

Abitare la Terra *Dwelling on Earth*

rivista di geoarchitettura a magazine of geoarchitecture

PER UNA ARCHITETTURA DELLA RESPONSABILITÀ | FOR AN ARCHITECTURE OF RESPONSIBILITY

Quaderni



9
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Con il numero 37 la rivista "Abitare la Terra", a quattordici anni dalla sua nascita, cambia il suo formato, ma non il suo obiettivo: la tutela dell'ambiente e la promozione di una architettura, che abbandonata la tendenza all'esaltazione individualistica delle grandi personalità creative, che ha condizionato la produzione architettonica degli ultimi decenni, torni ad essere una disciplina rigorosa, che ha per obiettivo il miglioramento della vita di tutti gli esseri viventi e per questo non rinuncia a utilizzare i frutti di una esperienza secolare che coinvolge le diverse civiltà umane. Il termine Geo-architettura, che si legge nella testata, è stato coniato da Le Corbusier, nel 1942 per la sua riflessione su *Les trois établissements humains* e allude a una architettura che abbracci tutto ciò che l'uomo ha costruito sulla superficie terrestre. Per noi oggi Geo-architettura vuol dire una architettura umile, che, sia arte senza per questo ammantarsi della superbia del nuovo fine a sé stesso, che si faccia carico della necessità di proteggere l'ambiente, di ridurre i processi di inquinamento, di combattere la disuguaglianza tra i popoli, di ridurre i processi che attraverso i cambiamenti climatici rischiano di distruggere gli equilibri del pianeta e il suo paesaggio. Per fondare la Geo-architettura è necessario a nostro parere: imparare dalla natura e dalla storia, rispettare l'identità dei luoghi, recuperare la "coralità" degli spazi urbani, abbattere gli sprechi di risorse non rinnovabili e di tempo umano, contrapporre a uno sviluppo senza limiti, che presuppone una impossibile "crescita infinita", una crescita spirituale di cui si avvertono i primi sintomi anche nella architettura.

Fourteen years after *Abitare la Terra* was published for the first time we have decided to change its format, but not its goal: to protect the environment and promote architecture. No longer an architecture that has abandoned its tendency to praise and exalt larger-than-life creative individuals and the architectural works that have influenced recent decades, but an architecture that is once again a meticulous discipline focusing on improving the lives of all living creatures; an architecture that exploits the "fruits" of its centuries-old history and many different civilisations. The term Geo-architecture at the top of the front cover of this issue number was coined by Le Corbusier in 1942 when he wrote *Les trois établissements humains*; the term refers to an architecture that embraces everything man has built on the earth's surface. For us, Geo-architecture means humble architecture, an architecture that is art without necessarily the arrogance of being an end unto itself; an architecture that assumes the responsibility of protecting the environment, reducing pollution, fighting inequality between peoples, reducing the processes of climate change that may destroy the balance that exists here on earth and its landscapes. We believe that to create Geo-architecture we need to: learn from nature and history; respect the identity of places; reinstate the "choral nature" of urban spaces; drastically reduce the way we waste non-renewable resources and human time; and replace unlimited growth (involving impossible "endless growth") with spiritual growth, the seeds of which are now beginning to grow in architecture.



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sommario summary

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Campi Flegrei, Pozzuoli: georeferenced image taken from the monitoring carried out with the Benecon technological platform, twin-engine aircraft equipped with PhaseOne 150Mpix and TABI 1800 TSR Thermal Search & Rescue sensors.

Editoriale

Carmine Gambardella

3

World Heritage and Dwelling on Earth Ecological Transition, Design for Health, Cultural Contamination

25 and 26 May 2023 in Napoli, 27 May 2023 in Capri

EDITORIALE

Abitare la terra! Questo è l'obiettivo essenziale, sintetizzato dalla denominazione della conferenza, cui abbiamo continuamente teso con i Forum "Le Vie dei Mercanti" lungo gli ultimi ventuno anni. Ancora oggi, questa rimane per noi la stessa prospettiva di lavoro. Un intento da perseguire con ancor più forte convincimento e con persino maggiore efficacia, dal momento che tutti noi siamo coscienti di trovarci in uno stato di emergenza con lo scenario drammatico aperto dai cambiamenti climatici.

Quindi, come agire adesso rispetto a questo imperativo globale?

Per prima cosa, mi piacerebbe partire dal lavoro che abbiamo fatto in tutti i Forum annuali, dagli approfondimenti interconnessi sulla transizione ecologica, la contaminazione, il patrimonio culturale, i disastri ambientali, per ciò che concerne il loro impatto sul World Heritage. In tale modo, la preoccupazione per l'abitabilità della nostra terra ha non solo integrato capacità, esperienze, buone pratiche di ricercatori e accademici, ma ha anche creato una comunità scientifica con provenienze da ogni parte del mondo che fosse in grado di interagire in modo interdisciplinare. Ci siamo fondati sul convincimento che un'azione collaborativa richiedesse,

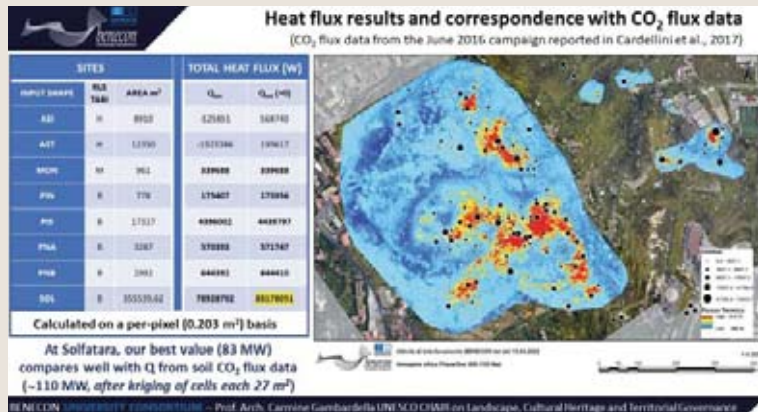


Abitare la terra! Dwelling on Earth! That is the essential goal, synthesized by the title of this conference, towards which we have been working with "Le vie dei Mercanti" forum over twenty-one years. It still remains today the same perspective for us. An intent to be pursued with greater commitment and providing even higher effectiveness, as we all are now aware of being in an emergency with the dramatic scenario opened by climate change.

Therefore, what are we to do now with respect to this global imperative?

First, I would like to start from the work we have done in every annual forum, the interconnected focus on Ecological Transition, Contamination, Legacy, Knowledge and Disaster, as regards their impact on World Heritage. In that way, the concern for the habitability of our Earth has not only integrated skills, experiences, good practices of Scholars and Academics, but has also created a scientific community from around the world for discussing such multidisciplinary topics. We had the conviction that collaborative action requires not only practices for control, but also a reliance on human ability to ever succeed in defending his patrimonial value with the strong determination to re-design our everyday





oltre una prassi di controllo, una profonda fiducia nella capacità umana di riuscire a difendere il proprio patrimonio ereditario rigenerandolo con forte determinazione. Questa è la migliore strategia per trasmettere al futuro i beni che ci ha consegnato la storia e che noi dobbiamo difendere. Lo scopo perseguito è ovviamente non solo quello di poter agire in anticipo rispetto a un disastro ambientale, ma anche di promuovere nel nostro mondo un processo progettuale in grado di ridisegnare la relazione tra ciascun uomo e l'ambiente in cui vive.

Ribadendo in ciascun Forum che “il futuro è un eterno presente”, abbiamo continuato a guardare a ciò che verrà con ottimismo, con la speranza che, cominciando sin d’ora con azioni efficaci e coscienti, noi potessimo porre le basi per il mantenimento di un equilibrio globale. La recente pandemia ha mostrato come, al di là delle strategie resilienti per neutralizzare processi produttivi che si sono mostrati ostili al benessere ambientale, dovessimo ricercare una nuova omeostasi nel nostro ambiente abitabile. Solo lavorando insieme in questa direzione, potremmo efficientemente riadeguare via via le reazioni, in modo da neutralizzare persino gran parte degli impatti ambientali nella ricerca di un nuovo equilibrio.

L’argomento del Forum di quest’anno invita i ricercatori a riflettere sulle buone pratiche implementate con progetti operativi,

places. This is the best way for transmitting to the future the values that heritage has passed on to us and we must protect. The pursued goal is obviously not only to act in advance with respect to an environmental disaster, but also to promote in our world a design process in order to re-design the relationship between each man and his living environment.

Emphasizing in each forum that for us the future is as an eternal present, we have continued to look at the future with optimism, with the trust that, beginning now with effective conscious actions, we can put the basis for maintaining a global equilibrium. Recent pandemic has shown that, apart from resilient strategies for neutralizing productive processes which showed to be hostile to the environment, we need to search for a new homeostasis into our habitable environment. Working towards this direction, we could effectively adjust responses to environmental changes, in order to neutralize even most of their consequences for reaching a new equilibrium.





strategie o proposte progettuali. Obiettivo principale è contrastare il processo che ha portato le persone e l'ambiente in cui vivono alle condizioni inaccettabili che riusciamo fisicamente a individuare con chiarezza nel degrado territoriale e paesaggistico. Inoltre, bisogna pensare a nuove strategie per un progetto difensivo che possa realmente dimostrarsi efficace. Ma ciò che è ancora più importante, una volta resosi conto dell'urgenza della situazione, è che l'enorme responsabilità ambientale ci impone di non fare affidamento su soluzioni semplicistiche. Non c'è alcuna semplice prestazione tecnologica che da sola possa essere assunta *tout court* come soluzione definitivamente ottimale, ma bisogna intervenire attraverso una dinamica osmotica di conoscenze e tecnologie. Solo attraverso un processo di conoscenze continuo le persone possono misurare lo stato del loro benessere e allo stesso tempo agire come garanti della qualità terrestre. Una nozione di "misura", fondata su una dinamica perpetua di conoscenza, può mostrarsi affidabile promuovendo nuovi modelli di sviluppo fondati su un rinnovato Umanesimo. ■

So, the topic of this year's forum invites researchers to reflect on good practices implemented with operative projects, design proposals or strategies. The main goal is reversing the trend which has led people and the environment in which they live to the unacceptable conditions we can physically recognize into territory and landscape decay. Then, we must think about new strategies for an adequate defensive design which can ultimately provide an efficient aid. But which is more important, once we have suddenly become aware of the urgency of the situation, the new enormous environmental responsibility requires us not to rely only on simple solutions. There is no easy technological performance to be assumed as a definitively optimal solution. Only the continuous practice of a "measure" that has been built upon continuous education process may give reliance; people, only with an adequate formation, can measure the state of their wellness and at the same time they can act as the guarantors of earth quality, for a new development model based on a renovated Humanism. ■

Prof. **Carmine Gambardella**, General Chair,
UNESCO Chair on Landscape, Cultural Heritage and Territorial Governance
President and CEO Benecon University Consortium
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1. P. 3. *Mater Matuta*, Museo Provinciale Campano Capua, photo by Giovanni D'Angelo.
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Landscapes in visualisations of architectonic hypotheses

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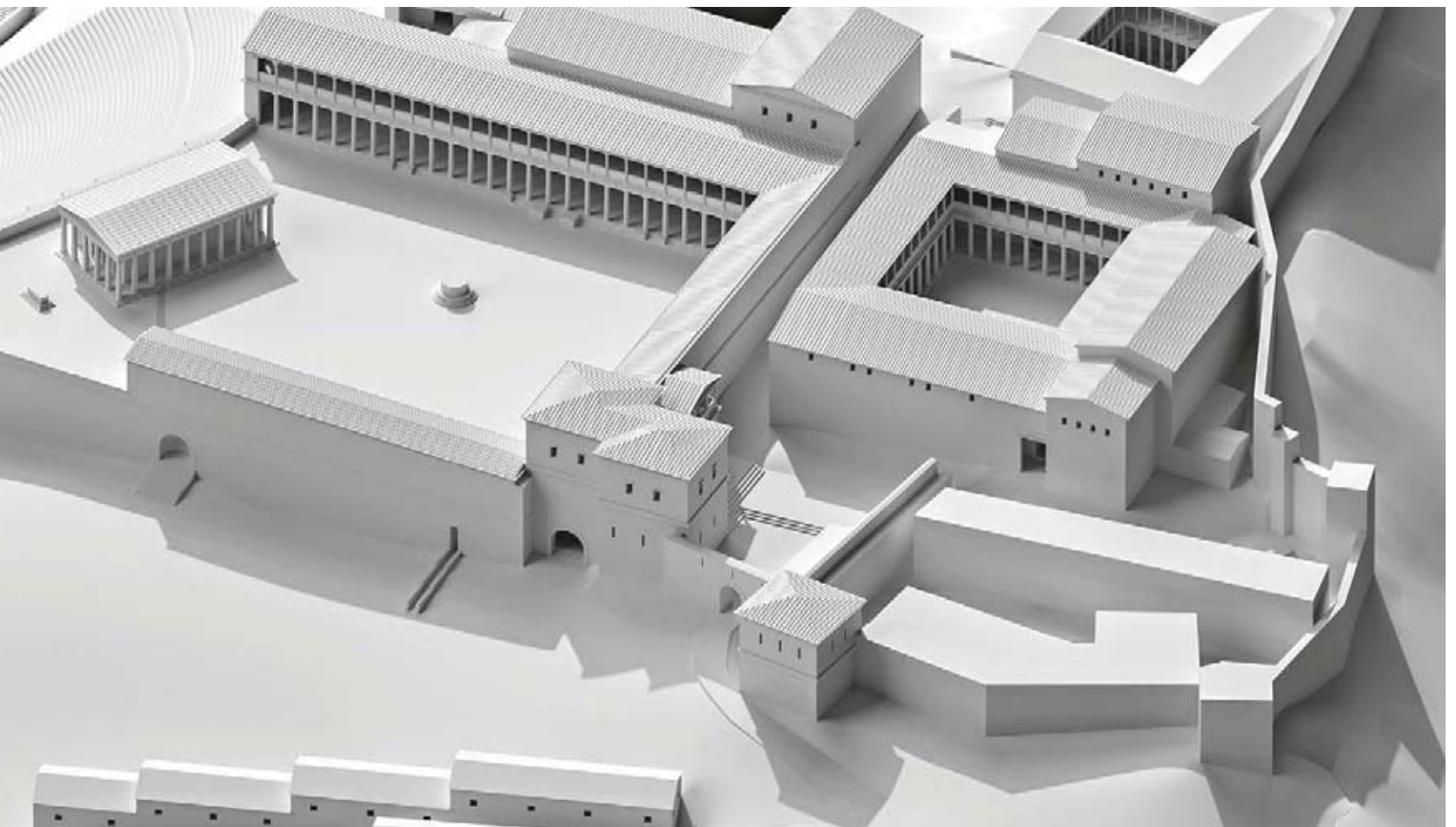
1. Introduction

The relationship between man and his living environment is

the cultural landscape. Making this appreciation visible in historical visualisations of architecture is a particular challenge. In the course of previous scientific visualisations [1,2], the focus has been on architecture, while in the two projects of Pergamon and the Caliphate city of Medina Azahara the view into the

wide landscape was found to be formative for the genius loci. In both cases the landscape, especially the view into the far distance, plays a central role, and it was necessary to adapt the representation to the uncertainty in order to obtain an overall picture of architecture in its context. The challenge in all

of these scientific and at the same time vivid visualisation is to simultaneously achieve the closest possible proximity to the scientific statement, including its inherent uncertainty. This process builds upon two traditional sub-disciplines of architecture, the design of abstract shapes and architectural photography,



i.e. to project abstract geometry as if it were built. In the end, the adaptation of the same principles is necessary in order not to weaken the architectural statement of the virtually built architecture, but at best to supplement it with the landscape context.

2. Idealised Landscapes

Landscape in visual perception consists of freely formed surfaces including rocks, water surfaces and vegetation. Vegetation in the context of scientific representations requires special attention. In the case of Pergamon, research about plants has not yet reached that of architecture. For this reason, no plants are shown even in those places where planting could take place with greater certainty, such as more distant ridges that were most likely forested.

It is similar with consistency as with polychromy, since here the dimension of vegetation, as there the dimension of polychromy as a whole, is not being opened in order to completely abstain from being stated. Distant forests combined with a lack of vegetation on the city hill would insinuate that the city hill

had not obtained any vegetation, which in all likelihood would not be the case.

Quite different is the situation when either sufficient information or at least a scientific statement on vegetation is available or when vegetation is the central topic of the statement. In this case, the discussion shifts to an adequate idealisation in the sense of idealised architecture. In the case of vegetation, more similar to architecture, in order to visually express the naturalness of vegetation, but at the same time also its generalisation, to make it clear to the viewer that the individual tree in this form is not to be understood as an individual, but rather as a placeholder either of its specific or even of its general genus, for example a tree.

Water surfaces, as elements of visualisation, are in some ways the counterpart of vegetation. While vegetation cannot help but display somewhat natural forms, which means that the individual element would often be interpreted as vegetation even in the absence of context, the visual presence of water surfaces is characterised by properties that would not be mentioned

in the characterisation of the material. Primarily, water would be described as fluid and transparent. In the context of landscape representations, on the contrary, water is primarily perceivable as a flat plane in the midst of either an architecturally equally flat or a landscaped curved surface in contrast at first. This circumstance is not comparable to the representation of water at close range, as in the *Domus Severiana* on the Palatine [1, p. 698], in which the authors visually simulated the materiality of water by the transition of refraction and reflection. Since in the case of distant water surfaces it is above all the contrast between water and landscape that determines their visibility, the obvious thing to do is to use this effect in the visualisation in the form of assigning to the water surfaces a reflection of a bright sky behind them, whereby the water surfaces stand out by virtue of their brightness, at best the brightest possible white.

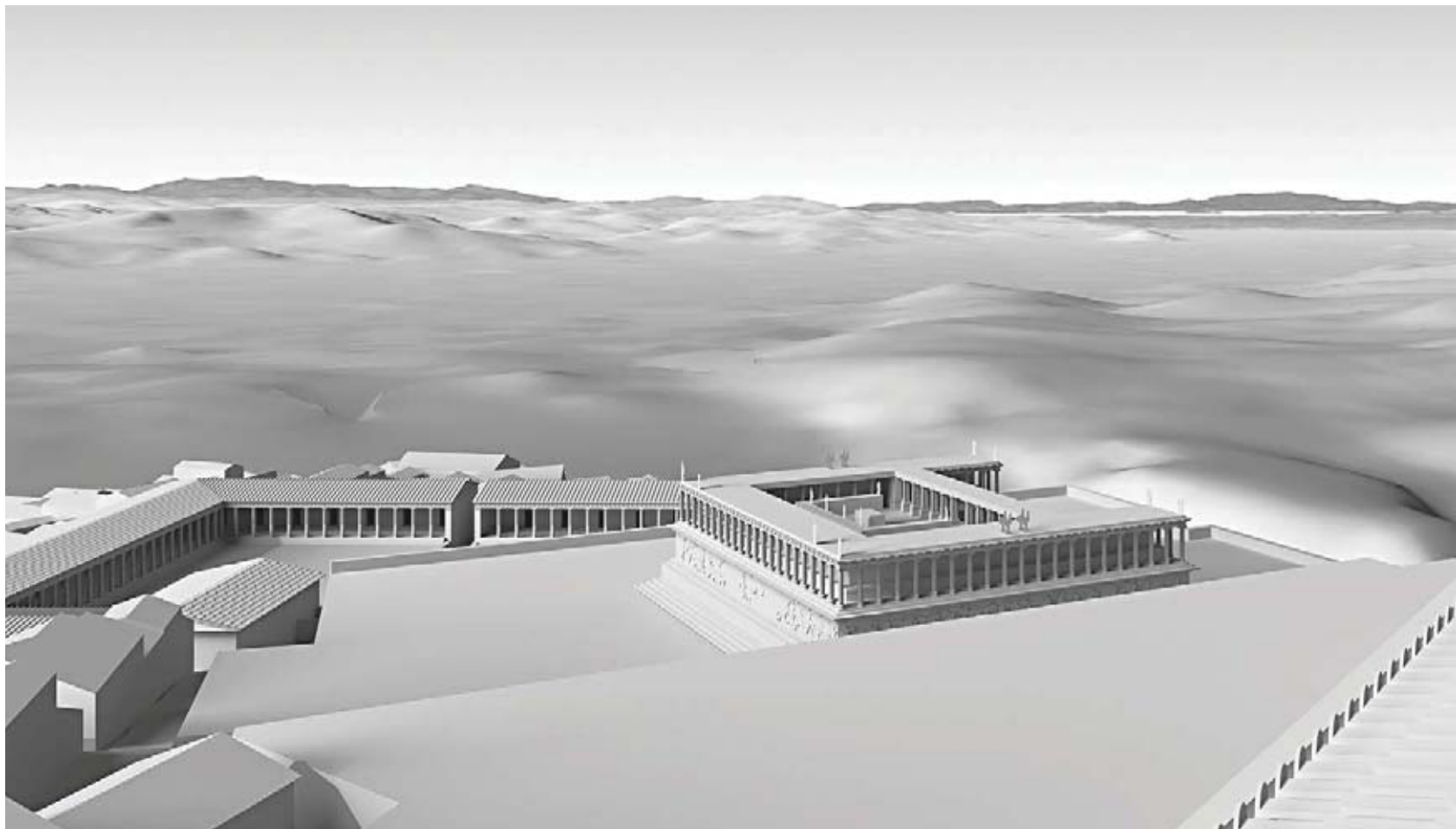
3. Case studies

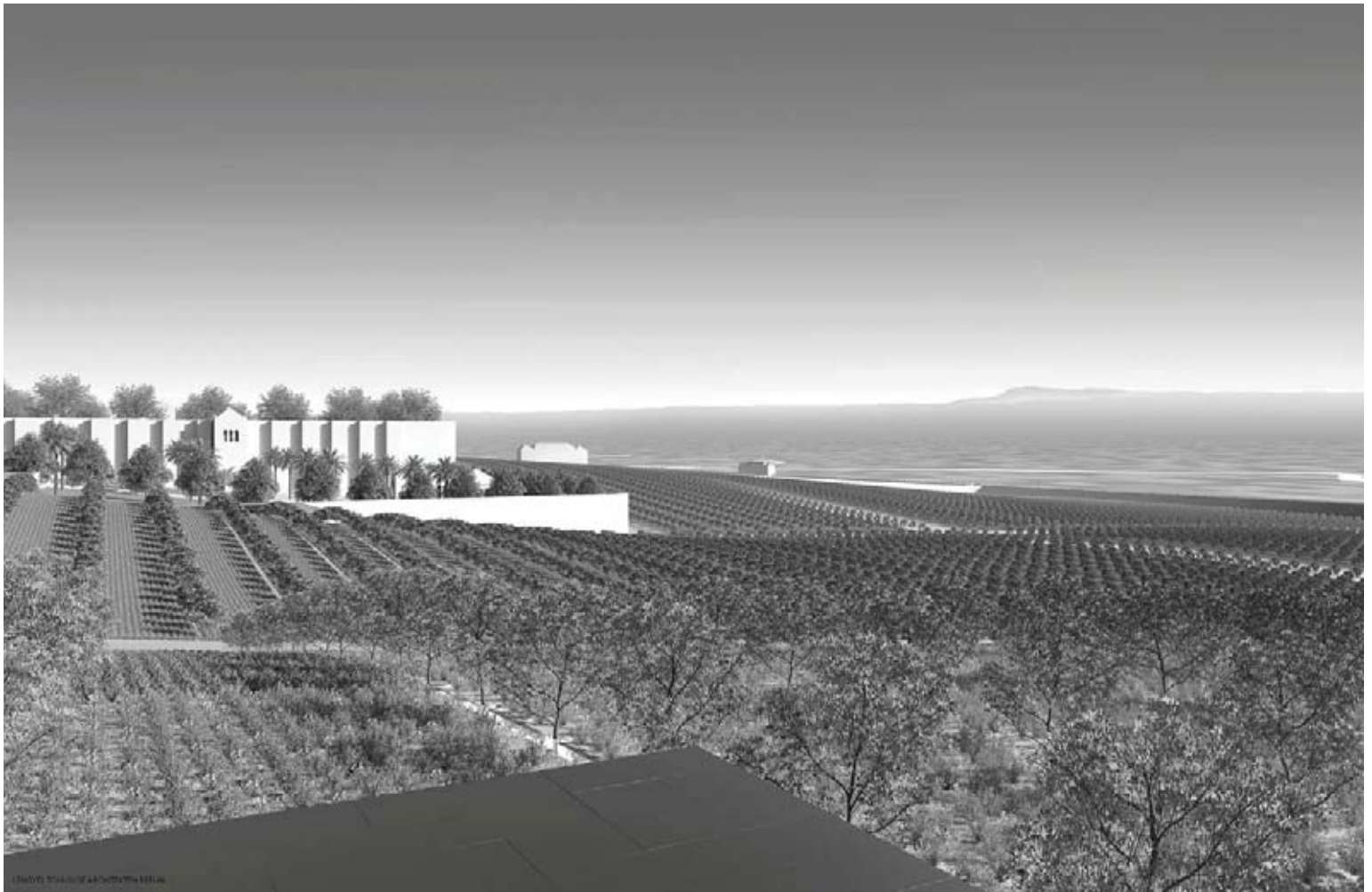
3.1 Pergamon's view towards its harbour Elaia

The project of visualisation

of Pergamon has been running for over a decade in cooperation with the Istanbul department of the German Archaeological Institute (Fig. 1). Attempts to include vegetation on the city hill have so far given way to insufficient information. A special feature are the tumuli between Pergamon and Elaia, the seaport assigned to Pergamon. The vastness of the landscape, which had to be included in the depiction represents the first challenge. Its abstraction, which had to match the architecture, the second.

Finally, a satellite-based model of the landscape was combined with the local capture and, above all, integrated in a highly abstracted way through the visualisation of the water surface. In order to make the reference to the city as vivid as possible, the steeply sloping city prospect was countered with a viewpoint from a window in the tower above the main gate (Fig. 2). In the foreground of this view into the valley (Fig. 3), the Great Altar is clearly visible. The visual reference to the sea is a white stripe in the upper right corner of the picture.





3.2 Medina Azahara's view over its garden

The project of the visualisation of the agricultural plantation of a fruit tree plantation of the Caliphate city of Medina Azahara for the Madrid Department of the German Archaeological Institute shows a plantation of fruit trees built in the middle of the tenth century CE (Figs. 4 and 5).

Here, too, the view into the vast landscape is central. The entire valley was cultivated up to and beyond the Guadalquivir river, so that the landscape is not pristine, but instead cultivated. Equally important is the display of the course of the river. As in Pergamon, the water was represented exclusively by the maximum contrast of the reflection. The cultivated landscape is represented by agricultural zones. Like the abstract architecture, the representation of the vegetation oscillates between individual plant and composed arrangement as a plantation, a set of repeated elements, just as in Pergamon the city texture is foregrounded over the individual building, helping to make its interpretation unmistakable.

4. Conclusion

The visualisation of landscape poses a particular challenge since abstraction cannot be achieved through simple bodies. Rather, the organic form needs to be maintained, not least to preserve the contrast with the architecture. Nevertheless, there are suitable methods of including the landscape, provided that instead of their general characteristics, their visual properties are worked

out. As in architecture, the discipline of visualisation is designed to meet this task adequately as well. ■

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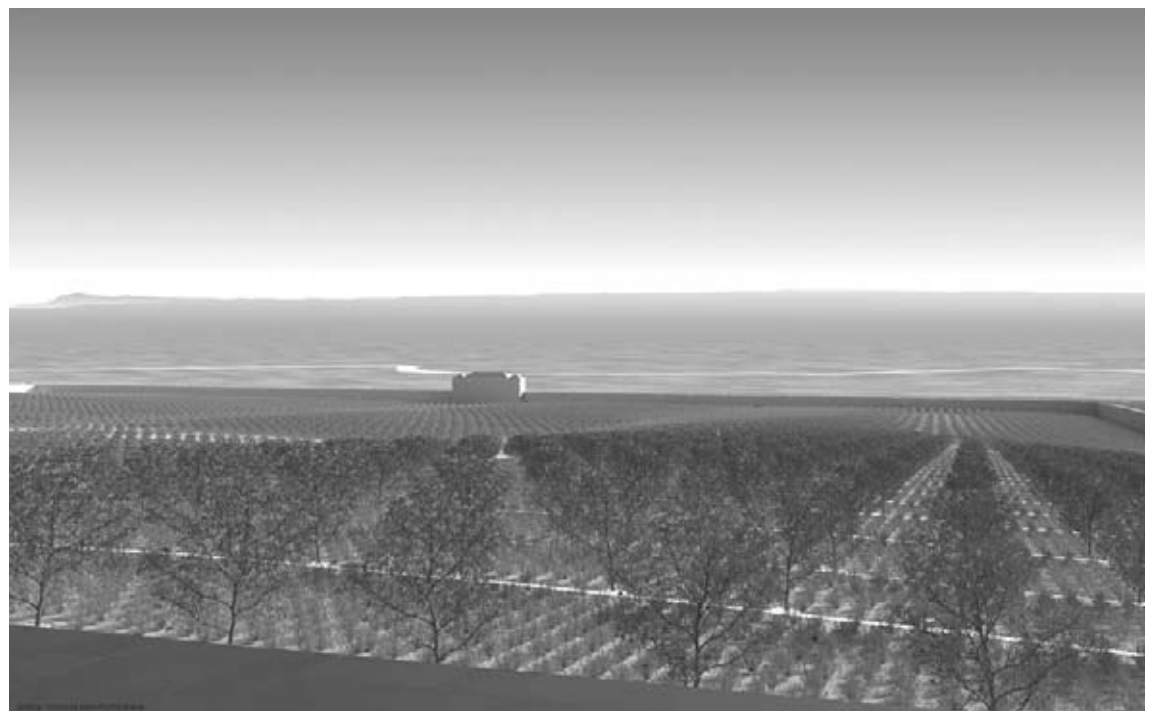
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[4] Office: <https://www.lengyeltoulouse.com>

1. P. 6. Pergamon around 200 CE.
2. P. 6. Castle gate of Akropolis of Pergamon around 200 CE.
3. P. 7. View from window above castle gate towards Elaia harbour around 200 CE with Great Altar in front.
4. P. 8. The Caliphate city of Medina Azahara in the 10th century CE.
5. P. 8. The plantations of the Caliphate city of Medina Azahara in the 10th century CE.



Study for Improvement of Evacuation Safety of Cul-de-sacs Roads in Historic Streets. A Study on the Installation of Emergency Evacuation Doors in Kamigyo-ward, Kyoto Japan

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Keywords: Cul-de-sacs Roads, Blind Alleys, Densely Built-up Wooden Area, Evacuation Simulation, Emergency Evacuation Door

1. Introduction

Kyoto city has extensive dense expanses of built-up wooden urban areas and copious narrow streets, with old town layouts remaining mainly in the city center and its periphery. These densely built-up wooden urban areas and narrow streets pose a major urban disaster prevention problem. They hinder evacuation and rescue efforts during earthquakes and other disasters, including the easy spread of fires. In particular, cul-de-sacs in densely built-up wooden urban areas that cannot be reconstructed may pose problems in evacuation and rescue operations in the event of a disaster. And although Kyoto City is currently implementing a road designation system, this system is based on the premise of building reconstruction

and the expansion of cul-de-sacs and will not be effective immediately. Therefore, it is necessary to eliminate the cul-de-sac without rebuilding. Hence, a new evacuation plan and eliminating cul-de-sacs need to be considered.

In Kamigyo Ward, the primary site of this study, there are 1,288 narrow streets, 69.4% of which are cul-de-sacs. According to the 2012 guidelines for narrow street measures, Kamigyo Ward has a very high percentage of cul-de-sacs, compared to 33% in the city's urban planning area. The purpose of this study is to improve evacuation safety by conducting research on cul-de-sacs and studying practical evacuation plans for cul-de-sacs, considered inaccessible for two-way evacuation, and methods to eliminate cul-de-sacs while preserving the townscape.

