

Adaptive Reuse plays a crucial role in the current discussion on the future of sustainable construction. By adapting and reusing existing buildings, significant amounts of embodied energy can be saved and a great deal of waste avoided. As a result, Adaptive Reuse improves a building's environmental footprint and also offers added value for people. The cultural identity of the place is preserved and complemented by new, contemporary forms of architecture. The location gains a complexity and fascination that goes far beyond that of a purely new building.

Thus Adaptive Reuse will continue to grow in importance in the future. This volume showcases around 50 buildings from all around the world that are already pioneers in this field today. Essays provide a general and in-depth introduction to the topic. Concise information tables present the most important background details for each individual project in a brief and clear manner.

The CRADLE and CIRCLE book series explores individual topics in sustainable, contemporary architecture on a single-theme basis. Each volume presents international projects with detailed text, numerous facts, as well as detailed and overview plans and images, thereby highlighting both the technical diversity and the design integration of the respective approaches.



ISBN 978-3-945539-60-6

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CIRCLE

Adaptive Reuse



CIRCLE Book

Adaptive Reuse

Upcycling of Existing Buildings



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Daipu Architects

Streaming Light Exhibition Hall

Courtyard with kitchen and warehouse → Exhibition space: A semi-abandoned rural courtyard, together with a former kitchen and dilapidated warehouse, was transformed into an exhibition and gathering space for the Guanzhong Mangba Art Festival.

In 2023, the Guanzhong Mangba Art Festival invited Daipu Architects to participate as an exhibitor and create a spatial work in Caijiapo Village, at the northern foothills of the Qinling Mountains. Initiated largely by teachers and students from the Xi'an Academy of Fine Arts, the festival has supported a series of art and rural revitalization projects in the region.

The commission involved converting the former kitchen and warehouse on the north side of the courtyard into an exhibition space. As heavy summer rains regularly caused waterlogging, the design combined spatial renewal with a new drainage strategy, while testing how a traditional rural courtyard could be upgraded through reclaimed materials and prefabricated construction.



The courtyard and connecting buildings before the renovation.

Inspired by the undulating profile of local tiled roofs, the architects developed a pleated screen of mirror-finished perforated stainless steel. A circular opening

ing at the entrance acts as a pivot around which the screen appears to rotate. Its radial geometry continues into the courtyard paving, where stainless-steel divider strips and subtle changes in level direct rainwater towards a prefabricated linear drain along the south side.

Varying perforation sizes create shifting effects of transparency, reflection and shadow. As the light changes throughout the day, the original brick wall alternately comes forward and recedes behind the screen, producing an image reminiscent of flowing water.

Inside the exhibition hall, a brick wall was removed to create a more open interior. The former kitchen chimney was retained and transformed into a skylit display niche that also provides seating.



The mirror-finished perforated stainless-steel panels were prefabricated in sections and assembled on site in two days.



Throughout the day, the perforated stainless-steel screen shifts between reflection, transparency and shadow.

Aerial view of the courtyard at dusk.



Facts and figures

ADDRESS Caijiapo Village, Huxi District, Xi'an, Shaanxi, China
ARCHITECTURE Daipu Architects
www.daipuarchitects.com
PRINCIPAL ARCHITECT Dai Pu
PROJECT ARCHITECT Zhao Xinyu
STRUCTURAL DESIGN I-Structure
CLIENT Guanzhong Mangba Art Festival
CURATORS Wu Xiaochuan, Song Qin
PHOTOS Wu Qingshan
PROCUREMENT PROCEDURE direct commission
GROSS FLOOR AREA (WAS/IS) 37 m² / 37 m²

Timetable

BUILDING INSPECTION May 2023 START OF CONSTRUCTION October 2023
OPENING April 2024

Approach to the original building

PRESERVED BUILDING STRUCTURE 293 m³ estimated PORTION IN TODAY'S BUILDING 92.3% by volume, estimated CO₂-SAVINGS approximately 70% compared with equivalent new construction

Construction and materials old

BASIC CONSTRUCTION masonry FACADE brick COURTYARD brick ROOF timber structure with clay roof tiles

Construction and materials new

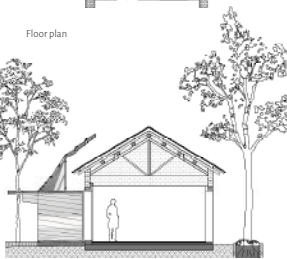
FOUNDATIONS reinforced concrete beams STRUCTURAL REINFORCEMENT lightweight steel frame FACADE mirror-finished perforated stainless-steel panels INTERIOR WALLS gypsum board COURTYARD PAVING reclaimed roof tiles and grey bricks DRAINAGE prefabricated linear drain ROOF tiles



Floor plan



Model



Section



The circular passage leads into the exhibition hall.

