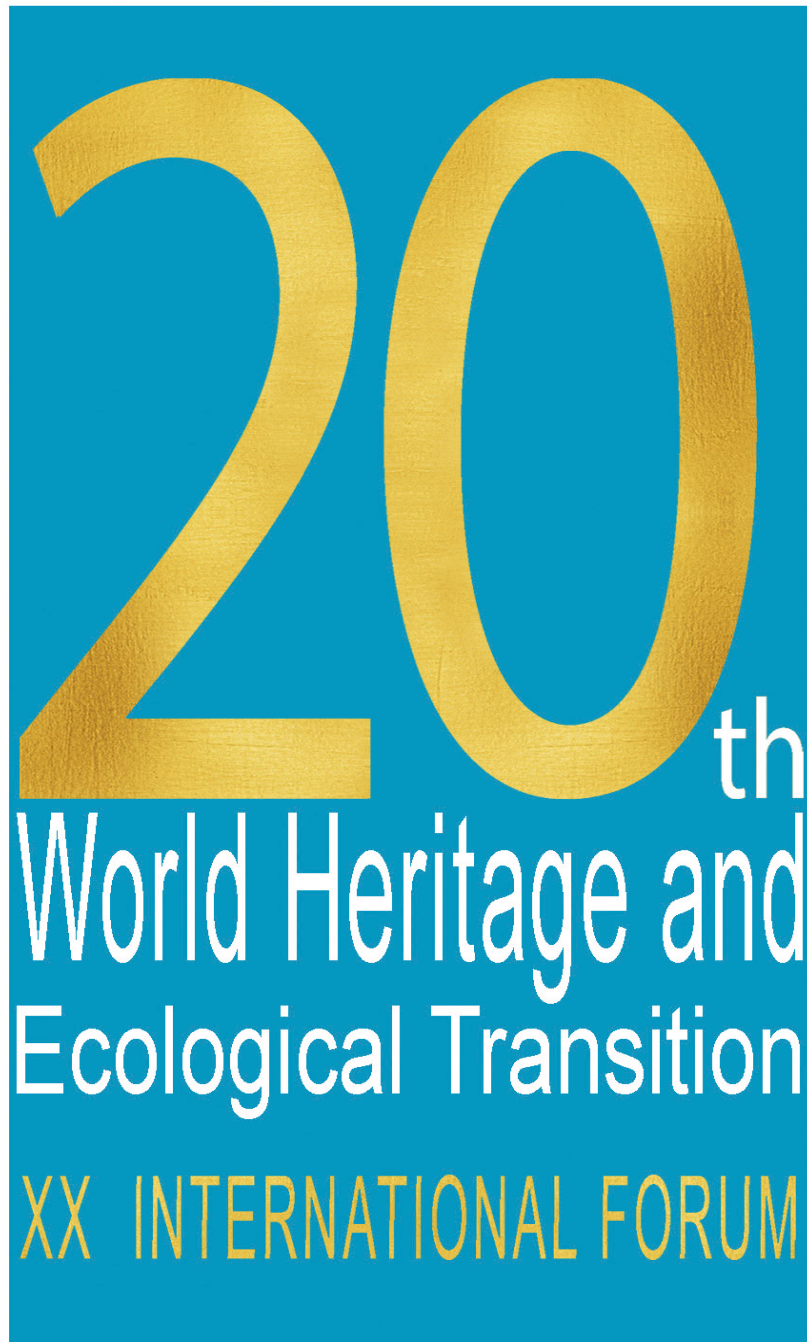


ARCHITECTURE HERITAGE and DESIGN

Carmine Gambardella

XX INTERNATIONAL FORUM

Le Vie dei
Mercanti



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Carmine Gambardella
WORLD HERITAGE and ECOLOGICAL TRANSITION
Le Vie dei Mercanti
XX International Forum

Editing: Alessandro Ciambrone

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Gangemi Editore spa

Via Giulia 142, Roma

www.gangemieditore.it

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ISBN 978-88-492-4530-1

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XX International Forum

Naples | Capri

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Peer review

Scholars has been invited to submit researches on theoretical and methodological aspects related to Smart Design, Planning and Technologies, and show real applications and experiences carried out on this themes. Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected. Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

Conference report

300 abstracts and 550 authors from 40 countries:

Albania, Arizona, Australia, Belgium, Bosnia and Herzegovina, Brasil, Bulgaria, California, Chile, China, Cipro, Cuba, Egypt, France, Germany, Greece, India, Italy, Japan, Jordan, Lebanon, Malta, Massachusetts, Michigan, Montenegro, Montserrat, New Jersey, New York, New Zealand, Poland, Portugal, Russian Federation, Serbia, Slovakia, Spain, Switzerland, Texas, Tunisia, Turkey, United Kingdom.