2. Methods and subjects of the study

(1) Research Methods

The study's methodology can be described in the following key points:

- [1] Conducting a literature and field surveys of cul-de-sacs in Seishin School District and Demizu School District in Kamigyo Ward to determine their current status.
- [2] Conducting building collapse simulation as a prerequisite for evacuation



simulation to designated evacuation centers in the event of an earthquake. Creating a road closure model based on the simulation results.

[3] Performing evacuation simulations for four different scenarios, described below.

- (1) Simulation of an evacuation to the designated evacuation centers under normal circumstances.
- (2) Simulation of an evacuation to the designated evacuation centers considering road closures.
- (3) Simulation of an evacuation considering road closures when using the existing emergency evacuation doors and privately-owned doors.
- (4) Simulation of an evacuation considering road closures when using the installed emergency evacuation doors and private doors by assuming new addition of evacuation doors in walls and fences along cul-de-sacs or blind alleys of cul-de-sacs.

Using the results of this simulation to evaluate changes in accessibility to the evacuation centers and the effectiveness of evacuation doors.

[4] Conducting interviews with the administration and residents residing along the cul-de-sac to investigate the reasons for the lack of progress in cul-de-sac safety measures.

[5] Making proposals for improvement of the safety of cul-de-sacs based on the results of the effectiveness of evacuation doors and the outcomes of interviews.

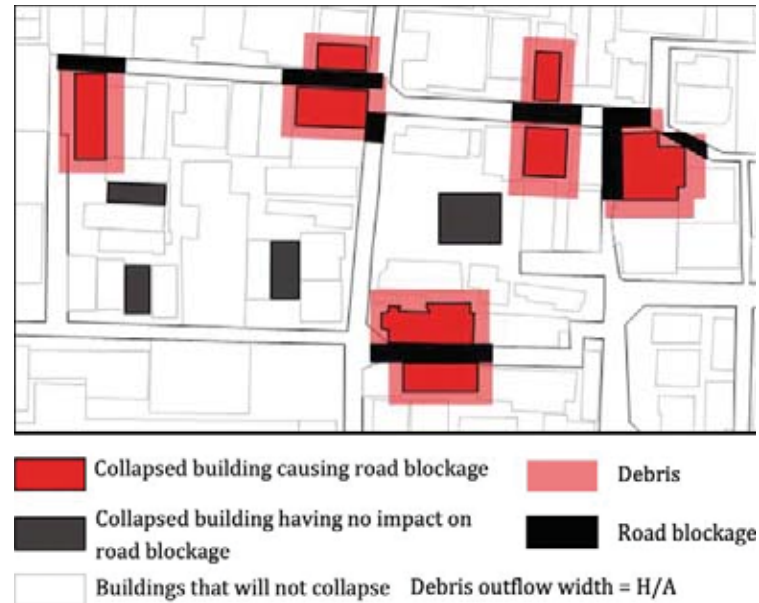
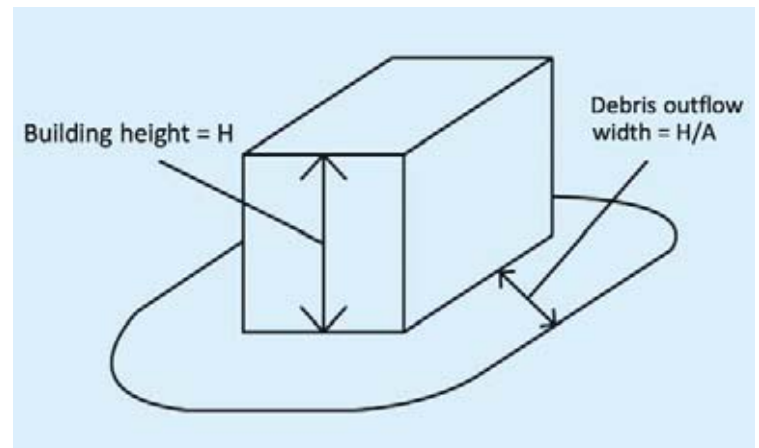
(2) Building collapse simulation

A necessary aspect in considering the building collapse phenomenon is the manner of the spread of the debris generated by the collapse, but the relationship between the phenomena of building collapse and debris generation for a given seismic motion has not yet been fully elucidated. The parameter $A = 2$ was

used in this study, referred from the Great Hanshin-Awaji earthquake surveys. The debris flow width is assumed to extend in all directions of the building by the distance obtained by dividing the building height H by 2. The building height was referred from the former study where the average floor height was uniformly set at 3 m and multiplied by the number of floors in the building.

(3) Road closure model

Since this study aimed to analyze evacuation routes, we assumed that people would travel on foot in the event of a disaster. Also, we considered roads completely covered by debris as road closures. Road and building polygons were generated by the CAD software (Vectorworks) by using the basic map information provided by the Geospatial Information Authority of Japan (GSI). The road was considered a blockage if buffers, assumed as debris flow, were generated from the building polygons and if they divided



Ranking of number of buildings collapsed	Seishin School District Number of buildings collapsed (cases)	Number of buildings contributing to road closures in Seishin School District (cases)	Demizu School District Number of buildings collapsed (cases)	Number of buildings contributing to road closures in Demizu School District (cases)
1	220	149 (67.7%)	375	186 (49.6%)
2	211	147 (69.7%)	372	203 (54.6%)
3	210	144 (68.6%)	371	189 (50.9%)
4	206	140 (68.0%)	369	203 (55.0%)
5	204	134 (65.7%)	368	204 (55.4%)

Ranking of number of buildings collapsed	Without measures	Using existing doors	Using newly installed doors
1 (220 cases)	18.5%	23.9% (+ 5.4%)	32.1% (+ 13.6%)
2 (211 cases)	14.7%	17.9% (+ 3.2%)	26.6% (+ 11.9%)
3 (210 cases)	11.4%	12.5% (+ 1.1%)	21.2% (+ 9.8%)
4 (206 cases)	21.2%	25.5% (+ 4.3%)	37.0% (+ 15.8%)
5 (204 cases)	18.5%	20.1% (+ 1.6%)	27.2% (+ 9.7%)
Average percentage of number of persons evacuated	16.8%	20.0% (+ 3.2%)	28.8% (+ 12.0%)

* Percentages given in parentheses () are the values compared to the case without measures

Ranking of number of buildings collapsed	Without measures	Using existing doors	Using newly installed doors
1 (375 cases)	32.8%	34.9% (+ 2.1%)	38.7% (+ 5.9%)
2 (372 cases)	31.6%	35.6% (+ 4.0%)	40.6% (+ 9.0%)
3 (371 cases)	28.8%	36.4% (+ 7.6%)	39.2% (+ 10.4%)
4 (369 cases)	29.5%	33.3% (+ 3.8%)	38.9% (+ 9.4%)
5 (368 cases)	34.9%	37.7% (+ 2.8%)	41.8% (+ 6.7%)
Average percentage of number of persons evacuated	31.5%	35.6% (+ 4.1%)	39.7% (+ 8.2%)

* Percentages given in parentheses () are the values compared to the case without measures



When looking at the number of people evacuated from cul-de-sacs with proposed emergency evacuation doors installed increased the average percentage of those who were able to reach the designated evacuation centers from 20.0% to 48.4% in the Seishin School District. In the Demizu School District, the percentage increased from 20.8% to 43.2%. From the perspective of cul-de-sacs equipped with newly installed evacuation doors, it can be said that the evacuation doors are effective against road closures. However, as there were many cases in which the evacuation doors were installed but could not be used because buildings near the evacuation doors collapsed, measures related to this aspect are also necessary. ■

1. P. 9. Historical Buildings in Demizu School District.
2. P. 9. A cul-de-sac in Demizu School District.
3. P. 10. Image of debris flow.
4. P. 10. Road closures caused by collapsed buildings.
5. P. 10. Top Five Cases with the Highest Number of Collapsed Buildings and Highest Number of Buildings Contributing to Road Closures in Seishin School District and Demizu School District.
6. P. 10. Percentage of Number of Persons Evacuated in Evacuation Simulation Considering Closure of Each Road.
7. P. 10. Percentage of Number of Persons Evacuated in Evacuation Simulation Considering Closure of Each Road.
8. P. 11. A cul-de-sac in Seishin School District.
9. P. 11. Example of a Three-dimensional Evacuation Route.

the road polygons. During the Great Hanshin-Awaji Earthquake, the road closure rate was about 10% for 8 to 10 m wide roads and 5% for 10 to 12 m wide roads. To facilitate the simulation, the road was not considered closed or blocked if the width of the road exceeded 10 m.

(4) Conditions used to simulate building collapse

This study targets the “Hanaore Fault Earthquake” which is assumed to cause the most extensive damage in Kamigyo Ward. Further, since the assumed seismic intensity of the Demizu School District and Seishin School District in Kamigyo Ward is 6-upper on the Japanese scale, this study also assumed an earthquake of 6-upper on the Japanese scale. For this anal-

ysis, the total collapse rate of non-wooden buildings was not handled, but the total collapse rate of wooden buildings was calculated and put into a Monte Carlo simulation. In this study, Based on a previous simulation of evacuation from along the cul-de-sac to the designated evacuation center, buildings facing roads that are considered impassable and newly constructed buildings assumed to be noncollapsible, and based on Google Street View, collapse simulation was omitted for the buildings that were found to be less than 10 years old. Assuming that all the buildings that got entirely demolished were wooden, the **building total collapse rate** was calculated to be $(1900 + 9200) \div 37347 = 29.7 (\%)$ Using Monte Carlo simulations, we predicted whether a

building would “collapse” or “not collapse” in the event of an earthquake based on this total collapse rate. To identify the cases with the highest number of collapsed buildings, 10,000 simulations were run for Seishin School District and Demizu School District. To analyze the road closure conditions, we selected the top five cases with the highest number of collapsed buildings.

3. Conclusion

The average percentage of those who were able to reach the designated evacuation center in the 5 cases was 16.8% for Seishin School District and 31.5% for Demizu School District when the cul-de-sac measures were not considered. Immediate action for appropriate measures is imperative in both school districts.





Puzzle design Between Vision, Speed, Design and Sustainability

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The cultural and methodological trend in project elaboration follows increasingly specialized dynamics and abilities that are mostly autonomous compared to other themes. They must be achieved quite rapidly, thus losing sight of processes and

integrations of many other subject matters that should bring forth innovative and sustainable solutions, thus becoming most attractive in the territories they are set up in, sites that nowadays most often need urban-regeneration interventions.

The solutions adopted today, more often than not, cause concern for cultural and methodological trends in

project elaboration, which prioritize specialized and autonomous abilities over a more holistic approach, that considers the integration of different subject matters. In the context of urban-regeneration interventions, for example, a more holistic approach would consider not only the physical infrastructure but also the social and economic needs of the community. This

would involve engaging with stakeholders and community members to understand their needs and priorities, and developing solutions that are responsive to these needs while also promoting sustainability.[1] Living on Earth is a complex theme to plan, taking into account the lengthy realization and rapid social mutations, the complexity is even greater if the areas





being considered include Cultural Heritages. These themes cannot be managed by using solely political, philosophical, economical or urban considerations; nor can the architects, archeologists or restorers be left alone in their abilities and competence,[2] it's essential to adopt a multidisciplinary and collaborative approach that brings together various stakeholders and experts from different fields. This approach recognizes that these themes involve complex interactions between social, economic, environmental, and cultural factors, and that no single discipline or profession can address them alone. [3]

Furthermore, it's essential to engage with local communities and stakeholders in the planning and management of these themes. These individuals and groups have important knowledge and perspectives that can help

ensure that strategies are responsive to local needs and priorities, and that they promote social and economic benefits while also preserving the environment and Cultural Heritages.[4] A multidisciplinary approach involves engaging experts and stakeholders from various fields and disciplines, such as architecture, archaeology, restoration, anthropology, ecology, sociology, economics, and politics, among others, to collaborate and develop comprehensive and holistic strategies. Using a Puzzle Design approach can help ensure that the context of the site and the socio-cultural composition of the community are taken into account when developing strategies. In order to create a sustainable project, it is important to consider all of these analytical aspects and have them interact with each other. Social design, Urban design,

Architectural design, Industrial design, Political design, Economic design, and Legal design (we shall call this "Puzzle Design"), all play a role in creating a project that is socially, economically, and environmentally sustainable, as well as safe, healthy, and aesthetically pleasing.

Many projects and achievements have followed a multidisciplinary design methodology that considers various aspects of sustainability, such as social, economic, environmental, energy, health, safety, and aesthetic sustainability. Some examples of such projects and achievements include:

1. The Vancouver Convention Centre West by LMN Architects and MCM Architects: This project is an example of sustainable design that integrates environmental, economic, and social sustainability. It features a green roof, sea-

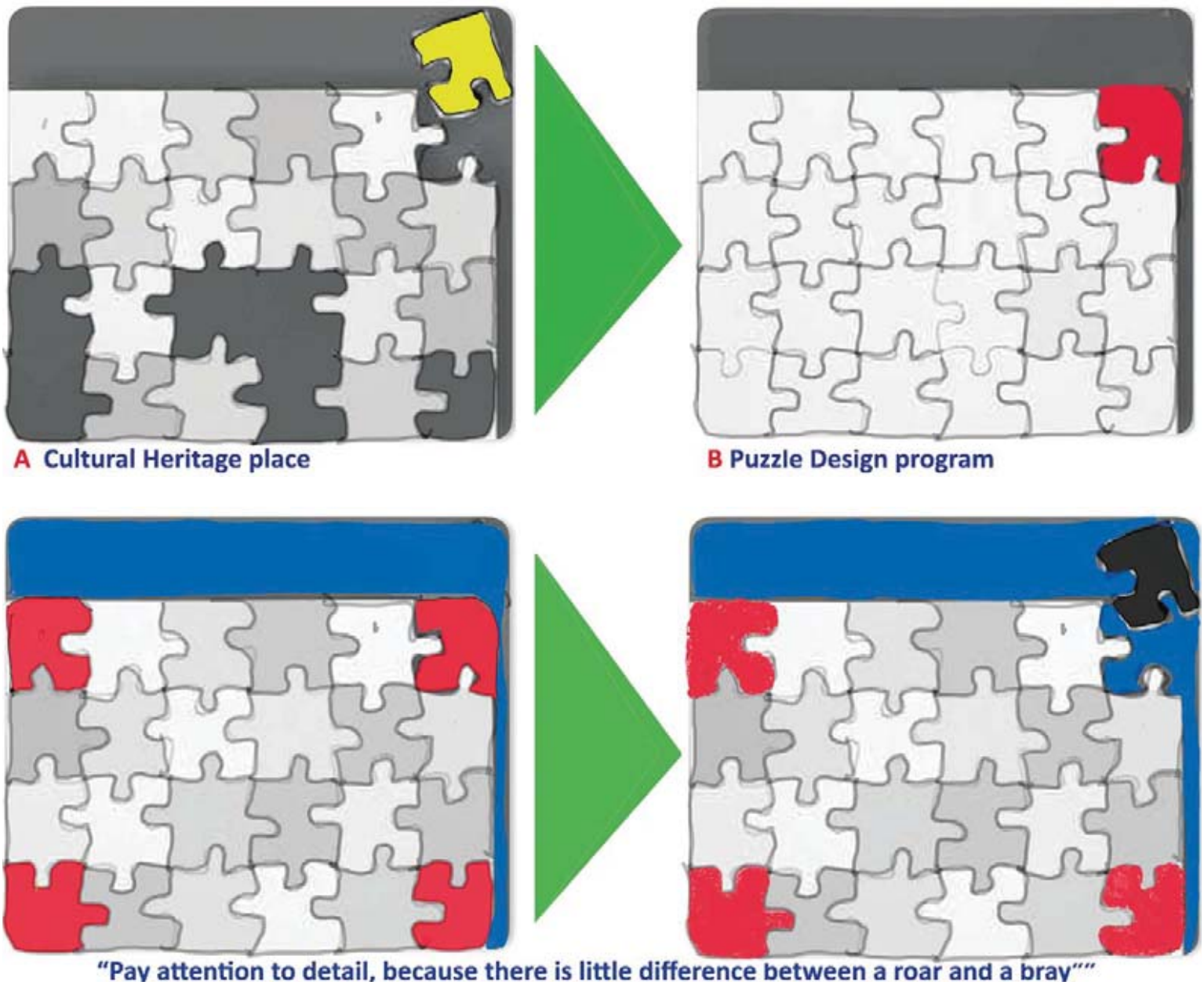
water heating and cooling systems, and a program that employs homeless individuals. [5]

2. The Bullitt Center by The Miller Hull Partnership: This project is an example of sustainable design that achieves net-zero energy and water use, and incorporates innovative building systems and materials that contribute to its energy efficiency. [6]

3. The High Line in New York City by James Corner Field Operations and Diller Scofidio + Renfro: This project is an example of urban design that incorporates ecological and social sustainability. It transformed an abandoned elevated railway into a public park that provides new green space for the city and promotes community engagement. [7]

4. The Masdar City in Abu Dhabi, United Arab Emir-





ates by Foster + Partners: This project is an example of urban, architectural, and industrial design that integrates environmental sustainability. It aims to be the world's first carbon-neutral city and features renewable energy sources, water management systems, and sustainable transportation. [8]

These are just a few examples of projects and achievements that have followed a multidisciplinary design methodology that considers various aspects of sustainability. Many other architects and designers have also embraced this approach, recognizing the importance of sustainability in creating livable, healthy, and thriving communities.

Paraphrasing a quote by G.K. Koenig in the actualization of Puzzle Design we could say: "Pay attention to detail, because there is little difference between a roar and a bray". [9]

In the context of Puzzle Design, we could interpret the quote by G.K. Koenig as emphasizing the importance of paying attention to details and ensuring that the various components of the Design are integrated seamlessly, this requires a multidisciplinary approach that brings together experts from different fields to work together towards a common goal.

The method "Puzzle Design" encompasses the important aspects of Vision, Speed, Design, and Sustainability. A "Vision" is also essential for providing a clear goal and direction for the project. It helps to align all stakeholders towards a common purpose and provides motivation and inspiration for the design process.

Speed is also important, but it must be balanced with a thoughtful approach. Rushing the design process can lead to mistakes, oversights,

and ultimately, a poorly executed project. Therefore, a well-considered speed approach is necessary to ensure that the project is completed in a timely and efficient manner without sacrificing quality or sustainability.

Design is at the core of Puzzle Design methodology. A thoughtful and innovative design can create spaces that are not only aesthetically pleasing but also functional and sustainable. Puzzle Design encourages a multidisciplinary approach to design, incorporating social, economic, and environmental sustainability into the design process.

Sustainability is a critical component of Puzzle Design. It is essential to ensure that the project has a positive impact on the environment, society, and economy.

Overall, recognizes the importance of balancing vision project, speed, design, and sustainability to create

successful and sustainable projects. ■

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- 1. P. 12. Convention Centre West Vancouver.
- 2. P. 12. Bullitt Center Seattle .
- 3. P. 13. High-Line New York City.
- 4. P. 13. Masdar-City Abu Dhabi.
- 5-6. P. 14. Puzzle Design Projects.

BACK R[H]OME

souvenir du posturbaine

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Rome always knows how to be contemporary. It is *Eternal* continually re-interpreting the meaning of living in the layering of its open spaces and in the forms of the social reason acceptance. The Roman Summer and the Wonderful Urban of Renato Nicolini's time as Cultural Advisor of Rome are the re-

cent and perhaps most shining examples of its feature. If the ecological aggression that Rome suffers today (indifference to climate change, CO₂ pollution, land consumption, too many new buildings and the abandonment of the existing, waste, social marginalization, tourism pressure, ...) prevailed over its resilience strength Rome would generate a new landscape. A seemingly informal place where nature and traces of previous

epochs are composed into a renaturalized and meaningful whole: a new *Disabitato Piranesiano* diverse and posturban.

There are at least three fundamental questions for architecture – regarding time, space, and meaning – in order to better understand the world in which we live and how we can produce urban quality, emancipation, culture, beauty and happiness through design today.

What is the fate of architecture (understood as a complex of design disciplines) in an age that seems to consider only – or at least with top priority – the evolution of intangible spaces and related devices? If today – and increasingly in the future – the theme of city development is no longer growth but resilience and environmental quality? Can architectural thinking always remain contemporary? In modernity *genius loci* and





genius saeculi coincide. Art, cities, architecture and fashion realize the age. It would have been unthinkable to dress or design furniture, houses or cities as in the previous century. Today it is normal. While everything is swirlingly changing in the Net and devices for digital connections, it is not so in the material world. Rarely has the distance between *gestalt* and *zeitgeist* been so dramatic. The paradigm that links aesthetics to the projection of time is exhausted. Above all, therein lies the overcoming of modernity. We live as in a long present where sensible forms and their representations in solid space no longer realize an idea of the future. Everything is changing now much faster

than before, but innovation takes place in the intangible spaces of the network rather than in physical space. Ways of experiencing and disseminating knowledge fuel a vortex of accelerated change where the tools and materials of virtual synapses engage lifestyles while more traditional and unconnected spaces tend remain inert or change very slowly.

The simultaneous action of three decisive factors: the economic crisis, the environmental crisis, and the revolution in shared information technologies is so profoundly changing our lifestyles and the way we imagine and desire the solid forms of our future that all our design knowledge suddenly seems inadequate both as an inter-

pretive tool of the current condition and as a device capable of generating new environmental performance, social emancipation, new beauty and happiness.

It is a phase that requires new visions of now and tomorrow (Thomas Khun's paradigms) and a new idea of designing physical space. The quality of the built environment depends above all on the environmental, economic, and social sustainability of interventions. Aesthetic values remain fundamental, but they are changing rapidly, and there is a growing consensus among social and technical actors on three design parameters for the regeneration of physical space that do not oppose but complement each

other: performance, social sharing, and narrative are not proposed as new urban or architectural concepts. They are criteria that identify an anachronistic design attitude in Agamben's sense, anti-aggravated and popular. They emphasize the need to break with a conception of urban development based essentially on the construction of the new. They are views on the meaning of architectural design and the city at a time when the dreamed future is probably no longer what we want, And the existing is the new heritage. The last possible conceptual intervention context for better living.

It is the shift from the aesthetics of signs to the aesthetics of the senses that

lends beauty to a new form of city-landscape that is probably the only sensible form of inhabiting the physical world in the time of the long present, where buildings can become trees and nature is the main infrastructure linking people and quality of life.

This landscape is the mother of new design paradigms in the age of the eternal present. In a sense it contains them all. Franco Farinelli makes this very effectively clear in an article titled “The Return of Landscape” in *la lettura - Corriere della Sera* on Sunday, December 20, 2015, where he states that “Landscape today is the only possible cognitive model (...) exactly as in front of a landscape, in the network between subject and object no distance is no longer possible, no space is precisely no longer thinkable (...) In short: precisely because the opposite of the spatial. The cognitive model of the landscape (based

on the totality and mobility of the subject as well as its indissolubility with respect to the object) is the only one that brings together the epistemological conditions that our world today imposes, and that on our part it is urgent to recognize and assume, if we want to attempt to understand how the world works.”

Landscape replaces the modern idea of territory as a projection of reality on a horizontal plane of representation with a single linear metric measure, because in the landscape as in the network no distance is no longer possible. The landscape, like the network is round. Like the net it is defined through the multiplicity of gazes and actions. Charles Waldheim writes in *Landscape as Urbanism* (Princeton University Press, 2016) that it is possible to compare cities after modernity to the Piranesian uninhabited. *A seemingly*

informal place where nature and traces of previous eras are composed into a landscape dense with meaning and people. Places, but also design tools and devices cannot remain the same in the city beyond the metropolis.

If the modernity that formed us has separated the past from the now by relegating it to history and invented the future as the only dimension in which the present is projected and takes on meaning, in **BACK R[H]OME souvenir du posturbaine** past, present, and future are frozen in the thickness of the now. Time is out of bounds, as Shakespeare writes in *Hamlet*. Time has nothing to do with it. Only social action, ecological performance and narrative can trace back through projects, the meaning and value of the Eternal City and allow those who live it to feel again with pride the sense of belonging. ■

* *BACK R[H]OME souvenir du posturbaine* is the installation of the Department of Planning, Design and Technology of Architecture of Sapienza University of Rome conceived and realized with students for the exhibition *Students as Researchers: “Creative Practice and University Education”* at the Venice Architecture Biennale 2023.

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with



Urban and social renewal in Castel Volturno

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'Luigi Vanvitelli', Italy

Cities and Immigration (Salvatore Losco)

The close relationship between land and migration dynamics is a vast problem affecting the urban sphere as well as the social balance. It is no coincidence that one of the goals of the 2030 Agenda (Goal 11) dictated by the UN General Assembly is to make cities and human settlements inclusive, safe, durable, and sustainable by 2030. An inclusive city can only foresee the integration of differences, and if this is one of the guiding ideas, and different possibilities for reusing spaces that are functional for the inclusion of all must be considered. With a premise, however: integration is the result of the socio-political condition of an area; therefore, to achieve integration understood as “positive inclusion in society”¹, it is necessary that the living conditions of “incumbent” citizens, or a large part of them, are not precarious. This helps to avoid the generation of social, as well as ethnic, conflicts. Of course, the contextual conditions and the quality of life of the community, even before the presence of immigrants, may make coexistence problematic and full of tensions. These are complex situations, which must be addressed by taking into account both components, the social and the urban, and by providing for multiple types of interventions, necessarily complementing each other. If this, translated into urban planning terms, means avoiding imbalances and concentrations and facilitating relationships, the experiences of the last decades have shown that only



with integrated programs is it possible to achieve these objectives on the level of tools and techniques. These make it possible to envisage interventions that contemplate the coexistence of several dimensions, actions, subjects, and financing. Precisely, it is the plurality of approaches that makes these tools particularly useful in any project for the contemporary city, which is increasingly characterized by different forms of degradation: physical, linked to abandonment and often to squatting, and social, due to the presence in precarious conditions of different ethnic groups that go to increase the bands of poverty and marginalization. This approach, as known, can be traced back to the policy of “neighborhoods in crisis” – the “urban areas in which there is a particular incidence of negative factors relating to both the social environment (the concentration of people in conditions

of serious hardship) and the spatial environment (the degradation of building and environmental)”², initiated in the 1980s and 1990s, which introduced the first programming of interventions for the weak classes. In Italy, after the phase of complex and European programming in the 1990s and 2000s, the PNNR fits into this wake and with its multiple measures, from the Innovative Program for Housing Quality, to projects aimed at reducing situations of marginalization and social degradation, to Integrated Urban Plans, gives new impetus to integrated programming. Unfortunately, it still lacks, as noted, “a unified frame of reference,” always dealing with episodic and fragmented interventions.³ Only through the coordination of different proposals, projects, and courses of action, effective results can be produced for the urban regeneration of severely compromised contexts.

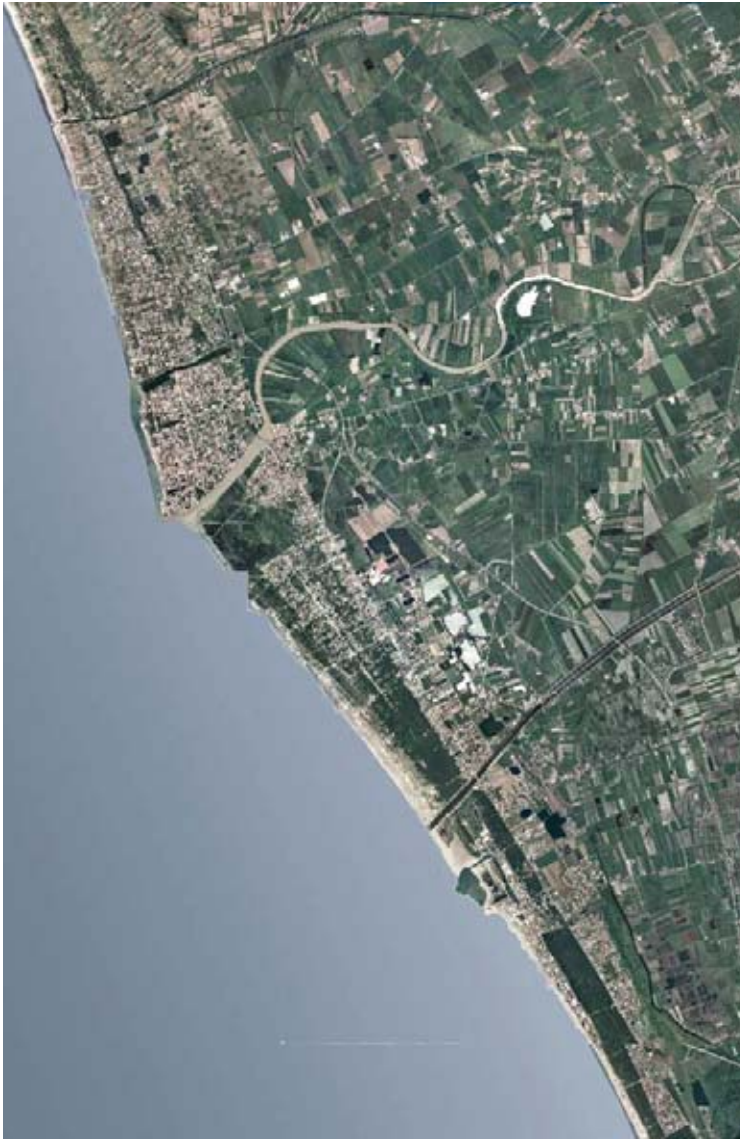
Castelvoturno and immigration (Claudia de Biase)

Castelvoturno is a municipality in the province of Caserta characterized by a relevant presence of immigrants in the area, who have altered the social fabric of the municipality by profoundly affecting the spaces and triggered “a process of re-functionalization of some places, inserting itself into the self-regulating dynamics of the territory”⁴. We are talking about 4933 (ISTAT, Jan. 1, 2022) official immigrants out of a total population of 27,804 and about 15,000 illegal aliens.⁵ As Clemente has written, “the presence of immigrants has changed the face of extensive portions of cities and ... has assumed a relevant role in the functioning of the urban system.”⁶ This is particularly true for Castel Volturno, where the massive presence of migrants has been grafted, as known, into a highly problematic and



A3 ANALISI DELLE MOBILITÀ E FUNZIONI





degraded reality, ravaged by abuse and still lacking urban planning tools.⁷ To offer an idea of the enormity and complexity of the phenomenon, it is sufficient to think about Destra Volturno, the locality in which the African presence is most massive.⁸ Two streets, with almost all illegal buildings, dating back to the economic boom period, devoid of any services, flooded with garbage and occupied by illegal immigrants and a few Italian families, all from the Neapolitan hinterland. On this area, at the moment, only primary interventions are planned: the remaking of the sewage system and the construction of a purifier.⁹ The complexity of the problem (not only that of Destra Volturno) can be addressed at present with urban regeneration interventions (heirs of integrated programs), at the small, medium and large scale, integrating a plurality of dimensions: settlement redevelopment, return to legality, revitalization of the local economy, inclusion of differences and environmental remediation. This is the road that the Municipality of Castel Volturno seems to have taken in recent years, drawing on regional, national and European resources, starting with the funds earmarked for the recovery of property confiscated from the Camorra, used for the joint solution of multiple critical issues. It is worth mentioning here, purely by way of example, the project of “Re-functionalization of assets confiscated from organized crime under the agreement on security, legality and social cohesion in Campania – Faber park assets villetta No. 37, 39 and ex Natale,” approved by resolution of the C. C. No. 5 of January 30, 2018, which provides, as a third intervention, a Multiethnic Kitchen Workshop in a property located in Baia Verde, an area of high concentration of immigrants, which, in addition to being an asset confiscated from the Camorra, insists in a squatter urban fabric.¹⁰ As stated in the report attached to the executive project,¹¹ the structure is destined to become “... a space related

to the various activities of the culinary art embracing not only the typical local cuisine, but also the cuisines of the different ethnic groups present in a massive way in the area, thus promoting integration.” The project, which is not only about recovering a property taken from the Camorra, but also about providing students, future chefs, with a multi-ethnic culinary culture, becomes an opportunity for social and ethnic inclusion, which “is reflected in the way the ... typically oriental-style structure has been integrated into the urban fabric, becoming part of it and a characteristic element of the area.” This single case, of course, is not enough to depict the complexity of the reality and by itself is certainly ineffective, yet it can stand for a virtuous example of recovery, also usefully aimed at integration. ■

Notes

¹ MELOTTI U. (2004), *Migrazioni internazionali: globalizzazione e culture politiche*, Bruno Mondadori, Pavia, pag. 195 e sgg.

