POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE 2
Degree in Architecture
Honors theses

The topological survey for the documentation and the diachronic analysis of archaeological structures: the church of Santa Maria del Lavello
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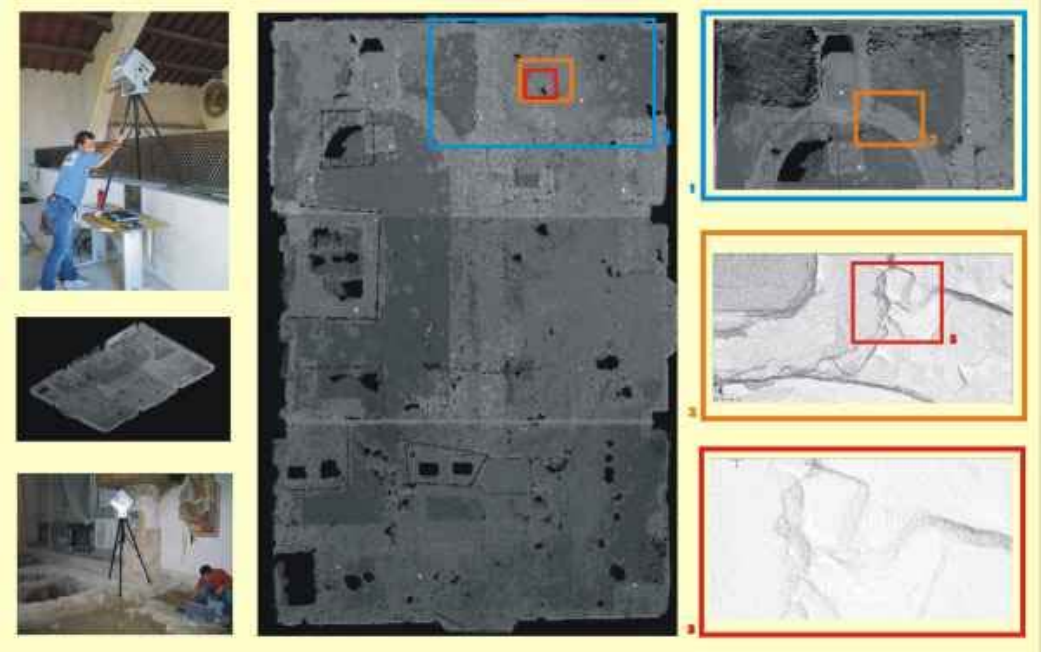
This thesis aims at providing an accurate analysis of the state of the archaeological researches performed in the church of Santa Maria del Lavello in Calolziocorte, in the district of the city of Lecco (the term “Lavello” is the Italian word for “wash-basin”). Our final purpose is to obtain a comprehensive archaeological survey. Data collection has been done by combining the traditional topographical, photographical and archaeological techniques with the use of an innovative tool called *laser scanner*. Figure 1 shows some examples of scanning activities and some images of the scanned surface at different detail levels.



Examples of scanning activities and images of the scanned surface at different detail levels

The result consists of a 3D model of the archaeological survey on which further analysis and elaboration can be performed; furthermore we explored the potentialities of the laser scanning technique emphasizing advantages and drawbacks.
The church of Santa Maria del Lavello has been object of deep archaeological researches both indoor and partially outdoor on the southern side near the door of Via dei Serviti.

The leading concept of our work has been that “the survey aims at documenting the structure to provide a thematic and geometrical classification and to plan maintenance”.

DIACHRONIC ANALYSIS

The diachronic analysis of the archaeological data referring to the church of Santa Maria del Lavello showed three different phases.

PHASE 1

CHAPEL OF SAINT SIMPLICIANO (1147)

In Figure 2, red lines show the perimeter of a rectangular building with semi-circular apse: this structure refers to the ancient Romanesque church belonging to a destroyed castle; its apse is oriented to the East and its door is oriented to the West. This church was embodied in a small fortification of the XI century.

