Abstract

Non-destructive techniques (ground penetrating radar, infra-red thermography, fibre-optics microscopy) were employed on south upper gallery mosaic areas of Hagia Sophia. The main aim of this on-site investigation was to evaluate the preservation state of the mosaics and the previous interventions, as well as to detect mosaics in layers below the external plastered surfaces. Results indicated that it is indeed possible with the aid of NDT to locate the grid of rendered mosaics. Additionally, the main environmental decay factors (moisture, salt, pollutants), areas where the mosaic materials (tesserae and bedding mortars) presented decay problems and sub-layers that pose risk of detachment or decay intensification, were identified. In this way, NDT can contribute to the development of a strategic planning for mosaics conservation, protection and revealing. In addition, consolidation materials already used in conservation interventions were assessed, with the aid of ageing tests and innovative restoration materials and techniques are proposed for mosaics sustainable protection.
Keywords
Non-destructive testing; Fibre optics microscopy; Ground penetrating radar; Infrared thermography; Hagia Sophia; Monument mosaics; Bedding mortars; Tesserae

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