Identity and regenerated landscape - An opportunity for the 'new' paper mill-museum in Tivoli.

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Abstract

The former Amicucci-Parmegiani paper mill in Tivoli, Italy, has been abandoned for a long time but is now the focus of a design competition for its restoration. This mill is part of a larger network of disused industrial paper mill settlements along the Aniene river, which reflect the area's history of production. The New European Bauhaus [1] strategy seeks to revitalize old structures by incorporating new approaches. In this case, a Sapienza startup has developed a remarkable example of renovating, repairing, and reconstructing the modern built heritage. Rather than discarding the past, it is important to work with the history of buildings and adapt them to current needs. This requires understanding and respecting the materiality and history of inherited structures. The proposed intervention strategy for the Amicucci-Parmegiani paper mill aims to preserve its industrial identity while incorporating a functional program that engages the community and showcases the building's history [2]. By following these principles, the renovation project will ensure the building's significance is maintained while meeting contemporary requirements [3].

Keywords: building rehabilitation; urban upgrading; landscape redevelopment; retrofitting of built heritage.

1. INTRODUCTION: VOIDS TO BE RETURNED TO THE CITY

The area in question has a long history of industrial activity, which has left its mark on the edge of the medieval urban fabric of Tivoli downstream [4]. Since the end of the nineteenth century, new construction and production technologies have been prominent in this fringe of the city. The massive industrial constructions have left a new margin of construction that has decisively questioned the ancient landscape relationships between city, land and river (Figure 1). It is evident that Tivoli requires regeneration, with the recognition of the values observed in the oldest and most recent forms of urbanisation. This should inform an overarching rethinking of the territory.

The Municipality of Tivoli, the proprietor of the building, has initiated a design competition with the objective of transforming the current industrial ruin, which has a significant negative perceptual-functional impact on the city, into an important and strategic opportunity for urban transformation. The former Amicucci-Parmegiani paper mill represents a waiting space, an urban void, so defined not because it lacks volumes but because it has lost its original functions and its meaning within the fabric of the city. The redevelopment of the area occupied by the building and its functional rethinking aim to generate a process of urban regeneration through the improvement of aspects such as the architectural perception of the context. This is to be achieved, in particular, through the redesign of the downstream façade, the attractiveness towards the city centre, mobility, the environment and integration with the surrounding landscape, sociality and economy. This is to be achieved, in particular, through the possibility of creating new public spaces and/or municipalities as closely as possible in connection with

the existing urban fabric. The area is of considerable scenic importance, given its position in close proximity to the historic centre and a number of important landmarks, including the Cathedral to the south and the valley formed by the course of the Aniene river, the waterfalls and the church of S.M. di Quintiliolo on the opposite side to the north, and the Sanctuary of Hercules the Victor [5].



Figure 1. Map of the ex-industrial areas born during the end of the nineteenth century (from the Technical-illustrative report of the "Design Competition for the construction of the auditorium and car park in the area of the former Amicucci Parmegiani paper mill" - source: Municipality of Tivoli)

2. THE FORMER AMICUCCI-PARMEGIANI PAPER MILL: ROOTS, TRANSFORMATIONS AND DECLINE

2.1. Industrial archaeology in tivoli: the values of a fertile territory

The medieval urban fabric of Tivoli is characterised by numerous ancient and modern canals. Since at least the 16th century, there have been numerous paper mills, ironworks and tanneries in the area, which were moved by water. From the beginning of the 20th century, structures were installed that had been in place since the previous century. These were fed by the waters of the Aniene, which were exploited through a system of underground canals. This enabled numerous paper mills, mills and factories to be fed [6]. As a consequence of these natural and industrial factors, the region became the site of the first hydroelectric power development and utilisation in Italy. Tivoli was the first city to benefit from electric lighting, produced by hydraulic motors in 1886 [7][8]. Huge industrial structures, predominantly constructed from reinforced concrete, are being erected on previously occupied sites, with the construction of new structures replacing and expanding upon existing ones. The context is that

of a medieval city with a walled edge comprising historic industrial concrete structures, including the former Amicucci-Parmegiani paper mill.