From the XIX FORUM WORLD HERITAGE and DESIGN for HEALTH to the XX FORUM WORLD HERITAGE and ECOLOGICAL TRANSITION

In 2022 the Capri International Forum 'Le Vie dei Mercanti' will reach its 20th edition.

A Story of love for the Earth and its Inhabitants, Landscapes, Architecture, Cultural and Archaeological Heritage told by over 7000 Scholars and Academics from all over the World in an interdisciplinary way, by integrating skills, experiences, good practices in order to train talented people who care about the destiny of our Planet.

If the Future is an Eternal Present, the renewal of the Forum in these twenty years has produced a wealth of knowledge to guide those who govern and administer the Public Good, and citizens in their daily activities. A future that must be prepared in this era, that cannot ignore the ongoing climate change and that should not catch future generations unprepared.

A Present that transmits to the future the values that Humanity has passed on to us and that must be protected and transmitted as regenerative sources of Humanity itself.

Not coincidentally, the First International Forum assigned the topic 'From Luca Pacioli to the Eco-geometry of the Territory' to the participants.

An invitation to submit scientific contributions and good practices based on double-entry, legitimized by the measurement of tangible and intangible assets, in order to integrate knowledge and state it like entries in an income statement.

Therefore, if Luca Pacioli, tutor of the Rompiasi Venetian merchants family, suggested the method to legitimize the results of the activities undertaken, that is, through the measurement he indicated the survey activity as managing a heritage, which as such must not only be geometrically definable but must be also discretized into batches, noted in its multidimensionality, in order to produce a result whose added value can always be quantified and is given by the difference between the value of the asset, as we have received it, and the value reached for the activity of knowledge and management of the potentialities which are identified and stated as in an income statement; Eco-geometry, intended as a technological echo of reality, feasible through the use of digital and artificial intelligence to create forecasting scenarios, a model in which it is possible to measure all the components and relationships between the parts and to restore the matter, no longer as an instrumental covering to be described only in the geometric matrices generating the forms.

Once again Leonardo point us the way, conceptually anticipating the transition from analogue to digital and to the management of big data: "io vò pigliare quella licenza ch'è comune ai matematici, cioè siccome loro, dividono il tempo a gradi e di quantità continua la fanno discontinua, ancora io farò il simile, dando col miglio o renella nella comparazione all'acqua" (Codice Atlantico, f. 126, t.a.).

Through the topic of the next XX Forum World Heritage and Ecological Transition, I want to provide some interesting food for thought, to identify a lived place, a life

environment, as an integral of forms of organization of the elements that surround us, examined through the prism of a civilization; we will deal with an innovative project of measurement and representation of the natural and built environment that is no longer an expression of the relationships between society and the natural environment but a construction of the relationships between the future as an eternal present and the legacy of the past as an economic value. A vital commitment that binds people to the environment; an educational revolution that match skills to the new way of managing what is learned and measured; the ecological transition with the use of technological innovation shall have the aim of entering the body of the territory, of the buildings and of the objects, it analyzes all its components through a multi-criteria analysis in order to establish a rating which in itinere defines the added of the results.

Just as the rulers and merchants in the mid-15th century, on the margins of international trade, in an economy contracted for mercantile life, combined research and training in new paths, taking refuge in agricultural operations, in favour of the reclamation of uncultivated lands in relation to the search for energy and its distribution and established the reasons of the earth compared to those of the sea in a perspective of systemic response.

Prof. Carmine Gambardella
General Chair XX Forum 'World Heritage and Ecological Transition'
President and CEO of the Benecon University Consortium
UNESCO Chair on Landscape, Cultural Heritage
and Territorial Governance

Dal XIX FORUM WORLD HERITAGE and DESIGN for HEALTH AI XX FORUM WORLD HERITAGE and ECOLOGICAL TRANSITION

Nel 2022 il Forum Internazionale di Capri, Le Vie dei Mercanti, raggiungerà la sua XX edizione. Una storia d'Amore per la Terra e i suoi Abitanti, i Paesaggi, l'Architettura, i Beni Culturali e Archeologici raccontata da oltre 7000 Studiosi e Docenti provenienti da tutto il Mondo in modo interdisciplinare, integrando competenze, esperienze, buone pratiche per formare Persone di Talento che abbiano a cuore il destino del nostro Pianeta.

Se il Futuro è un Eterno Presente, il rinnovarsi del Forum in questi venti anni ha prodotto un patrimonio di conoscenze per orientare coloro che governano e amministrano il bene pubblico e i cittadini nelle loro pratiche quotidiane. Un Futuro che va preparato in questa epoca che non può prescindere dal cambiamento climatico in atto e che non colga le generazioni future impreparate.

