SURVEY ACTIVITY FOR THE SEISMIC AND VOLCANIC VULNERABILITY ASSESSMENT IN THE VESUVIAN AREA: THE GOLDEN MILLE VILLAS

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INTRODUCTION

The Vesuvian area represents a zone of high hazard with regards to seismic and volcanic events. The volcano, Vesuvius, is associated to an explosive event, meaning that the catastrophic events related with its possible eruption should be very violent. With the intent to evaluate the seismic and volcanic vulnerability assessment on different constructive typologies located in this area, an intensive survey activity has been carried out. During this activity, the buildings vulnerability elements to seismic and volcanic actions has been identified through a visual investigation, aided by an ad hoc form, developed by the PLINVIS Centre. In particular this paper illustrates the survey activity on 9 historical and monumental Vesuvian Villas, located in the, so called Golden Mile. The investigation and survey activity have been inspired by two targets. The first one is the assessment of the seismic and volcanic vulnerability of the examined Vesuvian Villas, and the second one is the identification of appropriate damage mitigation techniques for such important constructions, which must be protected from possible exceptional actions, for positivity, due to their important heritage status.

LOCATION AND THE EXAMINED VILLAS

The Golden Mile is a part of the Royal Calabria road between Portici and Torre Annunziata, along this road are located 122 Villas built during the XVIII century, by the Neapolitan aristocrats. They form a representative street is a part of a rich architectural heritage. The predominant architectural styles present in the Golden Mile are Baroque and Rococo.

The Vesuvian Villas include typical elements of these architectural styles: all villas enjoy important views and are open to the natural beauty, of Vesuvius or the sea, in contrast to the elevation on the street. In all the villas there is a clear contrast between the rational plan, characterized by axes of symmetry and the free interiorization of ornamental elements. A predominant feature in most of these villas is the main axis connecting the hall of the building to the internal park, following the sequence portal–hall–courtyard–garden. The typical typologies of the Vesuvian villas are three: in the first, the building is surrounded by the garden, and the only contact with the street is a portal; in the second, the garden is on a side of the villa, and in the third, the build overlooks the street.

SURVEY ACTIVITY

THE USED FORM AND THE COLLECTED DATA

The investigation activity is carried out with the use of two different forms:

- MEDA schedule for data collection of the possible damage mechanisms
- An ad hoc form for the identification of volcanic vulnerability elements

The vulnerability elements of the 9 Villas located in Portici are:

1. Presence of a sacrificing wall or linear zone with continuous or segmental pattern. Vulnerability: MS 10 MS 15 MS 20 MS 25 MS 30 MS 35 MS 40 MS 45 MS 50
2. Presence of a non-linear or segmental pattern. Vulnerability: MS 10 MS 15 MS 20 MS 25 MS 30 MS 35 MS 40 MS 45 MS 50
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8. Presence of a non-linear or segmental pattern. Vulnerability: MS 10 MS 15 MS 20 MS 25 MS 30 MS 35 MS 40 MS 45 MS 50
9. Presence of a non-linear or segmental pattern. Vulnerability: MS 10 MS 15 MS 20 MS 25 MS 30 MS 35 MS 40 MS 45 MS 50

The investigation emphasizes a complex situation: the characteristics of the villas vary considerably, including their use and other aspects as structural characteristics. It is difficult to identify a unique type of construction each villa represents a unique case. However some dominant characteristics are present.

All villas are constructed in sack masonry; the horizontal structures include a combination of vaults and plane floors; they are not regular in plan or elevation; the percentage of openings in the façade are on average for half of the villas in the range of 10-25%.

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