



Design retrofitting on an ancient amphitheater by combined room acoustics and soundscape methodologies

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ABSTRACT

Several charters of renovations propose methodologies of rigorous restorations on archaeological sites. In Greece, the legal framework results in interventions of minimum footprint. The present study was carried out in the Ancient Greek amphitheatre of Dimitriada (294-292 BCE) of Volos, Greece. Regarding the stated condition, the selected site was comprehensively evaluated by combining two main studies: (1) An in-situ room acoustic analysis was performed to calibrate the acoustic response of the three-dimensional model. The reverberation time durations and intelligibility of speech criteria are evaluated as these emerged from the suggested spatial interventions (Scene, Proscenium, Kilo, Epitheatron) of the rehabilitation scenario. (2) A soundscape analysis of the site presents how the traffic noise from a road adjacent to the site is regularly masking the voice signal within the amphitheatre area but also masking sound signals and sound markers from the surrounding suburbia. Correspondingly, the soundscape analysis interacts with the architectural rehabilitation decisions concerning the introduction of new spatial interventions at the Kilon and the Epitheatron. The assessed results show that a multidisciplinary study of the acoustic qualities of an amphitheatre site with the combination of the soundscape notion and the room acoustic analysis is capable of providing more precise rehabilitation scenarios for architects.

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