



VOL. 9, NO. 2 (2023)

**KNOWLEDGE AND SCIENCE ON BUILDING TECHNOLOGIES.
MEANS, INSTRUMENTS AND MODELS**

TEMA
Technologies
Engineering
Materials
Architecture

e-ISSN 2421-4574
DOI: 10.30682/tema0902

Journal Director: R. Gulli

Assistant Editors: R. Albatici, A. Ferrante, G. Margani

Cover illustration: Stereotomic helical staircase in Villa D'Este, Tivoli, Italy.
© Riccardo Gulli (2022)



e-ISSN 2421-4574

ISBN online 979-12-5477-367-3

DOI: 10.30682/tema0902

Vol. 9, No. 2 (2023)

Year 2023 (Issues per year: 2)

Editor in chief

Riccardo Gulli, Università di Bologna

Associated Editors

Annarita Ferrante – Università di Bologna

Enrico Quagliarini – Università Politecnica delle Marche

Giuseppe Margani – Università degli Studi di Catania

Fabio Fatiguso – Università Politecnica di Bari

Rossano Albatici – Università di Trento

Editorial Board Members

İhsan Engin Bal, Hanze University of Applied Sciences – Groningen

Cristiana Bartolomei, University of Bologna

Antonio Becchi, Max Planck Institute – Berlin

Marco D’Orazio, Università Politecnica delle Marche

Vasco Peixoto de Freitas, Universidade do Porto – FEUP

Stefano Della Torre, Politecnico di Milano

Giuseppe Di Giuda, Università di Torino

Luca Guardigli, Università di Bologna

José Luis Gonzalez, UPC – Barcellona

Alfonso Ippolito, Sapienza University of Rome

Francisco Javier Neila Gonzalez, UPM Madrid

Alberto Grimoldi, Politecnico di Milano

Antonella Guida, Università della Basilicata

Santiago Huerta, ETS – Madrid

Richard Hyde, University of Sydney

Tullia Iori, Università di Roma Tor Vergata

Raffaella Lione, Università di Messina

John Richard Littlewood, Cardiff School of Art & Design

Camilla Mileto, Universidad Politecnica de Valencia UPV – Valencia

Renato Morganti, Università dell’Aquila

Antonello Sanna, Università di Cagliari

Matheos Santamouris, University of Athens

Enrico Sicignano, Università di Salerno

Lavinia Chiara Tagliabue, Università di Torino

Simone Helena Tanoue Vizioli, University of São Paulo

Claudio Varagnoli, Università di Pescara

Emanuele Zamperini, Università di Firenze

Assistant Editors

Cecilia Mazzoli, Università di Bologna

Davide Prati, Università di Bergamo

Anna Chiara Benedetti, Università di Bologna

Journal director

Riccardo Gulli, Università di Bologna

Publisher:

Ar.Tec. Associazione Scientifica per la Promozione dei Rapporti tra Architettura e Tecniche per l’Edilizia

c/o DICATECH - Dipartimento di Ingegneria Civile, Ambientale, del Territorio, Edile e di Chimica - Politecnico di Bari

Via Edoardo Orabona, 4

70125 Bari - Italy

Phone: +39 080 5963564

E-mail: info@artecweb.org - tema@artecweb.org

Publisher Partner:

Fondazione Bologna University Press

Via Saragozza 10

40123 Bologna - Italy

Phone: +39 051 232882

www.buonline.com

TEMA: Technologies Engineering Materials Architecture**Vol. 9, No. 2 (2023)**

e-ISSN 2421-4574

Editorial**Knowledge and science on building technologies. Means, instruments and models***Riccardo Gulli*

DOI: 10.30682/tema090013

5

Compressed-air foundations in Italy: HBIM-aided study of the Tiber River embankments (1876-1900)*Ilaria Giannetti, Stefania Mornati*

DOI: 10.30682/tema090005

6

Autarky metal roofing at the Mecenate Paper Mill in Tivoli: an unseen application of Gino Covre's patents*Edoardo Currà, Andrea De Pace, Riccardo Rocchi, Alessandro D'Amico, Martina Russo, Marco Angelosanti, Ana Cardoso De Matos, Vicente Julian Sobrino Simal*

DOI: 10.30682/tema090007

19

Digital representation strategies to reveal the cultural significance of Canadian Post-war Architecture*Davide Mezzino, Pierre Jouan*

DOI: 10.30682/tema090002

33

Beyond the appearance. Overwritten heritage communication*Alfonso Ippolito, Giulia Luffarelli, Simone Helena Tanoue Vizioli*

DOI: 10.30682/tema090009

46

Architecture and civic engagement. An ethical balance between social, architectural, structural, and energy issues in the redevelopment of existing building stock*Barbara Angi, Alberto Soci*

DOI: 10.30682/tema090010

58

Greenery as a mitigation strategy to urban heat and air pollution: a comparative simulation-based study in a densely built environment*Graziano Salvalai, Juan Diego Blanco Cadena, Enrico Quagliarini*

DOI: 10.30682/tema090003

67

Green roof as a passive cooling technique for the Mediterranean climate: an experimental study*Stefano Cascone, Federica Rosso*

