

Editors

Alessandro Benetti, Research Fellow, Politecnico di Torino,
Department of Architecture and Design (DAD).

Alberto Bologna, Associate Professor of Architectural and Urban
Design, Sapienza Università di Roma, Department of Architecture
and Design (DiAP).

Josep-Maria Garcia-Fuentes, Associate Professor of Architectural
and Urban Design, Politecnico di Milano, Department of Architecture
and Urban Studies (DASU).

Ilaria Giannetti, Associate Professor of Architectural Engineering,
Università degli Studi di Roma Tor Vergata, Department of Civil
Engineering and Computer Science Engineering (DICII).

Gabriele Neri, Associate Professor of Architectural History,
Politecnico di Torino, Department of Architecture and Design (DAD).

Would it be possible to re-examine Italian architecture from 1945 onwards
through the lens of *Upcycling and Design for Disassembly* – understanding
these as design strategies for reusing existing materials while adding new
value, and as critical alternatives to the relentless demand for producing
new materials?

This innovative volume identifies and analyses twentieth-century Italian
architectural experiences that reveal the continuous adaptation of ancient
design and building practices of reuse, which can be considered visionary
precedents of today's upcycling trends. In doing so, it challenges the usual
view of the twentieth century as the period when the construction industry
abandoned millennia-old practices of architectural reuse in favor of a
cradle-to-grave model.

The essays and case studies featured in this book examine anachronisms,
the endurance of ancient traditions, and pioneering design experiments in
Italy and beyond. They uncover the roots, ambiguities, and potential of an
architecture of upcycling, and provide a new historiographical, theoretical,
and design framework for its understanding.

Mimesis Edizioni

www.mimesisedizioni.it

28,00 euro



 MIMESIS

Upcycling Architecture in Italy since 1945

Upcycling Architecture in Italy since 1945

Edited by

Alessandro Benetti

Alberto Bologna

Josep-Maria Garcia-Fuentes

Ilaria Giannetti

Gabriele Neri

 MIMESIS

This publication is an outcome of the research project *Upcycling
Architecture in Italy. Forging and Promoting a Renewed Building
Culture*, conducted between 2023 and 2026 by the Politecnico di Torino,
the Sapienza Università di Roma, the Università degli Studi di Roma
Tor Vergata, and the Politecnico di Milano. The European Union has
funded the project through the Next Generation EU program.

Upcycling Architecture in Italy since 1945

**Edited by
Alessandro Benetti
Alberto Bologna
Josep-Maria Garcia-Fuentes
Ilaria Giannetti
Gabriele Neri**

Upcycling Architecture in Italy since 1945

Edited by

Alessandro Benetti
Alberto Bologna
Ilaria Giannetti
Josep-Maria Garcia-Fuentes
Gabriele Neri

Afterword by

Pierre Chabard

With texts by

Paola Altamura, Serena Baiani,
Andrew Ballantyne, Alessandro
Benetti, Viola Bertini, Alberto
Bologna, Nicole De Togni, Danilo
Di Donato, Antonella Falzetti,
Federico Ferrari, Josep-Maria
Garcia-Fuentes, Roberto
Germanò, Ilaria Giannetti, Laura
Milan, Giulio Minuto, Gabriele
Neri, Luca Reale, Jo Rigo, Kevin
Santus, Giulia Sergi

Published by

Mimesis Edizioni

Editorial coordination

Alessandro Benetti

Graphic design and layout

Cinzia D'Emidio

Printing and binding

Finished printing in January 2026
by Digital Team – Fano (PU)

ISBN

9791222328546

First edition, January 2026

This book is published in print
and in an open access digital
edition. The open access edition is
distributed under the terms of the
CC BY 4.0 International License.

Unless otherwise noted, all texts
copyright © by the individual
authors.

All rights reserved. No part of this
publication may be reproduced,
stored in a retrieval system or
transmitted, in any form or by any
means, electronic, mechanical,
photocopying, recording or
otherwise, without permission
in writing from the team of the
research project "Upcycling
Architecture in Italy."

Every effort has been made
to contact the owners and
photographers of the images
published here. Anyone having
further information concerning
copyright holders is asked to
contact the team of the research
project "Upcycling Architecture
in Italy" (info@upcyclingarchitecture.
it) so this information can be
included in future printings.

This book is published as an
outcome of the research project
"Upcycling Architecture in Italy.
Forging and Promoting a Renewed
Building Culture," funded by
the European Union – Next
Generation EU, D.D. n. 1409 of
14/09/2022 (PRIN 2022 PNRR
Call), within the framework of the
National Recovery and Resilience
Plan, Mission 4 Education and
Research – Component 2 From
Research to Business – Investment
1.1. Project protocol number:
P2022KSY9. CUP Master:
E53D23018760001. CUP Politecnico
di Torino: E53D23018760001.
CUP Università di Roma Tor
Vergata: E53D23018770001. CUP
Sapienza Università di Roma:
B53D23029120001. CUP Politecnico
di Milano: D53D23019720001.

It brings together the results of
research and critical inquiry
carried out during the project and
its final scientific event *Upcycling
Architecture International
Conference* (Politecnico di Torino,
29–30 October 2025).

Scientific Committee:

Filippo De Pieri (Politecnico di
Torino)
Corentin Fivet (EPFL)
Alfonso Giancotti (Sapienza
Università di Roma)
Franz Graf (EPFL)
Giulia Marino (Université
catholique de Louvain)
Renato Morganti (Università degli
Studi dell'Aquila)
Stefania Mornati (Università degli
Studi di Roma Tor Vergata)
Spartaco Paris (Sapienza
Università di Roma)
Edoardo Piccoli (Politecnico di
Torino)
Adam Przywara (University of
Fribourg)
Mario Rinke (University of
Antwerp)
Alessandro Rogora (Politecnico
di Milano)
Daniel Stockhammer (University of
Liechtenstein)
Albena Yaneva (Politecnico di
Torino)

This volume has undergone
a peer review process.

Upcycling Architecture in Italy

"Upcycling Architecture in
Italy Forging and Promoting
a Renewed Building Culture"
PRIN 2022 PNRR. Funded
by European Union – Next
Generation EU.