² http://www.infrastrutturetrasporti.it/sites/urban/urban26_01_01/cosa/novita.html

³ https://asvis.it/public/asvis2/files/Un_Goal_al_giorno_-_estratti_rapporto/2022/UGaG_estratoGoall1.pdf

⁴ D'ASCENZO F. (2014), *Antimondi delle migrazioni. L'Africa a Castel Volturno*, Lupetti, Bologna, pag. 29.

⁵ https://www.repubblica.it/cronaca/2022/03/30/news/vivere_a_castel_volturno-343348760/

⁶ CLEMENTE M. (2008), *Città interetnica. Spazi, forme e funzioni per l'integrazione*, Editoriale Scientifica

⁷ LUISE M. (2001), *Dal fiume al mare. Un lungo viaggio tra gli spaesati di Castelvolturno*, ESI, Napoli, pp. 103-107. Nel 2009 è stato avviato l'iter del PUC, che è stato adottato il 17 Giugno 2021 con Delibera di Giunta n. 49. Da allora è tutto fermo.

⁸ D'ASCENZO F. (2016) *Disfunzioni migratorie e Territorio*, pp. 132-133, in Petrarca V. (a cura di), *Migranti Africani di Castel Volturno*, in Meridione. Sud e nord del mondo, Anno XVI, N. 3.

⁹ The last intervention, in chronological order, is the one envisaged by Executive Determination No. 563 of December 16, 2021, which provides for “Urgent works on the collector related to the right Volturno sewage network and depurator of the community of Castel Volturno.”

¹⁰ On August 6, 2018, the project was financed with the amount of € 1.479,347.77 (D. D. No. 60) and the work, as planned, starts in October of the following year to be completed in 2021.

¹¹ I would like to thank arch. Claudio Fiorillo for providing me with such a report.

1. P. 18. Perimeter framing.

2. P. 19. Mobility and functions table.

3. P. 19. Analysis of services.

4. P. 20. National Geoport 2000.

5. P. 20. SAM_8678.

6. P. 20. SAM_8727.

Largo San Paolo in Pozzuoli: flexible and connective design

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Analysis and representation of port area in Pozzuoli

(Nicola Pisacane)

The case study discussed in this paper concerns the municipality of Pozzuoli with a particular focus on the coastal and port area. The variations of the coastline in the territory under investigation were the subject of the well-known phenomenon of bradyseism which, causing a rapid rise in ground level in the 1980s affecting the entire Phlegrean area, overwhelmed the urban reality of Pozzuoli causing a profound structural change, necessitating the repositioning of the port of Pozzuoli and the birth of the Largo San Paolo area (the so-called "Piazza a'mmare"), also characterized by its proximity to historical-archaeological emergencies such as the Temple of Serapis (Fig. 1).

The analysis activity conducted aimed to census and represent the temporal dimension not only in relation to the transformations mentioned above but also with reference to the behaviors of the inhabitants, citizens and users of this urban space (Fig. 2). Port areas change throughout the day and throughout the year in relation to the activities that take place in them, moving from moments of frenetic activity to others of total absence, just as the type of user changes: from tourists to workers, from residents to sportsmen. Uses and adaptations to this are also a function of the weather variations revealed by the climatic and wind analyses – with reference to data from the thirty-year period 1971-2000 from the Meteorological Station of Naples, Capodichino –, sunshine and the consequent formation of shadows carried (Fig. 3).

In addition, the analysis of an urban open space cannot exclude a census of street fur-

niture, green areas and their state of maintenance, as well as paths. The ordinary vehicular road system was surveyed and represented along with the pedestrian mobility paths that affect both the square and the piers.

The outcome of the analysis activities revealed potentialities and criticalities of the intervention area that may constitute guidelines for subsequent intervention proposals. Specifically, it turned out that for the urban road network, many sections characterized by the hybrid walkability both pedestrian and vehicular, without adequate safety standards. In addition, the lack of street furniture limits the permanence of citizens and users in general, also due to the insufficient urban lighting caused by the lack of lighting elements and the degradation

of existing ones. Finally, it is to be noted the lack of use due to the technical inadequacy of the parking level at +1.20 m above sea level.

Despite the many critical issues listed above, the area also has values to be preserved and enhanced through an urban redevelopment project. The immediately visible values of the area are related to the wide panoramic view, the presence of buildings of historical value of the municipal villa, as well as the proximity of the city center full of commercial stores and the presence of many regular visitors (Fig. 4).

Flexibility as a design strategy

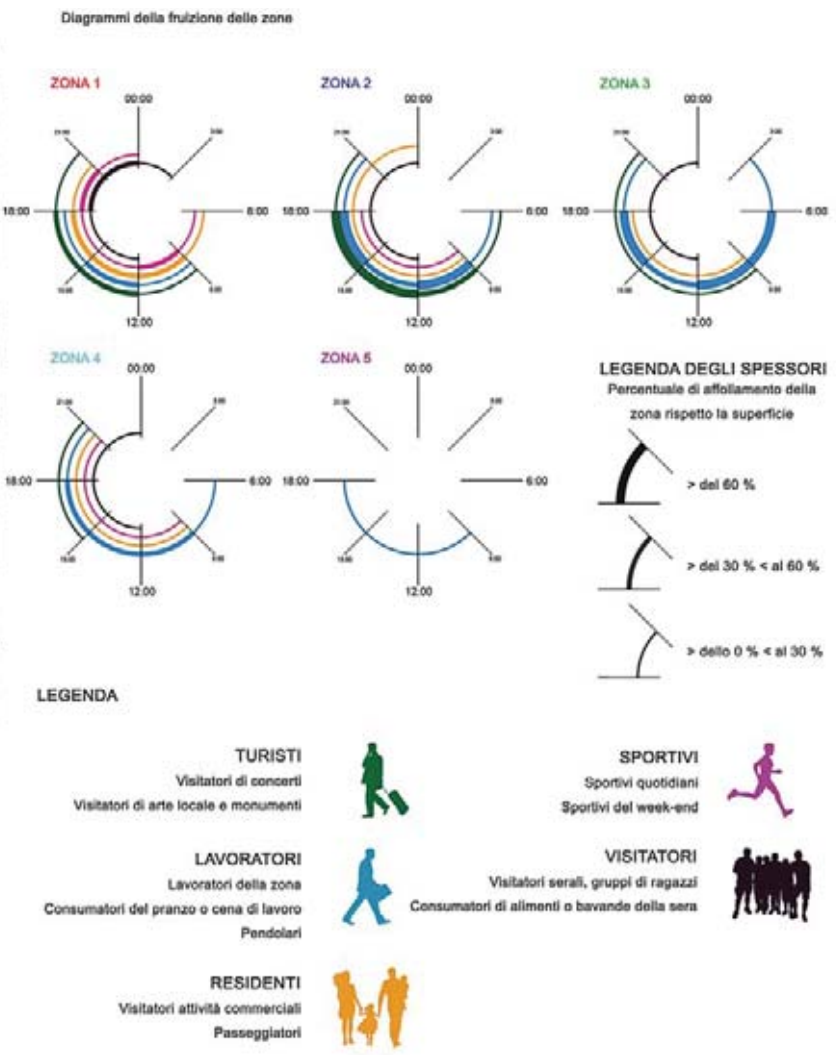
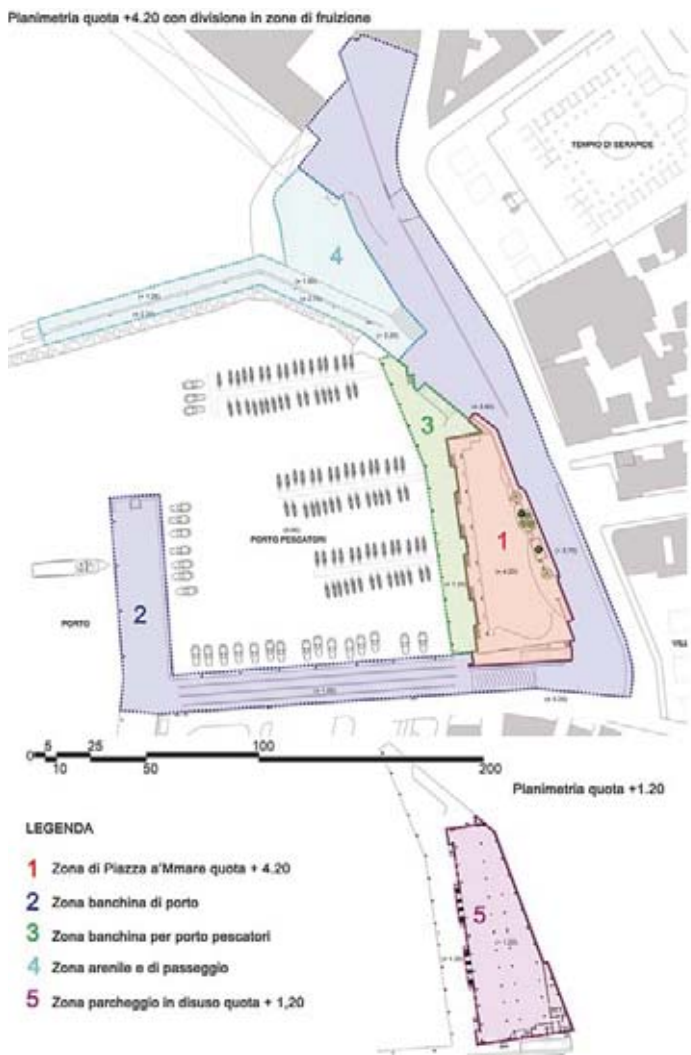
(Francesca Muzzillo)

The above discussed case study is focused on one of the most fragile coastal lines in South Italy. The Pozzuoli coastline,

because of bradyseism, implies continuous changes in the morphological asset of the places, so design efforts in this area are very complex. Variability in the range of plan and altimetry layouts implies an even higher attention to a fundamental principle of coastal design: flexibility.

An innovative cultural movement is advancing new attention to flexible design strategies, with the focus on places which are capable of being prepared to react in advance to natural variable and unpredictable movements. The conviction is that disasters response should also involve adaptive components which are not only capable to react when there is a disaster, but also relying on human capability of widely defending his patrimonial value while forecasting natural events. Pozzuoli is an





emblematic case of this urgency because of its huge heritage value.

This perspective could be pursued by affording the force of the water with diverging segments, retractable closures, advancing or retreating components which are flexible with regards to the variability of water level.

This approach for designing against earth and consequently water movements should be focused on a strategy which could be capable to anticipate previewed technological performances, with digital variability framework in the connection between flood events and a matrix of alternatives. The advanced strategy must be articulated into different phases, considered into a mathematic forecasting series of components behaviors: the first action is a reaction to what must be considered as an obstacle within a certain intensity of the hydrostatic pressure, while successively acting as a host basin after a determinate level of intensity has been overcome. The hypothetical variability of asset could be allowed through movable progression of small parts, serially connected by mobile and remodeling joint elements.

Anyway, there are a lot of different aspects that create a

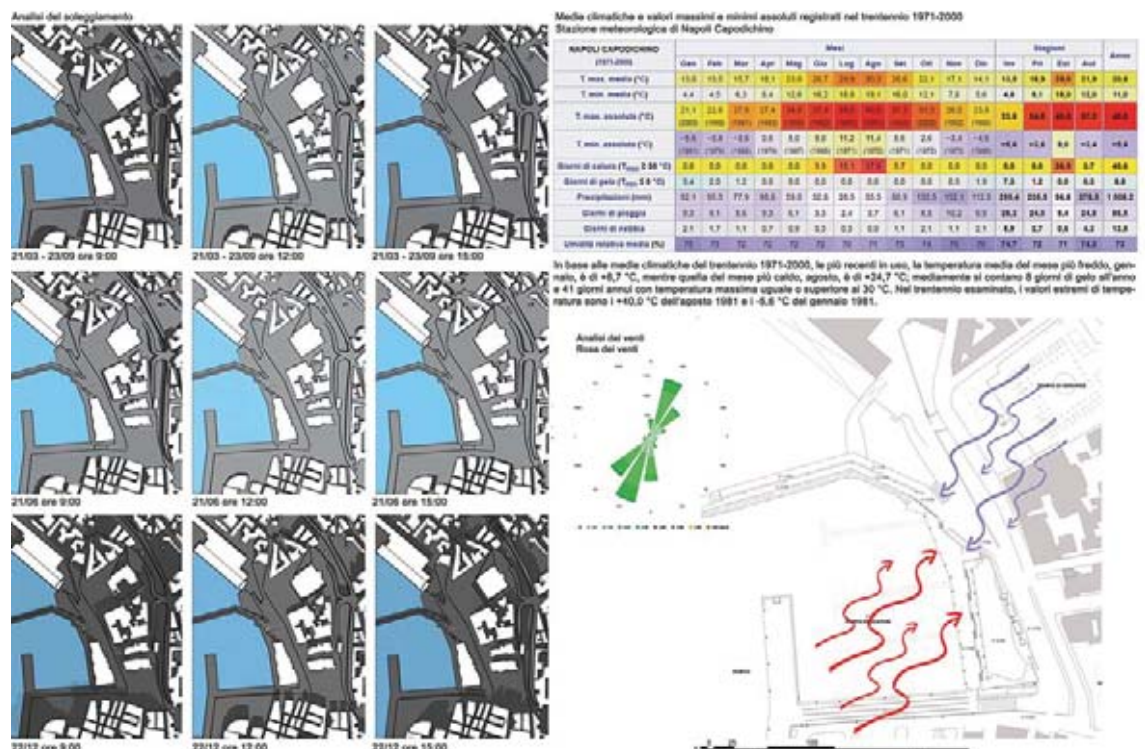
complex critical framework in which this perspective could be practiced. Definitely it is assumed that it is difficult to exactly predict in advance the real dimension of an environmental disaster while designing a project which is effectively opened to various alternative possibilities for resisting to the variable intensity of the water force.

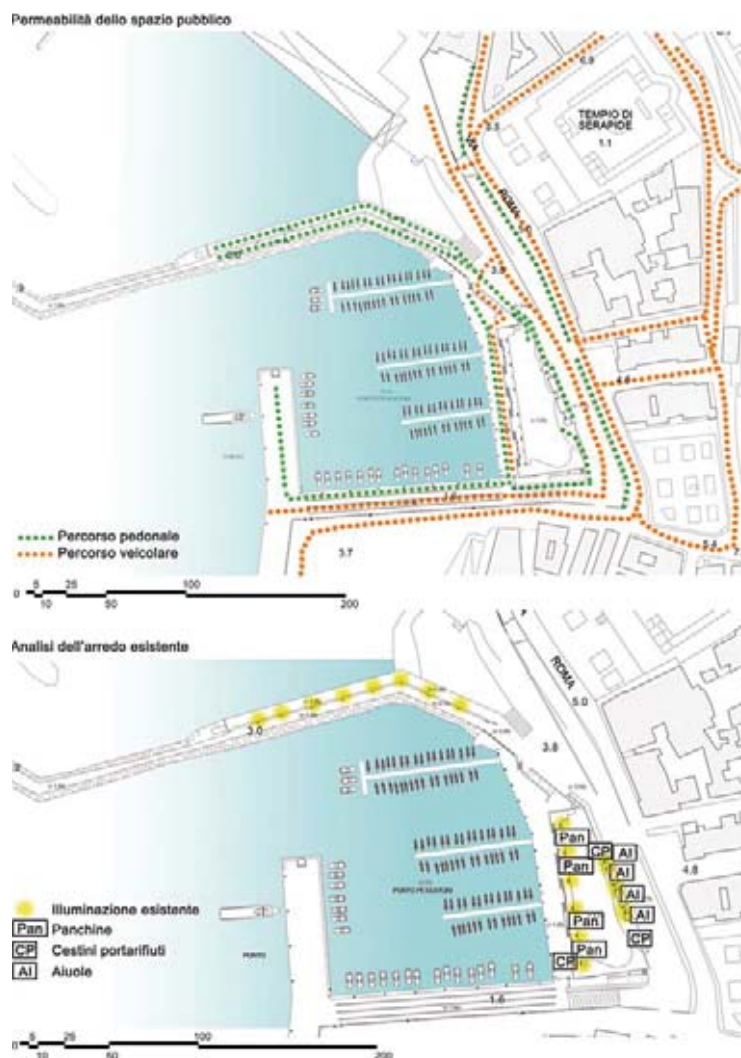
If design wants to afford this uncertainty, there are references to already experimented strategies which have given proof of facilitating mitigation against water force. Firstly, the contemporary so called “amphibi-

ous systems” which operate in floating phase. The fundamental idea is to design variable assets which could have different detail configurations into the phase of flooding and during the rest of the year, to assume flexible behaviors. The series of International Conference on “Amphibious Architecture, Design and Engineering” are very interesting for the pursued goal. Moreover, speaking of Pozzuoli the reference to an antique technical culture is almost mandatory: the whole Roman culture, which was permeated with the idea of “water as element

of architecture”. The Roman approach to water considered it a dynamic element, because of its flexibility and its attitude of being exploited both from a functional and an aesthetic point of view. Let us think of Piscina Mirabilis, which is an unsurpassed example of storing water into a construction.

Finally, an adaptive technology with variable behavior of technical components, conforming built environment as a mobile system, could have an effective scientific impact on the definition of technological performances, because it inev-





itably changes the idea itself of “technology”, like a less deterministic process in the field of Environmental Design, making it a more adaptable system in which grades of unpredictable requirements are allowed.

Ecological and environmental issues

(Raffaella De Martino)

The coastline analyzed in this paper has undergone a profound transformation over the past decades not only from a morphological point of view but also from an ecological point of view: the ecological relationships in both the terrestrial and terrestrial/aquatic spheres have in fact been profoundly altered by anthropogenic actions and “natural” events that have affected the area.

The area under consideration is territorially bounded by important natural basins that are part of the territory of Regional Park of Campi Flegrei. With the establishment of the park, the Campania Region attempted to carry out ecological rebalancing interventions by adopting the necessary measures to preserve, protect and enhance biodiversity, reversing the process of impoverishment of the natural heritage, triggering a process of reconstruction of an ecological network, preserving areas with existing natural

value and providing mitigation of the effects of existing and planned infrastructures (Regional Park of Campi Flegrei, 2001).

In particular, the ecological network represents a tool for connecting, through biological corridors, territorial areas, urban and non-urban, endowed with a greater presence of naturalness, allowing animal species to move from one environment to another, thus avoiding confinement in closed biotopes. Indeed, it is clear that an ecological network can only be realized if the principle of species-specific functionality is considered, that is, if the special habitat needs of the animal species in the area are respected. This is even more true for marine and marine-coastal environments where the importance of an ecological network approach to habitat and species conservation is now recognized (APAT 2005).

The conditions for the construction of an ecological network are twofold: its component elements must be of appropriate environmental quality, and these elements must be interconnected. Particularly in marine-coastal environments, connectivity between nature basins must be ensured in both terrestrial and aquatic environments. In such environments,

ecological-functional communication areas that are essential for migration, distribution, and genetic exchange of wildlife species must ensure both horizontal connectivity, i.e., connections between core areas located along the coast through exclusively terrestrial or aerial corridors, and vertical connectivity, which instead allows connections between coastal and aquatic environments and includes both underwater and above-water (aerial) corridors (APAT 2005).

The construction of a local ecological network in the area under consideration, therefore, requires a series of interventions that improve habitat quality and ecological value of the areas and implement connections in both terrestrial and terrestrial-aquatic environments. This local ecological connectivity can then hook up to the higher-level connectivity thus supporting the backbone of the regional ecological network. To achieve this goal, vertical and horizontal connectivity can be implemented so as to create an eco-relational system between the reclaimed systems and the large natural basins in the area such as Natura 2000 Sites SCI “Fondali Marini di Baia”, “Stazioni di Cyanidium caldarium di Pozzuoli”, “Monte Nuovo”, “Lago

Lucrino”, “Monte Barbaro e Cratere di Campiglione” and the Natura 2000 SPA Sites “Cratere di Astroni” and “Lago d’Averno” which are key nodes of the ecological network at the regional scale. ■

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1. P. 21. Port area in Pozzuoli: aerial view from 1960 till 2020. (Credit: Lorena De Nicola).
2. P. 22. Time analysis of port area in Pozzuoli uses (Credit: Lorena De Nicola).
3. P. 22. Climatic data analysis of port area in Pozzuoli (Credit: Lorena De Nicola).
4. P. 23. Potentialities and criticalities of port area in Pozzuoli (Credit: Lorena De Nicola).

Rediscovering Stefania Filo Speciale

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1. The professional story of Stefania Filo Speciale represents in an emblematic way the process of *damnatio memoriae* that post-World War II Neapolitan architecture underwent, branded for years as result of the real estate speculation and political malfeasance.

During Achille Lauro's term of office (1952-57 and February-November 1961), but also throughout the 1960s, Naples was completely transformed: from 1951 to 1967, 469,854 rooms were built without a master plan and or with variants of the 1939 master plan.¹ Since 1963, with the release of Francesco Rosi's famous movie “Le mani sulla città”, the image of building speculation was inexorably associated with the entire city. Within this framework, Filo Speciale became the symbol of building speculation. She was guilty twice: having built the city's first skyscraper, the so-called Grattacielo of “La Cattolica” insurance company (1954-58), and being a woman, the first female architect and the first university female professor of a composition subject in Naples. In Rosi's feature film, the builder Edoardo Nottola, alias Mario Ottieri, dominated the city right from the top floor of the skyscraper, where he had made his “headquarters”.

With rare exceptions, in the national context Naples had ended up becoming a historiographical gap in contemporary architecture, not to mention the international one. The process of historiographical revision of this period started late and slowly, since the 1990s.² Filo Speciale began to be studied from a different perspective only in 2003, but much remains to be done to

illuminate this heavy shadow cast over her, as well as to re-evaluate post-World War II Neapolitan architecture.³

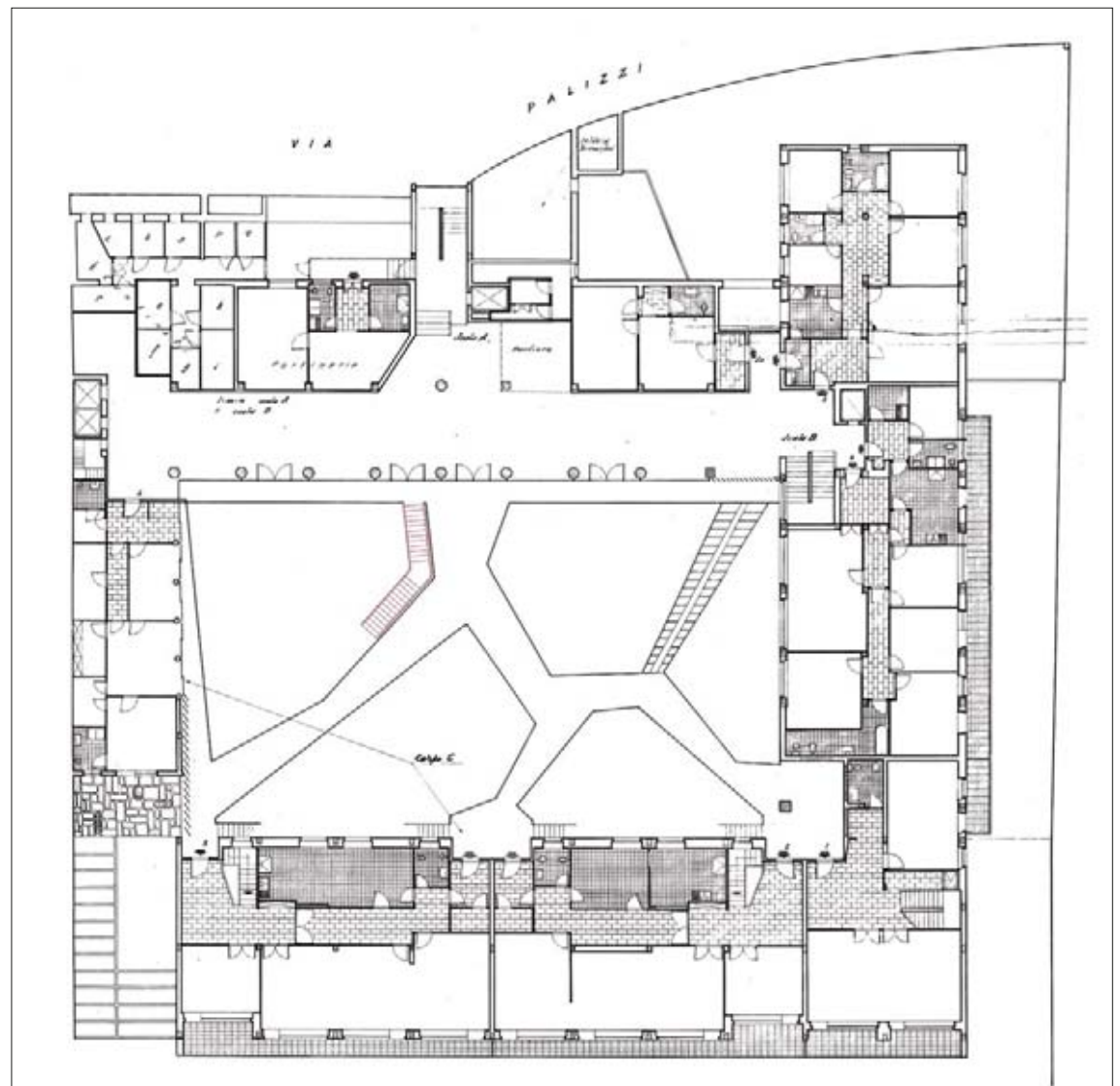
2. Of aristocratic origins, her full name being Filo della Torre di Santa Susanna, married in Speciale, the young Stefania enrolled at the Academy of Fine Arts, graduating from the new Regia Scuola Superiore di Architettura in Naples in 1932, even before the Faculty of Architecture was established (1935).⁴ She was the only woman of the “first generation” of Neapolitan architects; her colleagues included Carlo Cocchia, Giulio De Luca and Renato Avolio De Martino.

At the height of fascism,

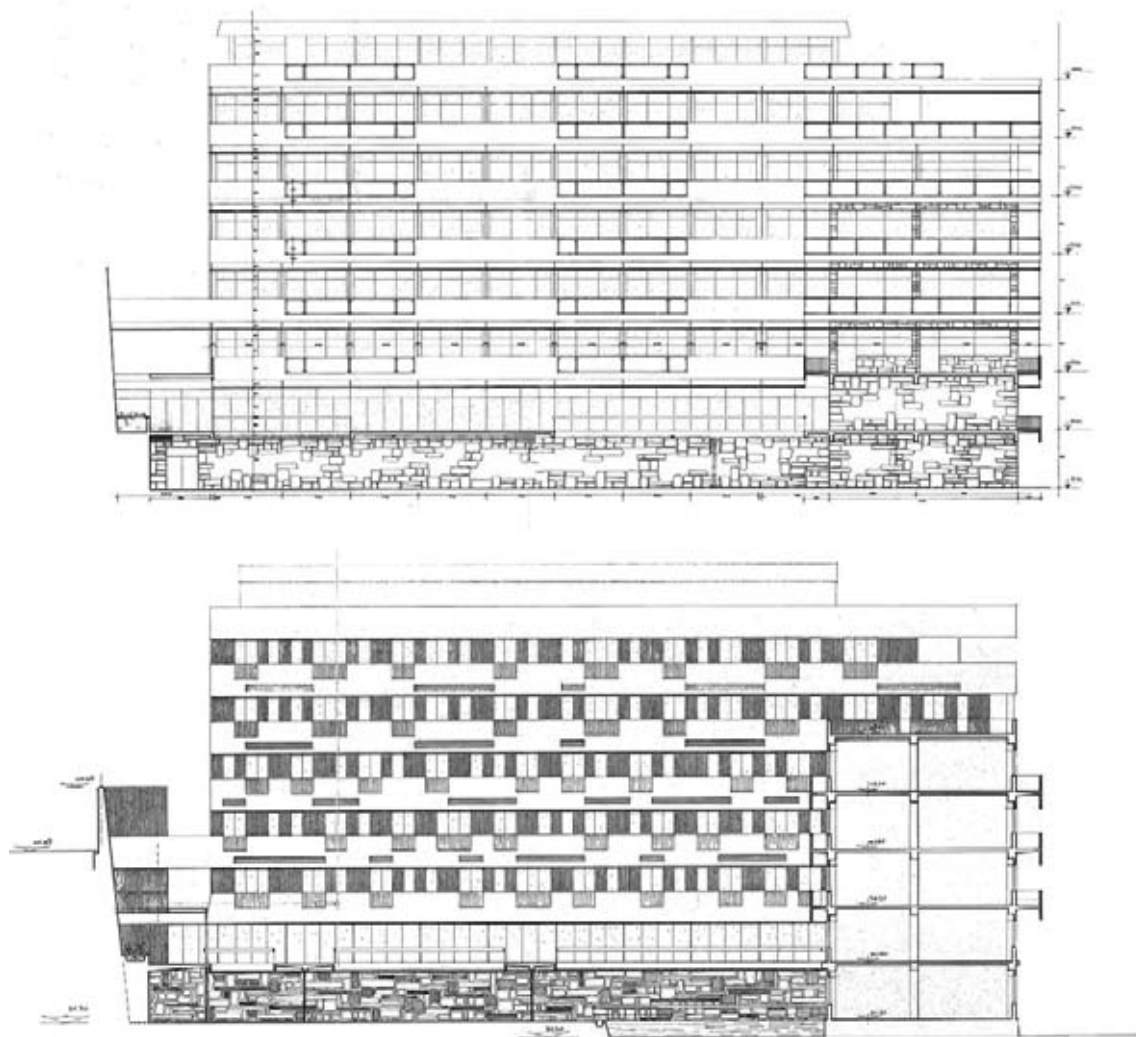
when the profession of architect was considered a man's business, she began her apprenticeship. Marcello Canino, Dean of the Faculty, immediately chose her as his collaborator, soon becoming his “right-hand man”. She worked on the project for the Triennale delle Terre Italiane d'Oltremare (1940) in his studio from 1937, contributing not only to the northern sector, where she designed the entrance and a series of important pavilions that were unfortunately destroyed, but to the entire urban project.⁵

At the same time, she embarked on a university career. She was appointed first to teach “Caratteri Distributivi degli Edifici” (1937), and then

became a full professor of the same subject (1955). In 1970 she was able to take over the chair of “Composizione Architettonica”, the most masculine subject in the Faculty. Her first work was the Metropolitan Cinema-Theatre (1948).⁶ Conceived in a natural cavity below the ancestral Palazzo Cellammare, it can be considered as an embryonic experimentation of a compositional theme she investigated throughout her life: the relationship with the context. It was the natural datum that dictates the form of this architecture carved out of tuff and composed of complex and diverse spaces, all technologically advanced. In the 1950s, she realized her



masterpieces: the Villa in via Tasso (1955),⁷ the Palazzo Della Morte (1957),⁸ the Villa Grimaldi (1959) and the Ina Casa neighborhoods in Capodichino (1951) and Agnano (1953).⁹ Also noteworthy is the 1954 project for the arrangement of the Naples Station square with the futuristic parabolic arch bridge-building that crossed the large public space. This was the period in which, with her young collaborators Carlo Chiu-razzi and Giorgio di Simone, Filo Speziale experimented a highly personal rationalism, of a Mediterranean manner of his own, attentive to the orographic conditions in Naples, which was integrated in a non-mimetic manner into the landscape of the unevenness, in and on the tuff of the city's cliffs. The work that most reflects this design approach is Palazzo Della Morte in corso Vittorio Emanuele in Naples. The entire complex, made up of several buildings of different typologies, is designed in relation to the orography of the site and the panoramic view: from the staircase that clings to the tuffa ridge of the hill, to the courtyard-garden, the true "green heart" of the composition, crossed by an articulated walkway on *pilotis* that fits between tall trees, bushes and flower boxes.¹⁰ Then came the "dark years" marked by the scandal of the Grattacielo "La Cattolica", the clashes with colleagues at the university and part of the critics, including Roberto Pane, Cesare Brandi and Bruno Zevi, who accused the project of not fitting into the ancient Neapolitan center. Although it was certainly his least successful work, this aspect was only marginally discussed within the controversy over his height and his failure to fit in. The criticism raised in cultural and academic circles, fuelled by the Superintendency, contributed to this result.¹¹ The consequences, as anticipated, were severe and marked her professional career, so much so that she disposed of her personal archives before her death. But her activity as a designer did not stop, reaching more than 150 works.



