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Preservation Strategies for Sabbioneta's City Walls and Recent Restorations

Sabbioneta and its city walls are nowadays recognized as a very important historical and cultural value, widely acknowledged throughout society: without this recognition neither protection, nor conservation, nor valuation could be achieved.

Sabbioneta's city walls are evidence for the use of different theoretical approaches: for example, at the beginning of the FIO works it was decided to replace lost bricks with reused material (old and restored bricks); because of the very high costs of this procedure, in accordance with our office it had then been decided to use new bricks, distinguished from the original ones by a "sanding surface". It had also been determined not to replace missing pieces of the bullnose element with original shaped bricks, in spite of emphasising the continuity of the bullnose with a different layout of new bricks. This methodology complied the theoretical principles of "recognition of the new elements" and of economical sustainability.

Today, if we look at the whole extension of the city walls of Sabbioneta, it is possible to compare different works and decisions taken during the years and understand how the theme of conservation and restoration of this masonry wall has been interpreted.

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Sabbioneta and its city walls are nowadays recognized as a very important historical and cultural value, widely acknowledged throughout society: without this recognition neither protection, nor conservation, nor valuation could be achieved (Abb. 1–2).

Today, these issues are very topical and are not to be questioned. However, the huge effort invested in this cultural property by our forefathers may not be forgotten: we briefly recall early efforts undertaken by Superintendent Da Lisa, who was able to prevent the demolition of Sabbioneta's city walls at the beginning of the twentieth century. We should also recall Superintendent Gazzola's modern idea of respecting cultural heritage by preserving it and by recognising and appreciating its own cultural and historical values.

Despite being a fundamental matter of any conservation disciplines, it is worthwhile to think of such a historical continuity which always has to deal with the past and with its evidence. That is why it would be worth it to briefly present the Italian cultural heritage protection system. It is a very old system which dates back to the end of the nineteenth century and which is currently subject to several reforms. The easiest way to introduce this extensive topic is to refer directly to the specific case of Sabbioneta and its city walls. Alongside, Sabbioneta will be introduced as an important cultural heritage. Despite being a small city (c. 4.300 inhabitants), its architectural, planning and artistic features are outstanding.

First of all, it is important to emphasize that a paragraph in the constitution

of the Italian Republic (dating back to 1947) is specifically dedicated to the protection of natural, historical and artistic heritage.¹

The actual Italian Cultural and Landscape Heritage Code was altered in 2004. It represents the first important revision of the law for cultural heritage protection from 1939, which was very modern at that time and whose basic structure and peculiarity have survived and are clearly recognizable in the new code.

According to article 2 of the 2004 cultural and landscape heritage code, "*cultural heritage is both real and personal property that, in accordance with articles 10 and 11, are relevant from an artistic, historical, archaeological, ethno-anthropological, archival or bibliographic point of view, and other things identified by law or under the law as evidence with civil values*".

Article 10 states that "*cultural heritage is both real and personal property belonging to the State, the regions, other local governments, as well as any other public body and institution and private legal entities non-profit organization, including the legally recognized ecclesiastical organizations, which are relevant from an artistic, historical, archaeological or ethno-anthropological point of view*".

Article 12 then differentiates between public and private cultural goods: goods which do not belong to private individuals are listed in article 10: they "*are the work of a dead author, the execution of which dates back more than seventy years, are subject to the requirements of protection law until the verification of the cultural value has been issued*".

Abb. 1, 2 . Freehand tracing of the map of Catasto Teresiano, before 1842. Archivio di Stato, Mantua, Mapped Varia Provenienza n. 526
Abb. 2. Sabbioneta, aerial perspective. Foto: Fotostudio Danilo, Sabbioneta.



Without this verification, the object remains automatically (*de jure*) under protection.² After an object's cultural value has been assessed positively, it becomes subject to a "declaration of cultural relevance". Owners then will be notified and in case of a negative assessment, the property remains no longer under protection law requirements and can be sold.

