

## Materials and Technologies Concerning Brick Masonries Rehabilitation

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### Summary

From the oldest times, brick masonries were the most used structural system for all types of buildings, from common houses to large engineering structures.

The brick, due to its structure, is a durable material, baring well the actions of destructive agents (water, frost cleftness, chemical attack) and has high mechanical properties. In associated structures which form the masonries, some of its positive qualities melt down because the presence of some materials with inferior properties (the common mortars) and also because of the mechanics loading approach (continuity lying sheds, vertically discontinuities). The building actions lead on consequently to the appearance and development of some degradation that are increased in time.

The activities that may create some degradations inside brick masonries could be grouped in: physical actions (the dampness presence, the temperature variations, the frost cleftness), chemical actions (the chemical corrosion, dissolution and



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levitation actions, etc.), mechanical actions (accidental loadings, seismic actions) and actions as a result of human acts (functional modifications, destinations transition). As a result of the destructive actions, in brick masonries the following changes can occur: cracks with different opening (which can occur in sheds or can also include pieces of bricks), crashes (when the cracks are associated with local displacements), disruptions (which included parts of the structural assembly) and local crushes (as a result of some loading discharges from small surfaces right on masonry elements).

The classification and the analysis of the degradation causes and their types had been studied in ample manner with some exemplifications from this domain's literature, but also based on "in situ" documentation which included works led by the author. The rehabilitation of brick masonries is a difficult activity because of the structure's anisotropy. Because of that it requires some special interventions with damp technologies and most of the times with manual technologies. The following studied technologies stand out: rehabilitation using welded meshes which can be used for all the types of degradation (local cracks, crashes, disruptions, structural rehabilitations), clamps and injection rehabilitations (who could be used in case of local cracks), metallic and reinforced concrete cross-ties (in order to assure the stability of the structural assembly).

Since most interventions made for the rehabilitation of brick masonries depend on how the interfering elements (common mortar - concrete) and the masonry support are combined, it had been also considered to analyse how the common mortar and the concrete link to the brick face of a wall. Some interesting conclusions were drawn from this such as: the indispensability of dampening the support long time before starting the intervention (for keeping the adequate dampness of the common mortar and concrete cement mesh inside), the out-dusting of the surfaces, the dissolution of the shed uncover with dust having a depth equal with its thickness, etc.

Key words: masonry, brick, rehabilitation, welded meshes, injection, clamps, crossties, linkage.