The "civil dwelling" has been the field of experimentation of Filo Speziale's best architectures, from villas to *condomini*. Still today they cover the Neapolitan hills, helping to delineate the skyline of that "middle city", between the center and the suburbs, which exploded in the boom years, where the Neapolitan middle-class went to live.¹² In via Nevio, in the Posillipo district, are the *palazzine* designed by Francesco Di Salvo and completed by Filo Speziale and his collaborators (1956-59). These buildings were also chosen by Francesco Rosi for one of

his films, "La Sfida" (1958), but here the social criticism fails to cast a shadow over the architectural spaces filmed. Some scenes are filmed in the hall studded with massive *pilotis* covered with mosaics, on the stairs and in the penthouse that the camorrista Vito buys, "the most beautiful and the most expensive in the building", as the real estate agent advertises. The flat has just been painted white and has deep balconies overlooking the sea, facing the Vesuvius. It is an image that restores to us all the beauty of Stefania Filo Speziale's architecture: mod-

ern, precise and rational, and at the same time more than sunny, dazzling.¹³

3. The circumstance that the *condominio* was in Naples, as in other medium-large Italian cities, the most widespread housing model, as well as the symbol of building speculation, is emblematic of how critics have in many cases operated too severely, in effect dismissing as of poor quality a large part of what today presents itself as the consolidated post-World War II city. Not to mention that in terms of social demand, there is no doubt that these architectures clearly reflected the desires and aspirations of a huge segment of the population in search of wealth and prestige: the emerging middle-class.¹⁴

The houses built by Filo Speziale are an example of the best private architecture realized in Naples in this period. The relationship with the landscape of the bay and the hills of the city can be considered as the element that characterizes these architectures, whereby it is the natural given that dictates the form of the building, adjusting the initial Cartesian geometry

in complex, diversified forms and spaces, according to a code which is undoubtedly modern, but at the same time strongly expressive, never dogmatic.

It is precisely from these architectures that we must look to rediscover post-World War II Neapolitan architecture, as part of the great heritage of Mediterranean modern architecture. ■

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- ² BELFIORE Pasquale, GRAVAGUOLO Benedetto. *Napoli, architettura e urbanistica del Novecento*. Bari, Laterza, 1994; DE FUSCO Renato, *Napoli nel Novecento*. Napoli, Electa, 1994; CASTAGNARO Alessandro, *Architettura del Novecento a Napoli*. Napoli, Edizioni Scientifiche

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1. P. 24. S. Filo Speciale, Palazzo della Morte. Plan of the courtyard-garden at the level of the atrium, 1957 (with additions of the state of affairs from ochre relief) (ADM)
 2. P. 25. S. Filo Speciale, Palazzo della Morte. Prospect of the northern bloc, 1954-55 (ADM)
 3. P. 25. S. Filo Speciale, Palazzo della Morte. The walkway on *pilotis* of the central courtyard-garden, 2023. Photo by Chiara Ingrosso
 4. P. 26. S. Filo Speciale, Palazzo della Morte. View of the atrium, 2023. Photo by Chiara Ingrosso
 5. P. 26. S. Filo Speciale, Palazzo della Morte. The central courtyard-garden, 2023. Photo by Chiara Ingrosso
 6. P. 26. Filo Speciale, Palazzo della Morte. Detail of the access staircase, 2023. Photo by Chiara Ingrosso
- Source:** photo by Chiara Ingrosso. Archive Della Morte (ADM)



Genua Picta 1982-2023

Experimentations of integrated surveys

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Genoa: painted city

The conference-exhibition “*Genua Picta - Proposal for the research and recovery of painted façades*” held in Genoa in 1982, launched the systematic study of the survey and restoration of the pictorial façades’ decorations also opening up to the various aspects of planning involving various local authorities, giving ample scope to the intervention proposals that took into consideration all the aspects related to the theme in question.

Thirty years after the Conference, the theme of color in architecture in historic centres, its recovery and enhancement remains an administrative and cultural emergency.

In Genoa in the 1980s, around 100 very damaged painted façades were identified, of which only 40 with legible chromatic and graphic traces [1].

This contribution presents a study on the current state of the never cataloged painted architectural heritage of the historic center of Genoa, using as an example the methodological approach of integrated survey, in the case study of the buildings in Piazza Pinelli (Fig. 1).

Painted decorations in Genoa was born in the second half of the 15th century as a “unification tool” of the new urban buildings, due to the transformations of the mediaeval fabric, with recasts, elevations, building mergers and with the construction of the new Renaissance buildings. The Genoese façades become evidence of the succession of different

decorative, design and colour typologies, but above all of all those contents, tangible and otherwise, linked to the his-

torical, political, economic and social events of the city.

We can identify the Gothic with ogival arches, white and

black ashlars, hanging arches, small twisted columns and multi-storey turrets and the Lombard matrix with mono-



chrome/bichrome portions, with niches and mythological and armoured figures. From the first half of the 16th century, the “narrative”, celebratory decoration of façades with scenes and figures, and those on an Alessian decorative style, with the use of decorative ashlar partitions, pilasters and coupled columns, will be the inspiration for numerous painted façades of buildings in the Historic Centre[2] (Fig. 2).

Genua Picta: Contents and Cataloguing

The 1982 conference address the themes of the image of the city described by an historical-iconographic survey, which highlights the difficulty of visibility of the painted building texture enclosed between the city walls and the porticos of the Ripa Maris. The methods of investigation in the 1980s involved a quantitative and qualitative approach of direct survey and traditional photogrammetry in order to cataloguing, which was divided into five sections: Location and Identification; Historical Research; Technical Research; Conservation Status and Causes of Degradation (Fig. 3). The degraded painted facades were classified into full visibility of preserved frescoes and fragmentary ones, the gaps were treated with mortar plasterwork matching the surrounding original parts, in order to achieve, legibility of the figurative texts with no reconstruction. Where this legibility could not be recovered, a tonal unification of the parts with the whole was applied. The interventions respected criteria of extreme caution. The debate of the time highlighted the different operational approach of the technicians working in central-eastern Europe, where the decorations were repainted for preserving the typological and visual characteristics of the city over time.

The survey of painted façades
During the survey it is essential to deepen the knowledge of the decorative models, elements and details of the decorative structure of the historical finishes, always in close interrelation with the

Location and identification	Historical esearch	Technical Research	Conservation State	Causes of Degradation
Planimetric identification	Bibliography	Wall support	Chronology of restauration	Tehnological
Painted surfaces	Direct and indirect iconographic sources	Coating sunstrate (layers and types of plaster)	Legibility of each painted façade, coexistence of colour and graffiti	Environmental
Description of pictorial decorations	Changes in real estate ownership	Painted film	Illumination of painted façades	
Visibility	Building dating	Stratigraphic analysis		
Correspondence of façade painting and architectural organism	Painted decoration dating	Chemical analysis		
	Cronology of painted façades' interventions			

Visual/perceptual investigation SURVEYS	Historical/iconographic investigation SURVEYING AND INVESTIGATIONS	SURVEY AND RESTITUTION	SURVEY AND COLOUR MAPPING	SCHEDULE
1.vision of the urban artefact 2.eidotypes 3.photographic reconnaissance from panoramic to detail	1.panimetric identification of plots by size and type over the centuries 2.historical-iconographic comparison 3.photographic survey: elevation and details 4.typological building identification 5.indirect sources 6.identification of constraints 7.SWOT analysis	1.direct survey 2.Indirect instrumental survey 3.Photo-recording 4.architectural detail survey of façade 5.detail survey of the decorative apparatus of the façade 6.photographic graphic processing 7.computerised graphic restitution at different scales of 2D/3D representation	1.direct perceptual survey by comparison with colour atlases 2.instrumental survey: indirect objective reading using a spectrophotometer 3.stratigraphic analysis carried out according to NorMal Recommendations 12/83 using the technique of optical microscopy 4.graphic restitution of collected data NCS system	1.general data 2.technological elements of the façade 3. survey of the typological features of the façade 4. survey of the facade's chromatic values 5.façade materials and decorative elements 6.mapping of degradation recommendations NorMal 1/88 7. PROJECT SECTION colour proposal: NCS system types of intervention
Instruments			Software	
Portable Laser GEO slam ZEB GO, Portable Laser GEO Slam HORIZON, Drone DJI Mavic Pro Platinum, n. 2 Cameras Nikon e Canon with telephoto lenses; Colour Pin, Munsell Book of Coloure, Stereomicroscope Leica MZ7.5.			Geoslam Hub, Geoslam connect, GeoslamDraw, Zephyr Aerial, Photoscan Metashape, Cloud Compare, Autocad 2023, Perspective Rectifier, Autodesk ReCap, Adobe.	

structural architectural whole. The lack of awareness of this fundamental type of bond has given rise to the figurative distortion and ungrammaticality so widespread in recent restorations. Therefore, the architectural relief of the fronts with the overall decorative layout and detail was developed and articulated in a particularly punctual way at the different scales.[3]
The advanced instrumental survey studies and experiments carried out on historical facades for documentary, conservation and maintenance purposes (Fig. 4), take into account: regulatory problems in the return of the survey, the survey for documentation and for the conservation and recovery project.

Piazza Pinelli in Genoa

The complex in question, consisting of two separate buildings erected around the 15th sec., is located in an area close to the arcades of Sottoripa.[4]
Over the centuries, both buildings have undergone renovations, expansions and divisions

on the basis of which new atrium-staircase systems and new morphological and decorative features of the façade are created, including the enlargement of the openings, the insertion of small columns and the frescoes.[1] [5]
In 2003 the facades and frescoes underwent a conservative restoration. The fronts consist of a basement band on the ground floor, an elevation band, consisting of six floors, vertically marked by three axes of windows of different sizes and a pitched roof with a mixed structure and a roof covering in slate slabs in which the dormers open. The sixteenth-century portals in finely decorated black stone are of great value. The atrium have a lunette pavilion roof from which the stairwells perpendicular to the front start, up to the top floor, parallel to the front with a double ramp trend side by side. The stairs have the same architectural features: slate steps, rampant cross vaults and barrel vaults with stuccoes on the ramps and octagonal marble and slate tile floors on the balconies.

Integrated survey trials: UAV + SLAM technology

The ongoing research is based on the integration of data resulting from the use of new advanced detection tools through the UAV methodology and SLAM (Simultaneous Localization And Mapping) technology.
The survey concerned the square, the painted facades, the external-internal relationship and the related decorative narration. Having adopted the integrated survey methodology, the following survey campaigns were compared and systematized: terrestrial photogrammetric survey, aerial photogrammetry from drones (Fig. 5) and static and dynamic laser scanners. The excellent performance of the SLAM technology in dimly lit and confined environments, the automation of the workflow and the high speed of processing of multiple datasets were also verified. The orthophotos derived from the aerial photogrammetric survey have proved to be fundamental for the reading and faithful rep-

resentation of the figurative and chromatic characteristics of all the really visible decorations and an interpretative reading of those weakly perceptible from the street level. The digital representation of the survey result and the comparison of different point cloud visualization and processing software in the case study of Piazza Pinelli in Genoa are interesting (Fig. 6).

Conclusions

This contribution deepens previous studies on the theme of the relief and color of the historic center of Genoa, to solve the problem of achiev-

ing quality, both in terms of technical realization and in terms of aesthetic realization and cultural congruence. The survey is as thorough as possible, in order to decipher

the chromatic peculiarities of the finishes on the historic façades, also in their temporal sequence, both chromatic and technical, as far as the current situation allows, often already

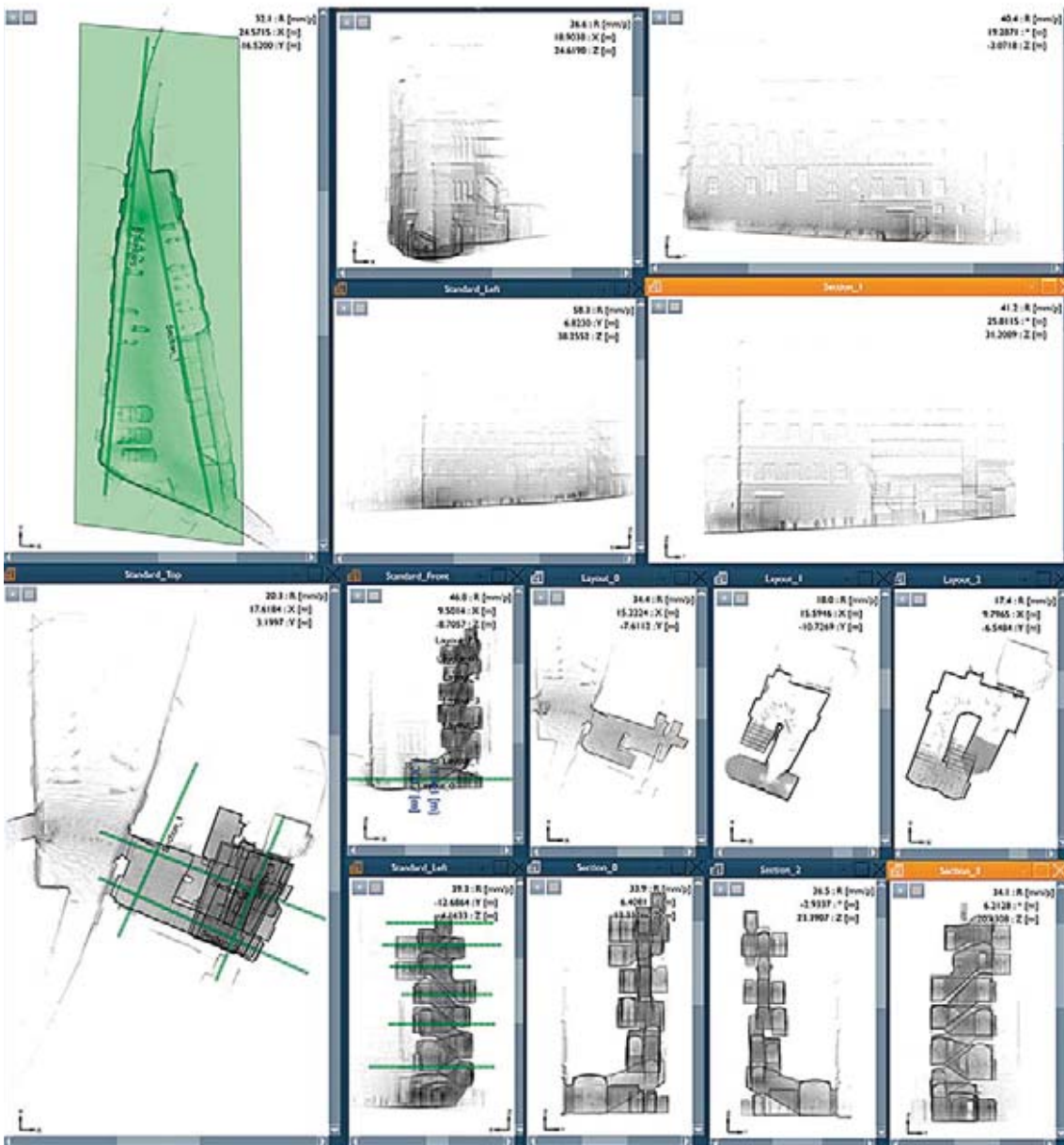
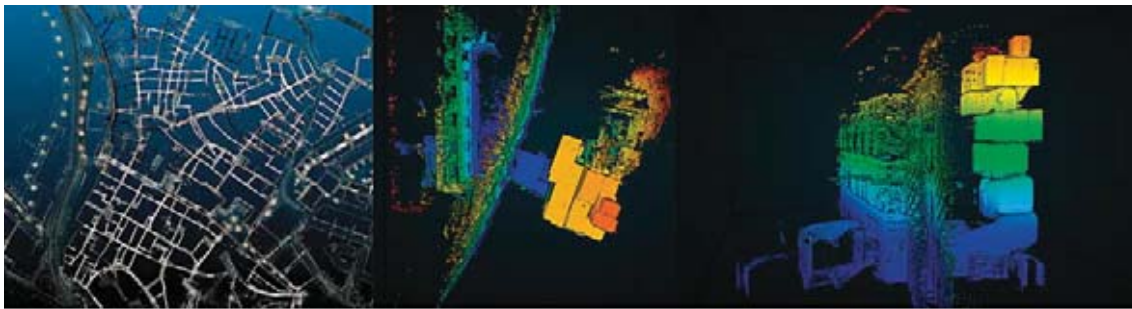
very compromised. The updating of the research methodology, the new technologies linked to the survey and to the advanced representation have allowed the integrated experimentation of tools and software, conferring a high precision of retrieval of the quantitative and qualitative data.

While sharing the positions expressed in the article, the result of theoretical approaches and common elaborations, the paragraphs “Genoa: painted city”, “Genua Picta: Contents and Cataloguing” and “The survey of painted façades” are attributed to Giulia Pellegrini, the paragraphs “Piazza Pinelli in Genoa” and “Integrated survey trials: UAV + SLAM technology” are attributed to Francesca Salvetti. ■

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1. P. 27. Stratigraphy of the pictorial decorations of the façade of a building in Piazza Pinelli in Genoa.
2. P. 27. First phase of research with a survey and photographic campaign to identify all the painted façades in the historic centre to complement the cataloguing of case studies in Genua Picta.
3. P. 28. Summary of the cataloging presented for the Genua Picta conference.
4. P. 28. Updating of the methodology for surveying and cataloging the results of the ongoing research.
5. P. 29. Detailed orthophoto of the painted decorations in the elevation strip of Piazza Pinelli decorated façades, taken from drone aerophotogrammetry.
6. P. 29. Top left: Coloured dense point cloud performed with the GEO Slam HORIZON Portable Laser of the portion of the historical centre investigated; followed by graphic elaborations of synthesis of the monochrome dense cloud performed with the GEO Slam ZEB GO Portable Laser of Piazza Pinelli and the elevations facing it. Finally, elaborations of plans and sections obtained from the dense cloud of the atrium and the stairwell.



Advanced Manufacturing Solutions and Additive Manufacturing for Existing Buildings Renovation

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Introduction

In the *2021 Global Status Report for Buildings and Construction* (ONU) “the Renovation of buildings is one of the seven flagship recovery areas identified by the European Commission” [1] and highlighted that building emissions will need to be reduced along their lifecycle through a triple strategy, namely a combination of reducing energy demand, decarbonizing the power supply and addressing embodied carbon stored in building materials [2]. In the current context, climate change requires rethinking and reorganisation of production patterns and behaviour. Renovation of existing buildings proposes activities on saving resources and safeguarding embodied energy [3]. This refers to the amount of total energy used to produce a good start from the phase of production of building materials and components; it also refers to the amount consumed (energy value):

- during general transport;
- during the construction;
- in the life of the building;
- the possible demolition or disposal of materials.

From these foundations, the proposed research wants to explore the relationship between traditional construction and entry of new parts by applying it to a block in

the district of Borgata Santa Lucia in Syracuse.

Borgata Santa Lucia as case study and for sustainable research

Borgata Santa Lucia district is a sort of second historical center of Syracuse, outside Ortigia and represents the late nineteenth-century expansion zone. It was subjected from 1885 to 1925 to intense building activity. The plotting of the Borgata Santa Lucia was built on a vast agricultural area cultivated with vines, overlooking the sea with farms and warehouses, divided into a system of regular lots, traced from the large

square, different for building types and construction periods [4].

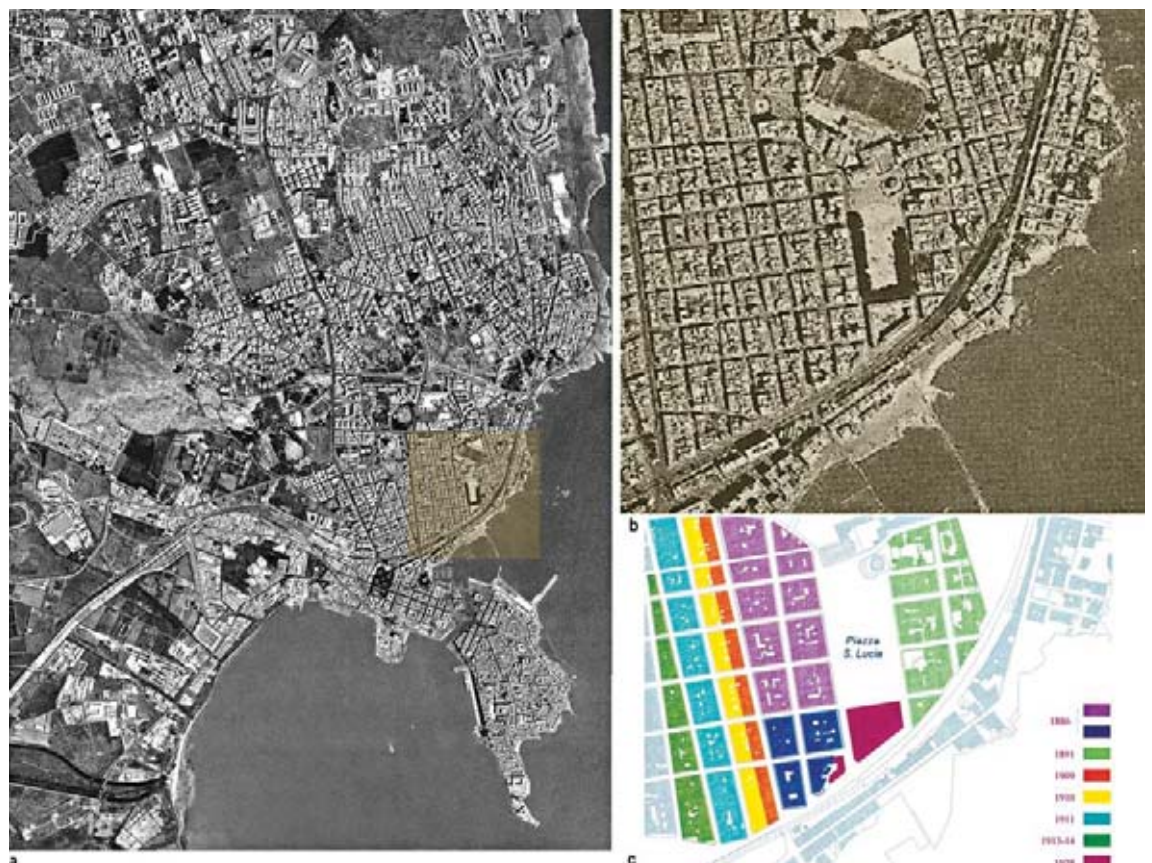
Today, the buildings generally consist of closed blocks with little space for the voids (courtyards, cloisters), with a high building density in variable height. This density highlights lots for completion interventions: there are many incomplete projects, with only the ground floor, frame and shelves for balconies that provided for the construction of an upper floor, never built. The trial was based on:

- the identification of the isolate characterised by incomplete building processes;

- the use of natural materials for completion;
- material and construction compatibility in the addition process;
- Process Innovations: Advanced Manufacturing Solutions and Additive Manufacturing.

Selections of buildings

The site is located within the district of Borgata Santa Lucia, defined between the roads of via Isonzo (West), via Agrigento (North), via Piave (East) and via Caltanissetta (South). The visible characteristics of the block and the homogeneity of the stylistic decorations constitute a





great qualitative potential, despite the transformations suffered by numerous interventions that altered the state of the facades. The creation of fractions and additions of volumes, over time, has introduced elements related to different architectural and stylistic languages.

The volume of the block is usually defined by building units with two or three elevations; however, the facades are often discontinuous in profile. These breaks are either placed in an intermediate position (type A) or occupy the angle of the lot (type B). In this case, the study element belongs to type B.

The construction of the *Palazzetto* has in fact been interrupted several times and this is demonstrated by the residues of recent interventions:

- the construction of the staircase connecting the first floor,

- the arrangement of the masonry to support the floor,
- incomplete internal partition walls.

On the elevations these interventions are legible through the presence of materials foreign to the original construction and in particular the position and development of the ramps of the staircase interferes with the geometry of the low arch holes defined by stone elements.

Building achievement with natural materials

In the prefabrication field, industrial production uses raw earth with increasing frequency; manufactured in Germany and South America in the form of straw-ground partition panels, lightweight infill blocks for insulation of walls and ceilings, or straw and earth panels used in roofing.

The proposed framework shows the possibilities offered by contemporary production of using raw earth components to complete the building identified as a case study. Operating within the Borgata Santa Lucia involves the conception of the project in a densely inhabited context, with a level of vehicular traffic sustained by the presence of numerous commercial activities. The limited size of the road sections makes it necessary to plan for a limited impact construction site with small equipment.

Technological compatibility in the project

The intervention must respect technological compatibility and identity characteristics. The intended use of spaces also derives from the comparison between possible functions based on:

- contemporary living parameters;
- pre-existing quality of the building and evaluations of the usability of the environments;
- neighbourhood needs and goals of this part of town.

The analysis set out the following objectives, based on the identification of:

- a construction system compatible with masonry;
- natural materials with low environmental impact;
- a low energy impact system;
- a site management system compatible with the urban area.

The research has identified and verified the suitability of elements in raw earth for vertical closures and vertical internal partitions and laminated wood for horizontal internal partitions.

Extrusion 3D printing for process innovations

The use of Key Enabling Technologies for the innovation of production processes is increasingly affecting the construction industry. The use of mobile robots in the construction site allows an optimization of the production phases.

Today, extrusion 3D printing represents the latest construction technique with raw earth. It is part of Additive Manufacturing and allows to produce three-dimensional elements from earth filaments, a few centimetres high and arranged by overlapping layers. Unlike the traditional pouring system of fluid material in formwork, 3D extrusion printing combines digital technology and dough design that can be used without media. It allows the construction of buildings with modular or monolithic elements whose implementation is based on the robotic construction process, automated with digital control. This system optimises execution and assembly times. Moreover, the evolution of printing machinery allows both the production of prefabricated and assembled components on site and in-situ production.



Experimental project

Renovation and completion of the building unit is consistent with the principles of Bioclimatic Architecture. The project of the pitched roof was conceived as a composition of floors with different laying and involves the insertion of windows and skylights for the interior lighting of disadvantaged spaces. The displacement of the staircase makes the two levels independent and identifies two residential levels (ground floor and first floor) and a working one (office) in a part of the ground floor.

The floors were designed in laminated wood and connected to the walls through wooden curbs, warped according to alternating layers in order to distribute the load on the different walls. The roof system includes trusses and inclined floors that create a non-pushing structure.

The study focuses on the benefits of Wellness and Environmental Protection that can be significantly improved by using raw earth, easily available and suitable for innovations. The use of computerised production tools can help to innovate a traditional system. ■

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- 1. P. 30. a) aerial photo of Syracuse, b) Borgata district, c) Plan of Allotments.
- 2-3. P. 31. Discontinuity in the façades.
- 4. P. 31. Survey of the existing building.
- 5. P. 32. Project of residential block.
- 6. P. 32. Assembly phases of 3D printed elements on-site and off-site.

Territorial governance and climate adaptation Towards an environmental perspective of urban regeneration

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1. Urban regeneration and governance of the contemporary city. The ecological-environmental perspective

The new urban question that characterizes the contemporary city underlines the implementation of new urban welfare to guarantee local communities the right to health, education, public mobility, housing, and the city.

The new welfare constitutes the priority objective of an integrated and inter-scalar strategy of public governance aimed at urban regeneration and territorial rebalancing, which finds a contextualisation in the EU policies, in the European Urban Agenda, in the policies for the sustainability and efficiency of cities from a Smart perspective. More recently, in coherence with the 17 “Sustainable Development Goals” (SDGs), regeneration and related issues have found operational references and specific funding in the European Green New Deal, in the Just Transition Fund and in the new EU programming 2021/2027 Horizon Europe.

At the national level, this integrated vision between territorial government policies and environmental, economic and social policies is reflected in



the National Recovery and Resilience Plan.

In particular, the Mission “Green Revolution and Ecological Transition” is aimed at achieving “the green and ecological transition of society and the economy to make the system sustainable and ensure its competitiveness.

In this context of reference, the integrated and inter-scalar strategy of public governance must become the central axis of a National Urban Agenda and, for these purposes, must invest all the policies of the government of the territory.

A strategy, therefore, not only of town planning but of social inclusion and local economic development, which, for these purposes, takes the public city as the framework for the realisation of new urban welfare constituted by a tangible and intangible, interactive and integrated network of networks [2].

The construction of new urban welfare requires,

therefore, a convergence of paradigms, legislative and regulatory apparatuses; programmes; new forms and new contents of instruments; implementation mechanisms; performance parameters and indicators; prototyping; levels of governance; to build the public city and implementing a concrete policy of planning and production of services.

In particular, the contribution emphasises several planning experiences, at the level of vast areas and the local level, conceptually ascribable to an ecological-environmental perspective of urban regeneration, which shows the search for a transcalar continuity of objectives and actions, in the dual strategic and regulatory form of plans [3], for the improvement of territorial connectivity and the harmonisation of ecological, landscape and cultural values.

Starting from these experiences, it is, therefore,

possible to outline new theoretical-methodological and operational references for an innovative planning system, able to support urban regeneration strategies.

New paradigms, legislative and regulatory apparatuses; programmes; forms and contents of the instruments; implementation mechanisms, parameters and performance indicators; prototypes; levels of governance, as well as practices of the urban plan as a tool for a sustainable and resilient regeneration of contemporary cities and territories, at the supra-municipal, municipal and local scale [4].

2. Experimentation and innovation of plans between strategic and regulatory dimensions

The article proposes an assessment of the effectiveness of policies and planning tools concerning adaptation to climate change in the case study of the city of Bologna. The

assessment concerned three levels of government (Region, Metropolitan City and Municipality) and the respective planning levels and tools (regional, supra-municipal and local).

The assessment criteria identified concern the *consistency*

of adaptation objectives and actions contained in planning tools, explicit nature (defined specifically as a response to climate change) or implicit nature (not specifically defined as a response to climate change, but also useful for adaptation); the *measurabil-*

ity of the expected impacts about the adaptation measures through parameters/indicators/standards for the measurement of the expected impacts about the implementation of the objectives and actions.

The LUR of the Emilia-Romagna Region no. 24/2017 contains explicit references to the land consumption and enhances the territory in its environmental and landscape characteristics through ecological and environmental endowments; in the remediation of air and water quality; in the proper management of the water cycle; in the reduction of noise and electromagnetic pollution; in soil permeability; in the ecological rebalancing of the urban environment; in the mitigation of the effects of global warming; in the reduction of seismic, hydrogeological, hydraulic and flooding risks.

The *Metropolitan Territorial Plan of Bologna (PTM)* outlines 5 strategies articulated in 10 strategic objectives. In particular, Strategy 1 identifies the fight against settlement dispersion through the preservation and protection of natural ecosystems and the reduction of land consumption by a maximum of 3%, and Strategy 4 the promotion of attractiveness and accessibility.