Legislative Protection Measures for Sabbioneta's Cultural Heritage

Founded in the second half of the 16th century by duke Vespasiano Gonzaga and located 30km away from Mantua, Sabbioneta represents a perfect example for a practical application of Renaissance's urban planning theories on the "ideal city".

Sabbioneta and Mantua are outstanding examples for the urban, architectural and artistic projects of the Renaissance, which is the reason for their status as a conjunct UNESCO World Heritage Site.

Sabbioneta has a rectangular grid layout and can be considered as a testi-

mony for a brief moment in history: the particular urban military design of the city walls informs the urban layout inside, which features a northeast-southwest axis (*Strada Giulia*). At the endpoints of this axis we find two city gates: *Porta Vittoria* at the northern point, built from 1560 to 1562, and *Porta Imperiale* at the southern point, built in 1579 in honour of Emperor Rudolf II. Both city gates are "*de jure*" protected monuments pursuant to articles 10 and 12 of the Cultural and Landscape Heritage Code.

In the core area of the city we may find three Renaissance squares. The main square, *Piazza Ducale*, presents two very important buildings dating from the 16th century, the church of *Santa Maria Assunta*, representing the ecclesiastical power, and the *Palazzo Ducale*, representing the civil one. Both are listed monuments due to a ministerial decree of cultural interest issued in 1952. In the neighbouring two squares, we find two more Renaissance churches, *San Rocco* and the centrally planned *Incoronata* Church, which are also both protected by a decree from 1952.

Abb. 3. Galleria degli Antichi. Temporary consolidation works on damaged frescoes through application of a protective coating of Japanese paper aimed to prevent further damage that could be caused by the consolidation works on cracked walls. The seismic events of May 2012 were strongly felt both in Mantua and Sabbioneta: numerous buildings were affected by the earthquake and, in the southern portion of the Mantua province (*Oltrepò mantovano*), 51 municipalities had been affected, with a total amount of 567 damaged buildings (notably including more than one hundred churches). A task force was established, chaired by the local Superintendent, to oversee the assessment of the damage and plan reconstruction activities. Several consolidation works were authorized to ensure the future stability of the structure and, after 4 years, a large part of these works has been completed.
Foto: Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Cremona, Lodi e Mantova.



Again, located inside the city walls we find another "de jure" protected monument: the *Galleria degli Antichi* (Abb. 3) is a brick masonry building with very precious interiors featuring Renaissance frescos.

The *Teatro all'Antica* was the last building to be commissioned by Vespasiano Gonzaga for Sabbioneta and is the work of famous Renaissance architect Vincenzo Scamozzi. After many centuries of neglect, the first restoration works started in the 1950s. Yet, only in 1969 the objective was achieved to use the building as a theatre again. Again, this structure is a "de jure" protected monument, as it belongs to the Municipality and is older than 70 years.

Located in the greater area of Sabbioneta we also find a precious building by the eighteenth century architect Antonio Bibiena, whose work is well-known all over Europe. This extramural church, dedicated to abbot Saint Antonio, is located in a village next to Sabbioneta called Villa Pasquali, and its wonderful interiors feature rich decorations and scenographically perforated domes (Abb. 4).

Abb. 4. Church of Saint Antonio in Villa Pasquali. Seismic improvements works, repair and conservation works have just been completed. Foto: Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Cremona, Lodi e Mantova.



Legislative Protection Measures regarding Sabbioneta's city walls

In accordance to its theoretical background the law §1497 from 1939 admitted a significant public interest to areas situated outside Sabbioneta's city walls due to their picturesque beauty. In 1960 a ministerial decree established a buffer zone, defining a protected area of 200m surrounding the walls.