DOI: 10.30682/tema090006

84

Virtual reality as a new frontier for energy behavioural research in buildings: tests validation in a virtual immersive office environment <i>Arianna Latini, Elisa Di Giuseppe, Marco D'Orazio</i> DOI: 10.30682/tema090001	95
Construction Productivity Graph: a comprehensive methodology based on BIM and AI techniques to enhance productivity and safety on construction sites <i>Francesco Livio Rossini, Gabriele Novembri</i> DOI: 10.30682/tema090008	108
A genetic algorithm-based approach for the time, cost, and quality trade-off problem for construction projects <i>Marco Alvise Bragadin, Kalle Kähkönen, Luca Pozzi</i> DOI: 10.30682/tema090012	121
Managing people's flows in cultural heritage to face pandemics: identification and evaluation of combined measures in an Italian arena <i>Marco D'Orazio, Gabriele Bernardini, Enrico Quagliarini</i> DOI: 10.30682/tema090004	135
On site data gathering by a collaborative network to assess durability, reliability, service life, and maintenance performance <i>Valentina Villa, Paolo Piantanida, Antonio Vottari</i> DOI: 10.30682/tema090011	149

ARCHITECTURE AND CIVIC ENGAGEMENT. AN ETHICAL BALANCE BETWEEN SOCIAL, ARCHITECTURAL, STRUCTURAL, AND ENERGY ISSUES IN THE REDEVELOPMENT OF EXISTING BUILDING STOCK

Barbara Angi, Alberto Soci

DOI: 10.30682/tema090010



e-ISSN 2421-4574
Vol. 9, No. 2 - (2023)

This contribution has been peer-reviewed.
© Authors 2023. CC BY 4.0 License.

Abstract

Contemporary architectural criticism is characterised by a dichotomy that could be described as of an ethical nature. On the one hand, the belief is that architecture is limited to the physical dimension of the building. On the other, the understanding of architecture as an expressly media event separated from reasons of physicality. This requires a rethinking of the role of architecture, of a discipline that, to preserve its scientific status, can understand the new demands of cultural and technical interdisciplinarity that characterise the contemporary context. The design practice of AdESA (Adeguamento Energetico, Sismico e Architettonico – Energy, Seismic and Architectural Adjustment) stems from these concepts, a path linked to the analysis of the building's function, genesis, and history. The city, the context and the social aspects of a place are indispensable settings for choices through multidisciplinary contributions that are certainly part of technical choices but, at the same time, a synthesis of them in the public service. The case study of the Don Milani Gym in the Villaggio Badia in Brescia, where the AdESA project was realised, allowed us to enter into the life of the neighbourhood and, through architecture, to generate new relationships, gathering spaces and community dynamics. In doing so, architecture has once again assumed a pivotal role in the design process between the demands of a technical nature and those of responsibility in terms of social and environmental sustainability.

Keywords

Eutopia Strategy, Urban Commons, Combined redevelopment, Offsite Architecture, Suburban Landscape.

Barbara Angi*

*DICATAM - Dipartimento di
Ingegneria Civile Architettura
Territorio Ambiente e di Matematica,
Università degli Studi di Brescia,
Brescia (Italy)*

Alberto Soci

*DICATAM - Dipartimento di
Ingegneria Civile Architettura
Territorio Ambiente e di Matematica,
Università degli Studi di Brescia,
Brescia (Italy)*

*Corresponding author:
e-mail: barbara.angi@unibs.it*

1. INTRODUCTION, METHODOLOGICAL AND DESIGN REFERENCES

In contemporary metropolitan contexts, there are conditions for the reuse of existing spaces and buildings that, as with raw materials, require targeted transformations to convert them in an ecological way. The practices of building renovation are an opportunity to reactivate the city's hidden potential through re-appropriating obsolete spaces and/or updating those still inhabited.

The dissemination of pragmatic design thinking for the ecological redevelopment of the existing building stock – now more than shared at the EU level, given the urgency of reducing the environmental impact of the construction sector – was seen in Germany's participation at the 13th International Architecture Exhibition during the 2012 Venice Biennale as a moment of notable interest for architects and engineers. This exhibition entitled *Common Ground* was curated by David Chipperfield. The

title also explicitly alludes to the ground between the buildings and the city's spaces. The projects investigated the meaning of the spaces generated by buildings: the political, social, and public fields of which architecture is a part.

The aim of the German exhibition *Reduce/Reuse/Recycle. Architecture as Resource* was to clearly make the value of the city in shaping the future of the next generations. According to the general commissioner of the German Pavilion, Muck Petzet [1], projects to reduce land use, together with large-scale urban redevelopment projects, must be approached with methods by which the building stock – built mainly after the Second World War – can be redeveloped through pragmatic transformation strategies. In this way, says Petzet [1], the project of architecture does not lose its quality; rather, it can be improved by new techniques that can acknowledge a complex system of values in the built environment.

This transformation can take place through a paradigm shift in the role of the architect and engineer, who is increasingly more a “developer of the built environment” than a designer of new urban contexts. Moreover, for the commissioner of the German Pavilion, an effective method for identifying new design strategies is to re-evaluate deteriorated existing buildings as “valuable raw materials” [1].

This approach is summarised in the slogan for the exhibition: *3R: Reduce, Reuse, Recycle*, key concepts of the so-called “waste hierarchy”. A principle of action on waste materials according to which the least amount of processing is, in any case, the most advantageous in terms of energy savings and ecologically achievable results.

Applying the *3R* formula in architecture can have more or less favourable aspects. This approach makes sense in terms of energy savings by determining, in some cases, the positivity or otherwise of performance upgrading, but it could also impede building and social design developments that attempt to find new uses for existing spaces. In fact, in addition to the energy balance of building processes, in the redevelopment of the built environment, there are other factors to be considered, such as the “hidden potential” in each building in historical, structural, architectural, and social terms, under which it

is also possible to evaluate a complete *remodelage* [2] of buildings. Moreover, still, in a design vision of a holistic nature – the building is unique and must be considered in its totality and in the interdependence of the properties (intrinsic and extrinsic) that compose it – it is possible to estimate the degree of improvement achieved thanks to the redevelopment action not only in function of the energy consumed.

