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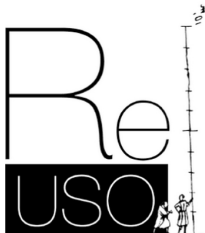
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TEMA 1 – CRITERIOS Y MÉTODOS EN ÉPOCA DE CRISIS
CRITERIA AND METHODS OF INTERVENTION IN TIMES OF CRISIS



**III Congreso Internacional sobre Documentación,
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REUSE OF THE ST. BENEDICT MONASTERY IN RECANATI (ITALY): A DIALOGUE BETWEEN OLD AND NEW FOR SUSTAINABLE DEVELOPMENT

IL RIUSO DEL MONASTERO DI S.BENEDETTO A RECANATI (ITALIA): UN DIALOGO FRA ANTICO E NUOVO PER UNA VALORIZZAZIONE SOSTENIBILE

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ABSTRACT

This paper focuses on the conversion of the former Monastery of St. Benedict in Recanati (Italy) and tackles the complex relationship between old and new architectures in order to respect the existing buildings and the quality of the project. By investigating and analyzing the building through the use of new methods of investigation (UAV-drones), two strong elements emerged and guided the design choices: the relationship of the complex with the surrounding landscape and the organization of the roof's spaces. The project idea is based on the inclusion of new polycarbonate volumes that allow to direct interior lighting and at the same time offer innovative views on the natural and building scenery. The restoration project, driven by the two principles of reversibility and minimal intervention, while the reuse involves three generations of people, creating new opportunities and services for the city, thus favouring its development: a place where technological choices meet old traditions, enabling more young people to become familiar with their architectural and urban heritage, in an innovative and engaging way.

Keywords

Restoration, improvement, evolution, interaction, lightness.

1. INTRODUCTION

The present paper deals with the restoration and conversion of Saint Benedict Convent of in the village of Castelnuovo, which is part of Recanati, a city in the Marche Region (Italy). The history of this building and its changes over time have made it one of the most important buildings in this area. Its historical roots and the events that mark its evolutionary phases contribute to its value. By reusing the building, it is possible to improve the complex and ensure sustainable development, while keeping in mind the multitude of factors that determine its identifying characteristics.

1.1 Observations on the city of Recanati and the village of Castelnuovo

There are no certain data regarding the origin of the first inhabited centre of Recanati. The surrounding territories were surely inhabited already in the prehistoric era, and the Romans consolidated the settlements along the valley of the Potenza River, founding two important cities: *Potentia*, at the outlet, and *Helvia Recina*, more inland. Due to the invasion of the Goths around 406 CE, the population fled to the hills, which probably led to the slow birth of *Recinetum*, in a place protected by nature, isolated and immersed in the greenery that would develop over the centuries. One fundamental aspect regarding the development of the city is the decision made at the end of the twelfth century by the local lords to unify their land holdings to form a stronger city equipped with defensive systems.

The history of Recanati follows that of other cities that benefited from recognition as a *Comune*, followed by the assignment of a *Podestà* and the struggle between the papacy and the empire. The city flourished during the fifteenth and sixteenth centuries as it enjoyed economic, religious, and political importance. In the eighteenth century it underwent a neoclassical transformation that would affect the appearance of the historical city, while in the 1900s no evident transformations were made with respect to its current state.

Situated to the northwest of the historical centre, Castelnuovo has never been enclosed within its walls; the development over time has mainly been due to the aggregation of political enemies, thieves, wrongdoers, and less affluent families, who, expelled from the protective borders of the fortified city, have populated this small inhabited centre. It has undergone, especially in the last century, evident expansion that has partly modified its original layout. The characteristics of the village relate to its history and its separation from the urban centre, both physically and on a social level.

