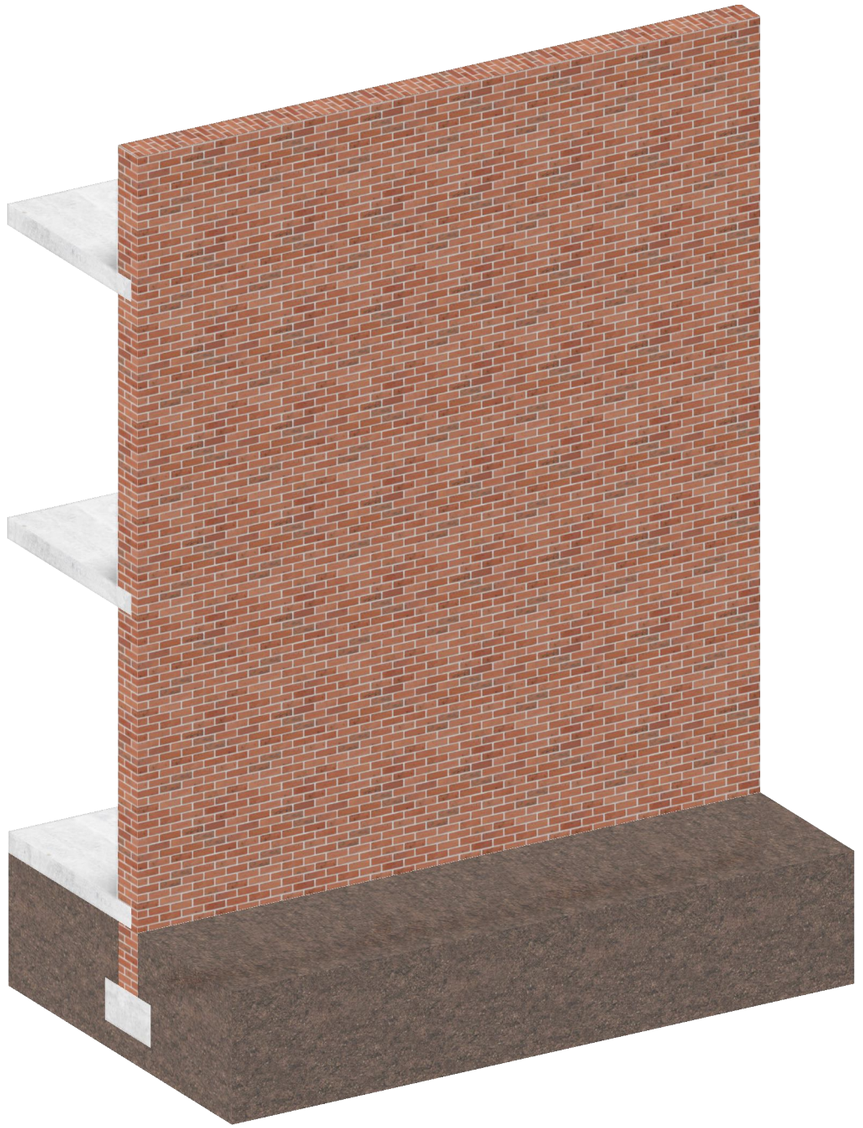
04

EcoCocon Wrapping Solution for Energy-Efficient Solid Wall Renovation

Introduction

Older masonry walls often require restoration to address weathering, cracks, or poor insulation. While preserving their strength and character is essential, today’s needs call for improved energy efficiency, reduced environmental impact, and buildings that provide comfort, durability, and resilience against changing climate conditions.

EcoCocon walls—prefabricated, straw-based panels—offer an ecological solution that enhances insulation and indoor comfort without compromising the masonry’s durability or interior appearance. Combining traditional masonry with EcoCocon technology achieves a balance between heritage preservation and modern environmental standards.