In our opinion, the pragmatic criterion of the *3R* formula defines new perspectives of action for transversal design approaches that can include structural, energy, architectural, and social issues through the possibility of juxtaposing technological elements.

However, it is essential not to lose sight of the building's relationship with the urban and social context in which it is inserted.

In the ten years since the German exhibition of the *3R* formula at the Venice Architecture Biennale, the approach described above has produced positive and tangible effects, especially in urban peripheries, places where it is not easy to make relevant contributions, mainly for economic reasons.

Moreover, in these contexts, informal community hubs, often self-managed, are very frequent and charged with welcoming some people looking for sharing and, maybe, for redemption from a problematic everyday life. This aspect can be found in various global urban realities and shows how community activities can regenerate abandoned spaces and/or people's use of them. These examples of collective living become the “trigger fuse” [3] for broader architectural and urban redevelopment plans also in an ecological key.

Today, such design beginnings can be identified in the work of an increasing number of researchers and designers engaged in “weak” and deprived peripheral contexts.

Among Italy's most interesting examples, the project *Civico* is worth mentioning. *LURT, Laboratorio Umano di Rigenerazione Territoriale (Human Laboratory for Territorial Regeneration)*, (Fig. 1) carried out in Riesi, a small urban reality in the province of Caltanissetta, by the “Orizzontale” collective of architects [4].

This project becomes a tool for sharing actions aimed at the social emancipation of the inhabitants and – simultaneously – is a way of denouncing a reality strongly

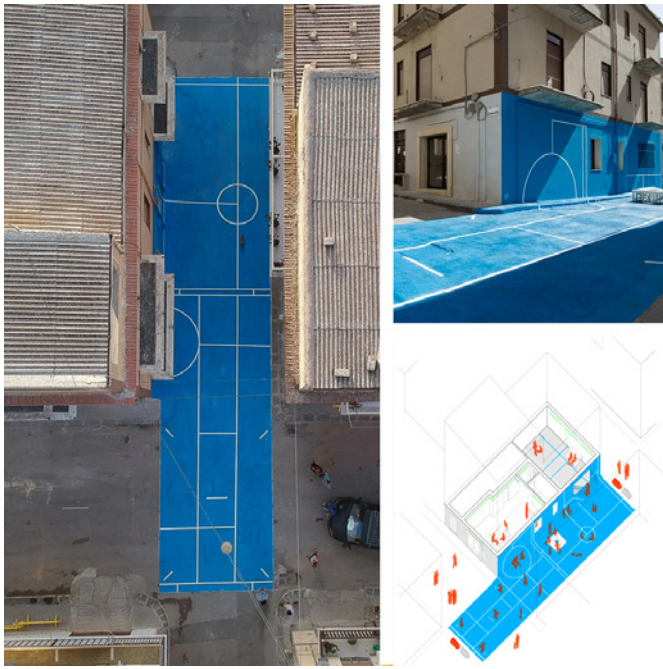


Fig. 1. Orizzontale, Civico Civico. LURT, Laboratorio Umano di Rigenerazione Territoriale (Human Laboratory for Territorial Regeneration). Riesi (Caltanissetta, Italy), 2020. Source: Orizzontale, La Flora Sita.

marked by phenomena of depopulation and marginalisation. The Workshop, in parallel with the sustainable and ecological recovery of existing buildings, proposes a reflection on the abandonment of historic villages in the country's inland areas, which today are experiencing a condition of marginalisation and lack of opportunities.

The project's overall objective – which passes through the planning, implementation, and operational phases – is to create a stable system of relations between people. A community that, when involved in the urban regeneration process and the cultural initiatives activated, can develop a renewed sense of identity and belonging to the neighbourhood. This feeling can, in fact, become the driving force for more sustainable development and a better quality of life for people.

Another noteworthy project was developed in France by “Collectif Etc” in 2017. *Le Rin-té* is a small redevelopment project of a courtyard near a building owned by the *Fraternité Belle de Mai* association, a Voluntary Sector organisation operating in an area of the city of Marseille characterised by a solid multicultural component. The intervention consists, in addition to the energy upgrade of the existing buildings, of the valorisation of the outdoors through the additions of community functions [5].

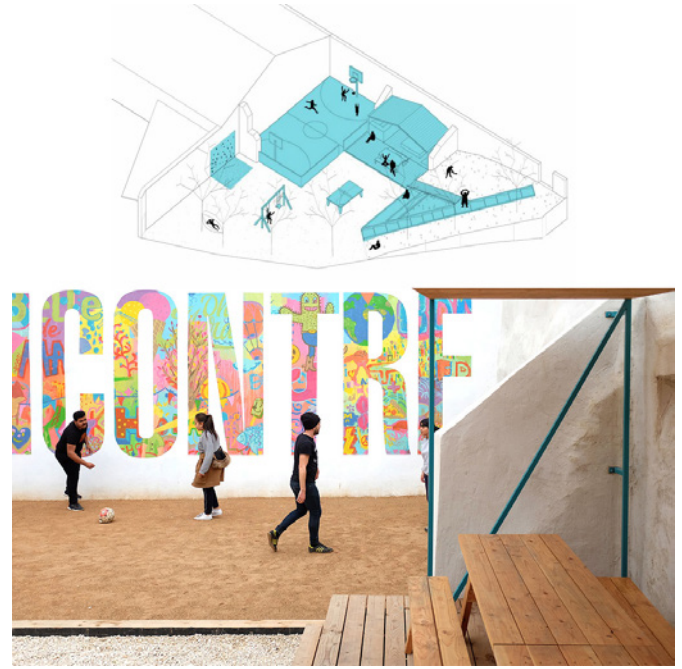


Fig. 2. Collectif Etc, Le Rin-té, Marseille, 2017. Source: Collectif Etc.