2. THE CASE STUDY

2.1 Historical evolution of the complex

A historical reconstruction of the convent complex begins in 1100, when the early church of St. Lawrence was built on the ruins of the ancient fortification atop the Antignano hill by those who had fled the nearby Roman town of *Helvia Recina*. During the following century, the convent of Saint Damian nuns was constructed around the church; the nuns later converted to the Poor Clares. In 1427, the convent housed no nuns and its abandoned state led to extensive structural damage. In the middle of the fifteenth century, the bishop of Recanati

gathered at the convent all the nuns from surrounding convents that were in a poor state of conservation. In the sixteenth century, the City of Recanati contributed to expanding the convent with a donation of 400,000 bricks from local kilns, whose sizes can still be read within the brick walls that characterize all the complex.

The maximum extension of the convent is evinced by the construction around the eighteenth century of two embankments in the eastern part for supplemental gardens. In 1720 the internal chapels and high altar of the church were restored, and in 1750 the convent was further expanded and restored under the architect Carlo Orazio Leopardi (1799-1878), who adhered to the neoclassical taste of the time, which was widespread in the Marche Region due to contact between its artists and the capital. In 1870, during the suppression of the religious orders, the convent was acquired by the Municipality but the nuns continued to occupy it until they were transferred to the nearby city of Osimo, due to their small number.

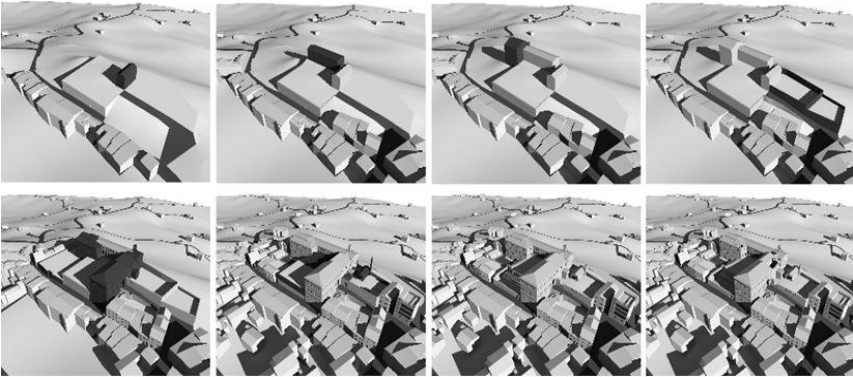


Figure 1. Evolution of the convent from its origins to the XX century

In 1918 the convent became the seat of both furniture manufacturers and an elementary school. Its use as a factory led to a series of transformations that greatly affected the layout of the convent: several spaces were added, and a drying room, which is still visible today, was built in the eastern part. All of the internal environments were used by the woodworkers and to show the furniture. During this period, the ample transformations caused evident structural problems that would become worse throughout the 1900s. Another change occurred in 1970, when, to make space for the ever growing number of cars, a large underground parking structure was created, producing a sizeable excavation that compromised the entire foundation plane of the structure.

Finally, in 1980 a school of music moved into the east wing, which had been appropriately restored to host this new function. The school remained open until 1995. In 2008 the entire building was sold to the IRCER Foundation of Recanati, who planned to establish a nursing home. Unfortunately, without the necessary urgent restorations, several areas of the roof collapsed, which then caused damage to the lower levels and a serious degradation of building materials.

2.2 Description of the complex

A multi-disciplinary approach is obviously required in any restoration project and the peculiarity of heritage structures, with their complex history, requires the organisation of studies and analysis in steps. The analysis have begun with a careful geometrical and architectural survey. It has been necessary, starting from a first phase, to define a measurement project, which uses different methods and necessities, according to an outline which organises the different operations to be carried out on the spot in function of the different architectonic elements. These can be divided in three groups differentiated according to the morphology, to which the different surveys methods correspond: the first group comprises simple geometric elements for which photogrammetric survey has been used; the second group includes more simple rooms which can be surveyed directly with a topographic station; and finally the third group constituted by constructive detail elements which are analyzed through traditional methods and instruments. After a more generally survey, the analysis focused on the brick walls. The *mensiochronological* method is based on the measures relief of the bricks which varies from one context to another and are characterized by different materials (clays) and different systems production with the ancient furnace. Even systems installation remain almost constant in the various historical periods so that we can study their characteristics for the case study, that allowed hypotheses related to the evolutionary phases of the complex (Petrucci, 2012, pp.98-111). Next, the degraded areas and the cracking pattern were identified, which originated mainly in the lack of maintenance, which exacerbated the deterioration. The main pathologies detected are presented and the most frequent structural problems concern cracking of the masonry elements, degradation of the timber and roof .