Explicit objectives are referred to the recovery of space for cycling and pedestrian mobility; the transformation of parking areas with re-permeable and vegetated interventions; the green and blue infrastructures including protected areas, wetlands, forests, wooded areas and parks; the recovery of the ‘space for water’; the ‘territorialisation’ of a strategy of local production of energy; the identification of areas subject to different risk to exclude them from possible urbanisations; incentives to counter the heat islands and to favour the absorption of rainwater.

The *General Urban Plan* has 3 prevailing urban strategies: Resilience and Environment; Habitability and Inclusion; Attractiveness and Employment.

The Plan identifies implicit and explicit structural objectives and actions, such as the recovery and efficiency of the existing building stock; urban regeneration of built-up areas and anthropised soils; the de-sealing and de-paving of soils to recover hydraulic functionality and the function of the ecological corridor; urban blue infrastructure and improvement of the urban tree balance; regular water flow in the mouths of canals and ditches and the network for the adduction, distribution and accumulation of rainwater; mitigation of the heat island effect in urban areas.

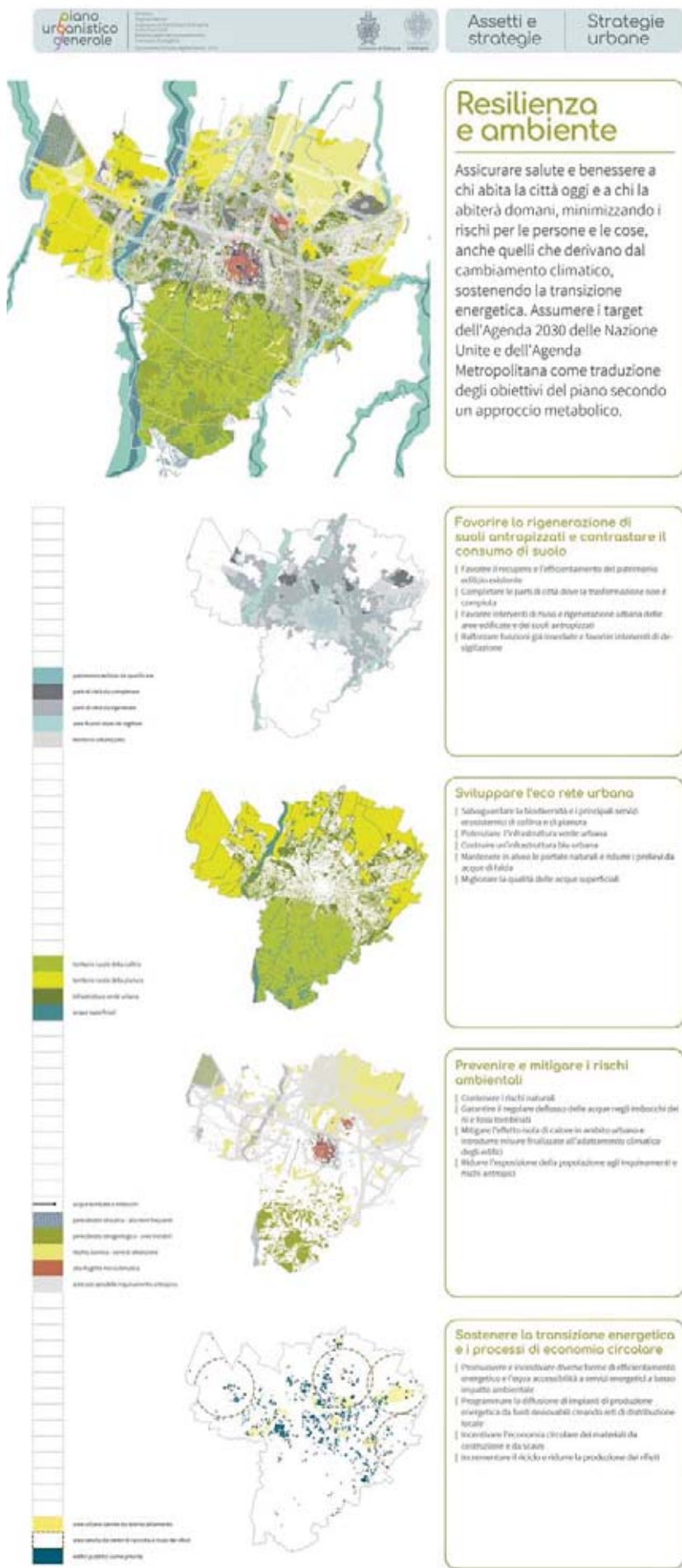
The local strategies identify the opportunities and criticalities of the site related to natural and anthropogenic risks and the possibilities for project transformation.

The Plan also identifies significant indicators about the objectives and monitors the effects, through annual updating of the set of indicators, such as the permeable, semi-permeable and impermeable surface area; the private and public green surface area; the tree balance (number of trees); the surface water quality. ■

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1. P. 33. Bologna is the most resilient city in Italy © Ingimage.
 2. P. 34. Bologna General Urban Plan (2021). Urban strategies. Resilience and Environment ©Bologna Municipality.
 3. P. 35. Bologna General Urban Plan (2021). Local strategies ©Bologna Municipality.
 4. P. 35. Water management as the prevailing measure for climate adaptation ©Ingimage.
 5. P. 35. View from Villa Ghigi over the historic centre of Bologna ©Wikimediacommons.
 6. P. 35. Urban Forestry actions ©Reteclima.



Opportunities and problems

-  public spaces
squares and open spaces, roads, intersections, equipment
-  landmarks
historical buildings, memories, identity
-  routes
-  green and blue infrastructure
-  areas under transformation
-  areas affected by natural risks
floods, landslides
-  areas affected by anthropogenic risks
microclimate, noise,
electromagnetism, accidents, abandonment

Functional and meaning connections

-  centrality
-  links
-  conversions



Rewilding Urban Space. The Regeneration of Budolfi Plads (Aalborg, DK)

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Tackling environmental degradation and halting the growing loss of biodiversity are among the most urgent imperatives at the turn of the third millennium. In response to the global environmental crisis, different approaches to nature conservation, biodiversity protection and ecosystem restoration are emerging. Among these, rewilding is conquering large fields of experimentation, an approach that aims to strengthen the adaptive capacity of ecosystems by restoring natural processes and minimizing human intervention or management [1-3].

Although rewilding was originally associated with rural projects, it is also experiencing growing interest in the field of urban regeneration. Urban rewilding is an urban design approach that can deliver quality built environments through the use of natural resources and the incorporation of native plants and animals [4].

Urban rewilding can help mitigate the effects of climate change by making cities more resilient and delivering a number of benefits, including:

- Promote biodiversity by providing food and habitat for wildlife and forming green corridors to connect fragments of nature together;
- Reconnect city dwellers with nature, enabling people to receive physical and psychological benefits, develop stronger connections

with nature, and appreciate ecosystem dynamics and aesthetic values of wilderness;

- Help create or inspire ecological and cultural change in society;

- Reduce the management costs of urban green using native species able to survive and reproduce in an almost autonomous way and without expensive maintenance interventions

(planting, pruning, cleaning, irrigation);

- Contribute to local rainwater management, enabling the collection, storage and purification of rainwater and its subsequent reuse;



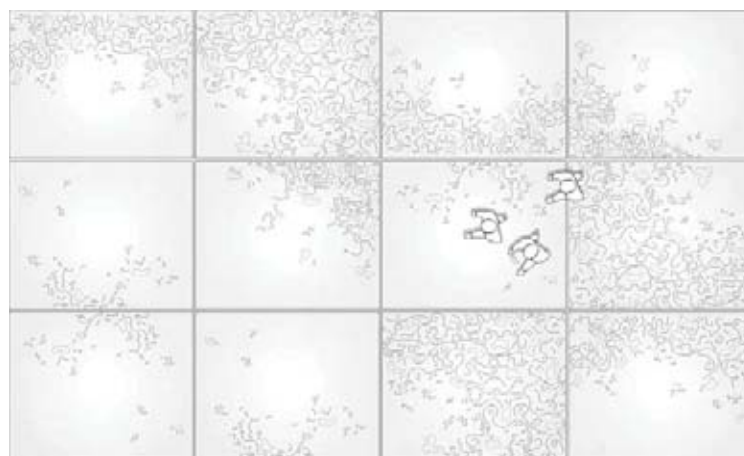
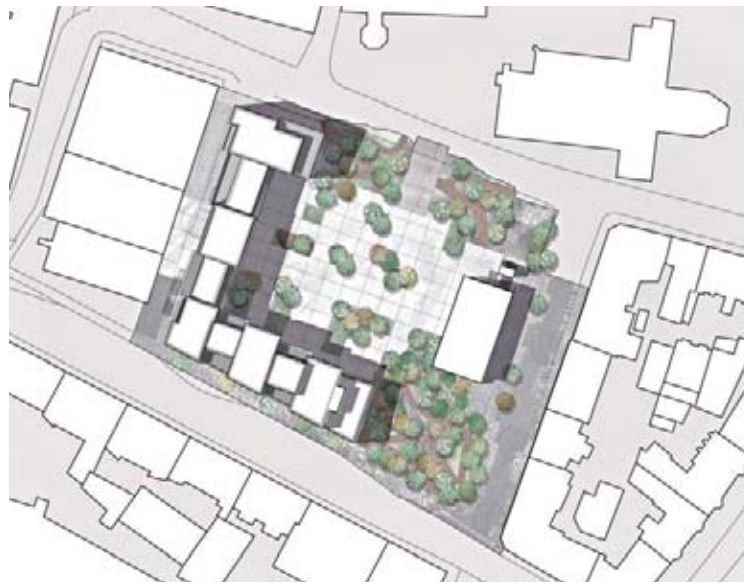
- Contribute to the reduction of urban pollution;
- Help reduce the heat island effect in cities.

In urban rewilding, nature cannot be left completely free to conquer its spaces; it requires careful planning and is configured as a trans-disciplinary practice involving the disciplines of urban design, landscape architecture, botany, environmental engineering and hydraulic engineering.

One of the most recent urban regeneration projects inspired by rewilding is the redevelopment of Budolfi Plads, the cathedral square of Aalborg in Denmark. The project – started in March 2017 and completed in November 2019 – addresses the delicate issue of introducing wild nature into the historic city centre and is part of Aalborg’s transition process from an industrial hub to a city of culture and knowledge [5].

The transformation of historical context had to deal with a radical change in the historicised image of places. This required a long and intense public debate, supported by the Municipality of Aalborg, which was attended by citizens and experts in landscape architecture and environmental engineering [6]. The general vision emerged from the debate was to create an oasis of peace and tranquillity in the centre of Aalborg, a green recreation area equipped for playing, meeting and socializing.

Before the transformation, the square looked like an anonymous parking lot and was separated from the church by a building built in the 1960s. The project involved the following transformations [7]: the building was demolished to reconnect the square to the cathedral; the walking surface was raised so as to leave the surface entirely pedestrian and cover the parking areas; the buildings surrounding the square have a common architectural language and are built in red brick to recall traditional building materials; all the environments that open onto the square host public functions (restaurants, cafés, art galleries, shops) and interact with the public space, favouring



a good synergy between the urban space and the function of the buildings; green roofs and green facades support local stormwater management solutions; most of the square is destined for greenery.

On the south and north sides of the square there are two large stairways intersected by ramps that blend into the vegetation, like paths in the woods. The large square above is paved with large white cement tiles interspersed with flowerbeds, like natural ground on which paving stones are laid for circulation. The tiles are marked by sinuous grooves that recall the traces that microorganisms leave in the plaster deposits, also acting as an anti-slip.

The general image appears as a slight hill full of vegetation inside which the paths leading to the top are inserted. The mix of plants restores the experience of a forest, importing a piece of Danish natural landscape into the historic city centre.

The Budolfi Plads regeneration project, starting from the greenery, provides an innovative contribution to urban planning in historical contexts for the original conception of urban green. The innovative value of the project consists in enhancing the ecosystem balances of nature, regardless of the principles of aesthetic-formal evaluation of urban green intended as mere decoration. Trees, shrubs, tall and perennial grasses, flower bulbs and ground cover plants were selected that are able to adapt to local climatic conditions and within an urbanized environment. The plants were planted according to specific associations, adopting the principle of collaboration, i.e. the ability to adapt, live, reproduce and support each other.

The project represents a breakthrough in traditional urban design and received the Aalborg Municipality Architecture Award in 2020 for the harmonious combination of wilderness and architecture in the historic city centre. The open space was designed following the principles of natural ecosystems, reconstructing a piece of the Danish forest landscape. Covered surfaces

and buildings adapt and integrate into this space, and not vice versa, reaffirming the priority role of greenery.

The urban policies implemented for the realization of the project involved citizens, specialists, investors and stakeholders in a process of cooperation. Dialogue and collective participation preceded the design phase and were the basis of the design choices. This ensured the appreciation of a project that transformed the appearance of the central square of the historic centre to the maximum. Moreover, the multifunctionality of the square has made it possible to respond to the various questions and expectations expressed by the different users. The project has made a significant contribution to the environment and biodiversity. The vegetation is varied, lush and verdant, appealing to the senses and ensuring different experiences as the seasons change. The species planted have been chosen to increase biodiversity, to create variety in terms of spatiality and to insert a new green volume in a dense part of the city.

The large biomass, that the project has introduced into the area through the green roofs, flower beds and trees, has multiple effects on the microclimate of the area: the vegetation absorbs CO₂, absorbs polluting particles from the air and reduces the acoustic resonance between buildings; provides shade in the summer months reducing the urban heat island effect; helps reduce rainwater runoff and increases evaporation.

With the transformation of Budolfi Plads, a new green identity has been created in the heart of Aalborg offering accessible meeting places for people of all ages, thus strengthening social cohesion. Today the square is buzzing with life and has become one of the busiest and most loved central points in the city. ■

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1. P. 36. Budolfi Plads before the transformation. The Budolfihus building separated the church from the square. The square was entirely occupied by a parking lot. Source: Aalborg Kommune, 2017.
2. P. 36. Budolfi Plads after the transformation. An artificial hill covers the underground car park. The pedestrian area is richly planted with native plant species. Ph. A. Badami, 2022.
3. P. 37. Transformation project of Budolfi Plads. Planimetry. Source: Aalborg Kommune, 2017.
4. P. 37. Transformation project of Budolfi Plads. North-South section and East-West section. Source: Aalborg Kommune, 2017.
5. P. 37. Render of the transformation project of Budolfi Plads. Source: Aalborg Kommune, 2017.
6. P. 37. Principle for engraving grooves in cement tiles. Source: Aalborg Kommune, 2017.
7. P. 37. Budolfi Plads. Stairways and ramps immersed in forest vegetation. Ph. A. Badami, 2022.
8. P. 38. Urban furniture in Budolfi Plads. Chaise longue in concrete and wood. Ph. A. Badami, 2022.
9. P. 38. Budolfi Plads. Stairway between the church of San Budolfi and the top of Budolfi square. Ph. A. Badami, 2022.
10. P. 38. Southeast side of Budolfi Plads. The terrain of the hill is contained by embankments in corten steel. Ph. A. Badami, 2022.
11. P. 38. The church of San Budolfi seen from the pedestrian square above the hill of Budolfi Plads. Ph. A. Badami, 2022.

A maintenance strategy for the care of landscape built environment: the artistic practice of Massa Lubrense

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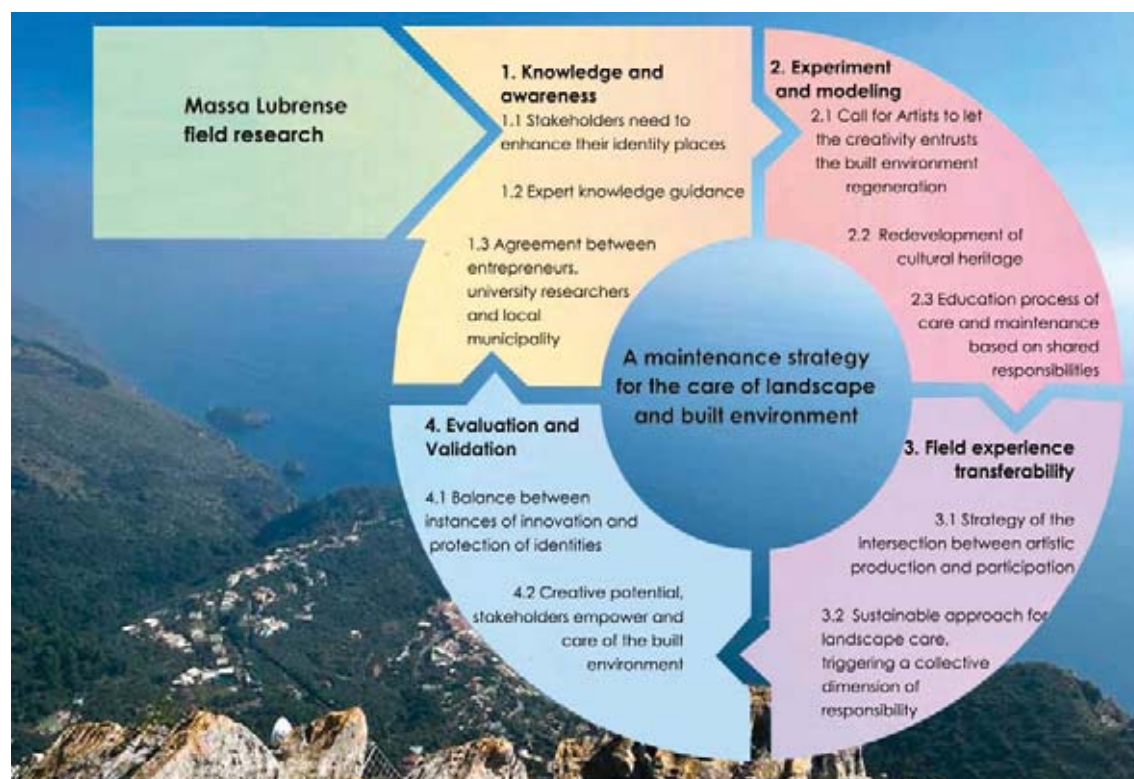
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reuse, built environment,
maintenance, community
engagement

In the ecological transition scenario, the artistic production is a driver to reconnect communities with tangible and intangible cultural resources of the Historic Urban Landscape (UNESCO, 2011). The paper discusses the Best Practice “Art, landscape and culture of food” in Massa Lubrense, implemented under an agreement between the Lubrense Restaurantes Association (ARL), the Department of Architecture (DiARC) of the University of Naples Federico II and the Municipality of Massa Lubrense. It also involves schools, associations and citizens, to develop shared maintenance and care processes (EC 2005). The site of the pilot project is the area of S. Costanzo Mount, a scenic pilgrimage destination overlooking both the Gulf of Naples and the Gulf of Salerno. The project identifies artist residencies as a way to improve citizen’s awareness, triggering a collective sense of place and responsibility toward protecting the value of local cultural resources. To deal with



the decline of co-evolutionary dynamics art could be an engine to raise civil society's awareness of beauty. This to counter the disruptive pressures affecting environmental and architectural heritages.

1. Introduction

In the scenario of global ecological transition [1] landscape is a prism that allows taking a human-centered perspective [1], focused on the result of a series of choices made by communities. The proposal aims to establish a methodology of participatory care and maintenance through the integration of artistic experimentations [2]. The research returns the results of a tested practice, the artist residence: "Art, landscape and culture of food". It was conducted in Massa Lubrense was funded by an agreement between the Lubrense Restaurants Association (ARL), the Department of Architecture (DiARC) of the University of Naples Federico II and the Municipality of Massa Lubrense. The outcomes define a transferable strategy based on creative involvement as a fundamental condition for achieving sustainable human development in the care and maintenance of the built environment.

2. Artistic production as a driver of tangible and intangible cultural resources rebuilding in the Historic Urban Landscape

In the international debate for sustainable development, cultural heritage is a driver of regeneration of the built environment [3]. The UNESCO Recommendations on Historic Urban Landscape recognize the fundamental role of cultural heritage and cultural landscape for sustainable local development. According to a systemic view of the built environment all technological components and all spatial elements constitute the cultural capital of the landscape, consisting of a tangible part (artistic productions and monuments of local culture) and an intangible part (values, beliefs, memories) [4]. In this scenario, the practice of artist residence represents



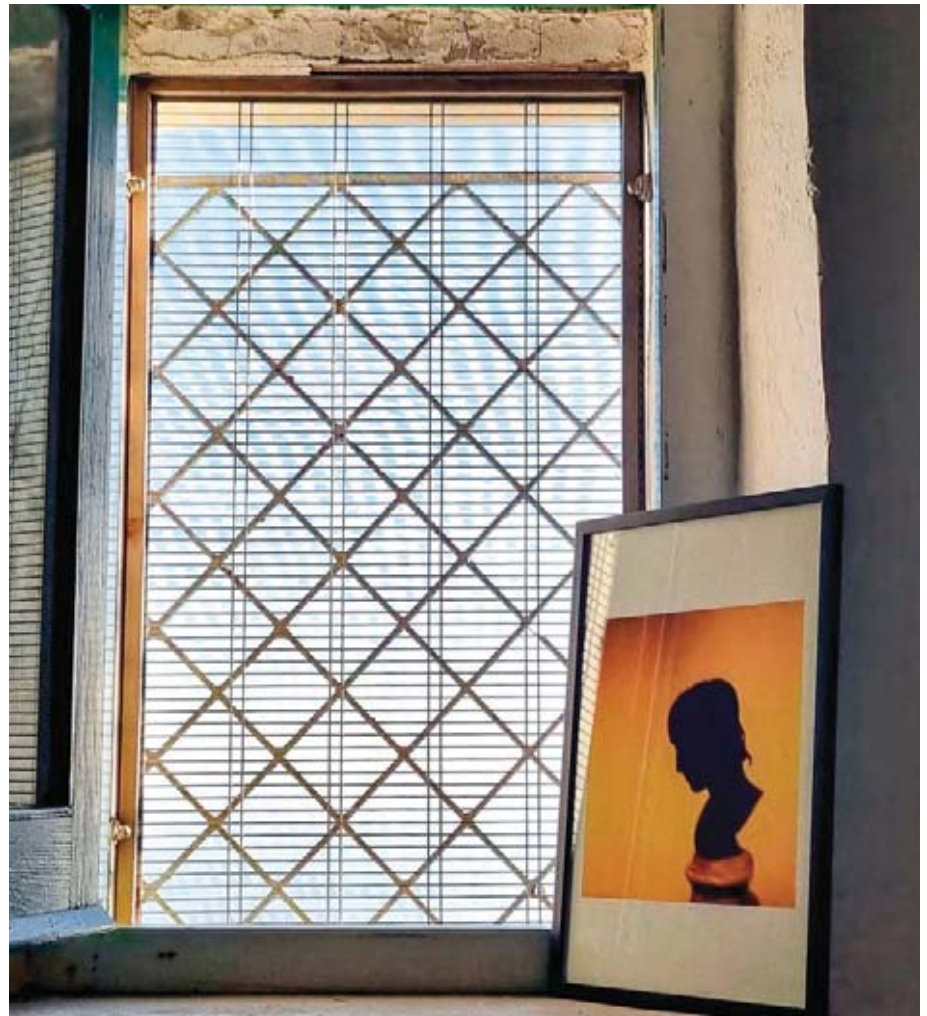
a form of cultural production that is capable of being an engine of development because of its ability to affect the reactivation of local creativity, the promotion of social cohesion, and the encouragement of commitment to the custody and regeneration of the built environment [5].

3. Methodology

The methodology adopts a systemic view of the built environment in which specific potentials affect how it is

integrated [3] and the quality of relationships among its components (physical, social, cultural and economic). The methodological approach, which is circular and iterative, represents a sequence of four main phases: Knowledge and awareness acquisition, Experimentation and modelling, Replicability and transferability, and Evaluation and Validation. In the first phase, the action criterion concerns what stakeholders felt the need to enhance their iden-

tity places through the guidance of expert knowledge by formalizing an agreement between entrepreneurs, university researchers and local municipality. In the second phase the action criterion is based by issuing a Call for Artists, the creativity entrusts the redevelopment of a beautiful environmental pathway, reinterpreting the right to cultural heritage and the sharing of responsibilities toward education process of sustainability care. In the



third phase the criterion for action in contexts marked by disruptive pressures that alter the qualities settlement and the new users' needs for transformation, the project experiments strategy at the intersection of artistic production and participation. In the fourth phase, the action criterion concerns balancing the instances of innovation with the protection of identities, it is possible to promote strategy by triggering relationships between creativity and environmental sustainability (Fig. 1).

4. Discussion and Results

The research was entitled “Massa Lubrense art, landscape, food culture” to care for the built environment. It was funded by an agreement between the Lubrense Restaurantes Association (ARL) and the Department of Architecture (DiARC) of the University of Naples Federico II, and the Municipality of Massa Lubrense. The creativity of artists was entrusted with the redevelopment of an extraordinarily beautiful environmental pathway that runs through the site (Fig. 2).

The experience activated collaborative regeneration processes, hosting of the two winning artists of the artist residence practice, Virgile Legavre-Jérôme and Marjan Fahimi. The project identifies the encounter and cooperation between community and artist as an educational form to activate the reinterpretation of landscape values. In a settlement of exceptional landscape value and maintenance vulnerability, the artist residence supports the transfer of innovative solutions for the regeneration of the built environment from research to the field of practice. The artists were assisted by DiARC students and students from the F. Grandi High School of Art in Sorrento in context exploration, elaboration and realization of the work, and by the community at the stage of identifying the location and the installation of artworks (Figs. 3 and 4).

The artwork established synergies from the community that lives the landscape and contributes to its creation and maintenance. The artists shares the community's memories and rituals, leaving

the traces of a relationship, inducing actions of landscape care (Fig. 5).

By rediscovering these sites artistically, the project provides a framework for the impacts of civic education on the care and maintenance of landscapes through the collective appropriation of knowledge and memories (Fig. 6).

5. Conclusion

The paper returns a strategy of caring for the built environment by entrusting the creativity of artists with the redevelopment of an environmental path in S. Costanzo Mount. This strategy enhances cultural and creative resources to promote sustainable economic, social and environmental development in which the involvement and participation of stakeholders in care and maintenance processes is necessary. The strategy can be transferred to other settlements of exceptional landscape value and high vulnerability. Due to abandonment or incompatible transformation through the practice of artist residence supports the replicability of innovative solutions for inte-

grated and participatory care and maintenance of the built environment. ■

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1. P. 39. Methodological path: a maintenance strategy for the care of landscape and built environment.
 1. P. 39. Landscape view of S. Costanzo Mount.
 3-4. P. 40. Community participation at International Conference of case study project.
 5. P. 41. Marjan Fahimi artwork on S. Costanzo Mount, La Finestra, 2022. Ph. Annalisa Mazzarella.
 6. P. 41. Virgile Legavre-Jérôme artwork on S. Costanzo Mount, Villa Nostalgica, 2022.

Know how and know how to do. Architectural design and theatrical biomechanics

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Incipit

This text documents and reports the cycle of experimental activities included in the educational courses on architectural design. The city of Rome is the tabula of layered fabric, consolidated over time and capable of welcoming the features of writing suspended in the fragile relationship between the ancient vestiges and the addition – in a different and friendly language – of a temporally distant insert. The analogy between design action and theatrical biomechanics suggests a method based on an execution tested in vitro in the opening laboratory of a genesis which slowly unties, by sudden leaps, the knots of the compositional process. This method is linked to the three moments that make up movement in biomechanics (intention, balance, execution) and shares the idea of total art at the service of the community.

Framework: stages of knowledge

During the elaboration process of a project, meaning

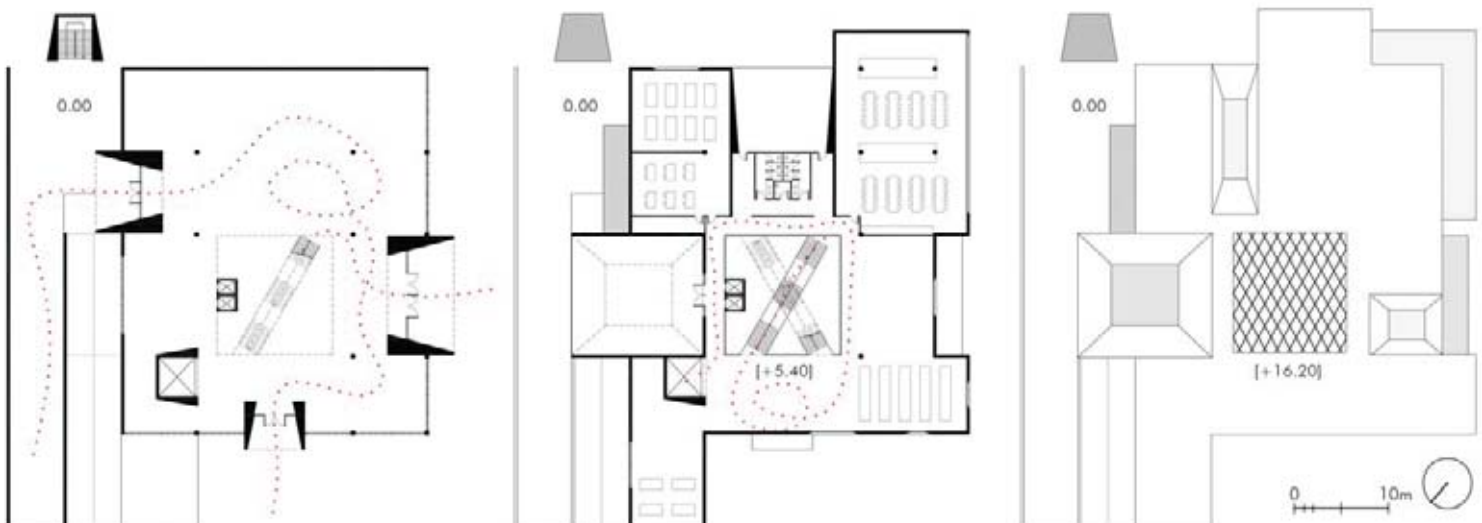


any kind of projection capable of overcoming the limits of a temporary material contingency, three different moments follow one another. The first concerns the “rational perception of the task received” [1]. This moment is supported by the analysis of the documents, the identification of the theme, and the game strategy, whose initial moves determine the process’s development line.

The second aims at the “realization” of the project. This moment triggers the cycle of mechanisms helpful to completing the same process as a synthesis of knowledge interconnected between different co-agent skills. Finally, the third points to the “diminution of the volitional reflex [...] in conjunction with the preparation for the reception of a new purpose” [2]. This moment concludes the pro-

cedural process by projecting the acquired competence beyond the temporary contingency to seal itself in method, ready to unfold for a new job. [3].

The three phases described above are associated with and derive from the three acts which, according to Vsevolod Mejerchol’d [4], inspire the acting of the biomechanical actor: intention, realization, reaction.





Just as for the theatre director actor's training is the preparation for the acting action, so for the student, the in vitro experimentation is the prelude to a comparison with reality mediated by a graphic and trough model artifice. From this point of view, some didactic works act as a test bed for experimenting with the application of a method. The topics taken into consideration have as their object: the Polo Civico Flaminio, a design competition, announced in 2020, aimed at converting some abandoned spaces of the former Electronic and Precision Materials Military Establishment into a library and home for the neighbourhood: a multifunctional space at the service of the commu-

nity; the Grande MAXXI, a competition of ideas, announced in 2022, requesting a multifunctional building to expand the MAXXI museum, on an area facing it, together with the design of the green area, connecting the two buildings. The areas are in the northern sector of the Flaminio district of Rome, within a consolidated fabric, with disused sections, which in recent years has undergone substantial development from a cultural point of view thanks to the creation of the museum and auditorium.