Un Presente che trasmetta al futuro valori che l'Umanità ci ha consegnato e che devono essere tutelati e trasmessi come fonti rigeneratrici della stessa Umanità. Non a caso, il Primo Forum Internazionale affidò ai partecipanti il Tema "Da Luca Pacioli all'Ecogeometria del Territorio". Un invito a presentare contributi scientifici e buone pratiche fondati sulla partita doppia, legittimati dalla misura dei beni materiali e immateriali per integrare conoscenze e per declinarle come partite di un conto economico.

Pertanto, se la figura di Luca Pacioli, l'Istitutore della famiglia dei Mercanti veneziani Rompiasi indicava il metodo per legittimare i risultati delle attività intraprese, e cioè attraverso la misura indicava l'attività di rilievo nel senso di gestire un patrimonio, che in quanto tale non solo deve essere geometricamente definibile ma deve essere discretizzato in partite, rilevato nella sua multidimensionalità, al fine di produrre un risultato il cui valore aggiunto sia sempre quantificabile e dato dalla differenza tra il valore del bene, così come ci è pervenuto, e il valore raggiunto per l'attività di conoscenza e di gestione delle potenzialità individuate e declinate come in un conto economico; l'Ecogeometria, intesa come un'eco tecnologica della realtà, attuabile con l'utilizzo del digitale, dell'intelligenza artificiale per creare scenari previsionali, un modello dove è possibile misurare tutte le componenti e le relazioni tra le parti e restituire la materia non più come strumentale involucro da descrivere nelle sole matrici geometriche generatrici delle forme. Ancora una volta Leonardo ci indica la strada, anticipando concettualmente il passaggio dall'analogico al digitale e alla gestione dei big data: "io vò pigliare quella licenza ch'è comune ai matematici, cioè siccome loro, dividono il tempo a gradi e di quantità continua la fanno discontinua, ancora io farò il simile, dando col miglio o renella nella comparazione all'acqua" (Codice Atlantico, f. 126, t.a.).

Con il Tema del prossimo XX Forum World Heritage and Ecological Transition intendo proporre spunti di riflessioni per identificare un luogo vissuto, un quadro di vita, come integrale di forme di organizzazione degli elementi che ci circondano esaminato attraverso il prisma di una civiltà; ci si dovrà confrontare con un progetto innovativo di misura e di rappresentazione dell'ambiente naturale e costruito

non più espressione delle relazioni tra la società e l'ambiente naturale ma costruzione delle relazioni tra il futuro come eterno presente e l'eredità del passato come valore economico. Un impegno imprescindibile che lega le Persone all'Ambiente; una rivoluzione formativa che omologhi le competenze al nuovo modo di gestire ciò che si apprende e si misura; la transizione ecologica con l'utilizzo dell'innovazione tecnologica deve avere il fine di entrare nel corpo del territorio, del costruito e degli oggetti, ne analizza attraverso un'analisi multicriteria tutte le componenti per stabilirne un rating che ne definisca in itinere il valore aggiunto dei risultati.

Così come i governanti e i mercanti, verso la metà del quattrocento, al margine del commercio internazionale, in un'economia contratta per la vita mercantile, saldarono ricerca e formazione in Nuove Vie, trovando rifugio in operazioni agricole, in favore delle bonifiche dei terreni incolti in rapporto alla ricerca di energia e di distribuzione della stessa e instaurarono le ragioni della terra rispetto alle ragioni del mare in una prospettiva di risposta sistemica.

Prof. Carmine Gambardella
General Chair XX Forum 'World Heritage and Ecological Transition'
President and CEO of the Benecon University Consortium
UNESCO Chair on Landscape, Cultural Heritage
and Territorial Governance

The transformation of the contemporary city. Exercises of retrofit and improvement of architectural and urban heritage.

Antonio BIXIO ¹, Giuseppe D'ANGIULLI ²

(¹) School of Engineering (SI-UniBas), Associate Professor SSD ICAR17 Drawing, University of Basilicata, Potenza, Italy
antonio.bixio@unibas.it

(²) Department of European and Mediterranean Culture (DiCEM), PhD Student: "Cities and Landscapes: Architecture, Archaeology, Cultural Heritage, History and Resources" – XXXV Cycle, University of Basilicata Matera, Italy
giuseppe.dangiulli@unibas.it

Abstract

The city and the building stock of the XX century require a reinterpretation and new design visions capable of interpreting the needs of contemporaneity.