Some of these structures serve only to preserve the values of work and the memories of intangible data. Others stand out as involuntary monuments with the intriguing shapes of reinforced concrete, a material that has become a defining feature of industrial architecture. Finally, there are those that contain some technological or scientific innovation, such as power plants or avant-garde architectural construction solutions. The concept of heredity encompasses many elements, including environmental and conservation issues. The consequences of neglect have manifested in the form of collapses and serious deterioration. However, despite the laudable intentions of some renovation operations, they have already resulted in the loss of architectural elements of considerable value. One such example is the metal vaults designed by Gino Covre for the Tiburtina paper mill¹ [9].

Historically, the area was characterised by an organic connection between the building fabric and the naturalistic emergencies, with the presence of cultivated terraces.

The relationship between the buildings used for productive activities, the city and the residences of the occupants of the sector in Tivoli was somewhat unconventional. Despite the industrial development, there were no workers' quarters. This immediately highlights how the phenomenon of urbanisation, which was typical of the period of the Industrial Revolution, did not occur here. This is evidenced by the fact that the city did not experience the "evils" of many cities.

The causes of this positive development can be attributed to two factors. Firstly, there was a gradual process of growth over time, during which the search for spaces and functions took place within existing buildings. Secondly, the historic centre represented the residential district of reference, thus generating a balance between home and workplace, between living and working. Conversely, since the paper mills and other industrial plants were abandoned, there has also been a gradual exodus of inhabitants from the medieval quarter.

In the ancient industrial area of Tivoli, therefore, important remains of the classical age coexist with paper mills, factories and related infrastructures, including, in particular, canals. The heterogeneous and overlapping elements make it challenging to identify the historical character of each individual part.

2.2. Historical evolution of the paper mill

The Amicucci-Parmegiani paper mill is characterized by a continuous evolutionary development over time that began around the '20s and ended during the '60s. (Figure 2)

Phase 1: In the early 1920s, construction began on the first building, replacing an old barn. In 1925, the mill expanded eastward, adding a new section towards a nearby alley.

Phase 2: Between 1934 and 1938, a driveway courtyard with concierge and loading floor was built on the north side of Tani Square. In addition, a boiler room and a new building for staging were built in the eastern part of the courtyard.

Phase 3: From 1940 to 1946 there was a significant northward expansion of existing structures. The buildings were used for both main and ancillary functions, including technical rooms and production facilities.

Phase 4: In 1947, the downstream building was expanded eastward to accommodate the first line of paper machines. Another smaller building was added for processing with a Dutch beater. In 1949, further extensions of the central building and boiler room were carried out.

Phase 5: In 1951, the original building was expanded with a large canopy and the courtyard was rearranged for the unloading of raw materials. The boiler room was extended to the west and a new warehouse was built to the northwest, partly on ancient Roman ruins.

Phase 6: In 1952 a significant expansion occurred, expanding the continuous machine building to install a second line with a

Workshop attached. The extension also included two upper floors for the storage of straw.

Phase 7: In the early 1960s, the mill expanded further with the construction of a new production line in the Northwest, which involved the demolition of existing structures. At the same time, the offices adjacent to Piazza Tani were demolished and rebuilt to improve the unloading of raw materials.

The former paper mill is situated on a steep slope, connecting a high summit elevation with a lower valley floor elevation. The slope has a sharp inclination ranging from 80° to 90° and is divided into two sub-vertical sections, separated by a narrow terrace that accommodates "Via degli Stabilimenti", a partially disused roadway. On 9 April 2009, a part of the paper mill collapsed, resulting in the immediate collapse of a section of "Via degli Stabilimenti" that passes through a tunnel. The collapse was likely caused by aftershocks from the L'Aquila earthquake. The slope is presently affected by two active landslide escarpments, as identified in the hydrogeological plan of the Central Apennine basins. However, these escarpments are only partially protected by deteriorating masonry support structures.



