they are made some recommendations regarding methods of structural interventions used in restoration. However, one must start from the premises that when it comes to historical buildings they are no valid universal “formulas”. Every single case represents an episode that must be independently studied and resolved using a succession of operative steps succession with a specific content and a specific objectives.

In the final part of this paper a case study is presented that is the consolidation and restoration of Aroneanu Church-Iasi. During this intervention, some very difficult problems arose when the spire consolidation was made. After the spire rendering unbinding it was discovered that it had 12 vacant windows instead of 4 how they were in sight before (8 of them they were embedded). This Walachia spire specific formation from the XVI century led to a huge vulnerability of the spire, therefore the spire suffered many fractures as a consequence of earthquakes happening along the years. The original contribution of the author was at the spire consolidation. Here I had to find reinforced concrete solutions for the real configuration of the spire and for the severe degradations that have occurred after the rendering removal..

Keywords: Heritage, monument, arch, vault, rehabilitation