Scene. Otkaz as a reminder of the past

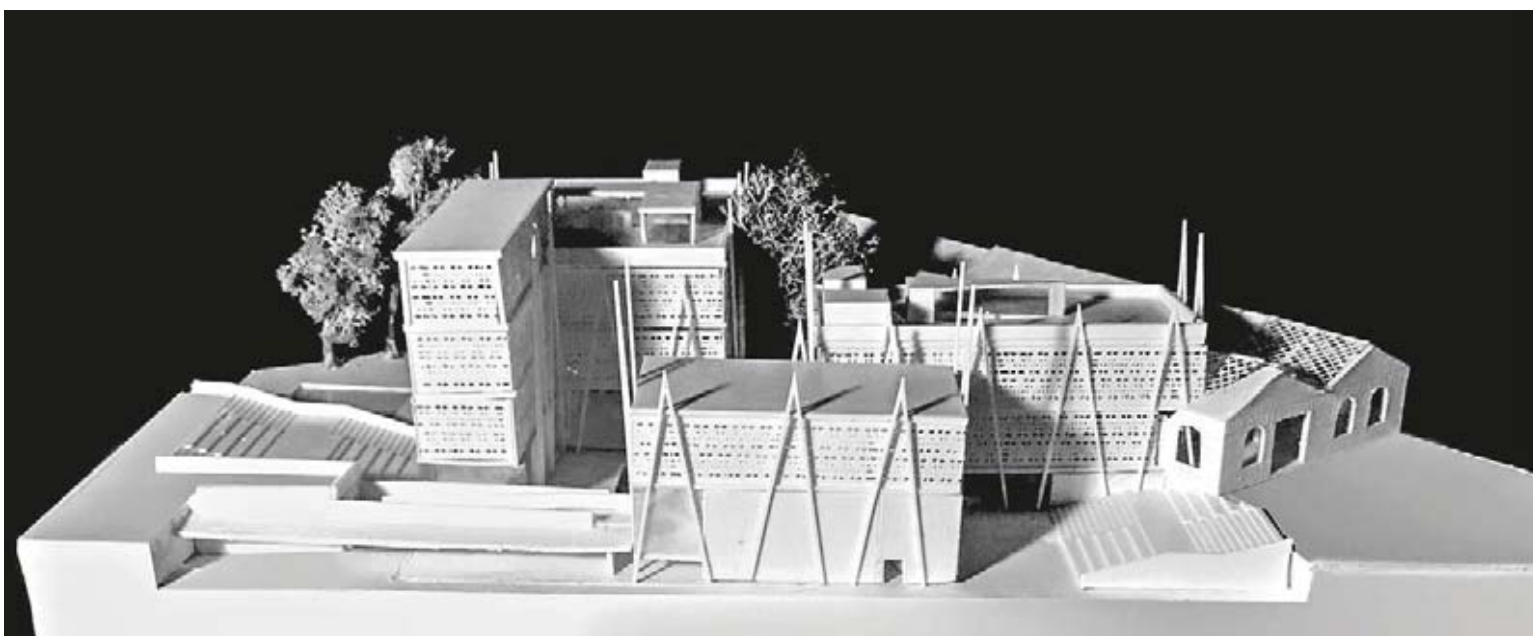
The intention is the prelude to every action and no intention does not draw upon past

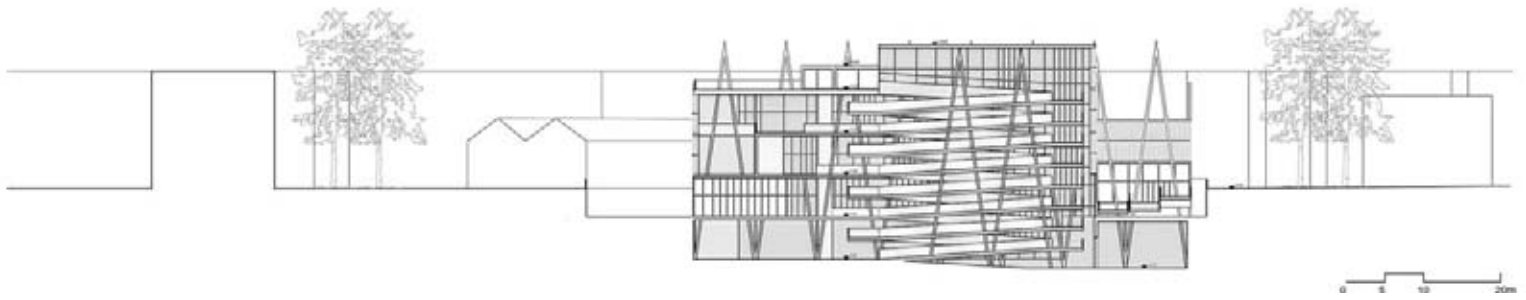
reflections. Mejerchol'd explains the intention to conduct an action as the perception of the task received and represents it, in preparation for the gesture to be performed with a retreat: the *oktas*, in English the refusal. Here, if you want to walk forward, you will first nod a step backward; if you want to throw a stone, your arm will move away from the point where your mind wants to throw it. A reference to the past to run into the future. The following images recall the spirit of Roman architecture, especially in the compositional technique of assembling the building bodies which, in some cases, develop around a central atrium surmounted by a large skylight which re-

fers to the impluvia of Roman houses, whose reduced replica is reflected in the terminal terraces oriented towards the sky to recreate a room en plein air. With a similar identification process, the central skylight recalls the nearby Basilica of Santa Croce al Flaminio, with polychrome glass that floods the atrium with plays of colourful light, instead the external finish is mixed with brick dust to give the building the colour of the *cocciopersto* (Figs. 1 and 2).

Action. Posil as realization of the movement/project

Posil, in English sending, represents the real test bench, the moment in which one gets involved, experiments, makes mistakes, corrects oneself,





and prepares for the realization of the action.

In this context, through the idea of a monolithic, closed, and inward-looking building, an urban regeneration project is proposed for the Polo Civico Flaminio where the introspective dimension favours the development of a path experienced in the likeness of an imaginary thread of Arianna. On this full-of-imagery assumption, the origin of the journey takes place in the underground space, where a game of staggered partitions reproduces a sense of bewilderment and leads to the atrium, where an isolated staircase intercepts the spaces above. The spaces are linked to each other in a succession that alternates, from bottom to top and then back to the bottom, the perceptive experience of the internal space, which opens outwards in a single point to physically connect the city and the building, allusively proposed here in the form of a monolithic ruin (Fig. 3).

Tochka. Projection towards the future

Tochka, in English position, identifies the dynamic fixation which, at the end of a movement, retains within itself the propulsive thrust of the action just concluded and

keeps intact the possibility of extending beyond. In comparative projection, a project that is identified with the *tochka* is a project capable of condensing the selves of the two past moments – *otkaz* and *posil* – and turning to the future.

The commensurate design exercises act on the contrast between object and context. In one case, several distinct bodies are configured as an agglutination of elements placed in comparison around an empty space: a transfigured replica of parts and pieces that are composed according to the additive process of Greco-Roman ancestry (Figs. 4 and 5). In the other case, a network of exposed beams supports two blind blocks that on top open to the surrounding context through two incomplete panoramic stairs. Space for waiting and a place for contemplation of a landscape that is known and unpublished at the same time. Fluctuates body – reversing the static/tectonic logic between heavy and light – on pellucid slabs crossed by the fluorescent veining of the crossed structures that envelop the polychrome film system, whose iridescences, during the night hours, dissolve the *chiaroscuro* contrasts and

come true in a flash of a lamp on an unusual scale (Figs. 6 and 7).

Epilogue.

Learning by doing

From the foregoing, the re-reading of Mejerchol'd's theatrical method experienced in the laboratory lends itself to a process of multiple appropriations. From the comparison between the different design approaches and the actor's movements, up to the learning process itself, the whole period of work carried out by the students can be made to correspond to the *otkaz* phase. That spatiotemporal in which the preparation for action invites the actor's body, just like the student's mind, to collect the necessary energies first, then hold them in compression, and finally imprison them at the right instant for putting into exercise. In this way, the knowledge acquired "by doing" is ready to resurface for future projects. The preparation, the gymnasium of the actor/student, who only must wait for a new beginning, is over for the moment. ■

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- [2] Ibid.
- [3] Intention as rational perception of the task received, realization as cycle

of mimetic and vocal volitional processes and reaction as diminution of the volitional reflex at the moment of realization of mimetic and vocal reflexes concurrently with preparation for receiving a new purpose, are the three obligatory moments for acting according to Meyerhold's theories.

[4] Vsevolod Mejerchol'd is a Russian actor, director, and pedagogue who, together with other protagonists of the Russian theatrical avant-garde, revolutionized the way of doing theatre. He operates between the late nineteenth and early twentieth centuries contributing to bring innovations regarding the entire scenic space, the use of music, texts, and the movement of the actor. He devises a form of training for the actor, which is defined as Biomechanics, based on the belief that a good stage performance starts from the physical training of the actor. He was persecuted by the Soviet regime for his avant-garde ideas, arrested in 1939 and subsequently sentenced to death by firing squad.

1. P. 42. Rendered view of the outside from which you can see the *cocciopesto*. Design by Angela Guarino and Michele Vitale.

2. P. 42. Succession of plans, from the ground floor to the roof. The central atrium with the skylight characterized by the same design as the stained-glass windows of the Basilica and the other impluvia that cover the terraces are visible. Design by Angela Guarino and Michele Vitale.

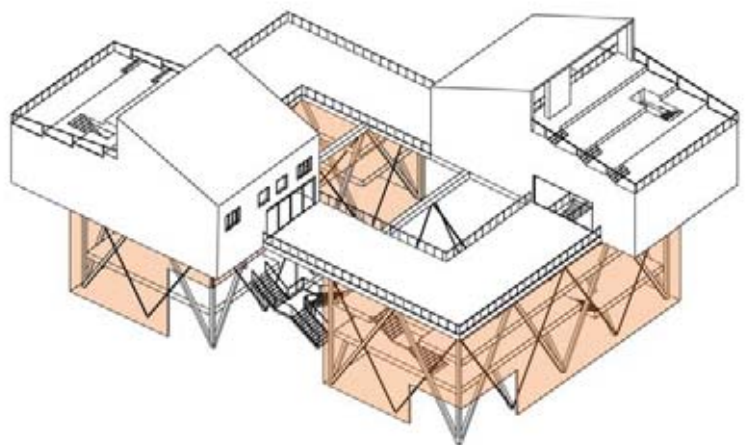
3. P. 43. Sx. Rendered view of the outside. Dx. Rendered view of the interior. Design by Daniele Di Franco.

4. P. 43. Model photo. Design and photo by Giuseppe Ceravolo.

5. P. 44. Section. Design and photo by Giuseppe Ceravolo.

6. P. 44. Sx. Model photo. Dx. Axonometric projection. Design and photo by Maria Festinese and Giovanna Del Prete.

7. P. 44. Axonometric exploded view. It is possible to understand how the structure of the building was conceived. The trusses below with light closures and the two blind wall blocks on top. Design by Maria Festinese and Giovanna Del Prete.



Forgotten architectures. The digital reconstruction of the Chigi stables designed by Raffaello

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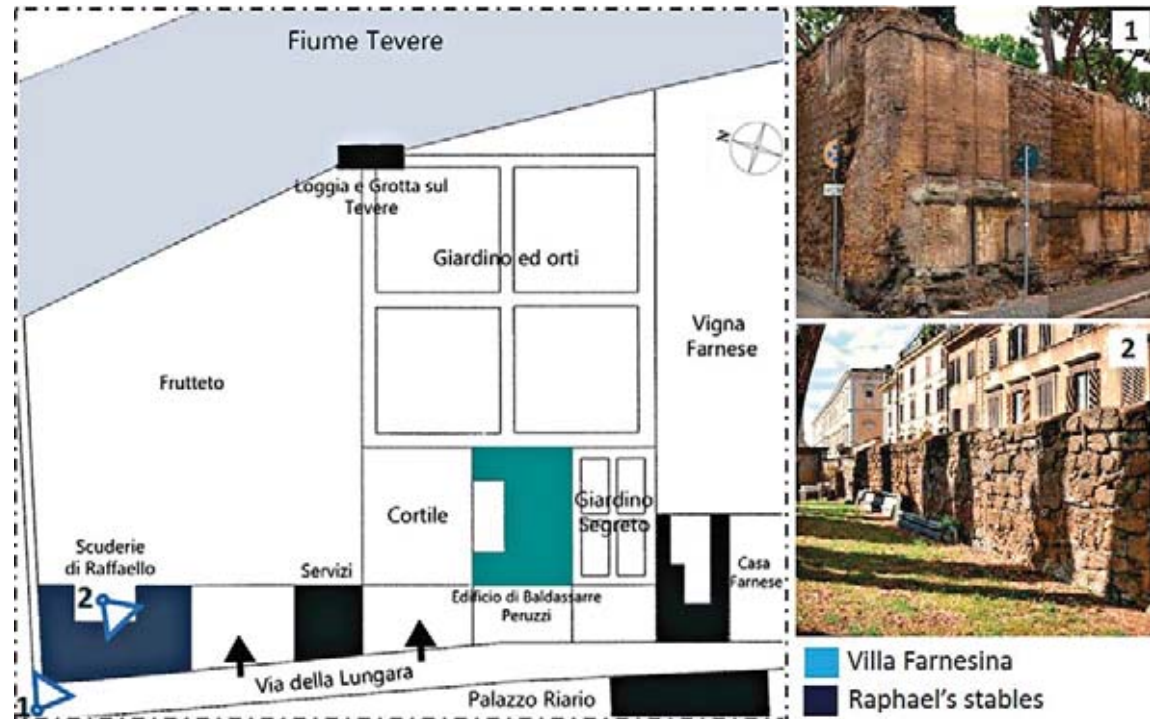
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Introduction

The representation of the disappeared architecture represents an important challenge for the knowledge of our history; the investigation and the interpretation of data obtained from a building and from archival documents allows to recover the information necessary for the knowledge of a site and to reconstruct the events of its creation, its transformation and, in some cases, also its destruction. In this research process, digital tools now offer powerful means of documentation, creating the conditions for collecting, through digital surveying, precise data on the actual state of the investigated place, but also, through 3D modeling, to guarantee a scientific reconstruction of the architectural artefact.

In this context, the paper describes the process of digital reconstruction of the Stables designed by Raphael for the wealthy banker Agostino Chigi in the Villa Farnesina complex in Rome (Fig. 1) [1], starting from the digital survey of the architectural remains and data obtained from historiographical research (Fig. 2). Very little remains of the Stables today: part of the perimeter wall on via della Lungara, however demolished up to about half of the lower order. Here it is possible to read the scansion



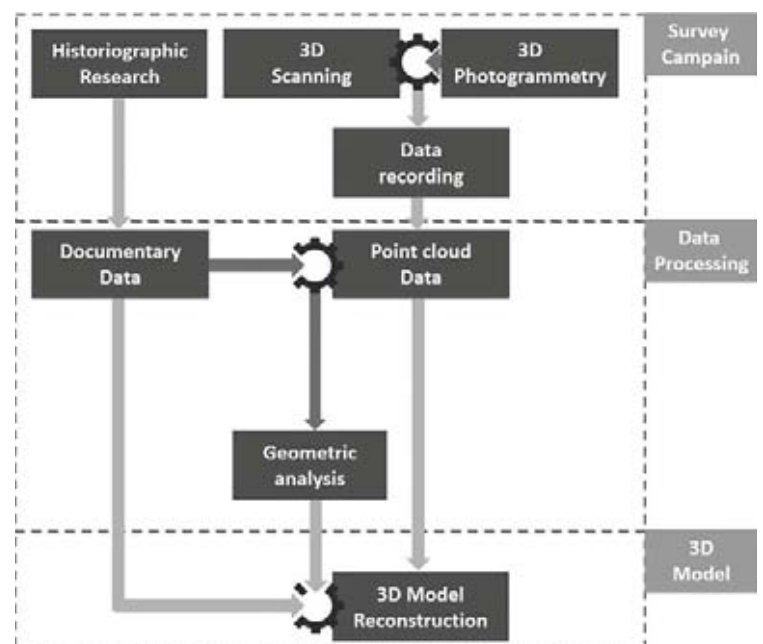
in seven bays of the entire wall with the alternation of paired pilasters and blind masonry panels. Nonetheless, through the analysis of historiographical research data and those acquired through an integrated digital survey, it was possible to reconstruct the overall conformation of the Stables in a digital model that reflects as much as possible the characteristics that the building could have had in the past.

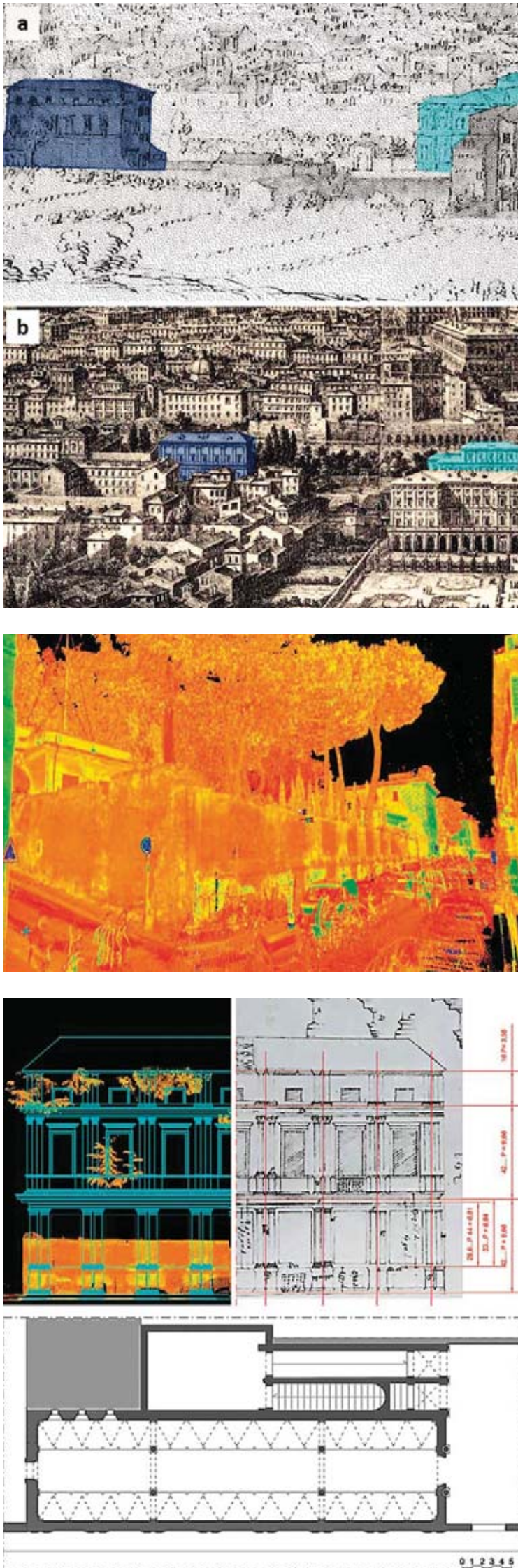
The ancient stables through historiographical analysis

When in 1506 the first stone was laid for the new residence that the wealthy banker Agostino Chigi was having built near the Vatican, it was not possible to identify, in the newly purchased land, sufficient space even for the necessary stables. We had to wait for 1511 when, with the purchase of some neighboring land, Chigi commissioned Raffaello Sanzio with the construction of a building used

as stables overlooking the new via della Lungara. They would have been the most elegant stables ever seen and there is no doubt that Agostino Chigi kept his word. The construction, which began in 1514, must have already been complete on the two main floors in February 1518, when

the stables were the site of a sumptuous banquet that saw the new pope, Leo X, as the protagonist, but the works had to continue for a couple more years, definitively ending in 1520 following the death of the artist, of Chigi and his widow Francesca Ordeaschi [2]. Nowadays is difficult to establish





with certainty what the Stables should have looked like: historiographical documents remain as evidence of this (some sixteenth-century surveys or that of an anonymous Franco-Flemish currently preserved in the Metropolitan Museum of New York and that of an anonymous French preserved in the Kunstbibliothek of Berlin) or the cartographic views from which it is possible to reconstruct the original structure (Fig. 3). Their analysis was favored by the integration of digital survey data, defining the elements of comparison for the digital reconstruction of the original facies of the building.

The survey for the knowledge of the original facies

In order to document both the current structure and the original one of the building, the research was conducted with integrated survey techniques [3, 4], between 2018 and 2020. Considering the relationship of the Stables with the surrounding urban space and with the nearby Villa, a laser scanner acquisition was conducted – with a Leica Station C10 laser – for the documentation and acquisition of all the data necessary for the reconstruction of its historical configuration. Target 2D mires were used in order to create a real “closed mesh” of the scans both externally and internally to the Villa Farnesina area so that a correct relationship between the data obtained outside and inside and subsequently be facilitated in the post-processing phase (Fig. 4). At the same time, the use of a widespread and systematic photogrammetric survey, with a Nikon D3100 Reflex camera, produced detailed data organized in an archive [3] organized by orientation inside and outside the building area. Direct or similar procedures (with the use of the laser meter, the double meter, etc.) were used for punctual checks and rapid comparisons, as well as for the survey of detailed elements or in situations in which the use of the laser scanner was not practicable. It was thus possible to create – after the progressive and overall union of the various point clouds – a general

model of both the walled facings and the residual elements, favoring the subsequent phase of geometric-morphological analysis and reconstruction of the original configurations of the building, in a continuous interaction between re-reading of the historiographical documentation and verification of the reconfigurative hypotheses in the two-three-dimensional restitution.

Analysis and digital reconstruction of the original configuration

The preliminary analysis of the measurements reported in the sixteenth-century archival drawings, with respect to the unit expressed in Roman palmi, and their comparison with the range-based survey, has allowed the reconstruction of the first validated results (in plans, elevations and sections) through the geometric-proportional analysis of the plano-altimetric composition (Fig. 5). The result is a system that in the three-dimensional reconstruction of a critical model [5, 6] reflects the different functions of the stables, with a basement floor, with ventilation and lighting openings towards the main road; a ground floor intended as a stable, divided into three modules; a first floor probably intended for storage, open to the outside by windows with balconies and balustrade parapets; an attic probably intended as a guesthouse [2]. The analysis led to a precise description of the external elevations, such as the one on via della Lungara with eight pairs of pilasters on pedestals marking a ground floor in the Doric order, an upper floor in the Corinthian order and an attic (Fig. 6a). The elevation towards the Villa, to the south-east, was composed differently for the part pertaining to the Stables and for that which enclosed the main stairwell; the part of the Stables was divided as follows: on the mezzanine floor an opening delimited by Doric columns which led to the hall; upstairs two large windows; in the attic two smaller windows. As regards the volume that houses the staircase, two adjacent openings led respectively to the access hallway



and to the corridor to the rear courtyard; on the upper floors there were three rows of windows, some of which were blind. The elements received so far do not allow a reliable reconstruction of the elevation along the Salita del Buon Pastore; the same for the internal organization, if not for the layout of the mezzanine floor (Fig. 6b), for the Stables and putting forward a hypothesis on the spatial organization of the staircase in accordance with the contemporary archi-

tectural typologies and the perspective representation of the vaults covering the landings indicated in the elevation drawing of the Franco-Flemish. The digitization process carried out on the remains of an artifact that has radically changed over the centuries is therefore not limited to the elaboration of images but is itself a process of knowledge [7] to broaden the knowledge that makes use of modeling to carry out a punctual reflection on the design problems faced

by Raphael in carrying out this delicate task and on the original solutions adopted.

Conclusions and future developments

The quality of what was produced at the end of the reconstruction process then led to create virtual contexts that can be visited, and to enhance the perception of the place on the spot through virtual reality solutions in order to rethink disclosure to users of virtual tourism who can access the contents developed in the research [8]. This is in fact leading the research to define an informative and interactive model, i.e. a system of ‘serious games’ which sees the attention paid to the multimedia presentation of the figurative and informative content [9]. ■

Acknowledgments

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1. P. 45. Framing of the Villa Farnesina complex with the location of the buildings in the area including the Stables designed by Raphael. Today's views of the remains of the ancient building.
2. P. 45. Methodological scheme applied in the reconstruction process of the digital model.
3. P. 46. The evolution of the Scuderie building (in blue), in the Villa Farnesina complex (in azure), through historical views of Rome in: a) second half of the 16th century, by Antonis Van Den Wijngaerde; b) 1765 by Giuseppe Vasi (Frutaz, A. P., 1962).
4. P. 46. View, along via della Lungara, of the point cloud model obtained by laser scanner acquisition. Observe what remains of Raphael's Stables.
5. P. 46. Reconstruction of the original configuration of the Stables in plan and main elevation along via della Lungara, starting from the digital survey and the analysis of archive drawings.
6. P. 47. External (a) and internal (b) views of the virtual model of Raphael's Stables in the original configuration: view on the ground floor towards the entrance from Salita del Buon Pastore.
7. P. 47. Overall view of the unique surviving elevation of Raphael's Scuderie for Chigi.
8. P. 47. Aerial view of the area where the Villa Farnesina stands and where Raphael's Scuderie once stood.



The analysis of values as a strategy for the conservation of cultural heritage

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1. Introduction. The analysis of values as a methodology for conservation

Contemporary European approach to Cultural Heritage (CH) is marked by the entry into force of the Framework Convention on the Value of Cultural Heritage for Society, Faro Convention, in 2011.

This convention emphasizes the value and potential of CH as a resource for sustainable development and quality of life in a constantly evolving society, linking CH to human rights and democracy.

According to this approach, we can affirm that conservation of CH relies under this approach in its capacity of being a resource of sustainable development and quality of life for the society, displacing the focal point of the former theories of conservation, focused on the object itself, to its “utility” for the society (Fig. 1).

One of the milestones of the Faro Convention is to encourage citizens to recognize the importance of CH through the meanings and values that these elements represent to them.

The concept of “recognition of values” has been widely developed since its first theorization that we could place in the work of Alois Riegl (1903). But it has been in recent decades that we have seen systematization through different schematization proposals that attempt the difficult, impossible, task of measuring the immeasurable.

It is noted that UNESCO, in the *Guide for managing World Cultural Heritage* [1] recognizes the analysis of values as a possible response to the growing complexity of the CH and to the need to define them by elaborating a *Declaration of meaning* as a basis for the development of conservation and management strategies.

The systematization of the analysis of values also finds significant references in the approach formulated by the Nara Document on Authenticity (1994) that attempts to broaden the concept of CH of the Venice Charter by placing it in relation to the cultures that generated it and consequently consider a wider variety of values that can be attributed to it. Based on this vision, Van Balen [3] develops a method of analysis of the Heritage Values (Table 1)

This approach is shared in the Faro Convention by the development of democratic participation, involving citizens and civil society in integrated mechanisms that identify values, from which to define priorities in CH projects. It remains to be defined how to translate these principles into a practical way of assessing values (Fig. 2).

2. Proposals for assessing values. When hazard and risk came into play.

A reference on this topic is the Getty Conservation Institute (GCI) forum where “the complex social, political and economic issues raised by [CH] protection could be explored and debated”[4]. This initiative evolved into the GCI’s Heritage Values Research Project, linking economic and cultural approaches to CH ap-



preciation and promoting the development of an integrated approach to conservation. Between 1998 and 2005, the project defined and evaluated CH values considered fundamental to conservation and examined case studies on values in the management of CH sites. The understanding of cultural significance becomes the reference for decision-making processes, providing a basis for the formulation of resilience projects.

This illustrates how conservation actions are more effective when the complexity of values is understood and supports decision-making processes. In the context of conservation, values refer to the different qualities, characteristics, meanings and perceptions attributed to CH. The latest trends embracing value analysis as a conservation strategy are based on the ability to recognize, document and act on the dynamism of values.

Another interesting approach is to introduce the factor of danger and risk into this analysis.

CH is constantly under threat, as shown by recent catastrophic events, both natural such as earthquakes and volcanoes, and man-made such as the war in Ukraine.

These extreme situations make it possible to establish evaluation factors that define a hierarchy of values, taking into account the need to preserve those considered essential for a project of conservation, reconstruction and recovery of identity (Fig. 3). When carrying out a risk analysis, it is first necessary to distinguish between two concepts: 'hazard' and 'risk', often used interchangeably. However, these terms have completely different meanings and functions: danger refers to something that has the potential to cause harm, while risk is the degree of probability that harm will occur.

Risk is calculated as the product of the hazard, the vulnerability and the value (damage) of the exposed objects, so it seems necessary to define 'value', which, however, is a subjective factor.

Therefore, the concepts described above come into play,

Table 1. Nara Grid

Aspects ↓	Dimensions ∞	Artistic	Historic	Social	Scientific
Form and design					
Materials and substance					
Use and function					
Traditions, techniques and workmanship					
Locations and setting					
Spirit and feeling					



where the attribution of value by heritage communities becomes meaningful when it comes to "weighing" the importance of CH so as to guide projects (Table 1).

One of the systems used to establish these values is the Nara Grid. However, this table remains qualitative and it would therefore be necessary to define a priori an order of importance of the aspects and dimensions investigated as well as the relationships between the different values. This means introducing a qualitative weighting in order to apply it to a quantitative system (Figs. 4-5).

3. Conclusions

The topic of value analysis appears to be of great interest and topicality, especially in the

European context to overcome the top-down approach. The vastness and complexity of CH, and of the phenomena that affect it, require awareness on the part of citizens. The creation of bottom-up sharing processes looms as an effective and sustainable solution to CH conservation (Fig. 6). Hazard and risk analyses are used to establish priorities and strategies to disaster. The hierarchies of intervention that such analyses define place people's lives first and property second. The resulting priorities for intervention cannot fail to take into account that individual assets take on different values, not just economic ones, and that these constitute a reference element in the definition of intervention hierarchies.

Therefore, it becomes clear that weighting this value according to people's perception of CH is a possible strategy to rationalise and optimize the efforts devoted to the CH conservation and, ultimately, to ensure a resilience strategy. One of the challenges facing conservation today is to understand the shift in focus from "what" and "how" to conserve to "for whom" to conserve. Understanding this can help develop the tools needed to outline conservation strategies.

Efforts must therefore focus on applicable upstream and downstream analysis of risky events to outline a conservation strategy that goes beyond the formal, material approach and considers the more current view of CH as a resource for endogenous development. ■

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1. P. 48. Belchite (Zaragoza, Spain) Ruins of the old town destroyed in the Spanish Civil War (1936-1939) Conserved as a place of Memory. Photography of the authors.

2. P. 48. Historical center of Moncalieri (Turin, Italy). The building depicted in the image constitutes a controversial example of conservation. Photography of the authors.

3. P. 48. Calatayud (Zaragoza, Spain). Photography of the authors.

4. P. 49. Church of La Virgen of Tobed (Zaragoza, Spain, included in the WHL) an example of use of the space for community activities. Photography of the authors.

5. P. 49. Fréscano (Zaragoza, Spain) Example of activities to promote a participatory process in decisions related to heritage tourism promotion plans. Photography of the authors.

6. P. 49. Belchite (Zaragoza, Spain) Ruins of the old town destroyed in the Spanish Civil War (1936-1939) Conserved as a place of Memory. Photography of the authors.

The existing building as a source of energy: proposal of a method for the development of operational procedures for reuse

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According to the World Cities Report, urban populations have been growing since 1990 and are expected to continue increasing until 2050 [1]. The transition to circular models is leading to densification solutions aimed at urban regeneration. To achieve these objectives, the phenomenon of urban densification is often associated with the obsolescence of existing buildings no longer able to meet current functional and environmental needs, causing an increase in construction and demolition (C&D) waste [2].

In this paper we are interested in the reuse of building components from deconstruction sites providing for selective demolition. For this purpose, it is necessary to develop an informed process capable of supporting production and research in the field of construction to place the building in a circular, continuous, and controllable model, from its design to its valorization at the end of life. To define a reuse management model for the existing building, thus reducing technical obstacles, we rely on the concept of embodied energy, defined as the difference between the energy required by all the elements that make up the building and the energy obtained by their valorization at the end of life. This definition refers to the life cycle of an element. The assessment of embodied energy at a given time therefore depends on assumptions about unknown future events based on predictive models

and relies on knowledge of construction methods from different periods. This can be problematic when the analysis must be extended over time intervals in which significant technological evolutions have taken place.