Preservation of structure

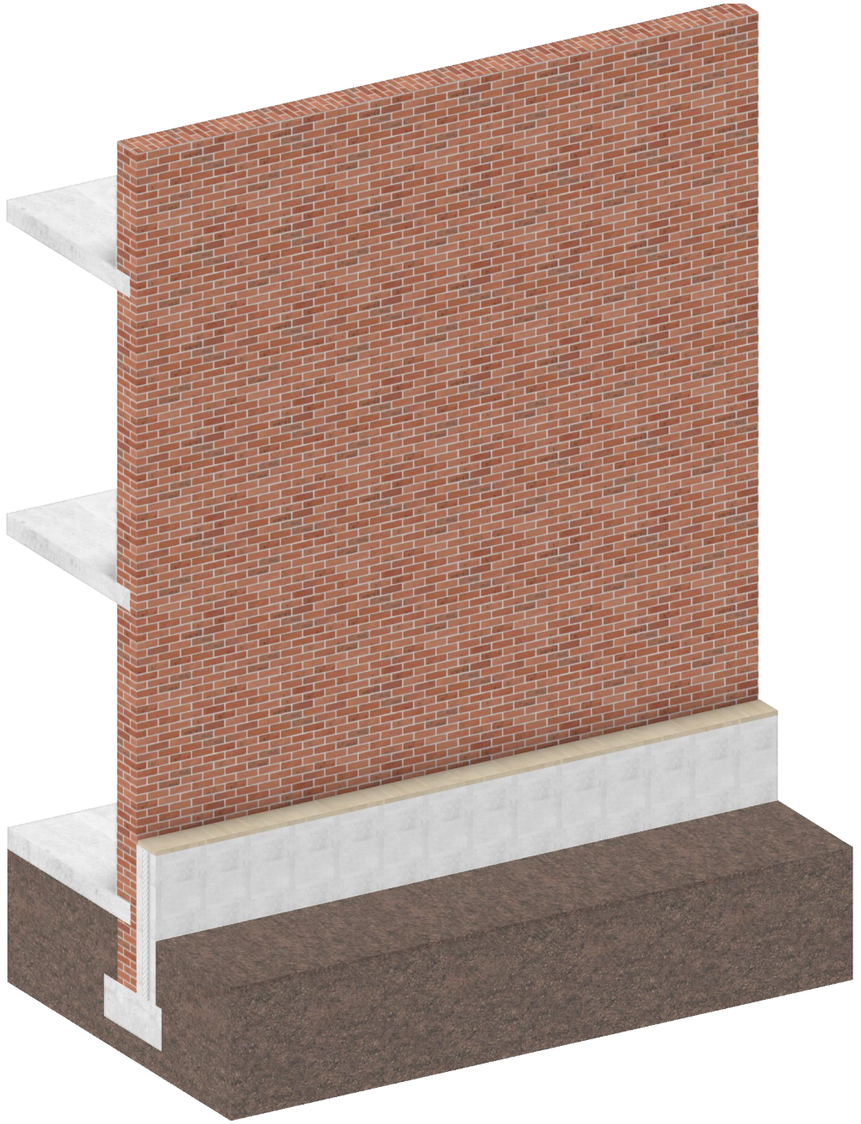
Thermal insulation /
Energy efficiency

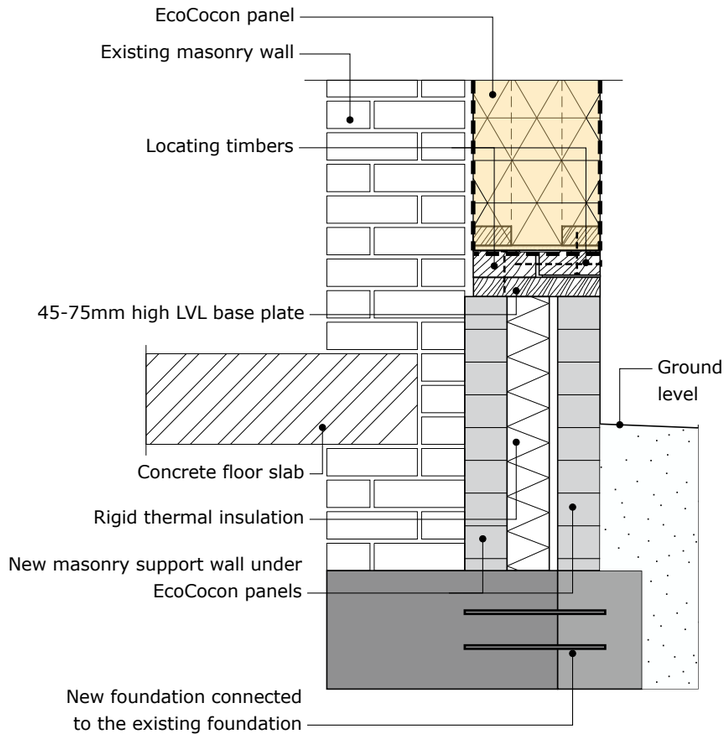
New Foundation

Existing foundations are unlikely to be adequate to support EcoCocon walls, so new foundations are usually required, especially if extending or altering the building envelope.

