Ground penetrating radar and electrical survey of the roman "Terme Achelliane" in Catania (Sicily): a case history

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A b s t r a c t : In the historic centre of Catania, various archaeological sites have been uncovered, as being the result of the various historic settlements established there over time and which were often covered by lava flows, and the topographic necessary levelling.

The aim of this work is to define the existing geometric relationship between the archaeological structures and the surrounding landscape through geophysics and drilling investigations and reconstructing the surrounding area of the *Terme Achelliane* (1C A.D), underneath the Duomo Square in Catania, through geoelectrical prospecting. The studied area is characterized by the co-existence of sedimentary and volcanic rock and by the notable presence of rubble material (1-5 m) originating from destroyed ancient constructions, which collapsed following earthquakes and/or from war damage. The investigation

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was carried out using and integrating the following methodologies: drilling investigations, georadar surveys (GPR) and geo-electrical tomographic prospecting.

The investigation allowed the delimitation of the surrounding area of *Terme Achelliane* which corresponds to a superficial area of high resistivity ($> 500\,\Omega$·m) and a clear-defined layer characterized by a resistivity $< 100\,\Omega$·m, corresponding to layers of detritus material. At a depth of 6 metres a resistivity value $> 200\,\Omega$·m attributable to lithotypes of volcanic nature was found.

Key words: archaeological investigations, ground-penetrating radar, electrical tomography, drilling surveys, urban area