Already in 1975, the ministry for cultural heritage protected Sabbioneta's landscape, while considering the landscape from a cultural point of view rather than from a natural one:³ within the protected area visible alterations undertaken by landowners are therefore subject to the local superintendence's prior approval. This modern legislation was strengthened in 2007 by an agreement which was signed by the Municipality and the Ministry of Cultural Properties. In addition, a core zone and a buffer zone were created according to UNESCO's high demands for sites on their world heritage list.⁴

Today, the city walls are protected pursuant to article 45 of the 42/2004 legislative decree, which indirectly commands safeguarding measurements.⁵ This means that there is no ministerial decree for the protection of the city walls themselves, which are therefore protected "de jure" as they belong to the municipality and are older than 70 years. This lack of legislation causes several problems due to the impossibility of establishing private boundaries, although a ministerial decree of cultural interest would prevent misinterpretation and dispute.⁶

The Italian law devolves protection duties to the Ministry of Cultural Heritage and Activities and Tourism, located in Rome which is organised on a national scale subdivided into peripheral offices. These operate in seventeen different regions and are called *Segretariati Regionali*; in addition to these *Segretariati Regionali*, the *Soprintendenze* are in charge of any practical measures regarding cultural heritage structures.⁷ These offices have a very old tradition (dating back to the end of nineteenth century) and, until their most recent reform, they were organised in different and specific technical competences: there was an authority for fine arts, an

authority for architectural heritage and landscape, and an authority for archaeological heritage. Nowadays these different kinds of *Soprintendenze* have been unified. For example, in Lombardy there are nowadays four *Soprintendenze Uniche* – two in Milan, one in Brescia and one in Mantua.

Apart from demolition and translocation of cultural heritage, which are subject to the ministrie's authority, any other kind of work on cultural heritage (including change of use) must be authorised by the superintendent (article 21 of the 42/2004 legislative decree).⁸ Article 29 of the same legislative decree states different kinds of preservation measures: conservation, prevention, maintenance and restoration.⁹ Sabbioneta's city walls are a good example for the importance of well planned endeavours concerned with prevention and maintenance (in particular, vegetation removal). Due to the walls' vast extension any neglect could lead to very costly emergency reparations and measures.

Between 1989 and 1999, courtesy to a national investment and employment fund (called "FIO Fund"), several conservative restoration works were carried out on the most important monuments of Sabbioneta owned by the Municipality.

Restoration works on the city walls included: removal of vegetation and trees (from coping and from joints of brick masonry): these works were also undertaken in order to evaluate the actual conditions of the structure; replacement of moldered brick courses, situated at the counterscarp wall bottom which deteriorated due to rising moisture; archaeological excavations on medieval castle ruins, including investigations of construction methods for the bastions; construction of a gravelled path in order to improve the accessibility of the site.

During preliminary studies – which are always a fundamental task at the beginning of any conservation project – large bracing walls were discovered. Compared to the course of the city wall they are orthogonally placed with a vertical expansion from foundation base to bullnose (the rounded brick element that marks the top of the counterscarp). Rebuilding works of this upper parapet

had to respect this discovery: this is why its reconstruction had to be restricted to a vertical wall – which tops the counterscarp above the bullnose element and only serves the purpose to restrain soil (the reconstruction of the parapet was therefore limited to some decimetres).

Studies also showed that the Santa Maria Bastion has a different structure than the other bastions: starting from the middle point of the brickwork, the wall becomes thinner and, above the bullnose element, it is merely made of one layer of bricks. In addition, the counterscarp's foundation was too small and the embankment had been built with poor materials and without bracing walls. Therefore the structure had to be reinforced with brick cladding. Restoration works of this portion were especially challenging because of its serious state of degradation. A vast block of bricks has fallen out due to the inappropriate construction methods.

Restoration sites are a precious source of knowledge as they enable us to learn about materials, characteristics and building technologies which were adopted in the past. Furthermore, they offer us the opportunity to learn about previous restoration works: in that sense, restoration practice goes hand in hand with restoration theories. For example, in past restoration works we can "read" the principles of "recognition" and "reversibility", such as the use of materials and, last but not least, the presence of skilled technicians and workers.

Sabbioneta's city walls are evidence for the use of different theoretical approaches: for example, at the beginning of the FIO works it was decided to replace lost bricks with reused material (old and restored bricks); because of the very high costs of this procedure, in accordance with our office it had then been decided to use new bricks, distinguished from the original ones by a "sanding surface". It had also been determined not to replace missing pieces of the bullnose element with original shaped bricks, in spite of emphasising the continuity of the bullnose with a different layout of new bricks. This methodology complied the theoretical principles of "recognition of the new elements" and of economical sustainability (Abb. 5).