Adding a staircase to reach the street level becomes a reason to design a seating system for meetings and communal events: a multifunctional space to welcome the inhabitants of the neighbourhood (Fig. 2).

These experiences show a possible way of ecological urban regeneration through the simultaneous use of technology for buildings and socio-cultural mechanisms for inhabitants. The aim is to transform degraded urban areas into many “good places” [6] where new forms of sociality and ecological awareness can also be achieved for the people who live in those spaces.

This paper emphasises the part of the Applied Research Project AdESA, where the architectural and urban regeneration aspects follow the methodological and design references described above. The applied research project was submitted to the Lombardy Region's call for proposals entitled Experimental development and innovation (S&I) projects in favour of the Smart living supply chain, in implementation of Lombardy Region Law 26/2015: Diffuse, Creative and Technological Manufacturing 4.0 and was admitted for funding. The partners involved are the companies Marlegno (Lead Partner), Edilmatic, Harpaceas, the University of Bergamo (scientific responsible: Alessandra Marini) for structural and energy surveys, and the University of Brescia (scientific respon-

sible: Barbara Angi), involved for in-depth studies of an architectural and urban nature. In addition to the scientific responsible in charge, the UniBS team that worked on the AdESA project is composed of Barbara Badiani, Massimiliano Battisti, Massimiliano Botti, Andrea Ghirardi, Renato Marmorì, Marco Preti and Alberto Soci.

2. METHODOLOGY: BEYOND TECHNOLOGY-BASED SOLUTIONS

It is precisely in the ambition to intercept the constellation of “good places” hiding within many European suburbs that the AdESA project begins.

The applied research project has a multidisciplinary nature. It offers designers tools that want to go beyond technology-based solutions for applicative experimentation that is also careful to the needs of those who live in those spaces [7].

AdESA is the brainchild of cooperation between different skills that work together from the design phase, thanks to shared design platforms (BIM - Building Information Modelling). The software’s use has not only been a technical support of AdESA but has been the conceptual framework in which it has developed (Fig. 3). With this approach, AdESA plans to operate on the built tissue burdened by chronic structural and energy deficits and wants to solve them by limiting energy consumption.

However, AdESA is not just stopping there. It focuses on the people living out of the buildings, trying to increase their ecological awareness through a human-based approach to redevelopment. In the first step, AdESA uses an “engineered skill” [8] to cover the existing building and its urban context by overlapping different layers, each with its own specificity. To be fitted on the buildings, the first layer consists of X-Lam type cross-laminated solid wood panels bonded with the existing structure to correct and strengthen its static behaviour. The second layer, also to be set up on the buildings, is the energy barrier, the materials and size of which change upon the building’s thermal insulation needs and the analysis of the climatic context. The third layer is the final surrender of AdESA. It is not the result of a simple *camouflage* of the building but offers the city what it covers: the other layers and their powerful performance (Fig. 4) [9].

Also, this layer is crucial because it returns a new building, and thanks to this “new look”, people can find new relationships with outdoor spaces. The issue of the ground connection of a building is relevant to the ongoing effectiveness of an architectural work.

The design of the ground around a building lead to externalising its content – its functions – and linking it with the surrounding city. This layer changes the paradigm of AdESA by transforming hermetically sealed “skin” – for building security requirements – into a “po-

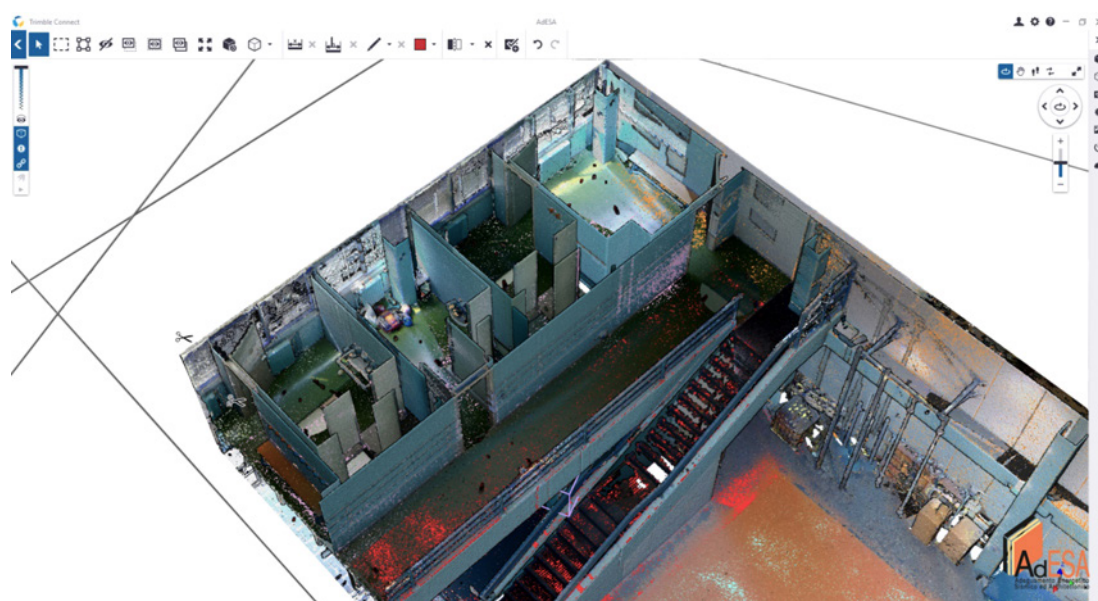


Fig. 3. The AdESA project, BIM as a combined design tool. The mapping of the building and its sharing via the Trimble platform. Source: Research Group (Harpaceas).