**Politecnico
di Torino**

Politecnico di Torino

Gabriele Neri (Principal
Investigator-Associate
Investigator), Associate Professor
of Architectural History
Lorenzo Savio, Associate Professor
of Architectural Technology
Alessandro Benetti, Research
Fellow



TOR VERGATA
UNIVERSITÀ DEGLI STUDI DI ROMA

Università degli Studi di Roma Tor Vergata

Ilaria Giannetti (Associate
Investigator), Associate Professor
of Architectural Engineering
Antonella Falzetti, Full Professor
of Architectural and Urban Design
Giulia Sergi, PhD Student

DIPARTIMENTO
DI ARCHITETTURA E PROGETTO



SAPIENZA
UNIVERSITÀ DI ROMA

Sapienza Università di Roma

Alberto Bologna (Associate
Investigator), Associate Professor
of Architectural and Urban Design
Viola Bertini, Associate Professor
of Architectural and Urban Design
Roberto Germanò, Research Fellow



**POLITECNICO
MILANO 1863**

Politecnico di Milano

Josep-Maria Garcia-Fuentes
(Associate Investigator), Associate
Professor of Architectural and
Urban Design



**Finanziato
dall'Unione europea**
NextGenerationEU



**Ministero
dell'Università
e della Ricerca**



Italiadomani
GOVERNAMENTO



Contents

Introduction

Towards an Architecture of Upcycling?

Alessandro Benetti, Alberto Bologna, Josep-Maria Garcia-Fuentes,
Ilaria Giannetti, Gabriele Neri

Chapter 1 curated by Alessandro Benetti

17

Reconstructing Italy Out of Its Rubble: Reuse Practices During and After WWII (1943–1947)

Alessandro Benetti

Case Studies

49

A. Annoni, A. Belloni, L. Grassi, P. Portaluppi, Restoration and Conversion of the Ca' Granda into the Università degli Studi, Milan (1939–1985).

Ordinary Rubble, Invaluable Rubble

Nicole De Togni

52

Headquarters of the Società Umanitaria, Milan (1940s).

Rubble for sale

Alessandro Benetti

55

Luigi Moretti, Tubular House for Extremely Rapid and Economical Construction (1945).

Beneath a Roof of Rubble

Alessandro Benetti, Roberto Germanò

58

Via Palmanova, Milan (1946–early 1950s).

A Rubble Road through the Modern City

Alessandro Benetti, Federico Ferrari

61

Piero Bottoni, Monte Stella, Milan (1946–1970).

Rising from Rubble

Federico Ferrari



Chapter 2 curated by Ilaria Giannetti

65

Disjoined Joints. Traces of Design for Disassembly in Italian Industrialized Architecture Culture (1945–1975)

Ilaria Giannetti

Case Studies

97

***Informatore Tecnico Cantieri* (1946–1950).
Industrial Culture in Architecture**

Giulio Minuto

100

**Renzo Piano, “Metodo per la costruzione di pareti” (1962)
Leonardo Mosso, “Blocco prefabbricato” (1962).
Assembly and Disassembly as Industrial Inventions**

Giulia Sergi, Ilaria Giannetti

103

***Prefabbricare* (1958–1979). Architecture as System**

Giulio Minuto

106

**CLASP School, XII Milan Triennale (1960).
Once the Exhibition Was Over**

Danilo Di Donato

109

**Djuric Tardio Architectes, La Crèche Itinérante (2019).
Dry-joints as a Founding Theory**

Antonella Falzetti



Chapter 3 curated by Gabriele Neri

113

Before Upcycling: Unconventional Design Theories and Practices in Italy (1960s–1970s)

Gabriele Neri

Case Studies

145

**Cesare Chiodi, Giulio Minoletti, Mixed-used Complex in piazza
Borromeo, Milan (1951–1954). A Staging of Fragments**

Alessandro Benetti

148

**Carlo Mollino, Casa Garelli, Champoluc (1962–1965).
Upcycling ante litteram**

Laura Milan

151

**Achille and Pier Giacomo Castiglioni, Mezzadro (1957).
Frankenstein Design**

Gabriele Neri

154

**Ugo La Pietra, *Recupero e reinvenzione* (1976).
The Reappropriation of the City**

Gabriele Neri



157 **Riccardo Dalisi, Workshops in Naples (1970s). Precision and Approximation**
Gabriele Neri

Chapter 4 curated by Josep-Maria Garcia-Fuentes

161 **Anachronistic Upcycling: Spolia, Elements of Architecture, Memory, and History as Design Materials**

Josep-Maria Garcia-Fuentes

Case Studies

193 **Casa degli Atellani, Piero Portaluppi, Milan (1919–1952). Memory as Design Material**
Giulio Minuto

197 **Luigi Caccia Dominioni, Palazzo Prospero Visconti, Milan (1957). Ruins and Invention: The Poetics of Fragments**
Kevin Santus

200 **Carlo Scarpa, Castelvecchio Museum, Verona (1956–1974). A Roof as a Pedestal**
Jo Rigo

203 **Palazzo della Ragione, Marco Dezzi Bardeschi, Milan (1978–2003). Flights of Fancy**
Andrew Ballantyne

206 **Francesco Venezia, Palazzo di Lorenzo, Gibellina (1980–1987). Transposing a Fragment**
Roberto Germanò

Chapter 5 curated by Alberto Bologna

209 **Upcycling as a Design Paradigm? Expressive Codes of “Cradle to Cradle” Contemporary Architecture**

Alberto Bologna

Case Studies

241 **Studio Albori. A Practice Based in Milan. Radical Reuse**
Viola Bertini

244 **Park Associati. A Practice Based in Milan. A Resourceful Intelligence**
Viola Bertini, Roberto Germanò

247	Orizzontale. A Practice Based in Rome. Constructing Temporality Luca Reale
250	Césaire Peeren – Superuse on Site, Villa Maggiore, Como (2017-2019). Heritage, Harvesting and Superuse Paola Altamura, Serena Baiani
254	ARCò Architecture and Cooperation, Casa Chiaravalle, Milan (2018). Earthbags and Earthship: a Manifesto Building Paola Altamura, Serena Baiani
	Afterword
257	Architecture Without End: Aesthetical Potentials of Upcycling Pierre Chabard
268	Biographies
270	Index of Names

