
INTERDISCIPLINARY AND NON-INVASIVE APPROACH TO BUILDING PATHOLOGY DIAGNOSIS IN A HISTORICAL MASONRY STRUCTURE

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Abstract

This paper centres on the investigations carried out prior to the restoration of the 19th century St Paul's Anglican pro-Cathedral, Malta. Initial works focused around the 67m tall bell tower due to visible signs of advanced deterioration. The paper presents the methodology adopted to identify the possible causes of severe building pathology, and the results and possible limitations of this approach. Following initial historical research, a building survey was commissioned for an accurate recording of the building state of conservation. Architectural surfaces were mapped, and the processes of deterioration were recorded on drawings and photographs, documenting the structural condition of the historical fabric. Crack patterns were mapped out to assess the local and global cracking mechanisms. Further analysis of historical bills of quantities which indicated the possible presence of chain-bond, focused on structural and construction elements. Guided by this information and by the observed structural movement, a non-invasive method using ground penetrating radar at different frequencies and endoscopy was adopted to verify historical data and possibly identify and characterise the chains at the locations of visible movement. Correlation of both sets of data allowed for a more accurate understanding of the deterioration mechanisms and accordingly to chart remedial intervention.

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