Abb. 5, 6. Fotos: Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Cremona, Lodi e Mantova.

The FIO works carried out at a section of the walls, provided some precious guidelines for the next intervention, realised in 2011–2012. A preliminary project was realised by the Municipality's technical office. The project aimed to restore and consolidate the masonry walls between the Saint Elmo bastion and the Saint George bastion and to fix the moat in order to ensure its correct functionality and its hydraulic and aesthetic regularity. Our office required to respect the classical principles of maximum conservation, minimum intervention, reversibility, compatibility and recognition of the intervention.

The situation of the city walls in 2011, namely before the last restoration works, was characterised by the classical degradation phenomena commonly present in this kind of architectural structure:

- the largest amount of damage was due to construction topics of the masonry itself, due to its degradation and due to the insufficient and discontinuous maintenance measures
- general degradation, caused by vegetation and deep degradation of mortar joints: grass and shrubs growing in the holes left by the degraded mortar joints caused also structural instability
- organic degradation affected the lower part of the walls, mainly caused by the moat's water and rising moisture. Algae, black patinas, moss and lichen began to cover the masonry
- erosion and weathering of masonry at the bottom of the walls

- widespread presence of ingrained and surface dirt layers, black crusts and local presence of crystallized salts on surface

In addition to these phenomena, we can find specific problems, with both widespread and local evidence:

- For example, on the wall right next to the Imperial Gate, very deep roots of a big fig tree caused serious structural problems and the expulsion of the crown (Abb. 6).
- Some parts of the walls showed an entire loss of the crown including the bullnose brick element, which in some cases had fallen down together with the corbels. This degradation is due to vegetation which caused the deep disintegration of the brick structure and could lead to its collapse. On the other hand, the masonry is supported and held together almost exclusively by soil and roots. Last but not least, it has to be noticed that the loss of the crown itself can aggravate the degradation process of the masonry wall (Abb. 7).
- Deep joint erosion is in many cases caused by crystallisation of cement mortar, an inadequate past intervention (Abb. 8).

After the valuation of the project, our office authorised the works with the request of respecting some technical conditions:

- Cleaning of masonry surface should be limited to a single passage of water, brushes and scrapers, in order to preserve the age-coating (patina).



Abb. 7–9. The installation of the scaffolding system required special attention, since several problems occurred during the construction as result of the difficulty of controlling water levels in the moat, that sometimes exceeded the first floor level. The bottom of the moat was prepared with timber structures to support the metal ones. Fotos: Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Cremona, Lodi e Mantova.





Abb. 10–13. Fotos: Soprain-
tendenza Archeologia,
Belle Arti e Paesaggio per le
province di Cremona, Lodi e
Mantova.

- Pulverised brick surfaces had to be consolidated with ethyl silicate.
- Pointing and general consolidation of joints should be done only if necessary, in order to prevent the accumulation of rainwater and deposit of organic material; the characteristics of these weather struck pointing mortar joints had to be fully compatible with the historical wall structure.¹⁰
- Removal and re-installation of bricks should be done only in case of serious and structural deficiencies that could cause instability or even collapse; the added bricks had to be installed slightly recessed in order to be fully recognizable.
- The aforementioned operations should be repeatedly carried out on small sections of the Walls in order to permit a controlled repositioning in the same location and to ensure both material and architectural authenticity. This last requirement of our office was not fully respected and a significantly long portion of the bullnose was entirely removed from its position, located on the scaffolding in a disorderly manner and waited to be rebuilt in a random way. To try to solve this problem and to give continuity to the visual presence of the bull line, our office asked to leave the existing structure visible and to complete the missing parts by placing a brick on its side only to give the idea of the change of texture and without reproducing the brick-shaped element (Abb. 10).
- In order to protect the top of the wall it was decided, following the FIO experience, to lay a layer of earthenware mortar to prevent water infiltration. Our Office asked to build this "copertina" slightly curved (Abb. 11).
- The most severe degradation regarding the wall sections were where the bull remained unprotected, as the wall crown had disintegrated a long time ago: the result of this situation was a disintegration of the bull-nose element as well as that of the underlying structures. In case of corbel losses, it was agreed to use new clay elements, shaped in the same way like the original ones but clearly recognizable (Abb. 12).
- The reconstruction of the parapet above the bull had to concern the total depth of the original construction and to be crimped

to the interior masonry buttresses; when the new elements of the bull-nose, which fills some gaps, could not be topped by a new crown wall, it was decided to fix them to the adjacent elements with metal pins (Abb. 13).

