



The Historic Centre of Vimercate: Investigation, Education, Community Involvement

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Abstract. In the last three years multidisciplinary investigations have been carried out on a number of historic buildings in the town of Vimercate, near Milan, whose origins date back to the times of the Romans. The red ribbon that ties together all the analyses, carried out in the frame of university courses, is the continuity of the layered structures and the slow evolution of building techniques.

Beyond the interest of some new achievements in history of architecture, as it is the case for the medieval S. Antonio's church and the baroque Trotti Palace, the main value of these activities has been a transfer of knowledge to trigger a changing attitude in preservation and planning policies.

In the last decades, the local Municipality did not put the preservation and valorization of built heritage as a leverage for development and quality of life. History was felt just as a burden. Therefore, relevant knowledge was just frozen in old sentences, as if research and innovation had no role in the development of the local community.

The organization of activities with schools, associations and people tried to disseminate curiosity and awareness. Some of the activities were also framed in granted projects on preventive conservation. The first tangible outputs have been observed both in the recognition of values in urban regeneration projects, e.g. in the area of the former hospital, and in the principles adopted for the future urban plan.

The implementation of multidisciplinary technologies proved to be effective in feeding communication and developing audience. The learning experience in the realm of real processes proved to be effective in improving students' attitudes.

Keywords: Diagnostic techniques · Heritage education · Community involvement

1 Introduction

Vimercate is a small town not far from Milan, which in its urban structure still conserves the footprints of its foundation, dating back to Roman times [1]. The historic centre embraces both outstanding buildings spanning from the Middle Ages to 19th

century, and layered dwelling houses built by techniques slowly developing through the centuries. For these reasons, the town was perfectly suitable in the last three years as a didactic laboratory for architecture students from the Politecnico di Milano. The didactic project, offered to international students, encompasses the geometrical survey of buildings or urban sectors, implementing both traditional direct techniques and instrumental acquisition with digital 2D and 3D modelling, and also GIS for some cases, the recognition of historical layers and building techniques, the technological analysis of buildings and their decays, the evaluations for a sustainable adaptive reuse, according to the planned conservation vision. It is therefore an articulated didactic project, inspired by the debates on education to heritage conservation and restoration [2–9].

The exercise is supported by archaeometric and on the field diagnostic techniques, with the aim of enabling students to get accustomed with these practices, as well as of enhancing the quality of the outputs. Unfortunately, up today it was impossible to implement also laboratory analyses, not for choice, but because of the practical problems, in the given didactic organization, of getting permissions to sample, paying the laboratories and getting results on time. The Authors hope to be able in the future to program also direct sampling and chemical-physical analyses, in order to complete the students' experience and to disambiguate some issues.

The analysed buildings include the churches of S. Antonio [10] and the Holy Virgin of the Rosary, still open to worship, and the relics of S. Marta's church, desecrated at the end of the 18th century and partially demolished, of which also the reuse as a cultural centre and museum has been designed; the Trotti Palace, currently venue of the Municipality, built in the first half of 18th century but never finished, which served for a deep understanding of traditional building techniques; the abandoned buildings of the former Hospital, which have been assessed in sight of an overall adaptive reuse in the frame of an urban regeneration process; the facades of the most interesting buildings in the historic centre, investigated for their conservation issues but also thinking at the theme of urban landscape [11, 12].

The limited dimensions of the historic centre enabled also on one hand to link the students' work to real problems and tasks, on the other hand to exploit their colorful presence as a pretext to call attention on the local heritage by the resident community, which did not care so much for it in the last decades, especially through the municipal town planning. This relationship between the didactic activity and the real processes has been supported by the continuity with some ongoing projects [13–16].

The pure technical aspects of conservation of the structures and the surfaces of historic buildings have been placed in such a frame, highlighting the multidisciplinary features involved in the conservation process: cultural approaches, regulations about protected and not protected buildings, urban planning, urban quality and regeneration processes, energy efficiency and fiscal incentives, and cost-benefit evaluation of a knowledge based approach. This latter aspect is the most important in order to pinpoint the impacts of conservation activities. It seems important to strengthen the students' awareness about the role of historic buildings, protected or not, and of their conservation in the development of the set of cultural values that a community can share, and therefore can give sound foundations to the management of urban spaces.