Among the various approaches for the transformation of the existing cities there is the attention to the redevelopment of the urban building stock and the social housing, through architectural retrofitting actions and the redesign of public spaces. Interdisciplinary models include projects from the urban landscape scale to the building scale, also looking at environmental issues. Retrofitting and its practical methodologies analyze and develop technological and energy aspects. The design decisions take into consideration the transformation of building, its context and the entire urban area.

The regeneration of the existing building and urban area, through 'microsurgery' operations to replace 'demolition and replacement' practices of large portions of buildings, emphasize an operating mode that is respectful of the social and urban identity of the consolidated city, even more sustainable.

These very topical themes represent an opportunity for reading, analyzing and reinterpreting existing buildings and the cities.

Keywords: Urban heritage, Architecture heritage, Re-design, Retrofitting, Regeneration

1. Introduction

The twentieth century, the century of modernity and technical evolution, marked the urban development of the city with new settlement models that looked to the monumental scale for the construction of buildings dedicated to social housing.

In the period between the two World Wars, in the era of reconstruction, the socio-economic conditions, characterised by the great demand for housing, the urgency of the situation and the need to build more and more housing while minimising the economic resources to be used, led to the construction of buildings without good architectural quality.

The demographic growth and the consequent urban growth, with the expansion of collective housing, saw in the 1960s and 1970s a trivialisation of the modern conception of living. This trivialisation can be traced in the effects produced by the " Grande Numero " (Great Number), themes identified by the XVI Triennale di Milano in 1968, curated by Giancarlo de Carlo [1].

The city inherited today is fragmented, and often distributed within the territory in a non-homogeneous manner, unlike the historical city and the consolidated fabric of the city developed with projects that followed the principles of state welfare, defining parts of cities that function and reflect the principles dictated by the concept of modern architecture. Alongside these, however, there is a city that does not follow precise forms and criteria, but pursues an ethic belonging to economic issues and consequently

leads to the formation of portions of the city defined as 'dormitory'. These architectures have developed in the suburbs, in often marginal fabrics formed by minor architectures that follow the logic of standardisation and prefabrication.

This heritage that we inherit today needs a reinterpretation, a redesign, capable of interpreting the new needs of the contemporary world, exploiting its resilience to be reintegrated within the urban and social fabric of the consolidated city. This is also underlined by the housing and real estate market issues that have resulted from the social, economic and product effects of COVID-19.

Also the environmental issue becomes a starting point for the definition of an interdisciplinary model that can consider the different aspects that concern professionals, enterprises, public administrations and stakeholders, as well as the inhabitants of the places. The focus on several fronts can lead to the concrete implementation of architectural recovery programs for the redevelopment of urban areas. Interventions on the built heritage, such as architectural retrofitting - an intervention of building requalification with the aim of updating comfort conditions, technological and typological aspects -, become an opportunity to think about a redesign of architecture and the urban context, considering the need to regenerate public spaces, often considered as interstitial spaces between buildings.

2. Context

Intervention in this fragile built heritage must follow attitudes and design choices that are critical of the experience of modern construction [2]. The solution is not demolition, but a series of actions aimed at giving new qualities to existing buildings, radically transforming them with intelligent additions, integrations and subtractions. Starting from these assumptions, the initial weaknesses of the building and of the urban areas, taken into account for the redesign, are evaluated as starting points and opportunities to regenerate the heritage and not as volumes to be deleted.

The reinterpretation of the modern is therefore necessary for the recovery of entire portions of the fabric of European cities. Starting from the characteristics of modern residential construction, new housing, spatial and social qualities can be defined. There is thus a "re-writing", a "re-design", of the built environment that is able to represent the beginning of a new architectural identity, thus triggering positive effects on a social level and on the real estate market.

Not of secondary importance are the current studies that start from the real estate market and outline the future of design and demand by inhabitants and stakeholders. This is underlined by the recent CasaDoxa 2021 study (4th edition of the National Observatory on Italians and the Home by Bva Doxa): the impact of the pandemic has consequences on the priorities of housing selection criteria. In fact, 65% (+17% compared to 2019) of the sample analysed prefer to choose based on the proximity of their home to green spaces, and having private gardens and terraces (67%, +9% compared to 2019)¹.

At the same level, the research on the theme of housing carried out in 2021 by Tecnoborsa shows that for 62.7% of the sample analysed, their home is inadequate for working or following distance learning activities. The aspect that emerges most is the inadequacy of small houses, and 76.8% would make major changes to their homes, such as a redistribution of internal spaces, if they could. Also from this survey the desire to have private and public green spaces is preponderant, underlining the importance of social relations and public spaces².

