# Torre degli Embrici: a sign of ancient cultures

## Digital survey of ruins of Torre degli Embrici in Rionero in Vulture, Italy

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## Abstract

This research originated from the curiosity to discover an abandoned area in the Melfi's part of Vulture territory, province of Potenza, in the south of Italy. A team of archaeologists worked for digging activity from 2004 to 2009 but then, due to administrative reasons, the work was interrupted and the whole area was abandoned definitively.

In the location "*Torre degli Embrici"*, archaeologists executed a grid pattern of the area with mesh of 5x5 m and extensions of 120x60 m; the structures can be dated from the 2nd century to the 7th century A.C. The ancient part of the site is a Roman villa that includes thermal rooms with various extensions; unfortunately the height of the walls is cut under the level of the ground and it's hard to collocate with certainty the various rooms of the villa and thermae. We know for sure that it was collocated close to an important road axis in the Roman viability, via Herculia. This road was connected with Via Appia and it's quite possible that in that period reached the city of Heracleia passing through "*Torre degli Embrici*". This road allowed crossing a wooded land whose viability was not yet well developed and this permitted the exchange of goods from population located to the south of Roman territory.

In this site it's very interesting to study the different phases of the building of the villa and how it was developed in the different centuries.

The aim of the archaeological investigation was first to give an organic view of the steps of the process of anthropization of the area. The archaeological evidences of rural settlements with villas at the end of the 3rd-2nd century B.C. are not always clear and are open to different interpretations that can change the proposed dating; most of the times this settlements have a long continuity of life and were often subject to activities of restructuring and extension between the late republican and imperial age that makes very difficult to discover the true extent of the construction interventions in the building establishment phase.

The site of "*Torre degli Embrici*" has pre-Roman origins connected to the settlement of Lucani population. Many sites where this population settled in the Melfi's part of Vulture where utilized in Roman period; thanks to the numismatic discovery in the hypocaust part of the thermal rooms and thanks to the analysis of the tiles discovered, the first building phase can be dated around the 2nd or the 1st century B.C.; the finding of an emperor Probus coin confirmed that the first building of the site was around 2nd century B.C. Later the *balneum* was extended and was also built a second thermal area with *calidarium* and *tepidarium* without breaking down the existing parts. A new reconstruction phase, in the 4th Century A.C., led to levelling of existing structures and the new ones were built above. A large apse of 11 meters ca. was added to the previous structures.

Thanks to the discovery of some ceramic remains founded under the floor and of some plaster removed directly from the apse, it can be dated around the end of the 5th century A.C.. Some other findings are dated around the 7th century A.C.

The purpose of the relief was bringing to light the whole area in order to raise awareness, among the community and the public administration, to protect and enhance this heritage.

The work started with an inspection where we decided to proceed with an indirect relief executed with a drone (Inspire 1 pro) which flew over the entire site taking pictures.

The photos (Fig.1) were taken following the orientation of the dig, both longitudinally and transversely, using the photogrammetry rule which intends to keep in the new picture 1/3 of the points in common to the previous one.

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Then the pictures were imported on the software “Reality Capture” software to get a first model through different steps. The first step was to align the photos in order to create a point cloud; this will be less detailed where images have too few informations; this problem has been resolved with the reconstruction of the box of selection. The second step concerns the reconstruction of the point cloud in “ normal Details” to create rendering/3d model. In this way the model can be extremely faithful to reality. The third step involved the creation of the “texture” which means the analysis of the pictures used and then the application of these textures on the obtained model. (Fig.2)

With this software it was possible to reconstruct the wireframe plan into “Autocad”, allowing also to obtain the altimetry of the structure, the dimensions of the “*domus*” rooms, the identification of the most damaged parts subjected to the changes of climate and environment. (Fig.3)

*Fig.1. Photo of a part of the Roman site*

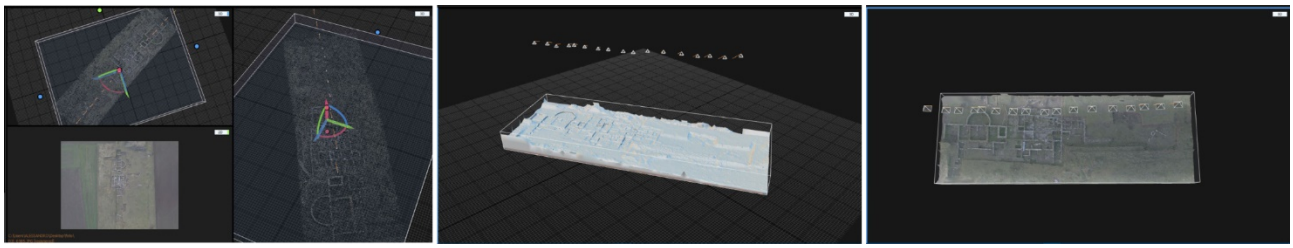

*Fig.2. Transition from point cloud to a mesh textured model.*

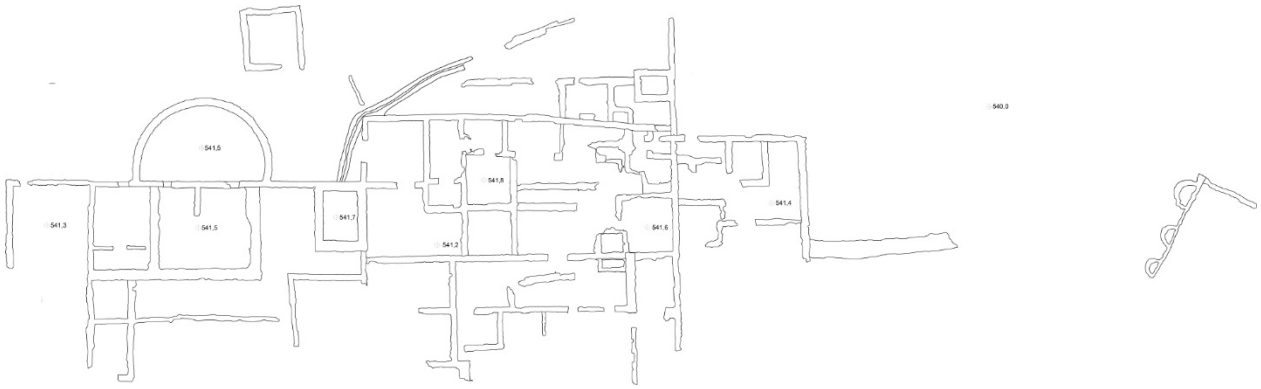

*Fig. 3. Digital survey generated with the software AutoCAD*

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