Figure 2. Present day situation: in the image (2020), we can see the actual state caused by the 2009 massive collapse, immediately upstream of a section of "Via degli Stabilimenti" that runs through a tunnel. (from the Technical-illustrative report of the "Design Competition for the construction of the auditorium and car park in the area of the former Amicucci Parmegiani paper mill" - source: Municipality of Tivoli)

3. THE 'NEW' PAPER MILL-MUSEUM: AN EXAMPLE OF RESILIENT URBAN REGENERATION

3.1. Methodology

The subject of this analysis is a section of the former paper mill complex, which is located in a strategic position overlooking the valley in which the Aniene flows. The mill has been decommissioned from all operational activities and is now in a state of complete disuse and deterioration. It is accessed via two main entrances: one on the north side of Piazza Tani and one from 'Via degli Stabilimenti'. The factory, comprising five levels, reaches a maximum height of 30 metres on the north elevation and has a linear development of approximately 160 metres. The surface area of the interior spaces of the current building is approximately 20,000 square metres, for a total volume of approximately 92,000 cubic metres. In addition, there are a series of external spaces adjacent and functionally connected to the Paper Mill, with a total area of approximately 2,400 square metres included within the perimeter of the Amicucci-Parmegiani complex. In order to ascertain the surface area, the central portion of the building, which had collapsed since 2009, had to be taken into account. This had created a generally dangerous

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situation which extended to the underlying gallery and "Via degli Stabilimenti". Consequently, measures had to be taken to ensure the stability of the slope in question.

Figure 3. State of design: Demolitions and reconstructions. Section of "Vicolo del Riserraglio" and the new connection. (source: BEST Design)

The final design choices serve to confirm and deepen the criteria and strategies established during the preliminary elaboration phase by the Municipality of Tivoli. Given that the building is a listed one, the general objectives of the project proposal were presented at meetings with the municipal administration's technicians and at a meeting with the Soprintendenza Archeologia, Belle Arti e Paesaggio per l'area metropolitana di Roma, la Provincia di Viterbo e l'Etruria meridionale. These meetings were held to discuss the redevelopment and valorization of the building block of the former Amicucci Parmegiani Paper Mill. In particular, the general hypothesis was presented as a framework for the project solution, which was then developed in accordance with the following guiding principles: The addresses of transformation and protection indicated in the historical-artistic report attached to the Decree² of constraint of historical-artistic interest pursuant to Article 12 paragraph 2 of Legislative Decree 42/2004 applied to the building complex.

The overarching objectives of the Design Competition3, in addition to the programme of uses and the delineation of the perimeter of the areas to be demolished in relation to the portions to be conserved, placed particular emphasis on the landscape relationship of the complex, in terms of its visual relationships with the valley system of the former paper mills, up to the complex of the Sanctuary of Hercules the Victor, and in relation to the opposite slope, where the complex of the Sanctuary of Maria SS. The Del Quintiliolo building is situated.

3.2. Architectural Design Strategies and Criteria

The industrial enclosures that overlook the valley form impermeable urban blocks of excessive size, which are ill-suited to pedestrian-oriented urban use [10]. The canals, which are mostly underground, still cross these compendiums, and their enhancement suggests a strategy of "crossings". A detailed examination of the compendiums reveals that the distributive was an extension of the urban routes. It is reasonable to suggest that the reopening of the now-closed enclosures of industrial realities would constitute a credible part of any strategy. This would be based on a mixture of new uses whose establishment would present an opportunity to bring out and enhance the phases and vicissitudes of the complexes, and to integrate them with the waterways and the industrial processes. These considerations must, however, be congruent with the forecasts of future use of the asset. In the case of the former Amicucci-Parmegiani paper mill, the intended uses have been outlined as part of an overall function of museum space dedicated to the fundamental segment of Tivoli's industrial history [11]. This space is intended to be complementary and integrated with the functions of a cultural centre, a civic centre for the city and an exhibition space for contemporary art. These are two distinct functions that require

specific plant, spatial and service equipment. This is represented by a very complex building programme, which can only be fulfilled if conceived in a way that is consistent with the existing object, albeit with different degrees of interaction with the architectural object and the context. The reference model of musealisation is that of alternative spaces, which are designed to facilitate rethinking the relationship between the observer and the work of art. These spaces emphasise the relationships that can be established between the visitor, the work of art, the document on display and the industrial structure. An essential aspect of the project is the integration of the existing listed buildings (the artifacts at the entrance of the former paper mill and the wall along Vicolo del Riserraglio) with the new redevelopment work through an overwriting operation. Additionally, the project encompasses the recuperation and renovation of the minor artefacts located at an altitude of 208.00, in addition to the maintenance and restoration of the wall along "Vicolo del Riserraglio". This wall is characterised by a lower height than the existing wall and a similar horizontal profile to that of the new designed building, which defines the altimetric limit of the new building.