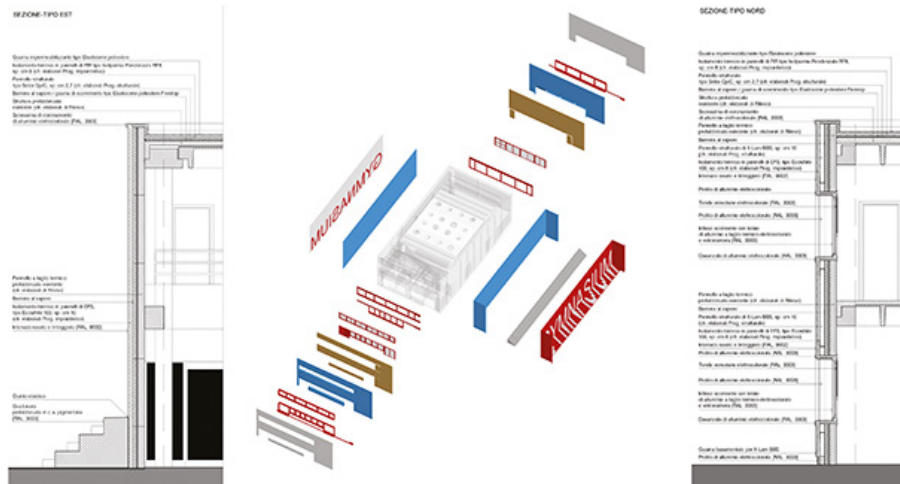


Fig. 4. The AdESA project's stratifications. Source: Research Group.

rous blanket”. This conceptual blanket can activate social mechanisms for the *Urban Commons* [10] by raising the inhabitants’ ethical value of sustainability. This is fundamental to combining highly technical solutions with people’s community-oriented solutions.

Furthermore, as Walter Benjamin describes the city of Naples: «Porous as this stone is the architecture. Building and action interpenetrate in courtyards, porticoes and stairways» [11]. Porosity seems to describe, in this passage, the way urban space is executed in the process of appropriation [12]. It is not that action is contained within the space. Instead, a rich network of practices transforms every available space into a potential theatre of expressive acts of encounter.

The fourth layer’s characteristics are the study of open spaces, their possible re-functioning, and their relationship with the neighbourhood bordering the building (Fig. 5). This layer deals with the city community through human-centred design [13].

The desire to motivate a renewed awareness in the community with respect to the natural and urban environment is at the heart of ADESA’s design concept. This concept is oriented towards the next generation benefitting from the redeveloped spaces.

The first AdESA application was built at the Don Milani primary school gymnasium in Brescia. The construction was the natural link between the building’s structural and energy redevelopment and the building’s renewed function within the school community. The upgraded gymnasium has become a concrete example of

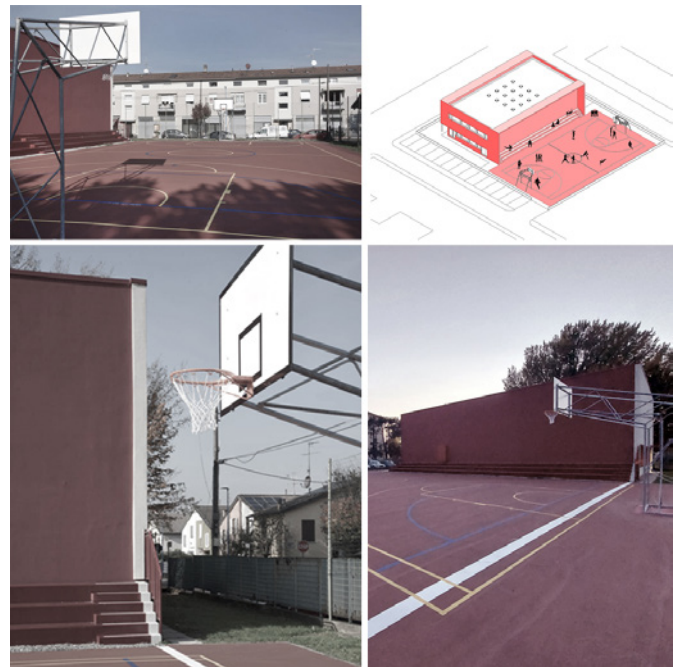


Fig. 5. The AdESA project's playground. Source: Research Group.

best practice in the energetic and socially sustainable re-use of the built heritage.

3. THE CASE STUDY: THE DON MILANI GYMNASIUM IN BRESCIA

«When architecture leaves the historic centre or the urban tissue, the structural module changes definitively. Therefore, the model is the industrial building where functionality becomes the reference element also at a formal level. This is declined under the sign of a repeatability understood in a contemporary way, which originates in

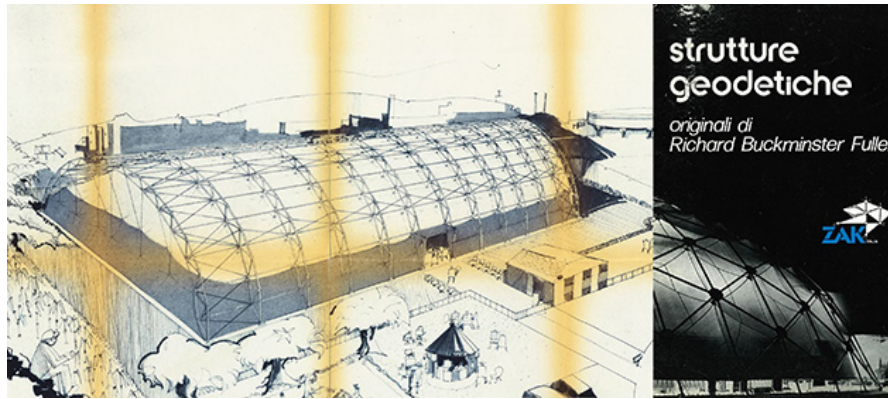


Fig. 6. 'Villaggio Badia' Elementary School, Preliminary project by the Company ZAK with Buckminster Fuller, 1978. Source: Brescia City Council Archives.