2.3 Analysis of the roof using UAV - drones

The restoration of an historical building requires technical and historical investigation in order to assess its main architectural features and the effects superimposed by its history (Binda et al., 2000). The new digital technologies propose innovative means, able to facilitate the methods of acquisition, recording and data processing and to control the state of degradation of the ancient buildings. In recent years, the use of Unmanned Aerial Vehicle (UAV), even for surveying activities, has grown exponentially. The most sought-after applications are connected to territorial management: photogrammetry, topography, environmental monitoring, and even diagnostics to ascertain the current state of cultural goods (Meschini. A. et al., 2014, 413-420). The use of an UAV was necessary in order to survey the multilevel roof of the complex. The partially collapsed roofs could not be observed from within since the environments were inaccessible, precisely due to the collapse; as a consequence, the only possibility for observation was externally from above. The various frames therefore allowed us to investigate the roofing structures, identifying materials and technologies with a mind to recovery through seismic improvement.

The most evident collapses affected the roof of the old church, constructed using wooden trusses, which, appropriately restored and integrated, can continue to carry out their load-bearing function. The study allowed three different types of trussed roofing to be identified. The

first, found in the north wing, is a simple truss with a centre gable stud; the second, in the church, is composed of a simple truss and a half truss. Further to the south in the same wing there is a double half truss supported by an internal wall. Using cross-sectional drawings, the current state was reproduced, highlighting the collapsed areas, both in the roof and parts of the walls. The drone also allowed us to study the convent from another perspective, relating it to the historical fabric and the surrounding hill landscape. The privileged position and its elevation suggested the creation of an exceptionally valuable panoramic lookout point from which the surrounding landscape can be observed: the Adriatic Sea to the east with Mount Conero off to one side, and the chain of the Sibillini Mountains, to the west. Surveying with the drone therefore simulated the project idea, which was centred on a special observatory creation.



Figure 2. Frames captured with the UAV - drone, during implementation of the survey

3. THE PROJECT

3.1 Initial data and development of the project idea

The project was motivated by the principles of reversibility (Serafini, L. 2003, 327-336) and minimal intervention (Fiorani, D. 2004, 17-26). The theme of reversibility goes with the history restoration since the beginning of its modern approach. The enlightenment reply to the scientific nature petitions made by a culture already aware of the separation between past and present, the principle of reversibility was proved with the passing of time to be as much effective in the pictorial field as vulnerable to the scale passages defined by other figurative arts, mainly architecture. Its dimensional differences, linked to the specificity of its irreversible interactions between form and substance, have exposed this principle to troubled debates on its adequacy to the architectural restoration both in terms of theoretical legitimacy and practical implementation (Varagnoli, C. 2004, 841-860).

The project on the existing architecture should bring out the value of the building damaged and abandoned, allowing its preservation and revitalization. In this case, the key points in interpreting the spaces were the paths and light. Bringing the space into functional use responds to a need to return a sense to the spaces and favour their interpretation, creating a multi-functional place that can operate throughout the year, including the external spaces as well. It has become essential to apply the *integrated conservation* principles established already since the Declaration of Amsterdam (1975) "as a result of the use of joint Technical restoration and research appropriate functions. This conservation involve the responsibility of entities local and requires the participation of all citizens" (Prescia, R. 2013, 26-27).

The project involves three generations of people, creating new opportunities and services: it is a place where innovative technological choices meet old traditions, allowing more young people to become familiar with their past and their identity in an innovative, involving way. To regenerate the life of the village, the idea was to develop a multi-functional structure capable of involving all aged citizens, a reality that could bridge the gaps in some services that are missing today in the Recanati community. The structure would house a creativity centre, a *FabLab* for youths, a laboratory for children, and a creative studio for the elderly, to generate interaction among the different groups in order to increase the level of culture and reduce the generation gap. The concept revolves around activities, which, if well organized, can interact together within the same building. After studying the project from the point of view of the interactions, investigations were directed towards problems connected to the internal liveability of the spaces, analyzing the light in particular, which is essential for the new functions but difficult to obtain in a thick-walled building with few openings. For this reason, the collapsed areas are used as a point for creating new volumes and spaces that would give new life to the complex. These volumes are integrated into the pre-existing building, with which they establish a spatial but not structural dependence so that they do not further burden a wall structure that was already modified several times and which would anyway need to be reinforced.



