

THE RESTORATION OF THE MEDIEVAL WALLS OF SAN GINESIO: A DEDICATED STUDY FOR THE CONSERVATION, REPAIR AND ENHANCEMENT OF AN IMPORTANT MILITARY FORTIFICATION

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ABSTRACT

The seismic events that occurred in central Italy in 2016 severely damaged the rich cultural heritage system present in the area hit by the earthquake. Particularly significant is the situation of the Marche Region, here it is necessary to intervene quickly and effectively in order to preserve and secure the damaged historical architectural heritage.

Following the agreement signed in 2019 between the administration of the Municipality of San Ginesio and the Marche Polytechnic University, a collaboration has been established, which is the basis of the present research work, aimed at studying and deepening the possible actions to be undertaken to be able to repair, preserve and enhance the medieval walls of the city. The city walls, dating from the fourteenth century A.D. [1], almost completely surround the historic center of the city and are characterized by the presence of a large part of the ancient fortifications such as towers, access doors, defensive walkways, loopholes, etc.

Since there is no complete survey of the planimetric configuration and of the elevations of the medieval walls, updated to the situation created after the earthquake, the first phase of the research focused on data acquisition. Combining DJI Spark MMA1 photogrammetric UAV images with cloud point by Mobile laser SLAM Kaarta Stencil, the 3D-dimensional modelling of the walls was obtained with the accuracy related to the output scale of 1:200 and with a detail and complexity useful for the following conservative analysis.

Once the data was acquired and processed, it was possible to carry out a complete analysis of the walls structure, identifying the materials and construction techniques, the state of preservation of the materials, the damage situation to the structures, the various construction phases with the consequent relative dating. The analytical phase was concluded, therefore, with the identification and cataloging of the types of walls present. Each of these has been characterized both from a typological and a technical-construction point of view, defining the wall quality (IQM) and the consequent mechanical parameters through the calculation process of the Wall Quality Index [2]. The study made it possible to identify possible strategic interventions to reduce the vulnerabilities found, pursuing the goal of the least possible invasiveness of the measures to be implemented. Design solutions and suggestions have also been identified, aimed at enhancing the medieval city walls in terms of accessibility and understanding of the various components.

REFERENCES

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