A triangular lightweight steel frame was added to reinforce the exhibition hall's roof.



View of the roofs and circular passage from above.

The circular pathway connects two fruit trees in the courtyard with a third tree behind the house.



Hardy Happle Architektur

Stinisehof

Farm → Home: With a great deal of dedication and their own hard work, two families transformed a historic, landmark-protected farm into a modern multigenerational home. Today, three generations live under one roof.

A few years ago, the 300-year-old Black Forest farmstead was essentially just standing empty and in the way. The heirs were considering designating the land for single-family homes.



This historical photograph from 1980 shows the farmstead, built in 1690, before its renovation.

The historic farmstead featured a solid-brick residential section on the ground floor and a vast wooden farm area – including a barn and stables – at the rear and upper levels. To assess what value this listed giant with its massive, deeply pitched hipped roof might still hold, the two owner families – spanning three generations – met with Hardy Happle, an architect from Wolfach with extensive experience in Black Forest farmhouses. That afternoon changed everything and together they eventually transformed the long-vacant building with great care. The expert's enthusiasm was contagious; that evening, his phone rang and the families told him: "We're crazy. We want to sell our houses and move into the farmstead together!" Multigenerational living in the old farmhouse.

The feasibility study – which included a site survey and structural analysis – was followed by the project and, finally, the construction site, which presented enormous challenges, required a great deal of personal effort and enthusiasm, and involved its fair share of setbacks... yet they were always driven by the conviction that they were creating something truly one-of-a-kind.

Extensive investigations had uncovered more original building fabric than initially assumed. The conservation concept had to address the challenge of preserving clear evidence of all the defining construction phases between the 17th century and the 1940s, while repairing major damage and accommodating substantial deformations. The attic floor alone slopes by more than 60 centimeters toward the rear.

The clients' own contributions were an integral part of the process from the start. Old, soot-blackened ceiling beams and struts dating from the 17th century were uncovered, painstakingly cleaned by hand, and finally professionally restored. Crumbling foundations and crumbling natural stone walls were carefully renovated and reinforced with expert assistance. Modern fixtures were installed, bringing new life to the space. The older generation now lives barrier-free on the ground floor of the original residential wing. The young family with two children has found their new home beneath the large hipped roof. The formerly dark and dusty barn wing is now a light-filled, open living space spanning several levels, allowing visitors to experience the monumental character of the roof structure.

The ground floor layout remained unchanged because it works perfectly for modern living. On the upper level, cubes containing the private bedroom and bathroom areas were inserted into the large, open-concept living space for the young family.



The very low first floor in between was incorporated into one or the other living area. By removing ceilings, extra-high rooms were created on the ground floor. Old parlors were cozily transformed into nostalgic children's playrooms. In addition, there is now plenty of space available to serve as a substitute for a basement and for space-intensive hobbies.

A study on the ground floor with modern furnishings and an authentic Black Forest cuckoo clock.



Facts and figures

ADDRESS 77790 Steinach-Welschensteinach, Germany
ARCHITECTURE Hardy Happle Architektur www.hardyhapple.com
CLIENT Caroline and Christian Wangler
PHOTOS Hiram Habitat
GROSS FLOOR AREA (WAS/IS) 776 m² / 776 m²

Timetable

START OF CONSTRUCTION 2018 OPENING 2022

Approach to the original building

PRESERVED BUILDING STRUCTURE 88% estimated PORTION IN TODAY'S BUILDING 88% estimated

Construction and materials old

FOUNDATIONS rubble stone FACADE wooden plank walls, pumice masonry with stucco INTERIOR WALLS wooden stud walls with masonry infill ROOF rafters, battens, tiles

Construction and materials new

FOUNDATIONS insulated reinforced concrete foundation beams FACADE pumice masonry with interior insulation, insulated plank walls INTERIOR WALLS wood-framed walls with clay plaster FLOORING Hiram Habitat ROOF exposed roof trusses with over-rafters, insulated and covered with interlocking tiles

Energy plan

Wood-burning stove on the ground floor and upper floor; combination heating system using firewood and pellets; photovoltaic system on the fuel shed with an electric heating element for hot water

Certificates and standards

KfW Efficiency House 100

Other sustainability aspects and technical building equipment

Eco-friendly building materials; clay plaster on the ground floor; solid oak flooring; double-glazed windows designed to meet historic preservation standards



Southwest View



Southeast View



Section



Top floor



The old wooden beams in the living area of the attic were painstakingly sanded down. Partition walls that were beyond repair were replaced with fir wood from the adjacent forest.

Solid oak floorboards from Hiram Habitat were installed in all living areas.

Kitchen on the ground floor of the Stinisehof.

The centuries-old farmstead in the Kinzig Valley after restoration. As in the past, fir wood from the Kinzig Valley forests was used for the siding and walls.