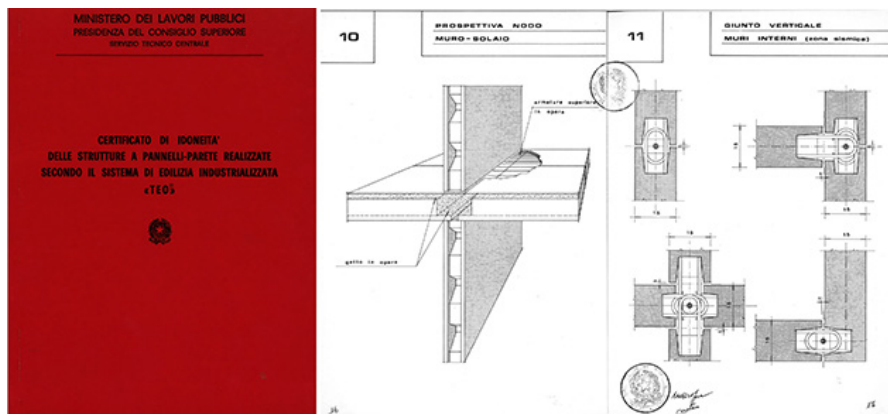


Fig. 7. Ministry of Public Works, Certificate of Suitability Teo-Valdadige System, 1979. Source: Brescia City Council Archives.

prefabrication. Consequently, were born the projects for the *Messaggero Veneto* headquarters in viale Palmanova (1967-1968), the Geatti showroom (1973-1974), the Valdadige prefabricated school (1976)»[14].

The Don Milani Primary School gymnasium is a rectangular building constructed using heavy prefabrication technology in 1980. Its construction was indispensable because the school had no space for physical activity. This lack forces children and teachers to spend their gym time in corridors or undercrofts. The inadequacy of the spaces is obviously functional, but it also involves static safety issues. In fact, the load-bearing structures of the spaces, so improperly used, are not dimensioned for this type of load and are not adapted to the existing regulations.

The preliminary design for the construction of the new gymnasium in the area adjacent to the school was entrusted by the Municipality of Brescia to ZAK Italia, «the exclusive concessionaire of Richard Buckminster Fuller's original geodesic structures», as read in the advertisements of the period [14].

Three contractors responded to the call for tenders [15], submitting the project and the relevant technical documents for economic evaluation. Among these companies was Valdadige s.p.a. from Verona, which won the tender despite not presenting the most economically advantageous solution. The winning company's architectural and structural design is by Gino Valle's studio. Gino Valle's work is linked to the industrial development of north-eastern Italy in the last century. The numerous projects he carried out describe a process of transformation of the Po Valley area, from rural to industrial, demonstrating his ability to meet at the same time all the technical and economic requirements imposed by the client, strong experimentalism of solutions, and extraordinary attention to the relationship with the urban context and the rural landscape [16].

In 1974, the Friulian architect had begun a collaboration with Valdadige s.p.a. to design a prefabricated building system called "Teo" (Fig. 7). The goal of the project was to construct buildings for middle schools,

which Italy needed at that time. Around thirty were built with this construction system in Veneto, Friuli, and Lombardy. According to Giorgio Macola, Valle's collaborator at the time [17], at least twice as many were designed.

In this respect, the gymnasium of the Don Milani school represents the first prototype realized with the 'Teo' system that Gino Valle would later use in a long architectural work (Fig. 8).

The structure of the building consists of prefabricated reinforced concrete elements assembled on site and reinforced concrete foundation plinths cast in situ. The pillars, except for the one supporting the mezzanine floor slab, are spaced 6.00 meters apart. All the prefabricated elements, as is customary for buildings adopting this technology, are part of an "Abaco," and each corresponds to a unique identification code. The ground floor accommodates the gymnasium, service areas, changing rooms and the heating plant.

The mezzanine floor, accessible by a staircase that was to become the signature of the schools designed by Gino Valle, has a balcony distribution and houses shower and storage rooms (Fig. 9).

The two long sides (west and east) have blank walls and overlook the street and an enclosed outdoor space. The two short sides (north and south) have ribbon windows with aluminum frames – fixed and sliding – for natural lighting and ventilation of the gymnasium areas and service rooms on both levels. Along the same sides are access doors to the heating plant and the gymnasium (south); an emergency exit on the opposite front (north), along Via Settima del Villaggio Badia. Sixteen fixed domed skylights, evenly spaced on the roof, contribute to the zenithal illumination of the gymnasium. Green areas are planted along the north and south sides and west-facing sides. A perimeter pavement is made of prefabricated concrete grit elements and runs almost attached to the building. The fence is made of painted metal grating (Orsogrill type) mounted on a reinforced concrete wall of variable height. A pedestrian gate and a driveway gate provide access to the area.

Furthermore, as noted, the urban area of the Don Milani gymnasium is the Villaggio Badia in Brescia [18].