Césaire Peeren – Superuse on Site Villa Maggiore, Como (2017-2019)

Heritage, Harvesting and Superuse

Paola Altamura

Serena Baiani

Sapienza Università di Roma

Since the early 2000s, the Dutch group Superuse Studios has developed a methodology for scouting waste materials suitable for architecture (e.g., by-products, remnants, defective products, surplus, construction waste, etc.) within a 25 km radius of intervention sites. This enables “harvesting” waste materials to feed a Harvest Map showing available sources for *superuse*, a design approach that looks for discarded materials and reads their reuse potential, transforming their characteristics into added value for new products or buildings. *Superuse* parallels reuse, as *upcycling* does with recycling, with *upcycling* intended – like in *Cradle to Cradle* – as a practice of recycling materials in such a way as to maintain and/or accrue their value over time. The Harvest Map serves as a design premise and open-source resource for multiple designers, encouraging experimentation with industrial waste to develop new design approaches while enhancing local waste from the urban mine. This approach aims at reducing embodied energy in materials, raw material consumption and emissions from producing/transporting “new” materials, while activating small-scale circular economy processes. On-site material harvesting, done before design choices, strongly impacts the project ensuring efficient resource use and

challenging conventional design processes, where material selection typically follows rather than informs design conception.

The Villa Maggiore project (2017-2019) on Lake Como, coordinated by architect Césaire Peeren (*Superuse On Site*), aimed to experiment with this approach in the Italian context. The project involved renovating and re-functionalizing a 1920s heritage-listed villa into a zero-energy holiday home. A Harvest Map was developed for the Como-Milan area – including the important Brianza Furniture District – by a multidisciplinary team coordinated by Césaire Peeren with Paola Altamura (researcher) and Elisa Saturno (designer) to identify waste materials from local companies suitable for the villa’s renovation. The 450 square meters three-story building features load-bearing stone masonry, wooden floors, and one unfinished floor. After years of abandonment, the villa underwent renovation with minimal remodeling (e.g., transparent protective coatings on concrete and wooden surfaces, bathrooms upgrades, installation of double glazing in restored timber windows, second-floor ceiling insulation) and passive/zero-energy systems (masonry mass for cooling, central stairwell for natural ventilation, ground pipes delivering constant 14°C air, original shutters for shading, internal curtains for insulation, solar-powered air-water heat exchangers for hot water and heating), all based on superused locally harvested materials.

During the harvesting phase, preliminary geographical desk research and site visits were conducted to identify local companies holding waste resources not reintegrated into production cycles (scouting phase). A database of available materials was created (indicating nature, typology, dimensions, production frequency, price): over 130 materials/products were identified, mapped and sampled, potentially usable for furniture design and villa refurbishment, then inserted into the geo-referenced Harvest Map database to connect suppliers with potentially designers interested. The project enabled, through collaboration between Superuse Studios and Giacimenti Urbani, the opening of the Italian page of the open-source *Oogstkaart* portal, launched in March 2018 at Milan’s *Fa’ la cosa giusta* fair. Subsequent projects, including Williams Bar in Milan and exhibition stands, successfully used materials



Fig. 1

Superuse On Site, Villa Maggiore, Como, Italy, 2017–2019. Detail of furniture in superused timber elements under construction. © Paola Altamura, 2018.

Fig. 2

Superuse On Site, Villa Maggiore, Como, Italy, 2017–2019. Detail of bed in superused timber boards and shutters, hung from the existing unfinished timber floor, in the Melbourne room, immediately after completion of works, by Refunc. © Denis Guzzo, 2018.

Fig. 3

Superuse On Site, Villa Maggiore, Como, Italy, 2017–2019. Detail of bed in superused metal profiles, timber shutters and laminated panels, in the Wien room, immediately after completion of works, by Superuse On Site. © Denis Guzzo, 2018.



4

sourced through Villa Maggiore's workshop.

Among identified waste materials/products, 22 were *superused* at Villa Maggiore as integrative layers of the existing envelope (insulation, flooring, finishes) or as components for interior and exterior space furnishing, including: textile production waste (textile selvages and defective silk); metal sheets derived as by-products from automotive laser cutting; leftover sandwich panels in metal and wood; a disused textile machine composed of high-resistance metal profiles; leftover pots of resin for interior surface treatment; fire extinguishers, metal trolleys, nozzles and brackets, foam panels, luminous signs. Material procurement coordination involved direct relationships with waste-producing companies to define procedural and economic supply aspects.

The villa's interior transformation occurred through two intensive two-weeks collaborative workshops, where four international teams (Superuse, Co2RO, Studio Cifra and Refunc) including fourteen designers, lived and worked on-site as designers-in-residence, producing custom-built furniture for seven bedrooms, storage spaces, lighting, dining areas and lounge facilities with *superused* materials such as: neoprene scraps as acoustic floor insulation, topped with reused exhibition flooring; leftover Malta pots (a resin-like material made from industrial waste like coal grains from filter systems, free from VOCs and CO₂ emissions) applied experimentally in bathrooms, kitchens and floor finishing using a mixed-color

technique; metal sheets from automotive laser cutting processes repurposed for furniture as well as to build the garden fence and the pillars of a new pergola supporting solar panels.

The Villa Maggiore project demonstrates how circular design requires fundamental shifts in design methodology and value chain collaboration and establishes a replicable model to reduce environmental impacts and create added value from waste streams while preserving cultural heritage.

Bibliography and list of websites

Altamura, Paola, and Serena Baiani. "Superuse and Upcycling Through Design: Approaches and Tools." In *SBE19 Brussels BAMB-CIRCPATH*, Vol. 225. Brussels: IOP Conference Series: Earth and Environmental Science, 2019. <https://doi.org/10.1088/1755-1315/225/1/012014>.