New foundation is typically extended out from the existing foundation, and a new low masonry wall is constructed to support both inner and outer stud of EcoCocon panel.

The requirements and design should be determined by the project Structural Engineers.





EcoCocon Wall-to-Foundation Detail

EcoCocon Panel Installation

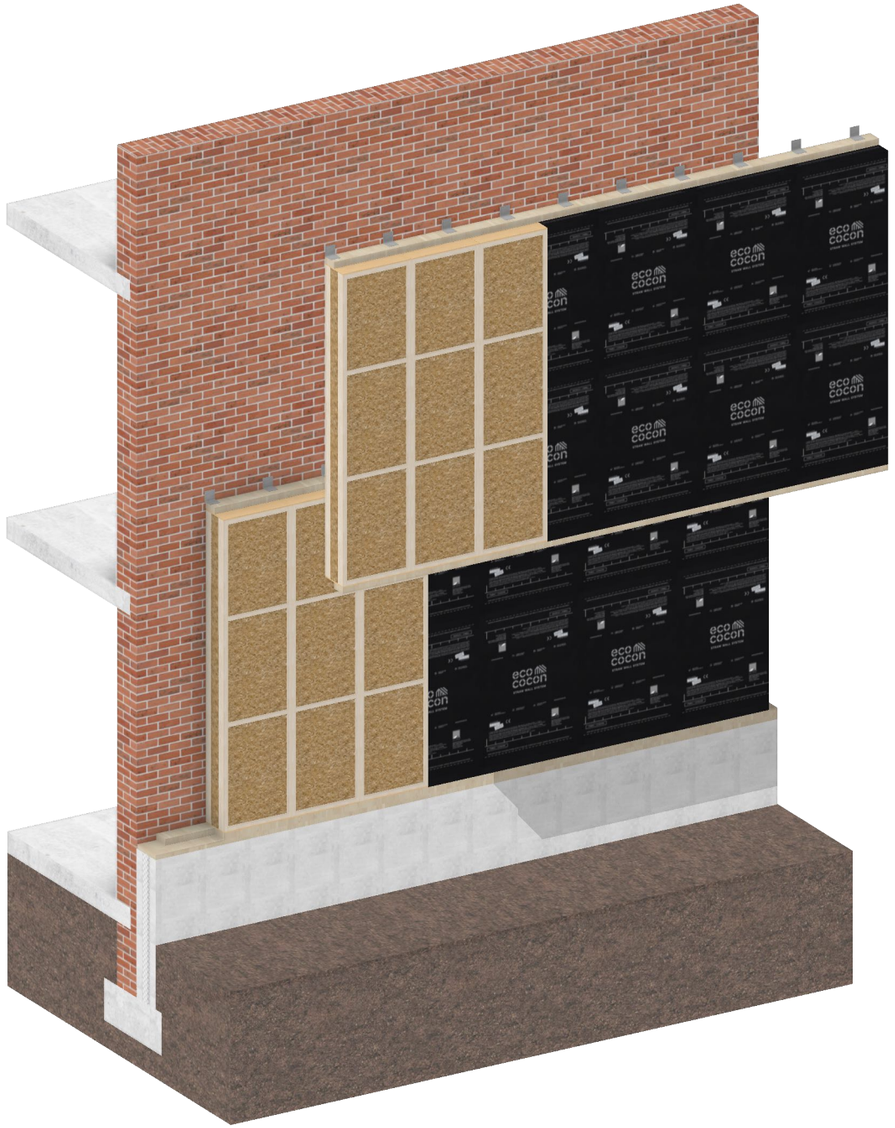
EcoCocon Wall Installation to Existing Masonry Walls (Wrapping)