The neighborhood retains a morphological layout consisting of the rational distribution of housing units

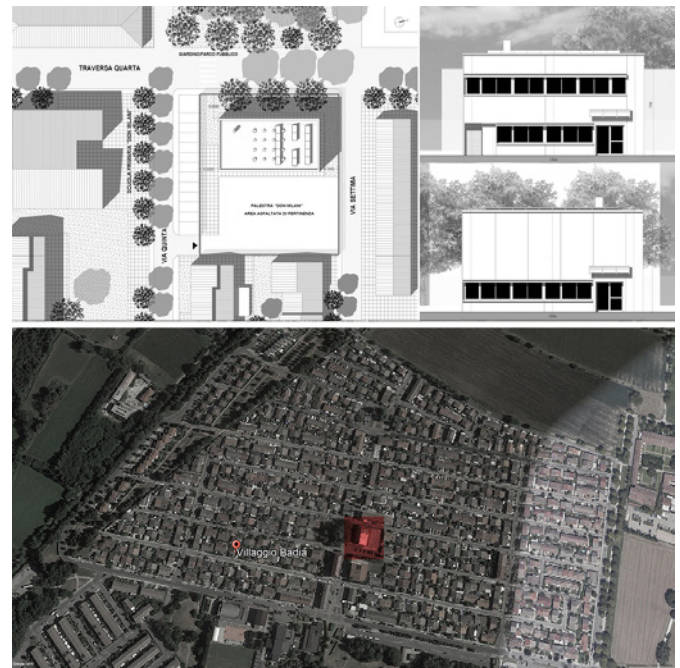


Fig. 8. Project location and status elaboration of the original project. Source: Graphic restitution by the research team.



Fig. 9. Gino Valle, Schools that were built using the Valdadige system. (Seriato, 1979, Chirignago, 1976, Zelarino, 1977, Negrar, 1980). Source: Gino Valle Archives.

arranged on individual plots with private gardens. The typological coherence of the semi-detached houses with pitched roofs has been significantly altered over time – due to numerous additions. Today, the image of an architectural approach like English garden cities is only conceptionally visible.

From this point of view, the gymnasium (a box volume built with prefabricated systems) is a foreign object to the urban context of the Badia village, both in terms of building type and the construction techniques used.

The first prototype of the AdESA project was applied to it and its outdoor area without demolishing the existing building. Therefore, the case study was redeveloped by juxtaposing the “engineered skill” that intervened on the building for a structural and energy upgrade and the outdoor space where the playground was restored in a multi-sport key, the “porous blanket”.

In developing the AdESA prototype, only the north and south façades are subject to the combined application of the structural and energy layers. In addition, there are windows in them, which required a specific technical study to propose a structural securing strategy – through steel hoops – that would not alter the architectural character of the façades, one of which is the entrance. The energy layer was applied on the east and west façades, and a simple but figuratively uniform cladding was applied.

A new bleacher (not initially present) was inserted along the west façade to accommodate the audience during the primary school children’s amateur events (Fig. 10).

The bleachers generate new relationships – the Smithson “patterns of associations” [19] – with the surrounding urban context not only of a school nature.

It opens towards a new multi-sport ground whose realization was made possible by private funds from the local civil society. Its aspect is proof of the great attention of the Brescia community towards actions that favor social interaction. The new social relations (sporting events, association assemblies, cultural and solidarity events, etc.) established through the sustainable redevelopment of the Don Milani gymnasium have become a reference point for the inhabitants of the Villaggio Badia. They approach it with a renewed ecological awareness that has emerged from the “shared” reuse of the building.

Once the realization was completed, the children of the Don Milani school were asked for their opinion on the result (Fig. 10). Their responses were enthusiastic and gave hope that, for the next generation, the ecological issue will be considered an essential aspect of their actions in the world.

4. FINAL CONSIDERATIONS

Rejecting the complete demolition of the built environment is perhaps ascribable to the vision of redevelopment projects as a “civil commitment” that puts the moral responsibility of the architect and engineer towards society first.

The AdESA project stems from this principle and envisages a theoretical/scientific integration of several disciplines (structural engineering, energy engineering, architectural and urban design) into a unique system of actions for the multidisciplinary redevelopment of the existing building stock. Moreover, the case study of the Don Milani gymnasium (Brescia) is an expression of this approach. The analyzed building reveals to us how small but timely interventions – in some cases – can become an ensemble capable of redetermining the identity of a place and giving rise to new social relations between the inhabitants.

«Dal cucchiaino alla città» (from the spoon to the town), in this famous expression by Ernesto Nathan Rogers [20], we find the meaning of a different approach to an established redevelopment method. The latter too

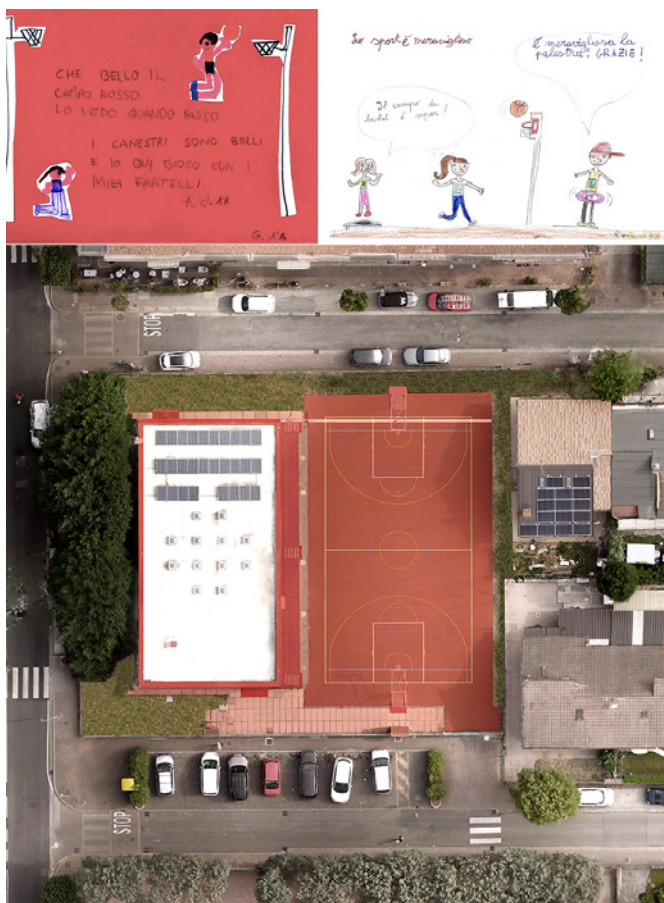


Fig. 10. Children’s drawings after the application of AdESA and Don Milani and the Gym after the intervention and the construction of the multi-sports playground. Source: Don Milani children, University Graphics Laboratory.