Altamura, Paola, and Serena Baiani. "Selezione e uso dei materiali per Edifici Eco-efficienti: dall'Harvest Mapping al Design for Deconstruction Selection and Use of Materials for Eco-Effective Buildings: from Harvest Mapping to Design for Deconstruction." In *Isole ecologiche e centri di riuso. L'architettura al servizio della Società tra Sperimentazione Teorica e Ricerca Operativa | Ecological Islands and Reuse Centres. Architecture at the service of Society between Theoretical Experimentation and Operational Research* edited by Patrizia Trovalusci and Roberto Panei, Rome: are_Architetti, 49-55. Roma Edizioni, 2021.



Altamura, Paola, and Serena Baiani. "Superuse e upcycling dei materiali di scarto in architettura: progetto e sperimentazione. / Waste materials Superuse and Upcycling in Architecture: Design and Experimentation". *TECHNE*, no. 16 (2018): 142–151. <https://doi.org/10.13128/Techne-23035>.

Baiani, Serena, Paola Altamura, and Gaia Turchetti. "Circular Contemporary Heritage. Design Experimentations on Conservation and Reuse Aiming at Material Resource Efficiency and Decarbonization." In *Contemporary Heritage Lexicon* edited by Cristiana Bartolomei, Alfonso Ippolito, and Simone Helena Tanoue Vizioli, 435–478. Cham: Springer Tracts in Civil Engineering, 2024. https://doi.org/10.1007/978-3-031-61245-9_20.

Guzzo, Denis. "Superuse Villa Maggiore, 2018." On Denis Guzzo's official website. Accessed September 4, 2025. <https://www.denisguzzo.com/superuse-project-villa-maggiore>.

Jongert, Jan, Césaire Peeren, and Jan Van Hinte. *Superuse: Constructing New Architecture by*



Shortcutting Material Flows. Rotterdam: Oio Publishers, 2007.

Peeren, Césaire. "HARVEST MILANO, 2017." On [behance.net](https://www.behance.net/gallery/59160629/HARVEST-MILANO-201709?tracking_source=project_owner_other_projects). Accessed September 4, 2025. https://www.behance.net/gallery/59160629/HARVEST-MILANO-201709?tracking_source=project_owner_other_projects.

Fig. 4
Superuse On Site, Villa Maggiore, Como, Italy, 2017–2019. Detail of the ground floor living room with floor finishing in superused waste resin and Firehosescape furniture by Co2RO. © Denis Guzzo, 2018.

Fig. 5
Superuse On Site, Villa Maggiore, Como, Italy, 2017–2019. Detail of one of the bathrooms with floor and walls finishing in superused waste resin. © Denis Guzzo, 2018.

Fig. 6
Superuse On Site, Villa Maggiore, Como, Italy, 2017–2019. Detail of storage cupboard by Studio Cifra. © Denis Guzzo, 2018.

ARCò Architecture and Cooperation Casa Chiaravalle, Milan (2018)

Earthbags and Earthship: a Manifesto Building

Paola Altamura

Serena Baiani

Spazio Università di Roma

ARCò Architettura e Cooperazione is a cooperative, founded in 2012 by a group of architects and engineers based on a design approach that combines social, economic, and environmental sustainability. A specific aspect is the choice to adopt the most appropriate techniques for the site, using waste, natural and recycled materials, in order to guarantee construction processes managed directly by the communities involved. This approach has allowed the team to address and resolve the various problems posed by the humanitarian emergency in international contexts.

The "Design and Build with Ø km (local and recycled materials)" project, developed in 2018 over a four-week period as part of the sixth workshop co-funded by the European Erasmus+ LearnBIØN (Learn Building Impact Zero Network, 2015-2018), was organized at Casa Chiaravalle, in Milan's Parco Sud, a farmhouse confiscated from organized crime and managed since 2016 by five social cooperatives. The team involved students, migrants, NEETs, unemployed individuals, architects and engineers, coordinated by ARCò, in a four-week training and application program that redeveloped an area within the complex using alternative and low-cost construction techniques to create a small



multifunctional building (wooden structure with a depth of 5 meters and a height of 2.50 meters), serving as a gathering and meeting place for the local community, with bioclimatic functionality. Despite the suboptimal exposure, a transparent facade was built for winter heating; openings were placed on all facades to enable cross ventilation in summer, while thermal insulation was provided by Earthbags. With the objective of responsible use of natural and unconventional resources, the project focused on reusing wooden window frames, bottles, plexiglass panels and pallets, combined with Earthship and Earthbags, seeking appropriate technologies with reduced processing, installation and transport times and low environmental and economic costs. The attention to "Ø km" and the use of local and recovered materials also aimed to enhance local traditions and architectural culture and to identify techniques that required low-level technological processing and minimal transport.

The development of the workshop modules, for the construction of a "manifesto building," trained the team in various construction techniques: the first, Earthbags, involved building with earthbags, a technique that uses sturdy bags filled with organic material, locally sourced earth. The system ensures



Fig. 1
ARCò, Casa Chiaravalle, Milan,
Italy, 2018. Main facade composed
of reclaimed timber windows.
© ARCò, 2018.



Fig. 2
ARCò, Casa Chiaravalle, Milan,
Italy, 2018. Earthbags envelope.
© ARCò, 2018.



Fig. 3
ARCò, Casa Chiaravalle, Milan,
Italy, 2018. Detail of the Earthship
wall incorporating reused bottles.
© ARCò, 2018.

Fig. 4
ARCò, Casa Chiaravalle, Milan,
Italy, 2018. Assembly of reclaimed
timber windows in the main
facade, acting as a passive heat
gain system. © ARCò, 2018.



structural stability by anchoring one or two strands of four-point barbed wire between each row of bags to join the bags together and prevent the walls from coming apart (resistance to fire, flooding, and earthquakes). It also promotes an optimal microclimate for the thermal inertia of the soil and offers excellent value for money (materials available locally and at affordable prices).

The soil used for the earthbags came from excavations for a new sewage drainage system at Casa Chiaravalle. During the first week of the workshop, participants learned the various stages of earthbag construction, including filling, compacting, and positioning the bags.