2 Description of the Teaching Methodology

2.1 Geometrical Survey

The geometrical survey, which is part of the official syllabus of the course, is understood as the basis of any knowledge approach, and as the preparation of the tools to control the transformation processes of existing buildings.

The proposed experience is based on the implementation of both direct and indirect techniques, i.e. the most advanced acquisition techniques (laser scanner and terrestrial photogrammetry) as well as the direct measurement (Fig. 1), usually for details and for the sake of integration on less accessible areas, so that students can deeply understand the complementarity of the techniques and the themes of the tolerances and the propagation of error.

The exercise includes also the organization of information in digital 2D and 3D files and the introduction to GIS and HBIM, implementing the outcomes of the researches carried out by the teaching team [e.g. 17].



Fig. 1. Example of geometric survey activity based on laser scanner and common measurements, implemented with image rectification.

2.2 Stratigraphic and Archaeometric Analysis

The development by students of an attitude to the stratigraphic approach to historic buildings is an important target of the Authors' courses, therefore being given quite a long time in classes and on the site, supplying often unpublished documentary stuff,

training students to deal with the different kinds of information. Several selected case studies featured not plastered facades, enabling a direct exam of the building materials and their arrangement in the walls. As in Vimercate a widespread use of bricks mixed to pebbles has been detected (Fig. 2), a special research has been carried out to test whether the dimensions of the bricks through time followed the trends of the Milan city market [18], or the local production had a fuzzy logic due to the local production uses. As a first result, it was concluded that the examined samples tend to follow the Milan trends, at least for the 15th–18th centuries: this statement confirms a strict dependency of the local patronage and building organization from the city, and several other historic issues. On the other hand, a building technique was studied, which exploited the potentialities of locally available pebbles as building materials. Relevant data from literature have been used to demonstrate the effectiveness of brick strips in confining and strengthening masonry made up of pebbles with a wide use of very weak mortar. This technique was widespread in Italy, but Vimercate area provided a rich set of case studies, enabling to highlight the long lasting evolution of the technique for several centuries, during which the characteristics of the typology evolved towards an optimal ratio between height and thickness.

The detected data therefore enabled observations on the production and supply of bricks in this typical subalpine area, and on construction processes at large. This knowledge provides also useful references for the conservation of historic buildings in Vimercate and surroundings, making understandable the distinctive characteristics of the buildings, thus also enhancing their significance [19].

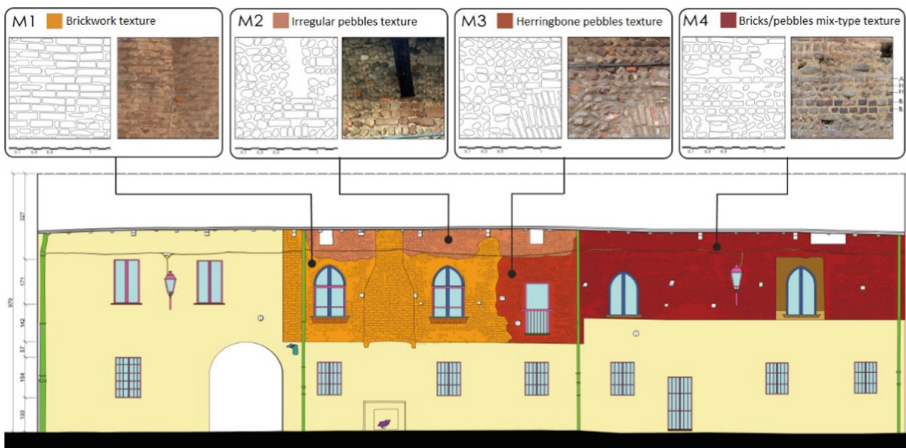


Fig. 2. Stratigraphic analysis through the masonry texture classification.

2.3 Thermography

Among the different diagnostic techniques, some on-site applications of thermographic tests were shown to the class. This investigation technique, being totally non-destructive, provides qualitative results concerning different aspects: masonry textures (for plastered

surfaces), hidden structural elements (like technological elements realized in different periods) and also decay phenomena afflicting the building. The distribution of temperatures recorded by the thermo-camera can drive to different interpretations and since the acquisition phase to the final elaborations of the radiometric images, the students were guided to get in touch with the common issues of a diagnostic campaign, improving the role of the knowledge path into the complex of operations forming the conservation process.

