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Thermographic mapping of a complex vernacular settlement: the case study of Casalnuovo District within the Sassi of Matera (Italy)

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Never as in the Sassi of Matera (Italy), the parties have a volumetric material identity and a special construction condition for which, first of all, you need to know the whole to which they give life, and then the individual components and their connections. The distribution of these building artifacts in symbiotic connection with the connective calcareous texture that hosts them, resulted in a spontaneously harmonious figurative balance that characterizes the constructive expedients employed and the distributive and morphological solutions. This is the reason why the Sassi, and the overlooking Park of Rupestrian Churches of Matera Murgia have been entered in 1993 in the UNESCO World Heritage List.

Our research focuses on a largely abandoned area within the Casalnuovo District, situated in the extreme south of the city, probably the place of the future Demoethnoanthropological Museum. It is known today that the particular shape of the area is made up of settlements mainly in cave; during the time architectures above ground, in a very limited number, filled almost completely the limited building space.

Here there are the most archaic types and forms of building and wine cellars within the Sassi, essentially derive from the natural cave only slightly structured by man. The exterior construction complete the elementary cave and it is called lamione.

The complexity of a built space like this one determines the need for a non-traditional approach, so you have to combine last generation tools and canonical ones for survey and energy diagnosis within a dialectic between memory, tradition and innovation, in order to identify solutions for an environment friendly recover of a cultural heritage such this one.

Since the evaluation of the historical buildings conservation state using destructive techniques should be avoided to prevent the integrity of the cultural heritage, the development of non-destructive and non-contact techniques is very important. For this reason, an appropriate cognitive apparatus has been set up for the entire technical process, first of all making use of infrared thermography. It is an affordable, fast and hence widespread method to detect temperature distributions on the surfaces of buildings. In the investigation of historical structures, where a restoration or conservation treatment can cause irreversible damage to the structure, it is considered to be of most importance. So we have made a thermographic mapping and we have analyzed the thermal conditions of approximately 15 caves, with the presence of rising moisture and condensation moisture.

The ability to investigate a so complex reality offers an important opportunity for the knowledge, valorization and fruition of the cultural landscape of Matera, where you can disassemble the constituents of full and empty spaces with the consideration that the whole is not merely the sum of the parts.