The second technique, Earthship, allowed the reuse of glass bottles, inserted into a support structure and fixed with mortar. The objective was to recycle over 3,000 bottles to build a separation element, facilitated by a partnership with a company for the supply and recovery of containers. The ‘bottle walls’ are inserted into a wooden framework, where the bottles, arranged in overlapping rows, are fixed in position with mortar prepared on-site. In these walls (used on the west side of the building), circular openings were created using plastic pipes, dismantled from the water system installation and reused as permanent formwork.

The recovery, cataloguing and adaptation of numerous discarded windows allowed the reuse of over 60 square meters of frames (*Design for Disassembly*), used to create a transparent surface (with polycarbonate panels) to close the south and east facades of the building, improving natural lighting and solar gain and establishing visual connections between interior and exterior spaces. A key aspect of the workshop was the recovery and

reuse of waste materials from the site, as well as from donations and local distribution networks. In addition to excavated soil, glass bottles and window frames, reclaimed wooden beams from demolished existing structures and closure panels not used in the renovation of Casa Chiaravalle were also used. The workshop aimed to explore the potential of applying a “harvest map tool” and developed the principle of “secondary use,” prioritizing the reuse of materials in their existing form, thus optimizing and adapting available resources rather than subjecting them to recycling, which entails material reprocessing. The project used 70% of materials sourced on site (within 10 kilometers: plastic pipes, wooden elements, paneling, soil), 20% locally (within 75 kilometers: bottles, fixtures, polypropylene fabric tubes), and 10% recovered from beyond 75 kilometers (mortar, metal wire, screws and bolts, polycarbonate panels). The project demonstrated the feasibility of building with “Ø km” materials, achieving minimal environmental impact while maintaining high symbolic and architectural value.

Bibliography and list of websites

Altamura, Paola, and Serena Baiani. “Superuse and Upcycling Through Design: Approaches and Tools.” In *SBE19 Brussels BAMB-CIRCPATH*, Vol. 225. Brussels: IOP Conference Series: Earth and Environmental Science, 2019. <https://doi.org/10.1088/1755-1315/225/1/012014>.

Battistella, Alessio, Valerio Marazzi, and Luca Trabattani, eds. *Design and Build with Local and Recycled Materials #6*. Booklet of the Learn BION (Building Impact Zero Network). Accessed September 4, 2025. <https://indd.adobe.com/view/2ea4d7b8-50bf-476a-8a61-5009072cbafa>.

Workshop *Design and Build with Local and Recycled Materials*, 4–29, June 2018. Accessed September 4, 2025. <https://www.biOn.eu/our-work/5-design-and-build-with-rlocal-and-recycled-materials>.

Index of Names

A

Aalto, Alvar, 97, 237
Aalto, Elissa, 237
Acquardo, Antonio, 37
Addis, Bill, 214
Albini, Franco, 83, 175
Allweil, Yael, 78
Almagioni, Emanuele, 241
Amadeo, Giovanni Antonio, 49
Ambasz, Emilio, 131
Amman, Jean Christophe, 124
Ammendola, Jacopo, 247
Anderson, Benedict, 18
Angelucci, Filippo, 44
Angst, Marc, 232
Anguissola, Anna, 162
Annoni, Ambrogio, 49
ARCò Architecture and
Cooperation, 254, 256
Arendt, Hannah, 120
Aristotle, 265, 266
Arrhenius, Thordis, 95
Arvati, Paolo, 33
ARW, 67
Avena, Antonio, 200
Avogadro, Cecilia, 124
Azzolini, Corrado, 44

B

Bahamón, Alejandro, 136
Baker-Brown, Duncan, 114, 214, 234
Balistreri, Corrado, 180
Balistreri, Emiliano, 180
Banham, Reyner, 50, 93, 94, 95
Barbiano di Belgiojoso, Ludovico, 83
Barco Marocco, Anna, 37
Barthel, Elena, 221
Bartolomei, Cristiana, 253
Barucci, Giovanni, 77
Barucci, Pietro, 77
Basiricò, Tiziana, 93
Bastien-Masse, Malena, 232
Battistella, Alessio, 256
Baubüro in situ, 114, 234
BBPR, 74, 76, 83, 175
BDS, 77
Beijker, Wiebe, 70
Belloni, Amerigo, 49
Benjamin, Walter, 120
Bennet, Jane, 115
Bergaglio, Barbara, 121
Berlingeri, Fabrizia, 175
Bernasconi, Gian Antonio, 86
Bertolazzi, Angelo, 78, 93
Bertorotta, Simona, 93
Beuys, Joseph, 158
Biraghi, Marco, 93
Bloch, Ernst, 120, 121
Boeri, Cini, 124
Boeri, Stefano, 44
Boericke, Art, 137
Boesch, Martin, 147
Boetti, Alighiero, 124
Boito, Camillo, 182
Bollinger + Grohmann, 65, 66,
112, 246
Bolocan, Andrea G., 87, 88, 90
Bonoli, Alessandra, 233

Borella, Giacomo, 230, 241, 243
Borgonuovo, Valerio, 132
Boriani, Maurizio, 52, 54
Bosisio, Pietro Giulio, 47
Bötticher, Karl, 211
Bottoni, Piero, 34, 52, 61, 63, 64, 78
Bourdieu, Pierre, 192
Bradley, Simon, 211, 229
Braga, Samanta, 31
Brandi, Cesare, 181, 182
Brandi, Guido, 232
Brandt, Marianne, 120
Branzi, Andrea, 141, 142, 159
Braque, Georges, 120
Braungart, Michael, 65, 213
Brilliant, Richard, 163
Brown, Meredith A., 132
Bruno, Andrea, 183
Brusconi, Augusto, 168
Bucci, Federico, 57, 185, 205
Bulegato, Fiorella, 123
Buro Happold, 233
Burri, Alberto, 41, 42
Buser, Barbara, 232