The application of thermographic tests offered a fruitful support to the survey analysis, allowing the identification of the component materials, when covered by external coatings, and providing indications on the moisture presence or on diffused detachments, showing the causes of some decays. For the present work, the acquired thermograms were useful for confirming the use of well codified building techniques, like masonry textures composed by pebbles stones or mix typologies combining pebbles and regular brick courses (Fig. 3).



Fig. 3. Examples of thermographic analysis for the masonry texture detection and the integration with the historical sources for interpreting the evolution of the buildings

2.4 Georadar

The roadshow of georadar technique enabled to point out how the recognition of probable underground structures can give important inputs to correct reuse and valorization projects of buildings in historic areas. Meaningful hints of pre-existent structures have been detected both near the former hospital, maybe pointing out the position of the ancient urban walls, and in Palazzo Trotti courtyard, where the walls of

the medieval house had been supposed to be located [20]. The most interesting data concern the relics of the former S. Marta church, where the tomb has been detected, which was used for the death executed comforted by S. Marta's confraternity, and beneath it, at a deeper level, a wall similar by depth and orientation to the archaeological relics of the Roman age discovered in the nearby S. Maria's church [21].

Furthermore, the investigation aimed at recognizing exactly the positions of the seven urban doorways demolished by the end of 19th c. is still ongoing; it will be based on the crosscheck of georadar data and the georeferencing of eighteenth-century cartography. The first encouraging results consist in the localization of S. Damiano doorway, nearby the former hospital (Fig. 4).

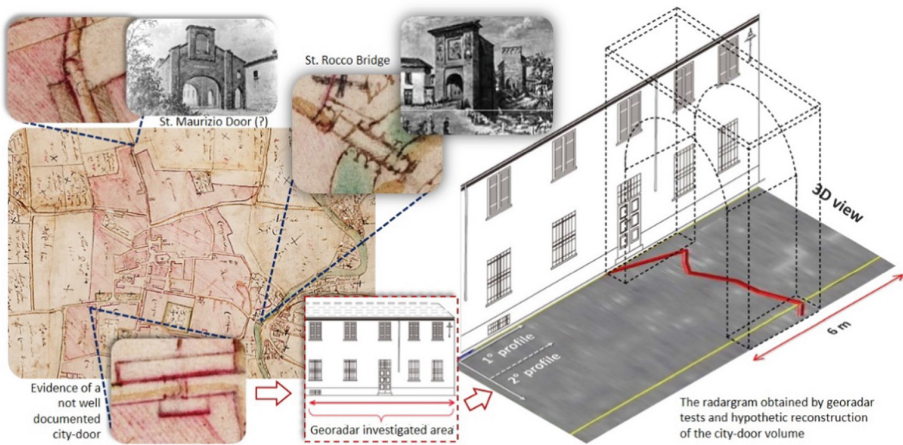


Fig. 4. Implementation of the evidences found through the historical analysis based on the door-system traces reported in the 1721 cadaster map of Vimercate by applying georadar for detecting the archaeological remains of an ancient city-door.

3 The Dialogue with the Local Community

Among the outputs of this ongoing process, the most important achievements may spring out from the discussion on the urban regeneration project concerning the area of the former hospital, changing decisions and attitudes. However, for the time being the processes involving the recognition of the values of the urban facades produced the most mature results.

In terms of Economics, the façades of historic buildings in the urban environment have the characteristic of not-excludability (the passing-by citizen cannot be excluded from seeing the facades on the public scene) and not-rivalry (among the facades no competition exists). Therefore, the facades of historic buildings can be described as a pure public cultural good, even if they keep belonging to private owners: they are on the threshold between private and public property, in physical not less than legal and symbolic sense.