Even from the design sector (home design), there is a re-evaluation of living and domestic spaces: the need for a change in the concept of living has emerged strongly, looking at the home not in terms of its size, but in terms of the quality of relationships and the ability of a space to meet the needs of its inhabitants³.

The adaptation of the existing building stock to contemporary living, therefore, achieves several different goals which may include perceptual issues of the city, issues related to the inadequacy of living, issues related to climate and environmental changes and issues related to the sociality of public spaces. All these issues have been understood and resolved in the 'Urban renovation' project in the Génicart neighborhood, near the centre of Lormont, by LAN Architecture, which mainly concerned the urban and social redevelopment of the collective use spaces and residential units of the neighborhood's four housing estates, built between 1960 and 1975.

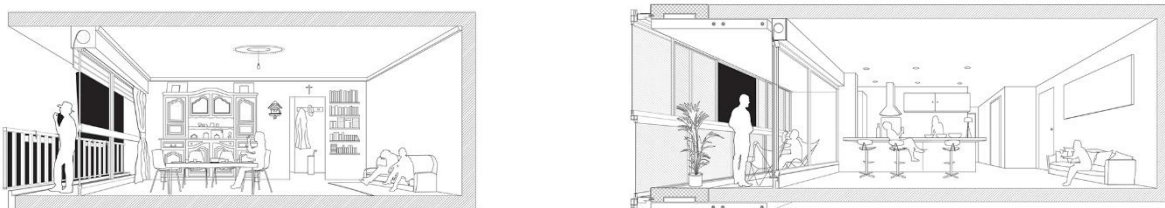


Fig. 1: Section of typical flat before and after the façade renewal; (credit: LAN Architecture, www.lan-paris.com).



Fig. 2: Building before and after the façade renewal; (credit: LAN Architecture, www.lan-paris.com).

3. Case studies of 'redesign' for community living and urban heritage

In Europe, for some decades now, recovery actions of this kind have been carried out in which the rehabilitation of social housing buildings and urban spaces gives rise, over time, to revitalisation processes at a social level and at the scale of the neighbourhood. The methods of intervention can take place at different levels: on the quality of public and private spaces, inserting new common areas and services for the neighbourhood, on the functional level increasing the number of dwellings or updating the distribution or intervening on the building envelope. This is the action that allows an update on the energy level and on the aesthetic level of the building.

National and international architecture awards are also increasingly including retrofitting projects in their short list of candidates.

This is the case of the famous Park Hill project [3] in Sheffield, England, one of the six nominated projects for the 2013 RIBA Stirling Prize, and winner of numerous national architectural awards. This residential complex, built between 1957 and 1961, has seen years of under-investment that have left it in a state of decline, despite the fact that it is part of the protected heritage ensemble due to its special historical and architectural interest.



Fig. 3: The original complex and façade designed by architects Jack Lynn and Ivor Smith in 1953; (credit: Hawkins Brown Architecture, www.hawkinsbrown.com).

The project arose from Sheffield City Council's need to regenerate a notoriously neglected estate into a place where people wanted to live. With developers Urban Splash, Hawkins and Brown Architects and Studio Egret West, have succeeded in making the building interact with the surrounding landscape. The building and the apartments have been given a thorough face-lift and renovated to 21st century standards, whose most visible transformation is the replacement of the original façade, brick panels and wooden windows added a new façade made of simple glazing and colored panels. There

have been over 5,000 repairs to the concrete frame, from patches to structural work. Aesthetically, the complex is updated in terms of colour and distribution with new external vertical connections.

