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### About the structural restoration of the S. Domenico's monastery in Naples (article)

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**Abstract**

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**Author keywords**

In-situ investigations; Masonry constructions; Monumental heritage; Preservation; Refurbishment; Study case

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INTERNATIONAL JOURNAL OF MECHANICS

## About the Structural Restoration of the S. Domenico's Monastery in Naples

O. Corbi and M. Candela

**Abstract**— In the paper one focuses on the need of coupling the building site experience with a deep theoretical knowledge, which is of primary importance especially when dealing with masonry fabrics, and in particular with constructions with an historical or monumental relevance. The case of the monumental complex of S. Domenico Maggiore in the Campania Region is focused on, by presenting some intervention strategy adopted for increasing the seismic vulnerability of the main Chapter Hall.

**Keywords**— Masonry constructions; Monumental Heritage; Preservation; Refurbishment; in-situ investigations; Study case

**I. INTRODUCTION**

The building site experience is of primary interest for examining some characteristic features of structural consolidation interventions on buildings of monumental and historic significance since it represents an important verification of the stage of structural design, in particular when dealing with interventions on masonry constructions.

An interesting examination of some of the structural solutions that one can take in relation to the constraints imposed by the specific characteristics of the constructions to be preserved.

Generally speaking, particular significance acquires the understanding of the behavior of masonry material in relation to its condition of damage and the ability to relate it to the causes of the damage.

Analogously it appears to be of fundamental interest the ability to distinguish what can be accounted to a purely physiological behavior mode of the material and of the structure, which tend to absorb the internal stresses through the redistribution of balances within the building masses with

the development and read of fractures and cracks; from what is, on the contrary, to be considered pathological, and which must, therefore, be the starting point for any planning and design for consolidation purposes.

In this context, the structural interventions of recovery and consolidation of monumental constructions should be aimed at the acquisition of a number of selected data for the proper analysis of the operating conditions of the masonry structures under examination.

As regards the modeling stage, the structure may be modeled under the hypothesis of material Non- resistant to Tension (NT). To this regard, a wide bibliography may be referred to, developed by the research group [1]-[16].

The Limit Analysis may be then successfully employed in order to identify, through the fundamental collapse theorems for NT material, the load-bearing capacity of these structures; the acquisition of proper tools for the set up and conception of the most appropriated consolidation measures [17]-[20] or most advanced technologies and approaches [21]- [31] is, then, to be related to the on-site experience, investigations and data in order to achieve the best results. This also in the light of future dynamic load, that may be hard to be forecasted in their properties [32]-[33].

In the following, a case study is referred to, located in the Neapolitan area, i.e. the monumental complex of San Domenico Maggiore.

**II. THE MONUMENTAL COMPLEX OF SAN DOMENICO MAGGIORE IN NAPLES AND THE CHAPTER HALL**

**III. The S. Domenico Monastery**

As most of the monumental constructions in the historical ancient centre of Naples, the monastery of San Domenico Maggiore is the result of centuries of organization.

The monastery (Fig. 1) forms with the S. Domenico church (Fig. 2) a complex of huge proportions, dating back in its original apparatus to 1277 when a group of Dominicans were sent in Naples.

From 1272 to 1274 Thomas Aquinas lived in the monastery.

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