Reasoning in terms of heritage protection, today we would be keen to think the topic in terms of the required proper maintenance that means also prevention of the risks caused by ageing, and limits to the transformation of the façade. In the past the façade was instead conceived as the place where the social status and the civic pride had to be exhibited. A long ribbon unravels from the medieval statutes, to the renaissance norms on “laute aedificare”, to the nineteenth-century discipline of public decorum: in the evolution of administration, the consistency among the owner’s culture and the governmental culture used to produce a common understanding of magnificence and good state of repair as a converging interest of the public and the private as well.

In the last years this concept has been developed in terms of Historic Urban Landscape, on which Unesco Recommendations have been issued since 2011 [11], while ICOMOS developed the principles approved at La Valletta again in 2011.

This approach is based on the idea that culture, in its diverse forms, should play a role in facilitating and carrying on sustainable development [22, 23]. In other words, the emphasis is no longer on visual integrity and protection, instead it’s on the involvement of local communities and stakeholders.

The reference of scientific research and international documents are often those historic urban centres, which outstanding value is widely acknowledged. In these cases, the recognition of cultural values usually coincides with the touristic exploitation: touristification and gentrification, adaptations and bombastic restorations threaten authenticity, as values related just to an external and aestheticizing approach often produce conflicts with the willingness to develop on behalf of local communities, as it has been detected and discussed [24].

Vimercate is not crossed by waves of tourists, but is located in the rich Brianza region, at the heart of a high-tech district that had better times some years ago, but anyway with a productive environment that could give many opportunities. Its ancient town core, with outstanding features, faces nowadays a crisis in its traditional nature of retail area, suffering the competition of other commercial locations, which look more consistent with contemporary lifestyle. Even if in a contradictory way, local dealers are aware of this problem, and therefore pay attention to the opportunities, which could be produced by the rediscovery of the urban quality of the historic neighborhood. In this climate, the work done by Politecnico students for the conservation of the urban historic landscape has been highly appreciated by the local stakeholders, even inviting the students to exhibit their work in the streets.

The Vimercate experience became thus an example of the inseparable theoretical relationship among conservation and valorisation, giving the latter the utmost political value, because of its aims of promoting knowledge and public enjoyment. Valorisation should be understood and put into practice with reference to the themes heralded by the Faro Convention [25]. Particularly meaningful is the definition proposed by Pietro Petrarola, speaking of “valorisation as the relational dimension of protection” [26].

Even the simplest didactic implementation of a knowledge-based approach (historic investigation, 3D survey, multispectral analyses...) triggered curiosity and several inspiring reflections, even concerning facades, which used to tell little stories. Then the students, mostly foreigners, imagined the presentation of their outputs as a mean to

propose an enhancement of the urban quality and of the relationships in the city core, with some interesting proposals.

At the same time, the interventions executed in the recent past on the historic buildings started to be seen by local people as lost opportunities, and even as misdeeds in some cases. It's still unknown when this awareness will be transferred into actual planning: the point here is the capability of this knowledge-based approach to rise interest (valorisation) and to start participation practices, which are the premise to make protection grow up from being authoritarian to becoming proactive and relational [27].

From university teaching a cultural transfer has been produced, already implemented in the process, through which the new municipal plan is developing, with the maximum commitment to put into action the innovative directives of regional norms about participated planning [28]. If in the past the planning document of Vimercate Municipality had been pretty rough on the provisions for the preservation and management of the historic centre [15], thanks to this new sensitivity the future plan is going to pay better attention in defining targets and tools.

On the other hand, students had the opportunity to understand what could be the role and the potential of heritage preservation in local processes. They had the opportunity to develop their exercise as a real task, similar to service-learning experiences, which are particularly proficient as implemented in heritage field [29].

4 Conclusions

In a vision of integrated conservation, the theme of urban environment requires awareness of the many analysis levels involved.

The advanced technical-methodological progresses are not useful, if they are implemented within a top-down logic separate from the mediation with stakeholders; on the contrary, by means of a knowledge-based approach the coordination among conservation activities, investigation being the first one, and social inclusion projects can build the conditions for a proactive administrative action, which in turn will require decision making systems adequate to the challenge [12].

On the other hand, the concreteness of the applied approach on case studies framed in real, and often problematic processes of protection and valorization is an invaluable opportunity to let the students learn the fundamentals of techniques but also become aware of the implementation contexts.

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