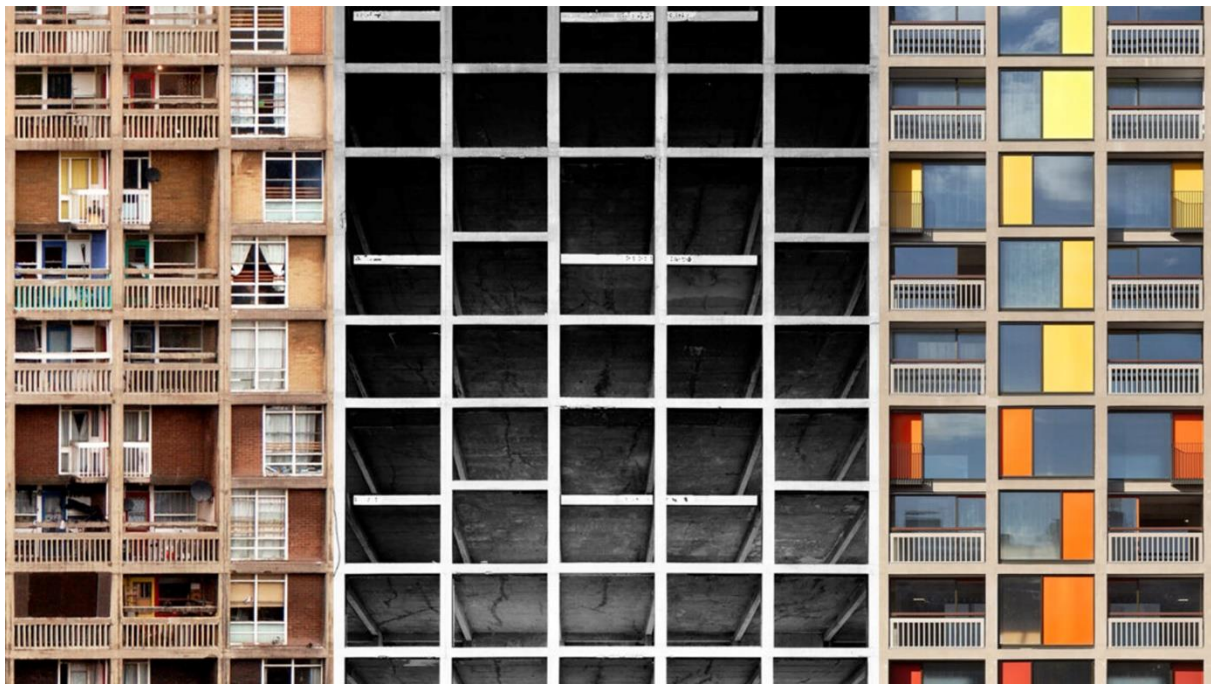


Fig. 4: Before, during and after regeneration action of Park Hill complex in Sheffield by Hawkins/Brown Architecture and Studio Egret West; (credit: Hawkins Brown Architecture, www.hawkinsbrown.com).

The transformation has also involved the flats, which have been reinvented and renewed in their internal distribution.

The Park Hill building has always had an uncomfortable relationship with its landscape, alienated from the main city. A reconfiguration of the services in this neighborhood included the inclusion of a community of services such as shops, bars, cafes and restaurants on the ground floor, revitalising the public areas for residents and becoming points of attraction from outside.

The public areas are also being redesigned in collaboration with landscape architects Grant Associates. The green space, thanks to the regeneration project, reconnects to the nearby Peak District, and every part of it is designed for the community.

The desire of Urban Splash and the designers was to manifest change to the city and the rest of the Sheffield community in a powerful way, manifesting the strength of transformation and renewal.



Fig. 5: Green space and new façade of Park Hill; Hawkins/Brown Architecture and Studio Egret West; (credit: Hawkins Brown Architecture, www.hawkinsbrown.com).

The Work of this project started in 2009 and in 2013 the first new residents and commercial tenants moved in to the building, a defining moment in the start of a new phase of its life. Urban Splash and Sheffield City Council have demonstrated how with the appropriate planning a complete regeneration of the Modern's residential stock is possible. Proof of this is that transformation is still taking place, although with a 'light touch' approach: in a second phase new flats are being recovered, as well as connections to the first building already redeveloped in 2011; in the third phase, already completed in

2020, there has been the transformation of housing modules into student accommodation, consisting of 356 rooms in 74 townhouse style units as well as communal spaces and a convenience shop; the fourth phase, currently in progress, involves the redevelopment of 95 residential units, artists' accommodation and a contemporary art gallery.

Another project that responds to the need for transformation of the built heritage is the project, part of the 'Cité du Grand Parc' programme, by Anne Lacaton & Jean-Philippe Vassal, Frédéric Druot and Christophe Hutin in Bordeaux, completed in 2016 and winner of the *EU Mies Award 2019*.

Thanks to their "democratic", social, technological and sustainable vision of transforming and renovating large building volumes, opposing demolition practices, Lacaton & Vassal have been declared winners of the 2021 *Pritzker Architecture Prize*. Their selected works include the transformation of the G,H,I buildings in Grand Parc (Bordeaux), with a total of 530 residential units. The estate can be considered a city within a city, with 25,000 inhabitants, conceived in the 1960s by planners Jean Royer and Claude Leloup, inspired by the urban projects of Le Corbusier. The project, promoted by the Aquitanis O.P.H. de la Communauté Urbaine de Bordeaux, is part of a larger regeneration project involving the Grand Essembles. It is commissioned to French architects who have been working on housing and its regeneration for more than 20 years. [4] The heritage of the Cité du Parc reflects the characteristics of modern architecture, with its standardised design elements and industrial prefabrication techniques.



Fig. 6: Façade Building G, before/after transformation; (credit: © Philippe Ruault, www.lacatonvassal.com).