often seems to forego the possibility of increasing the project with issues related to the real use of places.

It inevitably follows that the paradigms we must focus our attention on are three: a human-centered design method, the importance of the urban context in which the redevelopment project originates, and the objectives it should set itself.

It is our opinion that, as Lina Bo Bardi pointed out in 1958: «[...] Those who design in their studios leaving through architecture magazines without thinking [of the community for which the buildings are intended] will only create abstract buildings and cities. [Architects] must put in the first place not their formalizing individualism but their awareness of wanting to be useful to people by putting their art and experience at their service. [...] This is the true meaning of architecture today. Is not the modern architect, builder of cities, neighborhoods and houses, an active fighter for social justice? [...]»[21].

These statements are still highly relevant today. Nevertheless, in the severe ecological crisis that the world is going through, this ethical vision of the architectural and urban project must be integrated with the requests for environmental sustainability.

We believe that by working on these three registers – ethics, sustainability and *urban commons* – it is possible to identify novel, hybrid approaches to research, of which AdESA is a case.

Acknowledgments

Heartfelt thanks are addressed to all those who made the AdESA project possible. We extend our special gratitude to the Municipality of Brescia, the project partners (Marlegno, Harpaceas, Edilmatic), the University of Brescia, the University of Bergamo and the Lions Clubs International.

Funding

The AdESA applied research project was submitted to the Lombardy Region's call for tenders, "Experimental Development and Innovation (S&I) Projects in favor of the Smart living supply chain", in implementation of the Lombardy Region Law 26/2015 and was admitted for funding.

References

- [1] Petzet M, Heilmeyer F (ed) (2012) Reduce, Reuse, Recycle. Architecture as Resource. Hatje Cantz Verlag, Ostfildern
- [2] Castro R, Denissof S (2005) [Re]modeler, Métamorphoser. Le Moniteur, Paris
- [3] Angi B (2016) Amnistia per l'esistente. Strategie architettoniche adattive per la riqualificazione dell'ambiente costruito. Lettera Ventidue Edizioni, Siracusa
- [4] Chiorino C (2021) Restituire lo spazio pubblico dimenticato alla collettività. ARCHI 4:42–51
- [5] Besson R et al (eds) (2018) Infinite places constructing buildings or places?. Éditions B42, Paris
- [6] Montuori M (2016) E pleribus unum. In: Angi B (ed) Eutopia urbana. La riqualificazione integrata dell'edilizia sociale (Eutopia Urbanscape, the combined redevelopment of social housing). Lettera Ventidue Edizioni, Siracusa
- [7] Angi B, Soci A (2020) Gioco di squadra. EdA Examples of Architecture 7:143–154
- [8] Zanni J, Cademartori S, Marini A, Belleri A, Passoni C, Giuriani E, Riva P, Angi B, Brumana G, Marchetti AL (2021) Integrated Deep Renovation of Existing Buildings with Prefabricated Shell Exoskeleton. Sustainability 13:1–27. doi: 10.3390/su132011287
- [9] Mohamed R (2014) The challenge of camouflage in architecture as means of efficiency. The International Conference on Civil and Architecture Engineering 10(10):1–13. doi: 10.21608/iccae.2014.43773
- [10] Stavrides S (2016) Common space: The city as commons. Zed Books Ltd, London
- [11] Benjamin W (1985) 'Naples', in his One Way Street and Other Writings. Verso, London
- [12] Sennett R (1995) 'Theory', Harvard University – GSD Summer Issue:54–6
- [13] ISO 9241-210:2019(en) Ergonomics of human-system interaction – Part 210: Human-centred design for interactive systems
- [14] Zak Company (1978) Preliminary report for the Don Milani School project in Brescia. Document filed with the Municipality of Brescia on 16 June, Source: Brescia City Council Archives
- [15] Municipality of Brescia, Public Building Sector (1978) Report of the School Building Commission for the construction of the Don Milani Gymnasium. 9 September, Source: Brescia City Council Archives
- [16] Croset PA, Skansi L (2010) Gino Valle. Electa, Milano
- [17] Vitali P. (2010) Una scuola prefabbricata: Scuola media 'Mons. Carozzi, Seriate (BG) 1979. In: Menister P, Venturelli G et al "Scuole, lo spazio dei bambini, Ark n. 2/L'Eco di Bergamo", Bergamo
- [18] Busi R (2001) Padre Marcolini. Dalla casa per la famiglia alla costruzione della città. Gangemi, Roma
- [19] Postiglione G (2019) A+P Smithson, piccola antologia critica. Lettera Ventidue Edizioni, Siracusa
- [20] Rogers EN (1958) Esperienza dell'Architettura. Einaudi, Torino
- [21] Bo Bardi L (1958) Arquitetura ou Arquitetura. Crônicas de Arte, de História, de Costume, de Cultura da Vida 13:110–111