C

Caccia Dominioni, Luigi, 145, 147,
164, 172, 174, 190, 197, 198, 199
Caminati, Olga, 72, 73, 75
Camus, Renato, 73
Canali, Ferruccio, 73
Cangrande I, 200
Canguilhem, Georges, 264
Canino, Marcello, 133
Cansignorio della Scala, 200
Caputo, Andrea, 243
Carbonara, Giovanni, 44
Carimati, Paola, 246
Carrara, Gianfranco, 93
Carughi, Ugo, 94
Casati, Giannina, 193
Casciato, Maria Stella, 94
Castellano, Stefano, 30
Castelli, Pietro, 49
Castiglioni, Achille, 115, 124, 127,
128, 129, 143, 144, 151, 153
Castiglioni, Pier Giacomo, 115, 124,
127, 128, 129, 143, 144, 151, 153
Catenacci, Sara, 132, 133, 159
Cavaglià, Gianfranco, 102
Caye, Pierre, 258
Celant, Germano, 134
Cellucci, Cristiana, 44
Chiaia, Vittorio, 86
Chiodi, Cesare, 145
Chipperfield, David, 214
Chomsky, Noam, 133
Christensen, Peter H., 70
Ciagà, Graziella Leyla, 34
Cicarelli, Lorenzo, 71, 102, 108
Ciocca, Gaetano, 97, 99
Ciribini, Giuseppe, 78, 80, 81, 83, 91,
97, 99, 103, 104, 105
Co2RO, 252
Collovà, Roberto, 44
Colon, Stijn, 125, 223
Comba, Michela, 119
Consonni, Giancarlo, 34, 61, 64
Conti, Ettore, 167, 168
Corbellini, Giovanni, 113, 161, 209

Cordani, Roberta, 196
Cornoldi, Adriano, 208
Crippa, Maria Antonietta, 41
Crispoli, Enrico, 126, 139, 155, 160

D

Dal Co, Francesco, 93
Dalisi, Riccardo, 132, 133, 134, 136,
140, 157, 158, 159, 160
De Carlo, Giancarlo, 133, 134, 158
De Fusco, Renato, 123
de Kooning, Willem, 119
De Lucchi, Michele, 67
De Rossi, Antonio, 116, 118, 123, 150
de Saint Phalle, Niki, 205
De Sanctis, Fabio, 126
De Stefani, Lorenzo, 17, 23
Del Grosso, Giovan Nicola, 75
Delemonetey, Yves, 93
Della Campa, Massimo, 25
Dellapiana, Elena, 123
Devlieger, Lionel, 125, 223
Dezzi Badeschi, Marco, 165, 184,
185, 191, 203, 205
d'Hoop, Ariane, 258
Di Gaddo, Beata, 77
Di Lieto, Alba, 202
Di Palma, Bruna, 44
Di Sivo, Michele, 44
Diemoz, Luigi, 57
Diener, Anja, 221
Dini, Roberto, 118, 123, 150
Ditte Riunite Antonio Elia, 76
Djuric Tardio Architects, 65, 109
Doglioni, Francesco, 44
Dorles, Gillo, 80, 83, 84, 91, 103,
105, 140, 141
Dorrian, Mark, 266
Douglas, Mary, 48
Duchamp, Marcel, 120
Dulière, Aude-Line, 125, 223
Dyrvik Arkitekter, 66

E

Eco, Umberto, 131
Eisenman, Peter, 263
Ejzenstein, Sergej Michajlovič,
120, 121
Emett, Rowland, 205
Ercoli, Ezio, 79, 103, 105
Esch, Arnold, 163

F

Faccio, Franco, 80, 86
Fainholtz, Tzafir, 78
Feilden, Bernard, 182
Feldendrehers Olfs Köchling, 224
Felicori, Bianca, 102
Ferracina, Simone, 161
Ferrando, Carla Costansa, 239
Filarete, 49
Finelli, Luciana, 57
Fischli-Boson, Patric, 232
Fivet, Corentin, 232
Forlatti, Ferdinando, 200
Fortuny, Mariano, 175
Fossati, Paolo, 123
Foster, Norman, 205
Foucault, Michel, 155
Franceschini, Silvia, 132

Franchini, Ado, 79
Fratelli, Enzo, 86
Frediani, Gianluca, 133
Freear, Andrew, 221
Freudenthal, Hans, 133
Fryer, Greg, 229
Fuller, Buckminster, 130

G

Galimberti, Jacopo, 132
Gambardella, Claudio, 160
Gardella, Ignazio, 175, 176, 185
Garelli, Clotilde, 115, 148
Garelli, Felice, 115, 148
Gargiani, Roberto, 233
Garnerone, Daniele, 196
Garrido Arnaiz, Pablo, 239
Gavazzi, Alberto, 147
Gazzola, Piero, 178, 181
Gelmini, Gianluca, 174
Gentili, Eugenio, 99
Ghilardotti, Jacopo, 196
Ghilotti, Marco, 147
Giacomini, Laura, 199
Giambelli, Agostino, 21, 26, 47
Giancotti, Alfonso, 230, 249
Giangreco, Elio, 80, 103, 105
Giedion, Sigfried, 164
Giovannoni, Gustavo, 182
Gitler, Inbal Ben-Asher, 78
Giugni, Giovanna, 182
Gnecci Ruscone, Francesco, 106, 107
Goffi, Federica, 178
Goldberg, Lee H., 68
Gradecki, Klodian, 68
Graf, Franz, 93
Grant, Giuseppe, 247
Grassi, Liliana, 41, 49, 50, 51, 59
Gregotti, Vittorio, 123
Grimoldi, Alberto, 205
Grosz, George, 120
Grotowski, Jerzy, 134
Guala, Costantino, 73
Guarnerio, Giovanna, 105
Gupta, Surendra, 68
Guthrie, Peter, 259
Guzzo, Denis, 253

H

Habraken, John, 136
HARQUITECTES, 219, 220
Hawkwood, John, 201
Heartfield, John, 120
Hebel, Dirk E., 136
Heineken, Alfred, 221
Heisel, Felix, 136
Helg, Franca, 83
Herzog & de Meuron, 237
Hess, Regine, 78
Hillebrandt, Annette, 113, 214
Hume, David, 84
Illich, Ivan, 132, 134