The project of retrofitting starts from the addition of winter gardens and balconies, with a prefabricated self-supporting structure, in extension to the building, giving, for each apartment, a large luminous space and more living area. The same typology, already experimented by the same designers in the renovation of Tour Bois le Prêtre, has made it possible to increase the comfort and internal distribution of the flats and improve their sustainable quality.

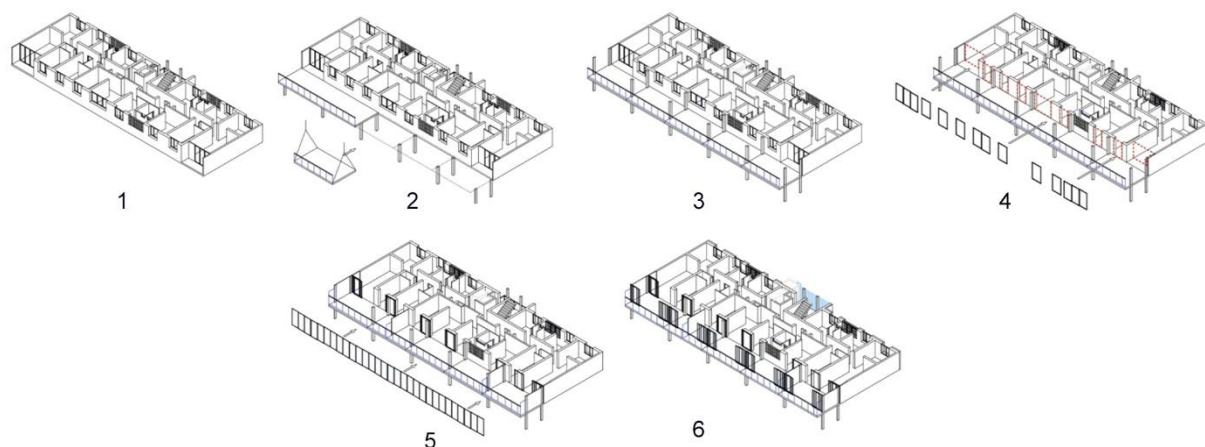


Fig. 7: Axonometric cross-section of construction phases; (credit: © Philippe Ruault, www.lacatonvassal.com).

Works are also planned in interiors space, with the renovation of the bathrooms and new electrical installation, and to improve the vertical circulation, a supplement new elevators and on ground floor, new access from green space under the buildings. One of the strengths of the project was to plan the

installation of the new façade in such a way that it could be installed without the residents moving from their homes during the construction process.



Fig. 8: Construction phases; (credit: © Philippe Ruault, www.lacatonvassal.com).

The architects demonstrate through this project how social housing, a heritage often judged low quality and criticized, can be transformed economically and with a 'simple operation' giving “generous , pleasant and performing dwellings, that renew the typologies and the living conditions, comfort and pleasure, and improve the urban dwelling image”. [5]

4. Case studies to ‘redesign’ local social housing heritage

Architectural retrofitting and urban regeneration are topics that are also investigated in the academic and educational context, during the training of designers, starting with themes related to the survey and analysis of the city and its component parts [6]. Thanks to the agreements between the University of Basilicata and local Institutions such as the Region and the Azienda Territoriale per l'Edilizia Residenziale (ATER), there is the opportunity to work on projects on concrete case studies that need to be transformed. This is the case of a design experimentation carried out on a public building from the 1960s, located on the outskirts of the city of Potenza, in Via dell'Edera, and the urban space adjacent to it. One of the aims of the project was to establish a new balance between the built and the green space. The architectural retrofitting operation consists in the addition of a volume on the façade that allows the creation of loggias and terraces, in order to improve the internal distribution, increasing the living space and improving the energy efficiency of the building and its functional parts.⁴



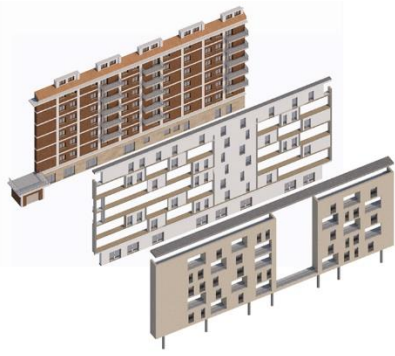


Fig. 9: Transformation of the façade and green space of a building in Via dell' Edera in Potenza (credit: Marialuisa Zozzaro)

In other university research, two other buildings were identified: the first, located in Rione Tre Galli in Potenza, and the second, in a town near Potenza, in Lavello, both of which were social housing projects at the turn of the 1970s/80s.

