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# Mechanical DT and NDT: characterisation of building stones and research of correlation for in situ analysis of ancient masonries

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Restoration works of the historical-architectural built heritage move from the typological and mechanical qualification of the buildings. Minimum destructive impact is required in preliminary diagnostic studies for the interventions, as it is possible. The use of the undestructive and non-invasive diagnostic techniques has always advantages in the activities on pre-existing buildings, in terms of sustainability; moreover, it is a need with respect to the conservation constraints when we act on the historical-architectural heritage.
This work deals with destructive and non-destructive tests for the mechanical characterisation of some traditional soft stones, used as building materials in the Southern Italy; it is a part of a larger activity devoted to set up non-invasive diagnostic procedures for the mechanical analysis and qualification of ancient masonries. The laboratory experimental activity is based on the use of mechanical compressive tests, ultrasonic and Schmidt-Hammer tests, and the research of correlation between the results obtained by these crossed tests. It is aimed to verify the effectiveness and/or to point out critical aspects and limits of the above mentioned non-destructive tests - already applied in the field of the concrete and compact stones - with reference to the characterisation of the soft stones. The research of correlations between the results of destructive and non destructive tests has the final aim to reduce the use of destructive analyses on the masonries, by acquiring substitutive information derivable from performing NDT in laboratory, as well as in situ conditions. Finally, data gathered by the mechanical characterisation give reference values for the evaluation and control of the effectiveness of restoration interventions and their monitoring.
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