

Press Release
22 October 2019

Mario Cucinella Architects and WASP start on site with TECLA A prototype 3D printed global habitat for sustainable living



*TECLA, 3D Printed Habitat by Mario Cucinella Architects and WASP
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MC A - Mario Cucinella Architects and WASP (Italy's pioneering specialists in 3D printing) have begun the construction of TECLA – a prototype for a 3D printed habitat, near Bologna, Italy. Borne from a vision to provide a home for everyone at a time of exponential population increase and an associated lack of affordable housing, TECLA is a new circular housing model, created using entirely reusable, recyclable materials taken from the local terrain. Built using Crane WASP – the latest innovation in on-site 3D construction, TECLA represents a step-change in the move towards eco-housing.

A United Nations report published in 2017 demonstrates that the current global population of 7.6 billion people is expected to reach 11.2 billion in 2100, and in 2030 nearly 5 billion people are expected to live in cities. Consequently, governments are faced with substantial challenges related to housing solutions. With more and more rural areas being incorporated into cities, it is the idea of city itself that must be challenged.

Since 2012, WASP (World's Advanced Saving Project) have been developing viable construction processes based on the principles of circular economy, that will create 3D printed houses in the shortest period of time, and in the most sustainable way possible. TECLA will be the first habitat to be built using multiple collaborative 3D printers, offering a greater scope of scale than ever before. Used in the context of a wider masterplan, TECLA has the potential to become the basis for brand new autonomous eco-cities that are off the current grid.

Designed by MC A and engineered and built by WASP, TECLA will be the first house to be entirely 3D printed using locally sourced clay – a biodegradable and recyclable ‘km 0 natural’ material which will effectively make the building zero-waste. It will be built to adapt to multiple environments, and it will be suitable for self-production through the use of WASP’s innovative Maker Economy Starter Kit. This approach will limit industrial waste and offer a unique sustainable model that will boost the national and local economy, improving the wellbeing of communities. Furthermore, the scheme will significantly accelerate the construction process as the 3D printer will produce the entire structure at once.

TECLA was developed using in-depth research undertaken by the SOS - School of Sustainability – a professional school founded by Mario Cucinella that combines education, research and practice. The research, conducted with the support of MA students from the Sustainable Environmental Design programme at the Architectural Association School of Architecture in London, explored the cause and effects of homelessness. It interrogated the use of technological advances to enable a solution, based on case studies in locations with different climates. The result is a highly flexible envelope, designed to be resilient to any climate and energy-efficient in a way that traditional housing models are not.

The collaboration between MC A and WASP has been supported by Mapei, a worldwide producer of construction materials, which has studied the clay materials and identified the key components within the raw earth mixture to create the final highly optimised printable product. Structural tests were carried out by Milan Ingegneria, a Milan-based engineering consultancy, which worked on the optimisation of the shape in order to create a self-supporting structure. The frames, customised and highly-efficient, have been engineered and produced by Capoferri, a company specialised in architectural frames and always at the forefront of technological advances, while the landscaping has been curated by Frassinago, a multidisciplinary company that includes a design studio that deals with landscape architecture, and a firm specialized in the gardening and outdoor sector. RiceHouse provided technical consultancy about bio-materials deriving from rice cultivation waste (rice husk and straw), which affected the thermal performance and living comfort of the building envelope. The lighting project, developed both internally and externally with the aim of achieving the maximum flexibility and sustainability of the intervention, has been developed by Lucifero’s.

The model was named TECLA after an imaginary city described by Italo Calvino in *The Invisible Cities* as a ‘continuous urban evolution’. It is representative of both companies’ efforts to combine technological innovation with a respect for the environment, and an understanding of natural processes. TECLA received planning approval in May 2019, commenced printing in September 2019, and is due to complete at the beginning of 2020. Starting with the first prototype at WASP headquarters in Massa Lombarda, the project’s aim is to work towards communities of smart houses around the world.