The first building, located in the Cocuzzo district, in Piazza Adriatico, consists of 80 flats with three different types of distribution and three sizes. This responds to constructive and compositional criteria of an industrial design, readable in the facades, anonymous and disconnected from the context. The retrofitting work mainly involves the shell, improving energy performance and guaranteeing new appropriate conditions of comfort in terms of function and distribution. This is made possible by an extension of the volume juxtaposed to the north façade, with the definition of balconies and loggias that offer each flat new functional conditions, with the opportunity to have a private outdoor space, especially for the flats with smaller sizes.

The second building, located on the outskirts of Lavello, was built in the 1980s to provide housing for industrial workers. Here too, the elevations, with few balconies and therefore few private open spaces, make the building anonymous and an ideal basis for redesigning the architecture. The intervention, after providing a new skin for an energy upgrade, was designed with a self-supporting prefabricated steel structure, which at the same time gives a new look to the building's envelope and allows it to meet functional problems related to new contemporary needs.

In both cases, the spatial reconfiguration with private open spaces and the inclusion of services on the ground floor underline the desire to adapt the building and its context to current comfort, while maintaining the typological and dimensional diversification of the flats to adapt to demand and needs.



Fig. 10: Architectural Retrofitting of the building in Piazza Adriatico in Potenza and the building in Lavello (credit: Authors)

5. Conclusions

The urban context of our cities, inherited from the theory of the Modern Movement, whose central theme was "a roof for all" [7], underlines the need to deal with a building heritage that is not only concentrated in the sprawl of the suburbs, but also constitutes part of the urban territory of the consolidated city. Architectural retrofitting and related methodologies analyse and develop performance issues in terms of energy, seismic and therefore technological aspects and design choices that produce functional adjustments that affect the building and its context, up to and including the entire urban environment. The transformation of the existing building through 'microsurgery' operations instead of 'demolition and replacement' actions of large portions of the building shows an operating method that is respectful of the identity, including the social identity, of a consolidated building fabric. This type of transformation is more sustainable as it allows to limit new land consumption with new building [8].

Notes

¹ CasaDoxa 2021: *I trend dell'abitare: opportunità e ispirazioni* (4° Edizione Osservatorio sugli italiani e la casa), Bva Doxa, 14/07/2021.

² Centro Studi sull'Economia Immobiliare - CSEI Tecnoborsa: *Indagine Tecnoborsa 2021 - Le famiglie italiane che vivono nelle sei grandi città e il mercato immobiliare: La casa dopo il Covid-19*, 17/05/2021.

³ Il Manifesto dell'Abitare, strumento utile alla progettazione degli spazi domestici del futuro, lavoro congiunto tra Strategy Innovation, Studiolo, Fuorisalone.it.

⁴ This study was partially treated in thesis project: ZOZZARO, Marialuisa. *La Rigenerazione Urbana di Via dell'Edera a Potenza: dalle previsioni del Regolamento Urbanistico all'idea di progetto*. Tesi di Laurea in Ingegneria Edile- Architettura, Relatore Prof. Ing. BIXIO Antonio, Università degli Studi della Basilicata (*The Urban Regeneration of Via dell'Edera in Potenza: from the Urban Regulations to the project idea*. Degree thesis in Building Engineering-Architecture, supervisor Prof. Ing. BIXIO Antonio, University of Basilicata.)

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CARMINE GAMBARDELLA

UNESCO Chairholder on Landscape, Cultural Heritage, and Territorial Governance; President and CEO of the Benecon University Consortium - Research Centre on Cultural Heritage, Ecology, Economy (Pegaso University, University of Campania “Luigi Vanvitelli”, University Federico II of Naples, University of Salerno, University of Sannio). Full Professor of Drawing at the Pegaso University and at the University of Campania. President of the International Forum ‘Le Vie dei Mercanti’ since its first edition in 2003 to the XX edition in 2022. Editor and Founder of the series “Surveying is/or Project”, “Knowledge Factory” and “Architecture, Heritage and Design”. Component of the Scientific Committee of International A Class Magazine ‘Abitare la Terra’/‘Dwelling on Earth’ (Gangemi Editor International Publishing). He covered various roles for the University of Campania, including the Pro Rector of Institutions, Academic Senator, Director of the Department of Architecture and Industrial Design Luigi Vanvitelli, Dean of the Faculty of Architecture Luigi Vanvitelli, Director of the Department of Culture of Design, Director of Doctoral School in the Discipline of Architecture, Coordinator of the PhD in Protection, Safety and Representation of the Environment and Structures and Territorial Governance, Coordinator of the PhD Program in Surveying and Representation of Architecture and the Environment. He is author of numerous scientific international papers, publications and proceedings on surveying and representation of the built and natural heritage.



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