

Seismic damage scenario induced by site effects of masonry clustered buildings: a South Italy case study

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ABSTRACT

The cyclic nature of increasingly destructive seismic events has shown how the influence of local effects plays an important role in the analysis of seismic impact scenarios. In fact, in the seismic impact simulation, site effects should be properly taken into account for better predicting the expected damage, so to safeguard people and buildings. Nevertheless, the possibility of adopting simplified methods to take into consideration these geological phenomena is not very simple to be implemented.

In this framework is placed the current research work, developed within the three-years ReLUI-DPC 2019-2021 project, which aims at predicting with a simple analysis method the influence of local effects on the physical vulnerability of masonry clustered buildings of the municipality of Baranello in the province of Campobasso (Italy).

The typological and structural characterization of examined clustered buildings has been carried out using the CARTIS form, developed by the PLINIVS Research Centre of the University of Naples "Federico II" in collaboration with the Italian Civil Protection Department.

The seismic vulnerability evaluation has been conducted using a proper form for historical aggregates [1] in order to identify the most vulnerable compounds of constructions.

Focusing the attention on a typical masonry clustered building representative of the samples of buildings inspected, non-linear static analyses developed in the 3Muri software package environment have been performed in order to take into account the aggregate effect on the seismic behaviour of single structural units.

Subsequently, the intensification effects have been quantitatively analysed through the definition of a local amplification factor, defined as the ratio between the maximum acceleration expected in-situ, obtained from the last seismic events occurred on 2002 October, and that corresponding to the rigid soil [2].

Finally, based on these considerations, the impact of the expected damage scenario taking into account the influence of geological effects has been compared to the one neglecting the soil influence in order to appraise quantitatively the site effects on the seismic assessment of the inspected urban sector.

REFERENCES

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