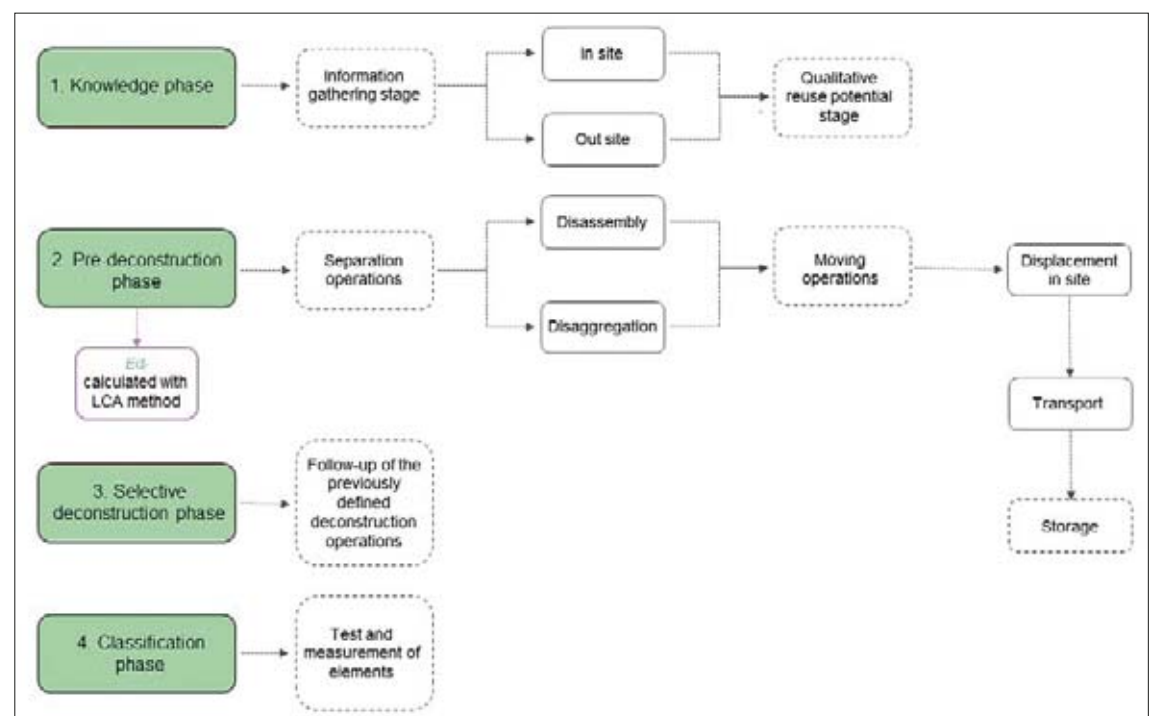
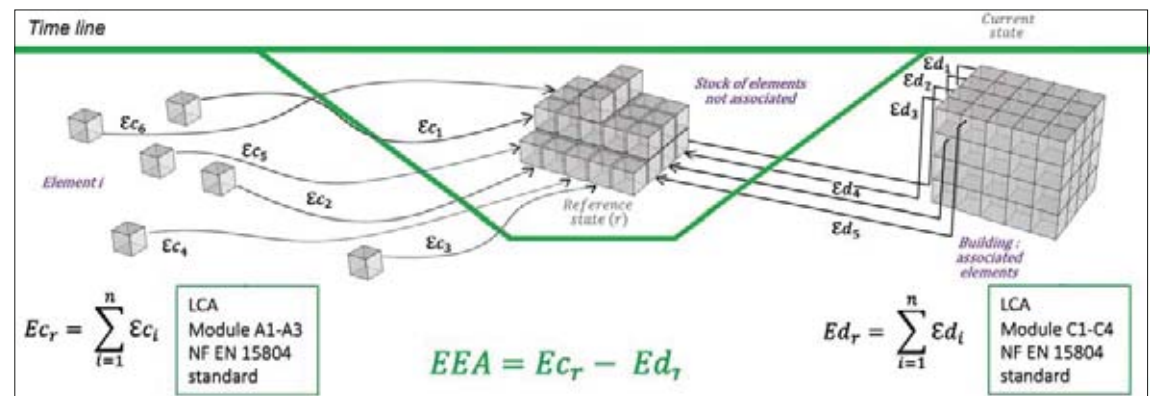
To overcome time dependency, we rely on a revision of the relationship between the elements of the construction and the building. We define the elements as units of the construction, identifiable throughout the analysed process – without reference to their intrinsic nature (a material, a set of parts...). The building is defined as a provisional association of elements, each with its own pathway in its life domains. On this view, the reuse potential is

the energy value it is possible to recover from the existing building, imagined as a stock of elements merely produced and not associated, ready for use in a circular process.

Analysing the reuse potential, based on the given definition, we choose an arbitrary reference state (r), close to the current state, in which the elements are imagined as if they had been produced but not associated in the building. Starting from method proposed by Brocato et al. [3], we name the “available embodied energy” (EEA) the energy it is possible to recover at the given moment – reference state – through the appropriate selective demolition procedures in a deconstruction site. This allows us

to overcome the limitations of a time-dependent assessment.

The is defined as the difference between the sum of the energies needed to produce all the building elements in a non-associated situation – calculated in the reference state () – and the energy required for the selective demolition operations, allowing the building elements to pass from the current state (associated) to the reference not-associated state () (Fig. 1). This calculation can be done with LCA methods stopped at the reference state, without projecting too far into the future. This assessment is carried out at the construction stage. The definition of the selective demolition path implies the study of necessary operational



procedures to be performed. Fig. 2 presents a method for the analysis of the reuse potential and the necessary procedures for the selective demolition process.

The first step is the knowledge phase, in which the necessary information on each element is gathered, and the elements that can be reused are identified according to the typology and period of construction. This can be conducted both in situ and off-site. The off-site data acquisition includes a documentary search of the building. In situ information gathering allows the collection of geometric, material, structural and technological data. Various digital tools exist to facilitate data acquisition and increase the accuracy of the survey – i.e. 3D scanners, photogrammetry, recognition algorithms.

Once the information has been collected, the qualitative identification of the reuse potential can be carried out. Since the existing building was not designed with technologies that foresaw potential reuse, the classification of the elements is based on physical criteria and not predictable procedural. The criteria are based on the analysis of topological, geometrical, typological, mechanical, and chemical properties. Opposing factors can be identified and a

Properties	Opposing factors	Examples
Topological	concentration dispersion	concrete slab cabling
	uniformity multiplicity	window tiling
Mechanics	structural nonstructural	beam insulating material
	resistance weakness	beam moquette
	ductility fragility	linoleum tiling
	versatility specialization	sheet metal panels tiles
	assemblage aggregation	metal frame reinforced concrete column- beam joint
Technological	compactness dispersed	reinforced concrete beam electrical wire
	tolerance accuracy	cabling joinery

qualitative scale of assessment can be defined ranging from 10 – favorable to any reuse operation – to 0 – unfavorable to reuse (Fig. 3).

The second step is the selective pre-deconstruction phase in which, for each element and according to its position, we construct a list of operations to be carried out to make it available. The selective pre-deconstruction operations are classified as separation technologies or displacement technologies.

The moving operations are related to the dimensions of the separate elements. The elements must be of a size compatible for use in the new construction project, and with the technologies and prices of the relocation operations.

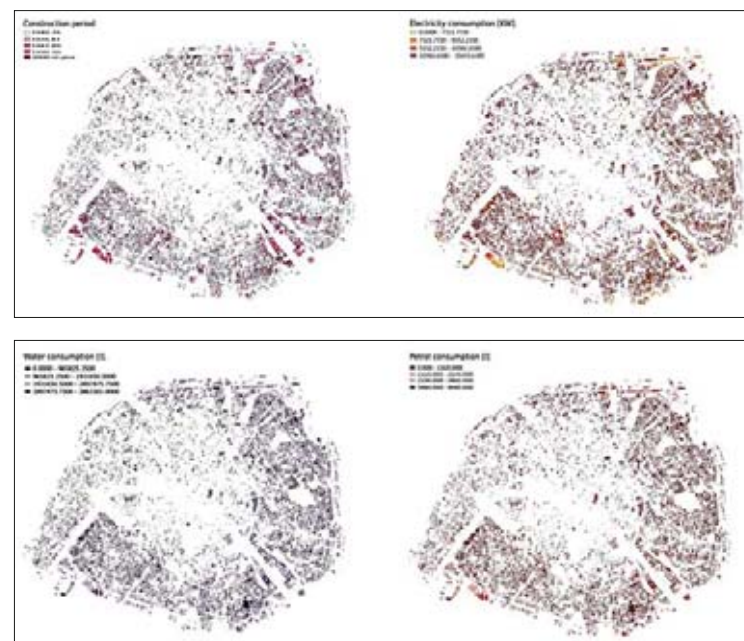
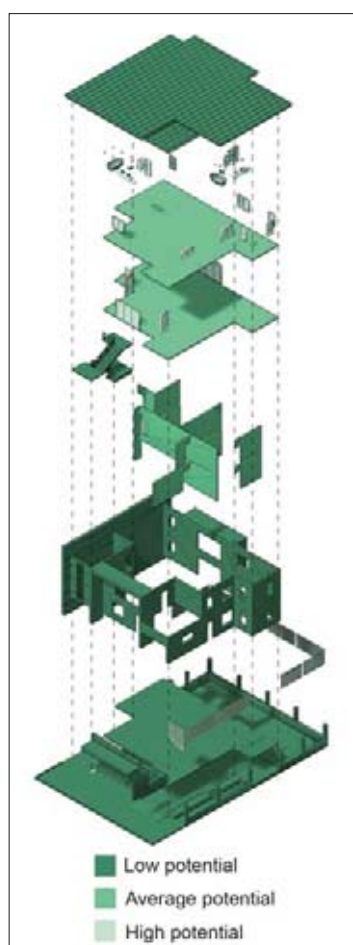
To perform this analysis of selective deconstruction operations, a reverse BIM model can be created [4]. This is a digital twin of the building containing the physical information of the elements and their locations. Using reverse BIM can help reduce the construction impacts, improve site operations, and make parts and processes on purpose, organizing the selective deconstruction operation stages. The last step is the transport operation to the storage site – medium to long

distance – or to the new construction site.

These operations are then analyzed with LCA software. An assessment at the end-of-life stage of the elements is conducted. The sum of the assessed impacts gives a global evaluation of the energy. After this stage, it is possible to evaluate the of all the elements of the building in its current state (Fig. 4).

The selective demolition phase foresees the follow-up of the previously defined deconstruction operations. During this phase, it is possible that the previously defined steps cannot be taken, because of subsequent information collected only on site. The presence of a reverse BIM could facilitate the process, integrating information throughout the project and execution of work and controlling site operations to the smallest detail.

The classification phase includes the analysis of the disassociated elements *in situ*. This involves carrying out tests and measurements on their condition. This allows the implementation of information on possible conditions of reuse in the digital model or to classify them as recyclable waste or to be recovered. The information



collected can also be stored in the elements, thus allowing the information to ‘move’ with the elements using a barcode or Radio frequency identification. The proposed method, organizing operational procedures for selective deconstruction techniques, could lead to an increase in the value of the elements and a reduction of site costs. This method could help the practice of deconstruction by providing an overview of the urban reuse potential and lead to an urban planning policy that integrates this data in the process. This approach was presented for the city of Paris (Fig. 5). Maps of water, electricity and petrol consumption have been created for reinforced concrete buildings to identify potential for reuse by homogeneous zone [18]. Future developments are planned to present the assessments of the reuse potential with the proposed methodology applied at building- and city-scale case studies. ■

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- [9] P. 51. Map of existing buildings in the city of Paris after 1940 (left). Maps of the evaluation of the electricity consumption necessary for selective demolition (right) [2]
- [10] P. 51. Maps of the evaluation of the water consumption (left) and petrol consumption (right) [2]

Representation architectural heritage: HBIM and IoT for the safety

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Introduction

(R. Parente, R. Tavolare)

Considering the international and national regular framework, it is clear that Building Information Modeling (BIM) is a design and representation methodology that will inevitably take hold within the entire construction chain, concerning not only the design and construction phases, but also - and above all - the management and use of building envelopes.

To this, we must consider the digital development towards which operational processes are migrating, thanks to the integration of auditing devices such as the Internet of Things (IoT) and digitized processes such as smart-contracts and block-chains. Due to the type of architectural heritage present in our territory, it is evident that this development must deal with some critical issues and limitations inherent in the morphology of the built that characterizes our territories.

This study aims to conceive a design paradigm that integrates IoT systems within the HBIM context, through a virtual use, using as a case study the Monumental Complex of San Lorenzo ad Septimum in Aversa, headquarters of the Department of Architecture and Industrial Design of the University of Campania "Luigi Vanvitelli".

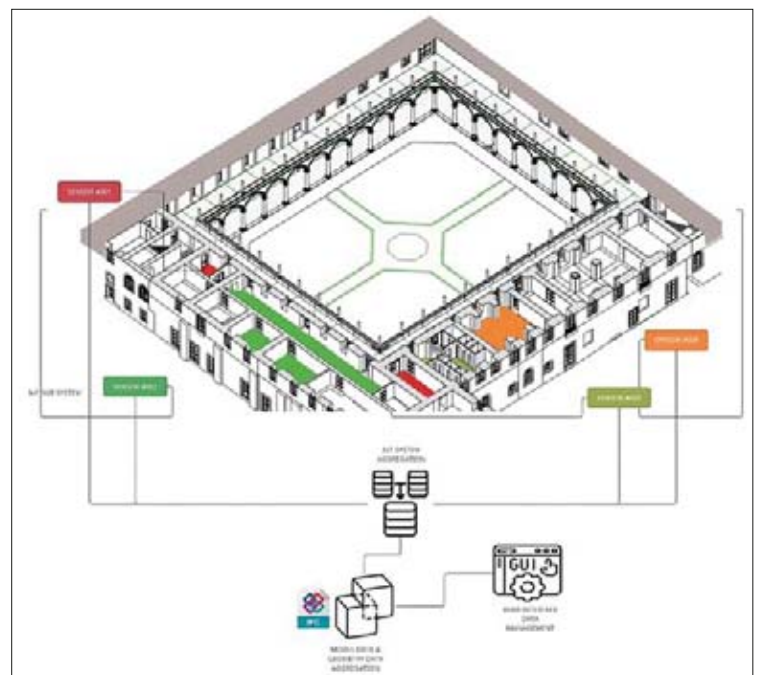
The survey aimed at drawing the HBIM model (R. Parente)

The knowledge activities, carried out on the San Lorenzo complex, arise from needs related to the seismic safety of the structure. The University

of Campania, in fact, has commissioned these activities to the Benecon University Consortium to involve multiple skills from the historical ones to those of representation and seismic, all aimed at carrying out emergency interventions, pursuant to art. 27 of the Cultural Heritage and Landscape Code. The emergency intervention, carried out because it is essential to avoid damage to the protected property, is part of the "knowledge yard" project and concerned the repair actions of some structures of the Abbey which, in an initial phase, were focused on a module located inside the cloister of the monumental complex.

Since its conception, the drafting of the 'Knowledge Yard' project has included the involvement, alongside Representation, of other disciplines related to history and building at different scales and thus inevitably linked to the safety of the building under analysis. The opportunity to carry out a survey even in the presence of a construction site opened up new possible research scenarios that led to the development of the present contribution focused on the integration of IoT with HBIM models on the topic of security.

The artifact has been discretized and measured in all its constituent parts to return it in a complex unity. Knowledge to date, therefore, equates to representation as the integrated management of disciplinary knowledge applied to the Monument. As is customary within the discipline of drawing, the survey of the architectural artifact was aimed not only at the identification of the characters and uniqueness of the places but also involved a historical-critical analysis for the definition of the characteristics, the state of preservation and the determination of the most significant elements.

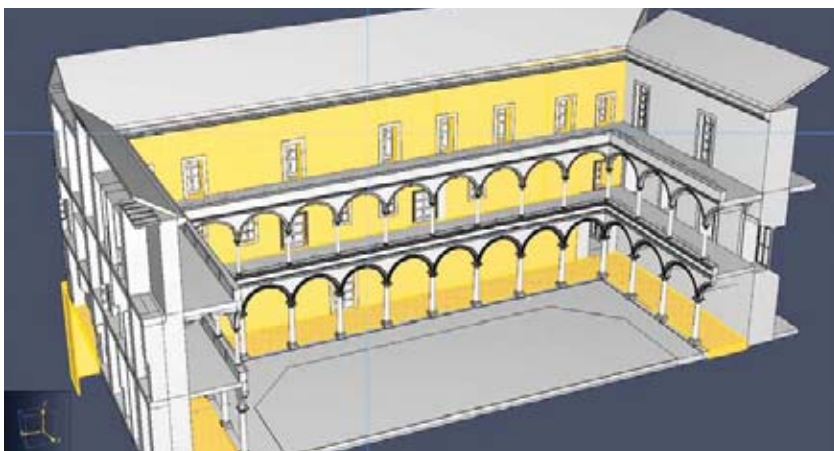
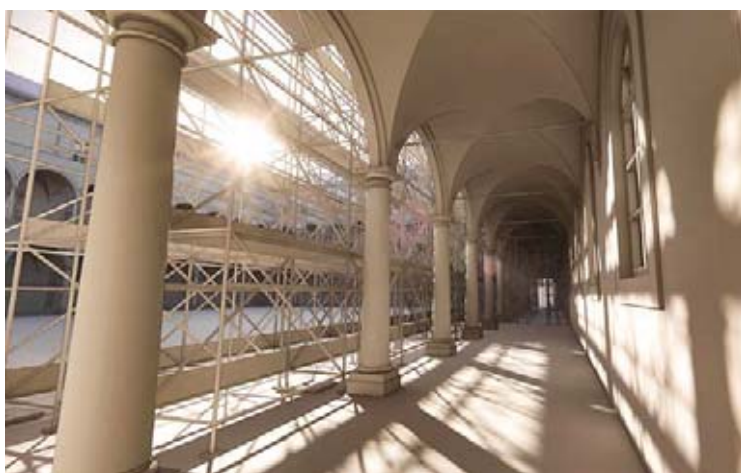
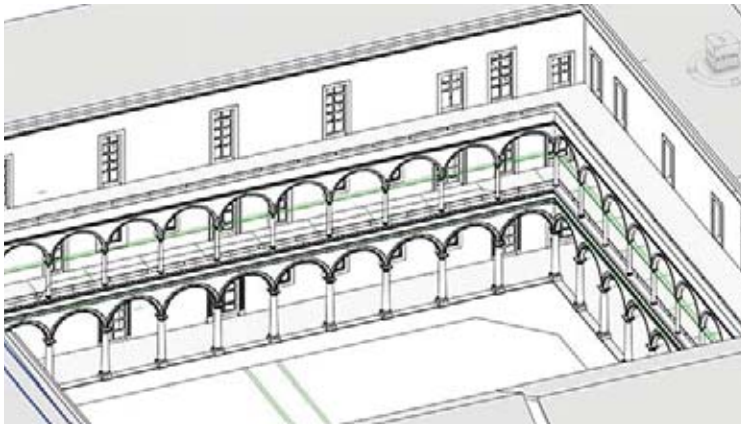


For design maintenance or restoration interventions, it is possible to use 3D models to include them in BIM (Building Information Modeling) in fact, this methodology provides the advantage of having full control of the entire design process and the possibility of timely verification directly on the 3D model of the findings of the intervention, with significant improvements in design quality.

A bibliographic and archival research first allowed for the reconstruction of the evolution of the complex over time, as

well as modifications and additions to the architectural layout. The perimeter walls, floor and roofs were preliminarily plotted on the original point cloud as BIM components, so as to create the building's exterior envelope, in a Scan-to-BIM logic.

The abbey of San Lorenzo arose in a locality that already in ancient times had characters of great interest: along the ancient route of the Consolare Campana, ad Septimum, at the seventh mile from the city of Capua, at the place where the road crossed the northwest



corner of one of the meshes of the centuriation of the Ager Campanus.

In addition, a section of the ancient Via Campana, which connected Capua-the present-day S. Maria Capua Vetere-with Puteoli, the modern Pozzuoli, was found outside the church of San Lorenzo.

With the aim of creating a three-dimensional survey network capable of understanding and controlling the entire area of the monument complex, the methodology used involved the integration of selected reality-based survey techniques: laser scanner survey of interiors and exterior facades, for the processing of a detailed, precise and accurate point cloud; terrestrial photogrammetric beating to fill in any gaps and improve the colorimetric data; classical topographic survey with total station to acquire Ground Control Point - GCP for purposes of data resizing and integration; GNSS survey for georeferencing spatial information. The first phase of indirect survey was focused, by means of topographic total station, on the south façade of the architectural complex, in order to determine some punctual features such as the exact location of window compartments, the identification of singular points of the portals not otherwise obtainable; then the spatial framing of the complex was carried out, thanks to the survey – of the points used as stationing for the topographic station – by means of GNSS receiver.

BIM modeling, in the three-dimensional authoring phase, is inevitably limited by the instrumental capabilities of the software environments used, which, due to their parametric nature, do not allow freedom of deformation and shape generation as is normally the case

within polygonal modeling environments, going to impact the digital design process (CHRISTENSON 2009).

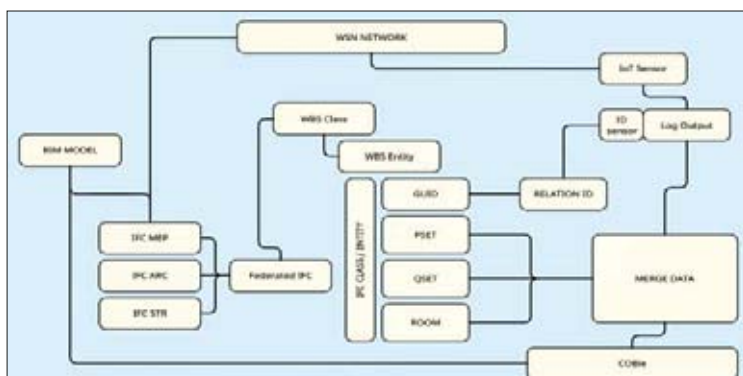
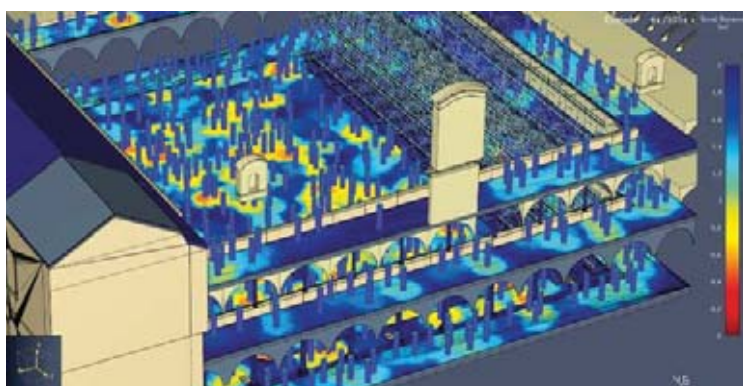
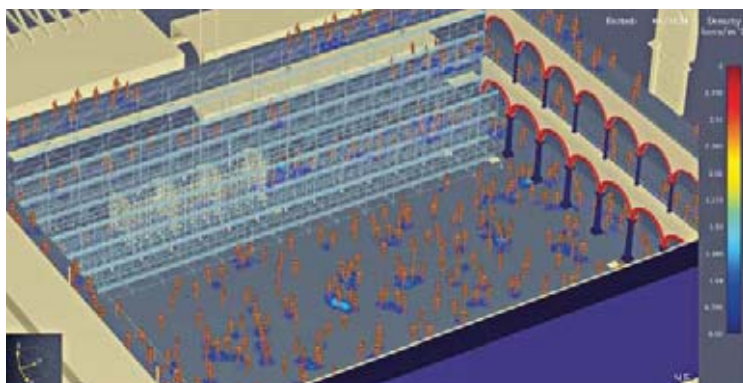
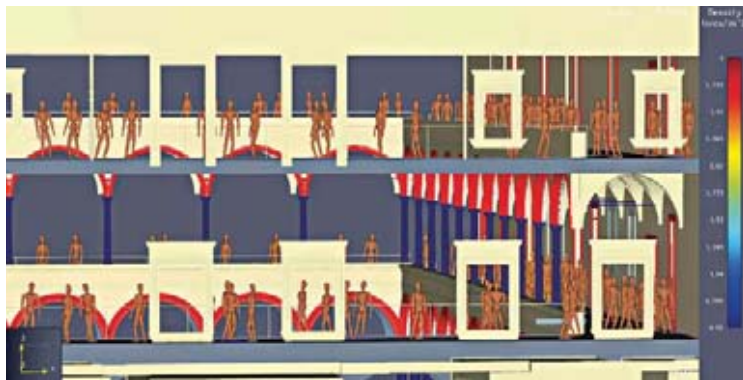
While this limitation can be partly overcome through the integration of external plug-ins and software or through the use of programming scripts, it is critical to consider the translation process to which such 3D environments will have to undergo in order to make them OpenBIM standards-compliant, thus using descriptive schemas and standards, such as the IFC format and related MVDs (Model View Definition) (BORRMANN et al. 2018). For these reasons, in the historical context, BIM modeling must necessarily transition from a preliminary phase of geometric study and decomposition that takes into account the generative geometric nature of solids, while preserving the semantic orientation with which each element must be associated, to allow for proper interpretation in the subsequent management phases, which are based mainly on standardized ontologies (JUNG et al. 2013).

Considering the difficulties of the historical artifact on which they were going to work, specific drawing and modeling techniques were adopted. In order to virtually represent and describe the actual complexity of the architectural apparatus, the integration of reverse engineering techniques was considered: the vaults of the cloister were segmented from the laser-scanned point cloud, reconstructed as mesh models and subsequently imported within the Autodesk Revit BIM platform. Specifically, the solids obtained were modeled as polygonal geometries in order to be used as subtraction solids of the parametrically constructed floors:



- the door and window holes as subtraction solids of the realized parametric walls;
- wooden and iron trusses, as external solids to which materials were later attributed;
- the cornices and decorations, as external solids superimposed on the parametric objects.

The BIM model is considered as an information container for the facility management of the modeled heritage and its possible integrations with digital sensor systems in real-time (IoT), in which the data-geometry connection is fundamentally based on unambiguous indices that identify environments or building



elements included in the three-dimensional scenario reproduced. In the case study, the restitution of the acquired data made it possible to generate a three-dimensional model as a synthesis of historical, geometric, and material information that can be extracted at any time.

The research activities aimed at the creation of a model in the H-BIM environment to enrich an interdisciplinary knowledge about the architectural heritage, resulting in a systematic reading of the built environment, where a model is created for its meaning rather than for its form and geometry, since its definition necessarily requires the identification of the individual parts and the connections that bind them and refer to them in their vocabulary and semantics.

Modeling in architecture makes it possible to study an artifact in all its metric and material specifications as well as in its volumetric organization. It also allows to investigate reality far beyond its contingent physical form as in this case study in which, starting from a laser and photogrammetric survey, a Scan-to-HBIM process was implemented, arriving at the reconstruction of the building elements the entire complex. To that three-dimensional model, management information (e.g., room use, location of escape routes, maximum room crowding, etc.) was associated through the use of design parameters subsequently associated with customized PSets in IFC 4 format. On that model, exodus simulations were finally tested by devising an IoT based information infrastructure for behavioral and environmental analysis.

BIM and IoT (R. Tavolare)

IoT systems are composed of a set of hardware and software technologies that enable to analyse and record data acquired by means of specific sensors, and transmit this information by wireless (3G/4G/5G, Wi-Fi, Bluetooth, etc.) or cable connections. The objective of these devices is to enable real-time sharing of the acquired information, making it available to inte-

grated systems or directly to people by visual interfaces.

In (PATEL et al. 2016) we find a classification of IoT into three categories, based on the connection type: person-to-person; person-to-device; device-to-device.

In such paradigms, BIM can be included in the second category as a visualisation and informative integration interface by exploiting the relational organisation that the OpenBIM standard provides in the coding of construction components in 3D models.

The connection and information integration network can be designed in various ways, depending on the design requirements and, above all, the so-called BIM Uses, as specified in ISO19650. In particular in (TANG et al. 2019) we find a possible integration taxonomy that has several application domains where the use of BIM and IoT is reflected:

- Construction execution task and monitoring
- Environmental monitoring
- Asset monitoring
- Communication and collaboration
- Construction performance
- Health and safety management
- etc.

In this research, a design integration system between BIM and IoT was imagined for managing security in a complex building context, such as the Complex of San Lorenzo. The destination of the building, as a University Department, involves some important aspects in security management, due to the number of people occupying the rooms and their movement, often simultaneous, through the rooms. In addition, being a historical building designed many years ago, it has some important criticalities with respect to the most up-to-date design guidelines, which require in-depth reflections in terms of security auditing.

Moreover, the historic building shell limits plant-engineering redesign interventions, thus imposing a different implementation study compared to the most commonly used smart-building practices, often introducing additional risks in

their adoption (CIHOLAS et al. 2019).

The integration of IoT sensors with BIM models has as main objective to conceive an external data connection with the building by his components and technology part. This connection allows to extend the BIM uses of the model enabling, for example, building performance analysis or location and monitoring systems on specific properties such as temperature, air quality, etc.

This data, processed and sent by a gateway system (WSN), can be synchronised with the BIM models, providing real-time feedback on the data detected.

(ROWLAND 2016) has proposed the use of gamification methods like MOG (Multiuser Online Game) as a paradigm for information fruition, achieving a fusion of real and virtual with Augmented Reality, within a BIM-IoT system.

The informative integration of IoT sensors can also be applied in the immersive experience (VR/AR) by using HMD equipment. In this case, it was possible to transform the BIM model into an immersive model by linking the information sources in the model to the parameters of the three-dimensional meshes, recreated during the VR conversion.

This approach made it possible to preserve the model's information contents by ensuring the reading of this data at the VR simulation stage.

The application of IoT sensors in a BIM digitalised context finds utility in two distinct design phases: plant-engineering design and information use.

In the first phase, the designer is called to elaborate in the same BIM model, the location of the IoT elements and their connectivity with the existing MEP system, using the disciplinary authoring tools provided in the workflow. During this phase, in addition to considering the construction requirements that a historic building imposes when installing such systems, it is also essential to consider the technological limitations that the building components impose (e.g. shielding of wireless connections due to wall thickness) (YOUSEFI, AZALI 2018).

In the second phase, the BIM model is 'linked' to the sensor data, by a wired or wireless system (WSN NETWORK) that allows the transmission and updating of a relational database indexed by a unique ID associated to the sensor (#ID SENSOR) and to the associated BIM element (#GUID) that represents the parametric basis of the BIM model.

A data consolidation was supposed through the integration of the analysis and evaluation reports that the manager normally does as a part of his functions. Therefore, we considered an automatic transcription flow by the open interchange format COBie, standardised by ISO 15686-4:2014 for the management of the building and its components, offering an additional interoperable management tool (KUMAR, LIN TEO 2022).