I

Ippolito, Alfonso, 253
Irace, Fulvio, 150
Itten, Johannes, 157

J

Jodice, Mimmo, 133

Jokilehto, Jukka, 182
Jongert, Jan, 253

K

Kay, Thornton, 161
Kelly, Tom, 221
Kinney, Dale, 163
Koolhaas, Rem, 164, 165, 186, 187, 188, 189, 191, 233
Krauss, Rosalind, 200, 202
Kroll, Lucien, 138, 139
Küpfer, Célia, 232

L

La Cecla, Franco, 134
La Pietra, Ugo, 137, 139, 140, 154, 155, 156
la, Carlotta, 17, 23, 36
Lacey, Dan, 108
Ladiana, Daniele, 44
Lake Price, William Henry, 120
Langdalen, Erik Fenstad, 95
Lanza, Attilia, 199
Latour, Bruno, 259
Le Corbusier, 160
Leach, Andrew, 264
Lendager Group, 66, 67, 210, 236
Lendager, Anders, 210, 236
Lévi-Strauss, Claude, 123, 134, 141
Levi, Franco, 103, 105
Lindhardt Weiss, Kristoffer, 236
Lloyd Wright, Frank, 133
Lods, Marcel, 97, 99
Loi, Maria Cristina, 147
Loli, Arian, 68
Lomazzo, Gio Paolo, 197, 199
Loorbach, Derk, 114, 221
López Cano, Juan, 247
Loria, Prospero Moisé, 52
Ludovico il Moro, 167
Luini, Bernardino, 168, 169, 170
Luppi, Ferruccio, 196
LYN Atelier, 234
Lysgaard Vind, Ditte, 210, 236

M

Magagnato, Licisco, 200, 202
Maggi, Pietro N., 86
Majorana, Carmelo, 182
Manfra, Margherita, 247
Mangiarotti, Angelo, 130, 134
Maranesi, Cesare, 74
Maranghi, Piero, 196
Marazzi, Valerio, 256
Marconi, Paolo, 182
Mari, Enzo, 124, 158
Mariani, Carlo, 197
Marinelli, Sergio, 202
Marinetti, Filippo Tommaso, 120
Marini, Sara, 113, 161, 181, 209
Mario Cucinella Architects, 67
Marshall, Daniel, 222
Martinis, Roberta, 196
Martinoli, Gino, 80
Martorana, Salvatore, 80
Masera, Gabriele, 244
Massmünster, Michel, 232
Mastino II, 200
Mastrigli, Gabriele, 140
Matthews, Mark, 130

May, Brian, 211, 212, 229, 240
May, Harold, 210, 211
Mazzocchi, Maurizio, 69, 97, 99
McDonough, William, 65, 213
Meda, Giuseppe, 197
Mendini, Alessandro, 86, 129, 157, 160
Mendini, Francesco, 87, 88, 90, 130
Meneghetti, Lodovico, 34, 61, 64
Meregaglia, Riccardo, 80
Michelucci, Giovanni, 185
Middleton, Wendy, 68
Mies van der Rohe, Ludwig, 120
Milan, Laura, 118, 119, 150, 226
Millar Fisher, Michelle, 132
Minissi, Franco, 184
Minoletti, Giulio, 99, 145, 147
Mohiti Asli, Nasrin, 247
Moholy-Nagy, László, 120
Molinari, Luca, 167, 171, 196, 243, 249
Mollino, Carlo, 114, 116, 117, 118, 119, 121, 123, 127, 128, 143, 148, 149, 150, 226, 227
Mollino, Eugenio, 123
Moncalvo, Riccardo, 121
Monotti, Mario, 239
Montano, Pier Giulio, 208
Montevecchi, Luisa, 57
Morandi, Corinna, 52, 54
Moretti, Luigi, 40, 55, 56, 57, 72, 73
Mornati, Stefania, 78
Mosso, Leonardo, 70, 71, 100, 101, 102
Mulazzani, Marco, 57, 243
Mullitsch, Sergio, 105
Murphy, Richard, 202
Musso, Francesco, 24
Mussolini, Benito, 19

N

Nassi, Giovanni, 80
Nastasi, Michele, 258
Negrin, Henriette, 175
Neutra, Richard, 97, 180, 181, 183

O

Obrist, Hans Ulrich, 124
Odabaşı, Sanem, 161
Oliveri, Giuseppe Mario, 87
Orizzontale, 230, 247, 249
Ostapska, Katarzyna, 68
Otero-Pailos, Jorge, 94, 95, 187, 189, 190

P

Pace, Sergio, 117, 118, 119, 150, 226
Packard, Vance, 134, 136
Pagliani, Filippo, 244, 246
Pane, Roberto, 181, 184
Panei, Roberto, 252
Pantaleoni, Roberto, 247
Papanek, Victor, 131
PARABASE GmbH, 239
Park Associati, 244, 245, 246
Patteuw, Véronique, 114, 221
Pauli, Gunter, 161
Pawley, Martin, 136
Pea, Cesare, 80
Peerén, Césaire, 230, 250, 253

Pellegrini, Pellegrino, 197, 199
Perogalli, Carlo, 97, 99
Perret, Auguste, 231
Pettina, Gianni, 130, 243
Philippot, Paul, 182
Piacentini, Marcello, 245
Piano, Renzo, 71, 100, 101, 102, 205
Pica Ciamarra, Massimo, 133
Picasso, Pablo, 120
Picchi, Francesca, 243
Piccoli, Stefano, 88
Pierini, Orsina Simona, 198, 199
Pihlmann Architects, 236
Pihlmann, Søren, 236
Pilz, Reiner, 161, 210, 212
Pivano, Fernanda, 130, 131
Plato, 256
Pogliani, Virginio, 80
Polano, Sergio, 125, 127, 153
Poli, Stefano, 196
Polin, Giacomo, 208
Pollice, Augusto, 80
Ponti, Gio, 103, 105, 106, 181
Ponzini, Davide, 258
Populous, 233
Poretti, Sergio, 93
Portaluppi, Piero, 49, 164, 167, 168, 169, 170, 171, 172, 174, 190, 193, 194, 195, 196
Portoghesi, Paolo, 183, 195
Pozzato, Felice, 24
Prouvé, Jean, 71, 109, 110, 112
Przywara, Adam, 18, 222