From the outset, the museum project sought to identify potential risks and elements that could oppose the decision to repurpose the property. This was done with the understanding that there was a risk of falling back into the practice of *damnatio memoriae*, which is the destruction of historical or architectural testimonies of strong interest. The provisions of the commissioning administration are equally stringent. In fact, the administration has expressed its personal interest in demolishing the ground floor, with access from Piazza Tani, in order to give the city a suggestive panoramic view of the valley. Furthermore, numerous studies have demonstrated that demolition activities result in significant CO2 emissions into the environment. In order to address these concerns, it will be necessary to implement selective demolition operations, focusing on the non-constrained areas, with the aim of reconnecting with the historic centre and extending Piazza Tani. This will enable the full enjoyment of the admirable and evocative views. Additionally, it may be possible to highlight historical and cultural aspects of relevance related to industrial archaeology, such as the processing chain of the former paper mill. The relationship with the landscape of great value for the view of the valley below and the opening towards the countryside, as well as the opening on the ground floor to ensure visual integration with the Tower of Santa Caterina located in the western area of the complex, which represents a distinctive architectural and geometric sign, will be sensitive issues. However, they are not only of the immediate context, but also of the entire skyline of the historic centre of Tivoli.

European policies are becoming increasingly rigorous in supporting and promoting recycling and reusing construction materials. The Municipality of Tivoli, as the client for the musealization project, shares this perspective and has requested particular attention to the reuse of materials resulting from demolitions. Various techniques and strategies for reuse exist, but they can primarily be categorized into two approaches: the first involves disassembly, particularly for finished elements such as fixtures, structural metal elements, and prefabricated components. The second approach involves the demolition of components, such as concrete elements, followed by controlled crushing to separate materials. In this case, the materials are concrete and steel, which are then recycled and reused. This practice of recycling elements from demolitions or decommissioning is commonly known as upcycling. The term upcycling is based on the principle of giving a second chance to elements that are capable of serving new functions and being part of new contexts. Given the proven scarcity of available resources and the primary necessity to recover and reuse materials with this potential, the ongoing project aligns with this recycling logic. It envisages on-site storage of discarded materials and their reuse or sale to third parties as raw materials.

4. THE ADAPTIVE REUSE PROJECT

The proposal for the restoration and reactivation of the historic building that forms part of the former paper mill complex in Tivoli aims to establish a Paper Museum that serves as both a cultural hub and a historical testament to the role that paper mills have played in the city's industrial and economic history. This intervention is of great importance for the city and represents a significant urban regeneration project. Its aim is to create a cultural structure of high architectural quality that will perform the function of a catalyst for cultural and relational activities, capable of revitalising the entire urban area of reference [12]. Initially, the option of demolishing the entire building was considered in order to facilitate the design of the museum settlement from scratch. However, this was rejected due to the potential for the work to be redeemed and the substantial economic and environmental sustainability of the redevelopment and regeneration of the asset [13].

The project proposal entails the demolition of the existing volumes at the height of "Piazza Tani" (altitude +208.77 m), which are not subject to protection, and the construction of a new belvedere square, which will serve as a new equipped public space that connects the historic centre with the natural landscape. While prioritising the conservation of the perimeter of the paper mill complex, the project identifies three significant urban themes. The first of these is the landscaping of the north and north-west fronts along "Via degli Stabilimenti".

1. The project also proposes the development of urban connections between Piazza Tani and an elevated area, which could potentially accommodate a future auditorium or belvedere square.

2. A fundamental limitation of the project is that the maximum height of the summit must not exceed the level of Piazza Tani, which allows for an extension of the square and panoramic views of the valley and the Roman countryside.