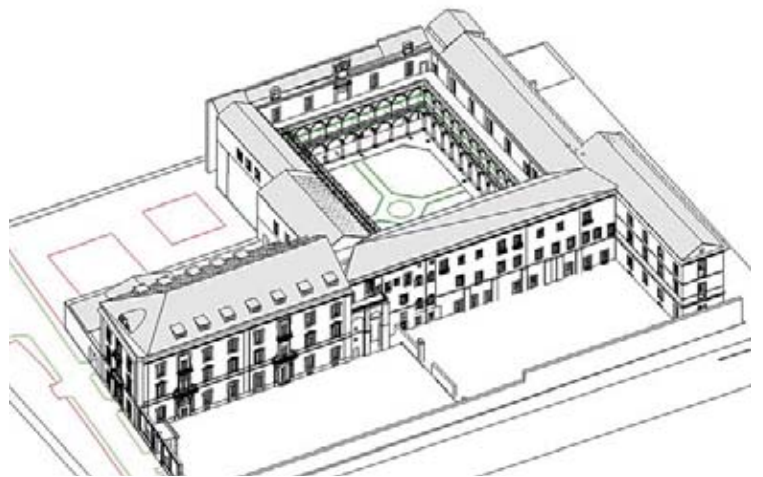
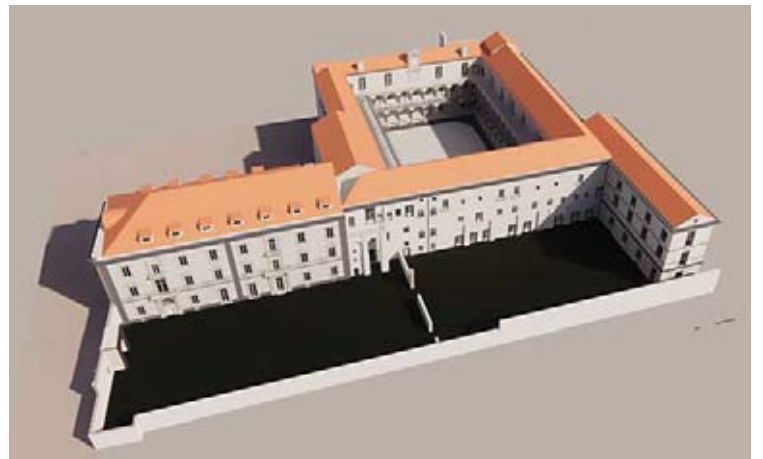
One of the critical issues to consider in this scheme is the parametric sensor data mapping.

In the user phase, the sensors record data often in a native format, without any real shared standardisation, thus requiring a further normalisation and formatting phase compatible with the structure and information coding provided in the BIM model. (DAVE et al. 2018). The use of IoT sensors, in addition to open to opportunities for real-time analysis, can provide useful foreshadowing information for further investigations and simulations.

For example, the use of sensors may allow the statistical recording of the crowding of specific rooms at specific times (density) or the prevalent use of some specific ramp connections for the use of floors.

These behaviours, even if chosen in non-emergency conditions, can be integrated into simulative applications for analysing and foreshadowing the behaviour of a building's occupants, using specific configuration parameters.

In particular, with the use of Pathfinder software, it was possible to use the realised HBIM model as a scenario for simulations in the field of security. This software has allowed us to observe analytically the use of escape routes, highlighting critical gathering



points that offer to the security manager, interesting analysis tools for risk mitigation and management.

This application, for example, allows the analysis of escape behaviour in case of indoor construction sites that may change the behaviour of the occupants.

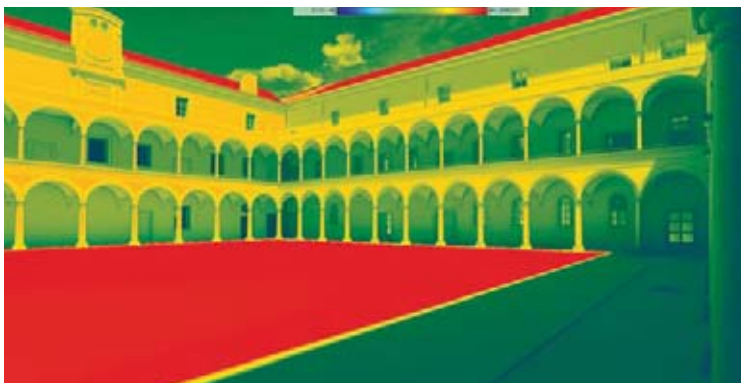
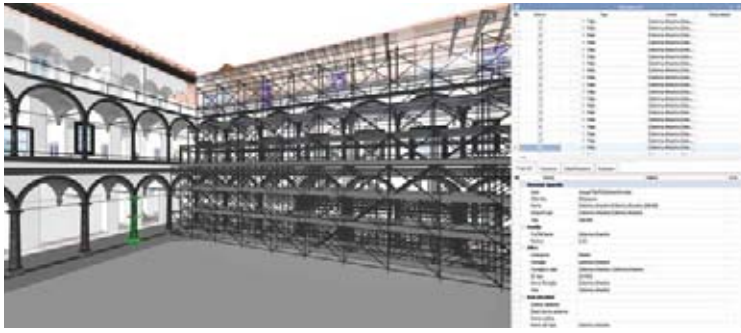
Conclusions

(R. Parente, R. Tavolare)

The research activity was aimed at the design and development of an information infrastructure between BIM and IoT into historical contexts. The design of the HBIM model of the San Lorenzo Monumental building had to respond to requirements of representability, recognisability and usability, compatible with the chosen IoT applications.

From the needs, that is to survey the asset for seismic safety purposes, we then looked at safety aspects in a more general sense and strongly linked to the current nature of the asset under investigation, as a structure frequented daily by numerous people including students and teachers, technical and administrative staff.

We performed a geometric and morphological translation of the existing spaces, implementing reverse-engineering operations, also through the adoption of photogrammetric structure from motion and laser digital survey technologies that, although they allow an immediate registration of the space, require further specific planning and processing capabilities in post production, such as to make the point cloud,



and the relative geometries obtained from it, compatible with the LOIN requirements (Level of Information Need, according to UNI EN ISO 19650) and required by the subsequent information design phases. The research involved the verification and optimisation of a design workflow that, starting from a laser survey, led to BIM modelling, which has become the implementation basis for an IoT infrastructure, enabling simulative analyses to support management activities. The activities carried out revealed a number of critical issues, both in the representative and implementation fields. In the first, the need for a cor-

rect and careful topological optimisation of the geometries used became evident. This is because it is essential to guarantee both the recognisability of the elements and their stylistic characterisation. Furthermore, it was necessary to study a semantic classification of the building elements coherent with the classification system in use in the management processes, so as to allow functional integration with facility management system and process. Furthermore, with regard to the implementation of IoT systems, a number of limitations that these technologies find in their installation in historic

buildings have been identified. These critical issues require an in-depth design phase that guarantees both the effectiveness of the automatic measurements and an integration with the building system that does not invasively alter the perception of the architectural spaces in place.

For the representation phase, which is useful for the prefiguration of the environments in which the interventions will take place, it was necessary to use opensource applications to be integrated into the workflow, in order to allow the generation of UV maps and textures of PBR materials, which are essential for a more efficient material simulation in the scene.

Considering the historical nature of a large part of university buildings in the Campania region, the simulation of construction sites presents itself as a crucial aspect for safety management in certain circumstances of ongoing works, for risk mitigation and management.

This study could be applied as part of a broader project for the management of university buildings, with the first objective being the digitisation of architectural works and restitution using BIM methodology, given the latest regulatory developments.

This research has shown how information modelling can become an interactive infrastructure with external systems, evolving into what is called the Digital Twin, offering a real-time management system available to the facility manager for facility management and security management. (BAGHALZADEH SHISHEHGARKHANEH et al. 2022).

The support of the digital approach also guarantees an immediate auditing and feedback function to support the designer and manager, who can thus obtain real-time feedback on environmental and/or behavioural conditions within the building. Moreover, at the same time, data become available for a more reliable parameterisation of risk mitigation procedures, also through the support of visual and analytical simulators integrated with BIM models. ■

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1. P. 52. The cloister of the monumental complex of San Lorenzo ad Septimum in Aversa.
2. P. 52. BIM-IoT infrastructure schema.
3. P. 53. Information model of the San Lorenzo building complex.
4. P. 53. Perspective render.
- 5-6. P. 53. Perspective render with visual impact analysis of construction site.
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12. P. 54. Parametric link between BIM models and virtual model within Unreal Engine.
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16. P. 55. BIM model.
17. P. 55. Luminance impact simulation.
18. P. 56. BIM model with parametric building element editing.
19. P. 56. Escape route simulation with analysis of escape time and escape route.
20. P. 56. Perspective render with visual impact analysis of construction site.
21. P. 56. Perspective render with luminance impact simulation.

World Heritage Sites in Germany and Dwelling on Earth

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Keywords: World Heritage, Germany, biosphere, landscape, sustainability

Introduction

Care for nature is high in the priority of global actions [1]. Using WHSs in Germany [2, 3] as a matter of research, we looked for patterns and accumulation of similarities in relevant common characteristics connecting the built heritage regarding the natural environment and analyze the chosen case studies.

In Germany, WHSs are distributed all over the country and treated with respect and according to the agreed rules and high standards; laws about nature and environmental protection are well-developed and reinforced in practice; the pollution is low and strictly monitored. All that gave us almost ideal conditions for our research and our AI experiment.

Materials and methods

The cultural sites in Germany occur mostly in the Rhine-Danube valley, in big cities, in central Germany (in the ring including Harz, defined by its northeastern border), and diagonally from there towards the northeast including the Berlin area (Figure 1). Nowadays, they are connected in cultural routes which of different themes: industrial, wild natural landscapes, Middle Ages including Roman heritage, religious, Hanseatic, Romanticism, Stone Age and far past [3].

Firstly, our focus was on materials and structure in correlation with technics, and if they are in balance with nature. The focus was on the recyclability

of materials and the natural origin of their components (for example concrete is made from natural elements but only partly recyclable, however, it is reusable under certain conditions; glass is made of natural elements and fully recyclable) and endurance of construction and reparability. Regarding structure, with construction technics taken into the account, we analyzed three categories: long-term resilient, repairable and replaceable structures.

As a control if the variables were set well, we compared the results with direct impact on the environment of dominant materials (e.g. traditional cement-based concrete is devastating, stone is environment-neutral, and glass is environment-friendly).

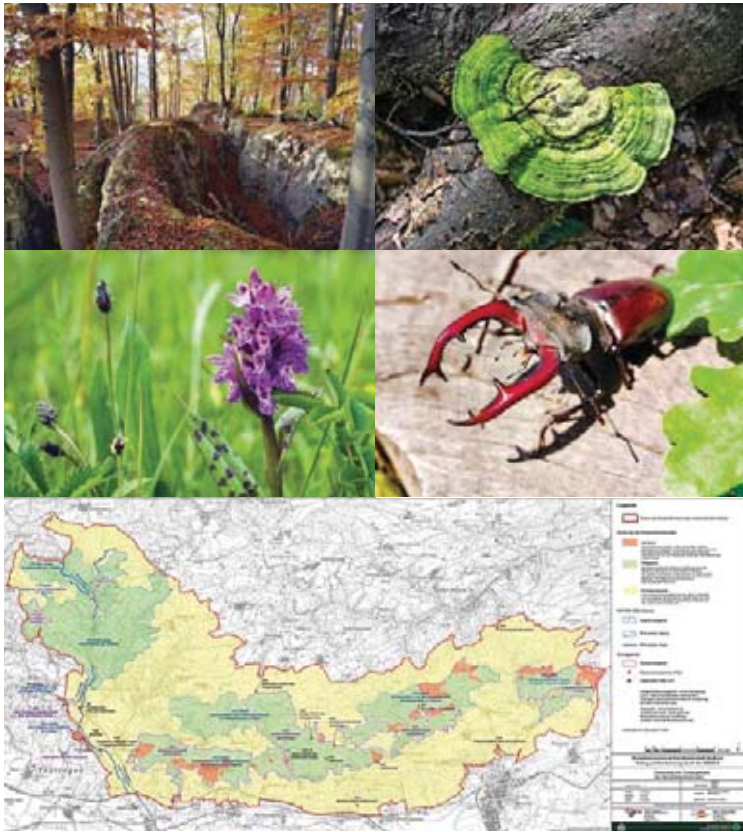
For statistical analyses, we used SPSS software. The variables were defined as intervals for chosen values. That was considered a reasonable operational strategy concerning the diversity and variations for each material in practice. In the following steps, we analyzed if German WHSs leave an impression of care and respect for the natural environment, based on case studies of WHSs in the Harz Mountain.

Harz Mountain has both cultural and natural values (Figure 2 and 3). It is clearly geographically distinctive because east from there the terrain is prevalingly flat along the same geographical width all the way from the Atlantic Ocean. In this area, there are no huge cities or navigable rivers which indicate the presence of a different type of quality woven into urban areas and authentic historical concept of vernacular spatial development. The protected area of nature, Karstlandschaft Südharz, covers approximately 300km² (Fig. 3). Harz is characterized by “a variety of landscapes, geological rarities and a diverse flora and fauna. . . It is the unique natural landscape of



gypsum karst and beech forests and the historically shaped cultural landscape with meadow orchards, castles, churches

and copper slate heaps Around 1500 ferns and flowering plants and a large number of mosses, lichens, algae and



fungi have been identified so far, including a large number of protected and endangered plant species” [5]. In this area, we examined the following cultural sites (Figure 4): Gosslar, known for the pre-industrial mining tradition as much as for more than 1500 half-timbered houses which are well-preserved; Quedlinburg, a unique medieval city with over 2000 half-timbered houses built over eight centuries, the castle hill with the Collegiate Church and the castle Münzenberg. The Fagus factory in Alfeld in the wider area of the Harz

Mountains is considered an iconic example of industrial architecture from the Bauhaus. Here, we used visual analyses to identify the presence of natural elements: greenery, water and earth, in images of WHSs. We also created AI image of a “typical” representative of the WHS from Germany based on the image feed of all 48 world cultural heritage sites for the purpose of comparison with the coming WHS site, i.e. those from the Tentative list. We tried several AI applications, including our own programming using open-source AI software and self-made al-

gorithms. In addition, we used software for the identifying of species to identify greenery on images.

Results

Firstly, the cultural heritage sites gather around the same points as natural heritage but do not overlap with them which are well visible on detailed interactive UNESCO map [6].

The representation of environment-friendly materials and structures is high and satisfactory. Results of the cumulative impact of different aspects compared to direct measuring gave similar results.

From visual analyses, the results were also good – elements of natural surroundings, both each and cumulatively, are well represented. Similarities of climatic influences, and therefore flora and fauna, are arguments in favour of the conclusion that these results are valid not only for the area of Harz Mountain but for the entire territory of Germany.

Our AI experiment gave ambiguous results. Although we did not get images which were sensible, or visually attractive regarding built structure, many of those attempts revealed recognition of greenery as dominant natural element. We couldn’t get images which will be adequate for comparison with sites from the Tentative list, as we originally intended.

Recognition of species revealed high repetition of several autochthone species. We focused on greenery as an indication of life apart from humans, considering that only small animals live in urban areas.

Our quest for the non-disclosed value of WHSs revealed that World Cultural Heritage sites cultivate values of the importance of the biosphere, they leave an impression of respect for the biosphere; however, the natural environment in those locations is cultivated and adapted to the needs of people.

Discussion and concluding remarks

Generalization regarding WHSs opposes their very essence. Similarly, the results, as well as the methods used in this paper, cannot be generalized. For example, the presence of greenery cannot be used as a manifestation of natural environment or a precondition for the presence of fauna elsewhere; cultural sites in deserts do not have greenery, yet they have wildlife and correlation with nature.

Finally, the research results were surprising to some extent and raised certain concerns, which convinced us that there is a lot more we should learn about dwellings on Earth.

Furthermore, we realized that our civilization reached the stage when, for the very first time, all living beings on our planet became subjects of honest concern. ■

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- 1. P. 57. Distribution of WHSs in Germany [3].
- 2. P. 57. The biosphere reserves in Germany [4].
- 3. P. 58. The biosphere reserves Südharz [5].
- 4. P. 58. The Upper Harz Water Management System (up right), Fagus factory in Alfeld (up left) and Quedlinburg (the two photos down) [2].



Transform of Traditional Sanliurfa Houses Located in the Historical Area of the City

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The historical center of a city is the most significant tool that transmits the city's past urban life, history, social structure, and cultural accumulation to the present day [1]. Traditional residential structures are buildings that reflect the beliefs, traditions, customs, and lifestyles of the era in which they were constructed, using the materials available in the region and built according to the economic conditions of the time. The reasons why historical structures cannot continue to function are summarized as the loss of their original functions and the functional obsolescence of the structures [2]. Functional change is the creation of new usage opportunities, including interventions that will meet new user needs, by preserving their architectural, aesthetic, social and cultural values, instead of the original functions of historical buildings that cannot be maintained due to different reasons such as environmental factors, economic reasons, socio-cultural changes [3].

The work area is the city of Sanliurfa located in the southeast of Turkey and adjacent to Syria in the south. Sanliurfa has attracted attention with its rich history and original historical urban texture that has been preserved until today. The traditional buildings located in the historic center of the city were constructed in the late 18th century using the technique of stone masonry with limestone, which was abundant in the region. The streets, shaped in accordance

with the architectural texture and climate conditions, have created a remarkable and unique urban texture [4].

As a result of the comfort of living in modern concrete buildings, traditional houses in the historic city center had been gradually abandoned one by one. The traditional houses remained empty for many years. After the Syrian War in 2013, these historic buildings became living spaces for Syrian immigrants. In recent years, the intense tourist visits due to the discovery of neolithic settlements Gobeklipe (on the World Heritage List since 2018) and Karahantepe have led to an increase in demand for hotel accommodation in the city, and so traditional houses located in the historical area have been restored and started to be re-functionalized as boutique hotel.

In this study, 6 traditional houses that have been restored using the method of re-functionalization within the framework of the Sanliurfa Conservation Purposed Zoning Plan, located in the Sanliurfa Urban Conservation Area, have been examined. Based on the data provided by the comparison method, the changes made to the houses in terms of removed and added elements have been identified, and the authenticity losses and the current comfort conditions provided have been analyzed. In conclusion, this study aimed to examine the balance between cultural heritage preservation and practical needs in the context of local examples. In order to utilize the abandoned and deteriorated housing stock in the historical center of the city, with the support policies of the Ministry of Culture, traditional houses in the historical city center have been converted into boutique



hotels. [5] As part of the study, six of these buildings were examined on site: Tessera Hotel, Hasbahar Guest House, Nahrin Hotel, Muzepotamia Guest House, and Vilayetler House Hotel Hanehan Boutique Hotel (Fig. 1).

The functional units that shape traditional Sanliurfa houses are the courtyard, iwan, rooms, and service areas such as "tandırılık" (kitchen), "develik" (stable), "zerzembe" (cellar), and "hela" (toilet). In the transformation of traditional buildings into boutique hotels, it has been observed that in some buildings, the courtyard, which is the main element shaping the residences, is partially or completely covered (Fig. 2). Cameras, modems,



fans and other devices have been added to the courtyards. In some buildings where traditional houses are converted into boutique hotels, the iwan, a semi-open space created by hot climate conditions, has been completely enclosed. In



some buildings, the back wall of the iwan has been brought forward to create a wet area for the rooms (Fig. 3). During the conversion of traditional buildings into boutique hotels, the most noticeable change seen in the rooms is the addition of wet areas in line with modern living conditions. Wet areas, which should be made of removable materials, have been added to some rooms in a corner of the room (Fig. 4). In some rooms, they have been designed along the facade, but the walls have been raised to a certain height and covered (Fig. 5). In some rooms around the iwan, wet areas have been added by pulling the back wall of the iwan forward (Fig. 3). It has been observed that in the

examined examples, the wet spaces are added to conform to current conditions in terms of materials, usage, etc., but they are in compatible with the traditional texture. It has been observed that airconditioning units have been added to most of the rooms (Fig. 4). In addition, interventions such as converting niches and/or windows into doors/niches into windows have been detected in the rooms. Tandırlık (kitchen) spaces are mostly used as kitchen again. There have also been cases where they are used as hotel rooms. The spaces like the cellar, stable with a rectangular plan and usually covered with a cradle vault located half a floor below ground level are used

for the boutique hotel's breakfastroom needs. There are also instances where hotels have converted the upper part of their terrace and/or courtyard into a covered space to serve as a breakfastroom for their guests (Fig. 6). The original restrooms in the building are generally preserved due to their functional use. It is known that functional change has been going on since the earliest ages of history. The continuity of maintenance and repair of buildings has ensured their long life. Considering the previous conditions of buildings that have faced destruction and threat of disappearance, the practice of refunctioning has provided the opportunity to preserve the buildings. However, there are also negative aspects of refunctioning. In refunctioning, wet areas, electricity, water and heating systems, as well as infra structure such as internet, phone, airconditioning, etc. are needed to provide today's comfort conditions and meet new functional and spatial needs. In order to achieve these goals, some applications may cause a slight damage to the authenticity of the building. Therefore, it should be considered that every intervention for a functional change may harm the authenticity value of

the structure to some extent. In this case, it is essential to observe the balance between conservation and utilization of the structure. ■

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1. P. 59. One of examined hotel, Hanehan Boutique Otel.
2. P. 59. Covered courtyard, Nahrin Hotel.
3. P. 59. The wet areas added to the back wall of the iwan, Muzepotamia Guest House.
4. P. 60. Added wet areas in the room corners, air conditioners added inside the room, Hasbahen Guest House.
5. P. 60. Wet areas added along the room facade, with walls raised to a certain height, Tessera Hotel.
6. P. 60. Interventions made to other units, covered terrace, Hasbahen Guest House.
7. P. 60. Sanliurfa in 1980's.
8. P. 60. Sanliurfa today.
9. P. 60. Narrow streets of historic center.





Square of art: a private art and cultural centre on the Naples' waterfront

ALESSANDRO CIAMBRONE

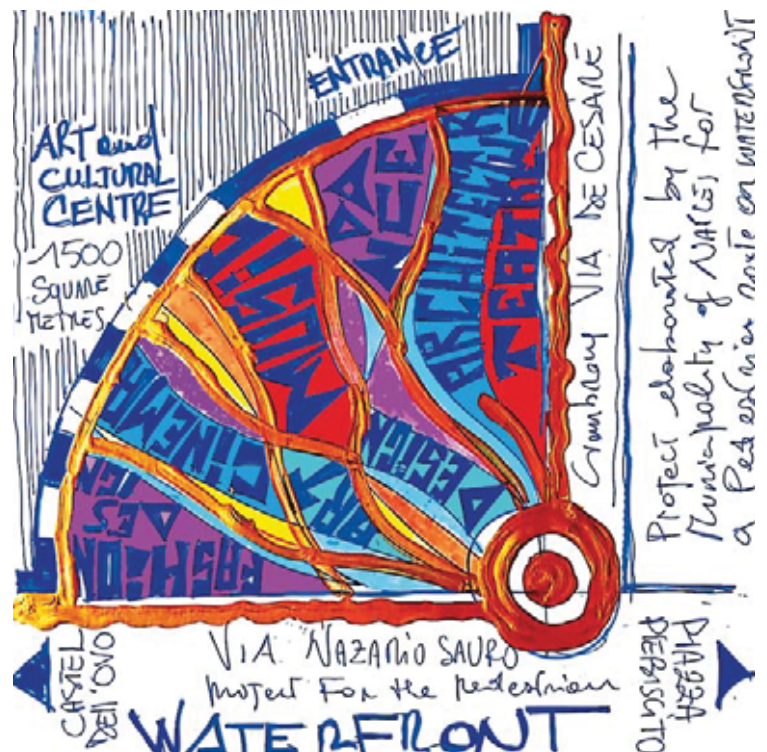
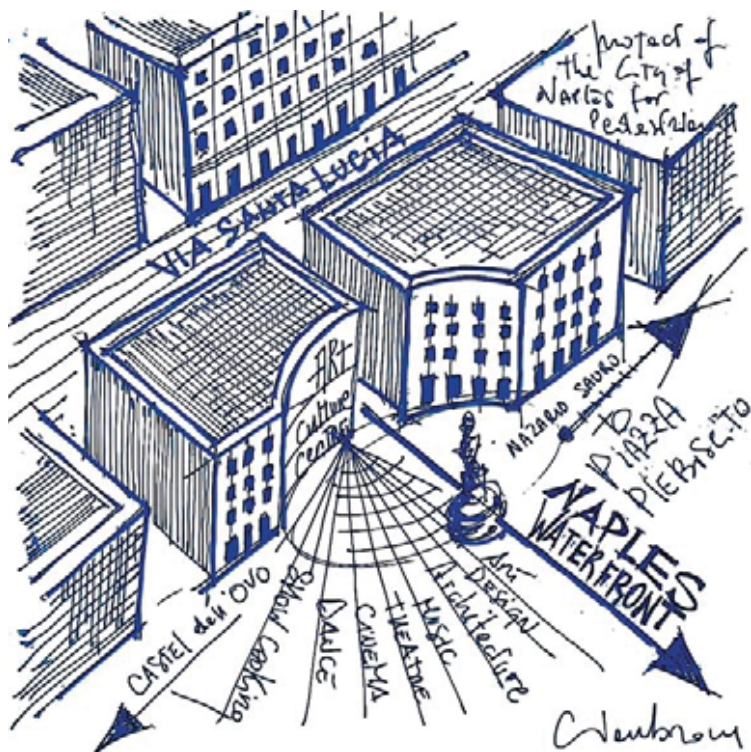
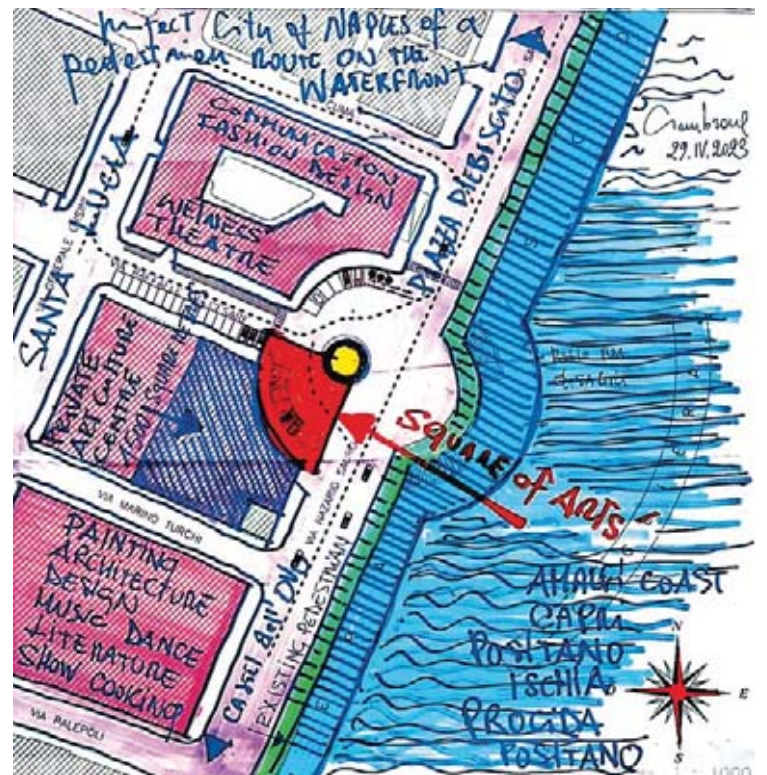
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Architecture, for Le Corbusier, is a fact of art, a phenomenon that arouses emotion, beyond the problems of construction, beyond them. This goal has certainly been achieved by numerous contemporary architects and designers around the world through works that integrate architecture, design and art. The artworks expressly declare the compositional matrix of the design idea, the sources of inspiration and the geometries underlying the proportions between the construction elements, the relationship between the project, the urban and landscape context, the importance of materials and immaterial values as a source and stimulus to design creation. In particular, architecture and art

are integrated in the creation of modern and contemporary art museums and centers for cultural promotion. The artworks deal with the relationships between art, architecture, beauty and the impact of architecture on the local community and on visitors, including foreign ones, in the context of cultural tourism. In this framework, the birth of a new private, artistic and cultural center in Naples, on the waterfront of Santa Lucia, is presented. Here, art, architecture and design create a single visual suggestion, between internal spaces and the landscape context, characterized by the sea and Vesuvius. In Arte Vesuvio (IAV), this is the name of the center, was founded in 2022 by the sisters Angela and Lucia Andolfo, with the creative direction of the architect and artist Alessandro Ciambrome. The paper refers to the planning and de-

sign of an external square, owned and requested for concession from the Municipality of Naples through the 'adopt

a road' public call and in line with the 'pedestrian and cycle redevelopment of the Naples waterfront, a stretch between





Piazza Vittoria and Molosiglio' (resolution of the Municipal Council n. 313 on 21 June 2018). The public call for the realization of the pedestrian route has already been completed and the works of the Santa Lucia waterfront are imminent. The proposed art square, 500 square meters, outside the IAV is characterized by a mural on the ground, which shows all the artistic activities developed within the center: painting, design, architecture, music, theatre, cinema, dance, fashion design, wellness and nutrition (Mediterranean diet). The idea of creating the Square of Arts on the Naples waterfront stems from the desire to offer a new space for the city and for tourists dedicated to all artistic languages, and to redevelop an area that is currently in a state of degradation. The internal and external space therefore express a dialogue between art, architecture and landscape where art is staged in this theater

on the sea. All the murals of the cultural center, including the one designed for the exterior, are based on the concept of measurement: 'measuring and discretizing in batches means detecting in the sense of managing a complex heritage, as historically already indicated by Luca Pacioli. In this sense, the infinite reasons mentioned by Cassirer are the n dimensions that constitute reality in this dynamic and continuously implementable meaning of knowledge' [1]. When designing, building and analyzing an architecture, the goal of controlling dimensions and measurements becomes the first learning step. This allows us to understand how some works between art and architecture have become points of reference for the history of architecture and for some cities [2]. The materials and colours, often those of the murals, take on a decisive role in the creation of architecture and urban spaces, for their characterizations.

The project for the internal and external space of the IAV aims to define this structure as an iconic place of the city precisely because it manifests the distinctive characteristics of the architectural poetics, in a constant search for art and beauty that derives from geometry, modules, mathematical relationships, interpretations of elements of the anthropic and natural world. Oscar Niemeyer affirms that the starting point is the tension towards beauty, towards art, so that surprise, amazement, the unexpected are part of the architectural work [3]. Frank Lloyd Wright writes and explains to Harry Guggenheim, referring to the creation of the New York Museum, that he did not conceive the project to sacrifice the paintings. Wright, on the contrary, wants the painting and the architectural structure to blend harmoniously, as never before in the art world. The letter was motivated by the numerous protests of the art-

ists who found the structure proposed by the American architect to be inappropriate for the exhibition of works of art [4]. In this logic, in the Guggenheim New York, during the descent of the spiral ramp, the visitor can concentrate on the works of art without losing sight of the other visitors and the entire spatial extension of the Museum, thus feeling part of a community interested in art. In the design and decoration of the IAV, each element of art relates to the architectural structure and the spectacular natural landscape that characterizes the exterior. This poetics is linked to the message of Zaha Hadid who challenged architectural rules and conventions and created daring works between architecture, industrial design and art. She created her own expressive language through radical design rules influenced by his rationalist experience. Hadid looks for aesthetics in art, nature and architecture and applies them



to her works. Abstraction and fragmentation are probably the most interesting and frequently used principles by Hadid to produce deconstructivist projects and creative spaces [5]. In line with what Meier says, art and architecture are complementary and integrate in the best museums in the world; the whole experience is made richer by a balanced dialogue with the surrounding landscape as in the project of the Getty Center in Los Angeles [6]. In Renzo Piano's works there is a constant research for beauty, as he writes: beauty is impregnable, but trying to reach it is a duty, seeking it is a political sign. Beauty makes cities better places, where living becomes civilized living, the urbe becomes civitas. And better cities make better citizens. This beauty is one of the few things that can change the world. Here his architectures, between design and art, are characterized as icons of urban landscapes, now in sharp contrast with the historicized context, as in the case of the Pompidou Center in Paris, now in a constant dialogue of a visual and material nature, as in the case of the Whitney Museum of America Art in New York [6]. In the context of a balanced and constant relationship between architecture and art, which characterizes Jean Nouvel's design methodology in the museum complexes, scenographic backdrops are created, between artifice and reality, to develop a poetic narrative linked to the function of the building and arouse emotions in the daily life of those who experience the work [7]. The IAV Square of Arts' project moves in this direction in a city that preserves its authenticity and that seeks a contemporary expression for the future in the spaces dedicated to art. ■

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1-2-3. P. 61. Project of a mural for the Square of Art in 'Piazza Nazario Sauro'.
4-5-6. P. 62. Murales in the IAV club by In Arte Vesuvio.
7-8-9-10. P. 63. Murales in the IAV club by In Arte Vesuvio.





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