Q

Quaroni, Ludovico, 175, 176

R

Ragazzo, Stefano, 247
Raimondi, Giuseppe, 81
Rapposelli, Marco, 208
Rauschenberg, Robert, 119
Raymaekers, Marcel, 125, 127, 223
Recalcati, Massimo, 42
Refunc, 252
Reichlin, Bruno, 57, 118, 150
Rephisti, Francesco, 51
RI-MAT, 24
Ricci, Giulia, 249
Richini, Francesco Maria, 41, 49
Riegl, Alois, 182
Riegler-Floors, Petra, 113, 214
Ritter Santini, Lea, 120
Riva, Francesca, 241
Rocchi, Giuseppe, 182
Rodia, Simon, 139
Rogers, Ernesto Nathan, 36, 171, 175, 176
Rogers, Richard, 205
Romano, Giovanni, 52
Rosen, Anja, 113, 214
Rossari, Augusto, 52, 54
Rosselli, Alberto, 80
Rossetti, Edoardo, 196
Rossi, Aldo, 158, 183
Rossi, Michele, 244, 246
Rossini, Gabriele, 233
Rotor, 228
Rouger, Carillo, 197
Rovati, Federica, 119

Ruby, Andreas, 113, 209
Ruby, Ilka, 113, 209
Rudi, Arrigo, 202
Rudofsky, Bernard, 48, 140
Rural Studio, 220, 221
Rusconi Clerici, Carlo, 99
Ruskin, John, 182
Rüther, Petra, 68

S

Saccenti, Giovanni, 77, 103, 105
Sacco, Ugo, 77
Samonà, Giuseppe, 175
Sanjinés, María Camila, 136
Sapper, Richard, 124
Sartori, Alessandro, 147
Sassi, Enrico, 214, 216, 220, 224
Saturno, Elisa, 250
Scarpa, Carlo, 164, 175, 177, 178, 179, 180, 183, 185, 190, 192, 200, 201, 202
Schmidt, Clarence, 138
Scott Brown, Denise, 183
Seassaro, Alberto, 81, 83, 104, 105
Seggewies, Johanna-Katharina, 113, 214
Seitz, William C., 120
Semper, Gottfried, 211
Serrano-Bernardo, Francisco, 233
Settis, Salvatore, 162
Sforza, Francesco, 49
Shapiro, Barry, 137
Shelley, Mary, 120
Siza, Alvaro, 42, 44, 241
Smith, Paul, 205
Snelson Kenneth, 205
Società Anonima L'invulnerabile, 73, 75
Solari, Guiniforte, 49
Somai, Antonio, 121
Somarè, Marileia, 199
Sonderegger, Andreas, 232
Sorbo, Emanuela, 41
Soriau, Étienne, 126
Spadolini, Pier Luigi, 86
Sterpini, Ugo, 126
Stierli, Martino, 120
Stockhammer, Daniel, 113, 161, 210, 221
Stricker, Eva, 232
Studio Accurat, 244
Studio Albori, 230, 241, 243
Studio Cifra, 252
Sumi, Christian, 147
Superstudio, 140, 158, 165, 183
Superuse Studios, 230, 231, 250, 252, 253
Suriano, Stefano, 147
Svatoš-Ražnjevič, Hana, 216
Svevo, Italo, 140
Swain, Henry, 108
Szacka, Léa-Catherine, 114, 221

T

Tafari, Manfredo, 176
Tamanti, Giulia, 202
Tanoue Vizioli, Simone Helena, 253
Targia, Giovanna, 162, 163
Tecnosider, 77
Tedeschi, Letizia, 57

Tenca, Cesare, 80
 Testa, C., 90
 Thompson, D'Arcy, 133
 Thompson, Michael, 261, 262, 263, 265
 Till, Jeremy, 259, 260, 261, 263
 Tinguely, Yves, 205
 Tomba, Alberto, 61
 Tonon, Graziella, 34, 61, 64
 Toppetti, Fabrizio, 44
 Torsello, Benito Paolo, 182
 Trabattoni, Luca, 256
 Tranfa, Federico, 243
 Transborder Studio, 66
 Treber, Leonie, 17, 47
 Treccani, Gian Paolo, 17
 Trincanato, Egle, 175, 180
 Trovalusci, Patrizia, 252
 Tschumi, Sean, 97
 Turchetti, Gaia, 253
 Turchini, Giuseppe, 86
 Turner, John F., 134

U

Uccello, Paolo, 200
 USUS Landschaftsarchitektur, 239

V

Valente, Ilaria, 196
 Van Hinte, Jan, 253
 Vande Capelle, Arne, 125, 223
 Varlonga, Giovanni, 80
 Veenstra, Peter, 114, 222
 Veerakamolmal, Pitipong, 68
 Venezia, Francesco, 165, 183, 206, 207, 208
 Venturi, Robert, 183
 Venturini, Gianpiero, 249
 Versaci, Michele, 246
 Viati Navone, Annalisa, 145, 147
 Vidler, Anthony, 263
 Vinca Masini, Lara, 136
 Vinti, Carlo, 123
 Vitiello, Gennaro, 134
 Vitruvius, 216

W

Wang, Shu, 214, 224
 Warburg, Aby, 163
 Warhol, Andy, 158
 Wescott, James, 125, 223
 Wigglesworth, Sarah, 260
 Wilde, Carolyne, 205
 Wisniewska, Marta H., 136
 Wolton, Henry, 164
 Wyller, Maria, 216

Y

Yaneva, Albena, 259

Z

Zaffagnini, Mario, 86
 Zanni, Sara, 233
 Zanoatto, Francesca, 161, 217, 221
 Zanuso, Marco, 103, 124
 Zardini, Mirko, 243
 Zevi, Bruno, 157
 Zirkular GmbH, 114, 239
 Zitouni, Benedikte, 258

Zucchi, Cino, 175, 191, 199
 Zucconi, Guido, 167, 169, 170, 171
 Zúñiga, Pedro Ignacio Alonso, 93