The redevelopment project aims to optimise the panoramic views of the area while enhancing the urban fabric and architectural features. The functional reorganization of the paper mill ensures the preservation of significant elements while incorporating contemporary needs. This process involves the selective preservation and demolition of non-essential parts, with a particular emphasis on the preservation of historically significant elements. In accordance with the stipulated constraints, the project provides for the maintenance and restoration of the existing volumes that allow access from Piazza Tani. These volumes will house spaces for catering, information points and bookshops to the east.

Two distinct connection systems are proposed for consideration:

- a. An external public path is proposed to be constructed along the Vicolo del Riserraglio, which will lead to a new public terrace at a level of +204.00 m. This terrace will connect to a future "belvedere basso" square at a level of +199.00 m.
- b. An internal system within the building complex that provides vertical connections between the various levels.

The construction of a new connecting 'plug' is proposed as an extension of the portion of the old control space at the entrance, which is a constrained part of the existing structure. This extension will also include the lift area and a small linear extension. The new spine, which is aligned with the medieval tower of the convent of Santa Caterina, houses the entrance to the service rooms of the museum complex and the vertical connection systems, including the elevator block and new staircase, between the two main levels of the museum building, which are located at 209.00 m. The two aforementioned levels, 204 and 201.00 m.a.s.l., are in direct relation to the new 'low' square.

The functional organisation of the interior spaces is designed to define a promenade, as far as possible in relation to the residual fragment of the Paper Mill complex, in a manner consistent with the narrative of the production process. Nevertheless, the decision to establish, through the binding decree, the portion of the pre-existing building to be preserved, favouring the landscape aspects, prevents the definition of a route adhering to the original production process, as it provides for the demolition of

the eastern part of the complex. In this regard, the proposal entails the delineation of a principal exhibition area at an altitude of 204.00, which will serve as a venue for temporary exhibitions and multimedia installations pertaining to contemporary art and the memory of the paper supply chain. The objective is to establish a malleable space characterised by temporary installations with a fluid layout and a pronounced visual impact. Additionally, an annular path encircling the aisles of the boilers provides a view of both the external landscape and the extraordinary double-height spaces of the former paper mill (mill area and kiln area). This is achieved through a system of walkways.

On level 3, at a height of approximately 197.05, a multifunctional space is planned for educational workshops, events and public demonstrations. This will be created by the construction of an equipped area located below the 'kettle lane'. This is a longitudinal space of remarkable quality that, through the addition of simple furnishing elements and the implementation of an adequate system (lighting and air conditioning), can host permanent exhibitions, events and collective activities for approximately 100 people.



Figure 4. Render of the new entrance of belvedere square. Level at +208.77 m. (source: BEST Design)



Figure 5. Render of the new belvedere square. Level at +208.77 m. (source: BEST Design)



Figure 6. Render of the connection of Piazza Tani to the future "belvedere basso" square at a level of +199.00 m. and the vertical insert to connect the various levels. (source: BEST Design)

5. CONCLUSION

It is important to highlight how the heritage value recognised in the buildings gives priority to the location within the urban and territorial context, opting for selective protection in favour of the value of the surrounding landscape. Emphasis is therefore placed on the integration of the site into its valuable landscape context, rather than opting for a more conservative approach, focusing on the specific

conservation of the buildings. The case study reveals an intriguing positive anomaly pertaining to the safeguarding of an edifice of historical and artistic merit [14]. This situation has significantly impacted the redevelopment of an abandoned industrial site and the integration of a public construction value chain, thereby enhancing urban quality of life. The anomaly is linked to the protection measures imposed by the Italian authority responsible for the safeguarding of cultural heritage, which stipulate a gradual transformation process for different parts of the building complex. This has resulted in the partial demolition of certain structures, a practice that is relatively uncommon in the context of the protection of cultural assets. This selective protection is derived from a specific hierarchy of values attributed to the paper mill complex, with the original building core being accorded the greatest significance. This is situated in a valuable landscape context overlooking the Aniene River and the Sanctuary of SS. Maria di Quintiliolo. This landscape value was deemed to be of greater importance than the preservation of industrial buildings, reflecting a shift in the recognition of the significance of the landscape[15]. The approach is based on the integration of the site into its natural surroundings, rather than solely on the preservation of industrial history. This is achieved by reducing and demolishing parts of the modern factory in order to partially restore the original landscape. The podium opens towards the scenery, framed by the remnants of the former convent of Santa Caterina.