Figure 3. Overall view of the intervention. The new volumes included in the cuts of coverage are evident

These new spaces are set apart formally and materially from the historical building, underscoring the coexistence of the old with the new, a theme that now enjoys a strong theoretical presence on the European level (Carbonara, G. 2011,35-57). Through the reuse and consequent introduction of elements and new materials, the building can begin a new life with respect to its former one. A substantial difference -a duality between the building to be conserved in its historical identity and its new use- is thus produced in the transformations that such reuse induces. This duality tends to distinguish the new parts and elements with respect to the existing ones, making them autonomous and recognizable. The design proposed confronts such a difference and, in this sense, the convent can become a space for architectural reinvention. It is the project, in fact, that identifies the means with which the new relates to the old, the scale and meanings that it assumes in the context in which it is located. The new spaces have different functions related to their position; the most important is located within the perimeter walls of the church; in addition to compensating for the collapsed roofing, this transparent structure allows a panoramic lookout point to be created.

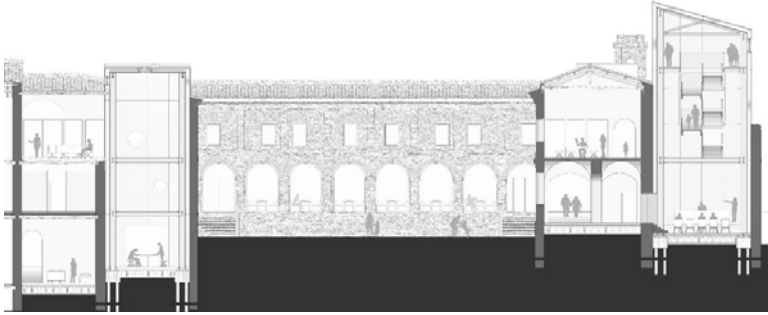


Figure 4. The-section of the complex with the new integration volumes.

3.2 Construction details

Making use of a specific free tool. (Velux Daylight Visualizer), it is possible to predict daylight levels and appearance of a space lit with natural light, prior and after, to realization of the new polycarbonate environments. Setting parameters related to the position and orientation, it was possible to obtain renderings of the interior based on the quantity of light and the value of visible radiation to guarantee the right natural brightness in both spaces. The new volumes are not supported by the walls, but have their own independent system: steel pillars and beams that distribute their weight on concrete plinths



Figure 5. Study of interior brightness with a specific free tool

The floors of the building were integrated to respond to the new needs of the building and the vertical closures were entrusted to a double building envelope of compact polycarbonate; the internal one is fixed to the main structure; the second is detached by about 35 cm and rests on the existing wall, which was appropriately consolidated and surrounded with light steel beams. The closure system is similar to that used for the vertical walls, with a support realized in steel trusses, recalling the collapsed roofing of the church. The remaining roof was maintained but reinforced seismically; the beams in the trusses were anchored to the walls with steel cleats.

4. CONCLUSIONS

In the case study, we highlighted how the history of the complex and its relationship with the city have been imprinted with spatial and functional transformations that were progressively radical and characterized by a desire to profoundly transform the building for its future use. In investigating the vast complex from a particular view, two strong elements emerged and

guided the choices in the project: the relation of the complex with the surrounding landscape and the organization of the roofing volumes. Combining these aspects, an idea was developed to insert new polycarbonate structure into the old building. The duality between new and old architectures is recreated in the unity of the project, with respect to the goal of its conservation. So that the transformations introduced by the reuse are congruent with such a goal, a sustainable design was necessary, making the different areas of knowledge converge and interact around the theme of the project.

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