Today, if we look at the whole extension of the city walls of Sabbioneta, it is possible to compare different works and decisions taken during the years and understand how the theme of conservation and restoration of this masonry wall has been interpreted.

- When structural problems were not present it was aimed to respect the minimum intervention dogma. It was chosen to maintain the gaps in the facing bricks: on the other side, such a decision that was taken in agreement with the municipality requires a continuous maintenance of the walls and a correspondent increase in preservation costs (Abb. 14).
- Those sections in which the fig tree roots had caused the expulsion of the upper part, it was necessary to remove the corresponding section of wall because its shape was extremely deformed. The dead tree was cut off flush with the bank while keeping its roots in their home. The wall was then reconstructed with the same construction technique.

Abb. 14. Foto: Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Cremona, Lodi e Mantova.



Anmerkungen

1 "Rule 9 – The Republic promotes the development of culture and of scientific and technical research. It safeguards natural landscape and the historical and artistic heritage of the Nation".

2 Considering the richness of the Italian cultural heritage, it is easy to understand why an exhaustive listing of protected items has never been carried out, although declarations of cultural interest date back to the beginning of the twentieth century (the first list of protected monuments "Lista degli edifici monumentali" was drafted in 1902).

3 Ministerial Decree of 3rd July 1975 - Declaration of relevant public interest for this area of Sabbioneta which has a recognized public relevance as it represents a lookout point from which you can enjoy the view of the ancient city.

4 "(...) the agreement states that any kind of project on buildings and areas for which as yet no cultural heritage protection decree exists (pursuant to Cultural Heritage Code 42/2004) must be in any case submitted to the competent authority...".

5 "The Ministry has the power to prescribe distances, measures and other rules aimed to prevent any risk that could affect the

integrity of the cultural property, to prevent any damage to its external appearance (to its perspective and overview) or any modification of its environment and décor".

6 It is worthwhile underlining the particular legal situation of this architecture, which is divided between several private owners: of course, this feature makes it more difficult to solve practical coordination problems, first of all the identification of the "de jure" protected areas (the property of the Municipality is meant to be measured 3m from the counterscarp wall bottom, but there are actually no written rules). For the same reason, it is extremely challenging to create a touristic route of the city walls, as walking on their top would be continuously interrupted because of different private ownerships. In addition to this, without any protection system, the risk of falling over is high and it is clear that structures such as protection fences or parapets, to be placed on the top or even at the groundwork of the walls, could damage the perception of the architecture.

7 Unlike Germany, there is no shift in power in the direction of municipal or regional administration.

8 Pursuant to article 5, the authorization (or

negative response) is given by Superintendence on the project and may contain general and technical requirements. The project must be designed by an architect (according to a still in force-law of 1925) and submitted by the applicant.

9 *Conservation of cultural heritage is ensured through a consistent, coordinated and planned activity, which includes study, prevention, maintenance and restoration; prevention is the set of activities designed to limit any risk situation related to cultural heritage where it is; maintenance means the set of activities and interventions designed to control the conditions of the cultural property and its parts and also to preserve its integrity, functional efficiency and identity; restoration means the direct intervention on the cultural property through a series of operations aimed at preserving its material integrity, to restore it and protect it, in order to help its cultural values be communicated. In the case of buildings situated in areas at risk of seismic activity, restoration includes structural improvement works.*

10 It was chosen to use lime mortar and water-reactive lime for the lower part of the wall in contact with the water. Grain size and color had to be similar to the existing neighboring joints, after having been cleaned.