These principles have informed the criteria for the transformation and revitalisation of the area, as outlined in the Design Competition guidelines for the construction of the auditorium and parking area in the former Amicucci Parmeggiani paper mill. In addition to defining the utilisation programme and identifying areas for demolition versus preservation, the competition objectives placed significant emphasis on the landscape integration of the complex. This entailed considering the visual connections between the valley system of the former paper mills and the Sanctuary of Hercules Victor, as well as between the Sanctuary of SS. Maria di Quintiliolo and the opposite side. Maria di Quintiliolo is situated. At the urban level, the project for the recovery of the former paper mill included the creation of three new public spaces at different heights, with the intention of revitalising the urban significance of this landmark in the city of Tivoli. The ambitious project is currently underway and its impact will be assessed in the coming years to evaluate its effectiveness in transforming disused industrial assets into lasting public values and integrating them with historical heritage. In essence, the collective endeavour is not merely to conserve the vestiges of the past; rather, it is to imbue them with new life, transforming industrial heritage sites into catalysts for sustainable development and cultural enrichment. By demonstrating unwavering dedication, ingenuity, and a shared commitment to our cultural heritage, we pave the way for a more resilient and inclusive future, where the echoes of the past resonate vibrantly in the tapestry of our collective identity. As we chart a path forward, we envisage a future that embraces adaptive reuse, cultural tourism initiatives, and community-led empowerment strategies. By capitalising on the inherent resilience and cultural capital of sites such as the former Amicucci Parmegiani Paper Mill, we seek to foster vibrant ecosystems where heritage conservation coexists harmoniously with economic revitalisation and social cohesion.

Notes

¹ Edoardo Currà et al., "Autarky Metal Roofing at the Mecenate Paper Mill in Tivoli, an Unseen Application of Gino Covre's Patents," TEMA: Technologies Engineering Materials Architecture 9, no. 2 (2023): 19–32, https://doi.org/10.30682/tema0902.

² Extract of the constraint of historical-artistic interest placed on the building complex by Ministerial Decree no. 104 of 30/07/2020:

As can be read in the excerpt, the part of the complex located above a height significant for landscape perception and the most recent portion of the building, built in front of the ancient complex of the Convent of St. Catherine, are excluded from the constraint

(...) In the part of the complex to the west, accessible from the square facing Piazza Tani:

1. the part identified by red shading in the drawings on the various levels, which preserves legibly the chain of workings in its vertical development, is subject to protection:

2. the part of the building set at the height of Piazza Domenico Tani (elevation +208) is not subject to protection - due to the poor architectural quality, the degraded state of the structures (mostly cement), and not preserving significant elements of the chain of workings - in order to restore the view towards the picturesque river valley below; and the Quintiliolo hill, which has always constituted, until before the raising of the paper mill, the main attraction of the square itself.

(...) Of the remaining part of the industrial complex, located to the east and of the forecourt towards Piazza Tani:

3. the buildings are not subject to protection, as they are post-1950 and of no historical, architectural or cultural interest.

All demolitions shall be carried out with due caution so as not to cause damage to adjacent parts and with the involvement of an archaeologist for the part at the lower level.

³ Extract from the 'Design Competition for the construction of the auditorium and car park in the area of the former Amicucci Parmegiani paper mill'. , Municipality of Tivoli, 2020: (...) The current building, with its massive out-of-scale volume of the former paper mill, obscures the Tower of Santa Caterina located in the western area of the complex, which represents a distinctive architectural and geometric sign, not only of the immediate context, but of the entire skyline of Tivoli's historic centre. The tower, in addition to requiring urgent consolidation works, constitutes an element with which every design intervention will have to integrate and relate

⁴ Spartaco Paris, "Riflessioni Sul Progetto Di Riqualificazione Del Costruito Moderno: Esigenza, Necessità e/o Opportunità per Ripensare per Ripensare e Rinnovare l'abitare," in Ri-Abitare II Moderno, ed. Spartaco Paris and Roberto Bianchi (Quodlibet, 2018), 19–51.

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