CONTACTS

For more press information about Mario Cucinella Architects please contact:

Ellie Mackenzie or Fiorella Lanni at Caro Communications

E: ellie@carocommunications.com | fiorella@carocommunications.com

T: +44 (0) 20 7713 9388

For more press information about WASP please contact:

Maurizio Andreoli

E: press@3dwasp.com

T: +39 (0) 545 87858

Mario Cucinella Architects Srl

via Flora, 6 | 40126 Bologna | Italy
via Brera, 16 | 20124 Milan | Italy
T +39 051 631 3381 | F +39 051 631 3316

Mario Cucinella Studio Inc

584 Broadway #1201 | New York, NY 10012 | USA
T +1 212-431-9191

comunicazione@mcarchitects.it | www.mcarchitects.it/en/

WASP

Via Castelletto, 104/106 | 48024 Massa Lombarda (RA) | Italy
T +39 0545 87858

info@3dwasp.com | www.3dwasp.com

MC A social media

[Facebook](#) - @MarioCucinellaArchitects
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YouTube Channel

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Official hashtag

#Tecla3DHouse

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A project by Mario Cucinella Architects & WASP

Mario Cucinella Architects: Architectural design and management

WASP: Engineering and 3D printing construction

In collaboration with:

[SOS - School of Sustainability](#): Research partner
[Mapej](#): Materials consultancy and supply
[Milan Ingegneria](#): Structural consultancy
[Capoferri](#): Frames engineering and production
[RiceHouse](#): Bio-materials consultancy and supply
[Frassinago](#): Landscaping
[Lucifero's](#): Lighting design
[Ariatta](#): Energy and internal comfort consultant

Under the patronage of:

Municipality of Massa Lombarda

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- Notes to Editors -

Mario Cucinella Architects

MC A - Mario Cucinella Architects is an established architectural firm with offices in Bologna and New York and an international team of 90 professionals including architects, engineers, graphic designers, model makers, and researchers. The firm was established in Paris in 1992 and opened its offices in Bologna in 1999.

MC A has extensive experience in architectural design that combines environmental and energy efficiency strategies and relies on an R&D department that carries out research on sustainability with a holistic approach.

MC A is synonymous with top quality and professionalism in every step of the process, adopting a coordinated and multidisciplinary approach. An in-house team of BIM managers and coordinators ensures the implementation of BIM processes. MC A also boasts an in-house Interior Design and Industrial Design department.

Among MC A's highlight projects (in Italy) are: Unipol Group Headquarters Tower, the new surgery and emergency unit for the San Raffaele Hospital, San Raffaele Hospital and Rovati Fondazione Fondazione Rovati Etruscan Museum, all in Milan; WSR-Workshop Ricostruzione Emilia in Emilia Romagna, Italy and the new headquarters of the Rectorate of the Roma Tre University in Rome Italy; The firm has also projects in progress in Europe, China, Central Africa, Algeria and the Middle East: Viertel Zwei in Wien, Austria, two mixed-use buildings in Albania and the new headquarters for the Algerian Regulatory Authority for Post and Telecommunications in Algiers.

WASP - 3D

WASP - World's Advanced Saving Project is Italy's pioneering 3D Company founded by Massimo Moretti in 2012. Inspired by the potter wasp, WASP builds houses with natural materials, at a cost tending to zero. The company has been characterized by Delta WASP 3D printer adapted to all needs, from small to large dimensions, of which a whole line has been dedicated to the Industrial 4.0. Its goal is to bring real benefits to people through innovation and research.

In 2015 WASP presented the Big Delta WASP 12 meters, the largest printer in the world, with the aim of build monolith housing module. In 2018 WASP launched Crane WASP, an innovative technology to print on site eco-districts at low environmental impact. Gaia has been the first 3D printed earthen house built by Crane WASP, glimpsing a new way for sustainable housing. In December 2018 the Financial Times included WASP among the Europe's 100 Digital Champions.

Among WASP highlight projects are Gaia 2018, the first 3D printed earthen house; 3D printed Staircase wall in collaboration with IAAC; Conifera-COS and Teardrops at Burning Man 2018, both designed by Arthur Mamou-Mani; Trabeculae Pavilion in collaboration with Milan Polytechnic; the scenography for Fra Diavolo on stage at the Rome Opera House.