PHASE 2

FIRST EXTENSION (1490)

The new church, bigger than the previous chapel, was dedicated in 1490; it was composed by three spans of transverse arches which sustain a wooden ceiling. The building consisted of a presbytery oriented to the East, a structure covering the so-called miraculous water source, and a small monastery on the northern side. This phase is represented by the yellow colored elements in Figure 2.

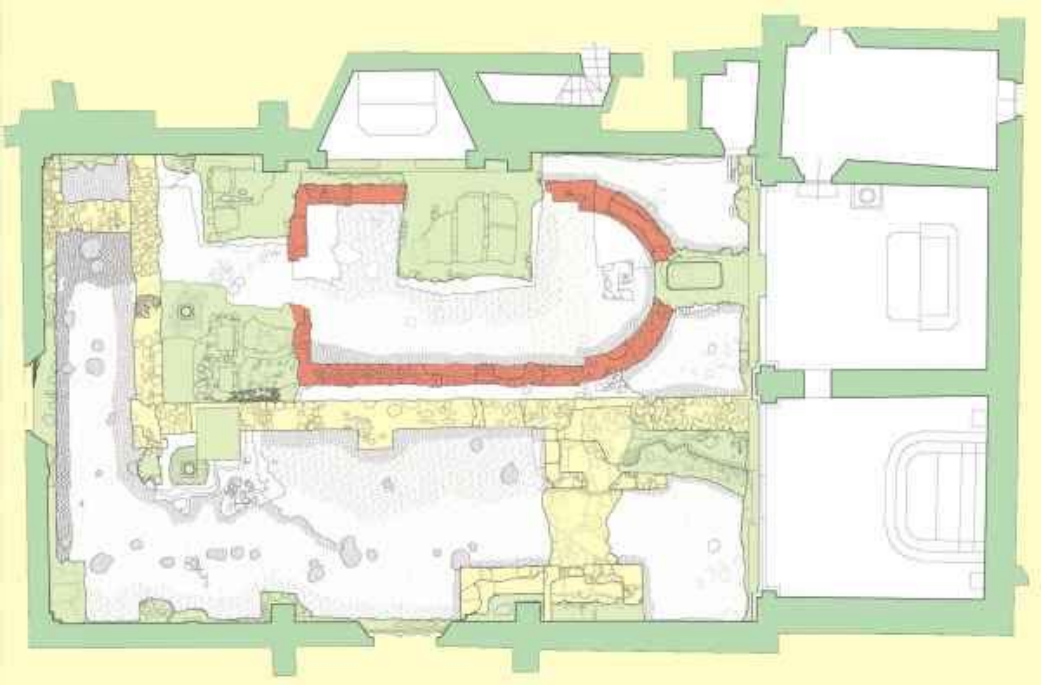
It is worth noting that the East-West wall is displaced with respect to the partition wall of the current two apses and for this reason the building of the northern apse cannot belong to this phase even if the northern wall of the current church contains the oldest frescoes. A further archaeological research could find a structure belonging to an intermediate phase.

PHASE 3

SECOND EXTENSION (1582-1597)

This phase is represented by the current Church of Santa Maria del Lavello (green part of Figure 2). The structure of the church reflects the approach of Padri Serviti; they adopted the simplicity of the buildings of the mendicant orders.

The church consists of a nave with twin presbyteries and wooden ceiling and a loggia for the chorus in front of the altar; the wooden ceiling is divided into three spans by the mean of pointed arches as diaphragms.



Diachronic map. PHASE 1: ancient Romanesque church 1147 (in red). PHASE 2: first extension 1490 (in yellow). PHASE 3: second extension 1582/1597 (in green)

The result of our work consists of a 3D representation of both the excavated surface and the church; these representations was obtained through two different techniques. Concerning the excavated surface, a kind of mould of the surface has been created starting from the laser scans; therefore this is a reproduction rather than a representation. This reproduction allows the photorealistic representation of views and spaces (see Figure 3).

The model of the church was obtained from a geometric reconstruction made with the support of computer graphics applications (Autocad, Bryce3D and 3DStudio). This architectural model is important to better understand the structure of the church.

Reproduction of the excavated surface obtained through the elaboration of the laser scans; outside and inside 3D representation of the church

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