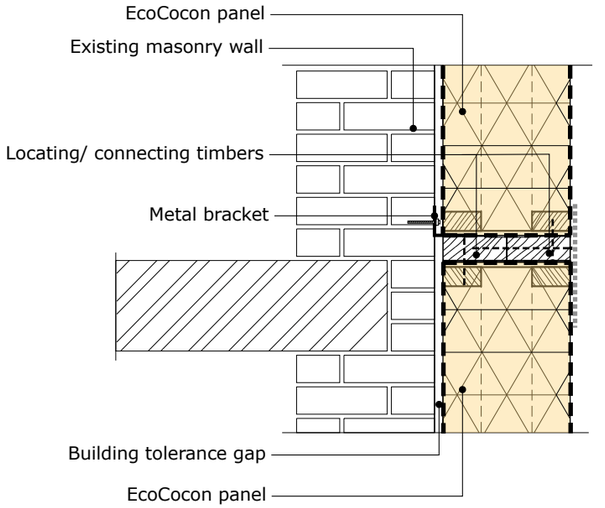
For wrapping EcoCocon walls around existing structures, the system must be delivered as pre-assembled walls, as there is no access to inner side of new walls.

In this example, metal brackets are fixed to the pre-assembled EcoCocon wall before it is attached to the existing brick wall, and locating timbers are used to connect the walls to each other.

It is recommended that the pre-assembled walls have breather membrane applied to both sides for protection against rain.

The final design and method of fixing should be confirmed by the project Structural Engineers.





Masonry Wall to EcoCocon wall connection in section

Airtightness and Weather protection

EcoCocon walls consist of individual prefabricated panels.

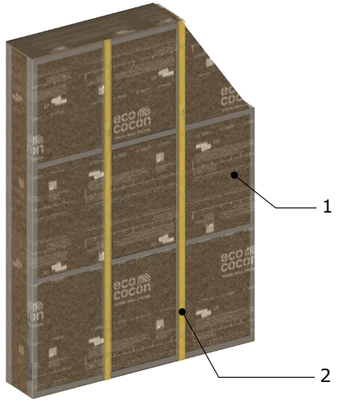
On the exterior side, a vapour open membrane ensures airtightness while allowing moisture diffusion. Internally, it is recommended that the same vapour open membrane is applied for protection against rain during assembly.

Externally, an airtight vapour-open membrane can be combined with additional layer of boards, followed by ventilated facade - typically timber or render cladding - for a durable weather protection, visual appeal and quicker assembly.

Outside

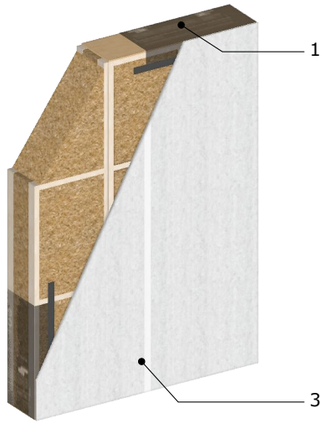
Membrane + thin plywood strips

Inside



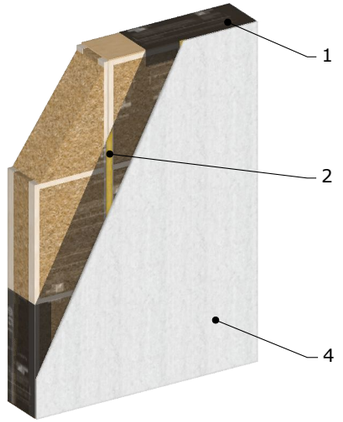
Membrane + thin plywood strips

Outside



Protective board with taped joints

Outside



Protective board with additional membrane + thin plywood strips

Key

1. Membrane over the top + sides
2. This plywood strips
3. Taped joints
4. Board + membrane

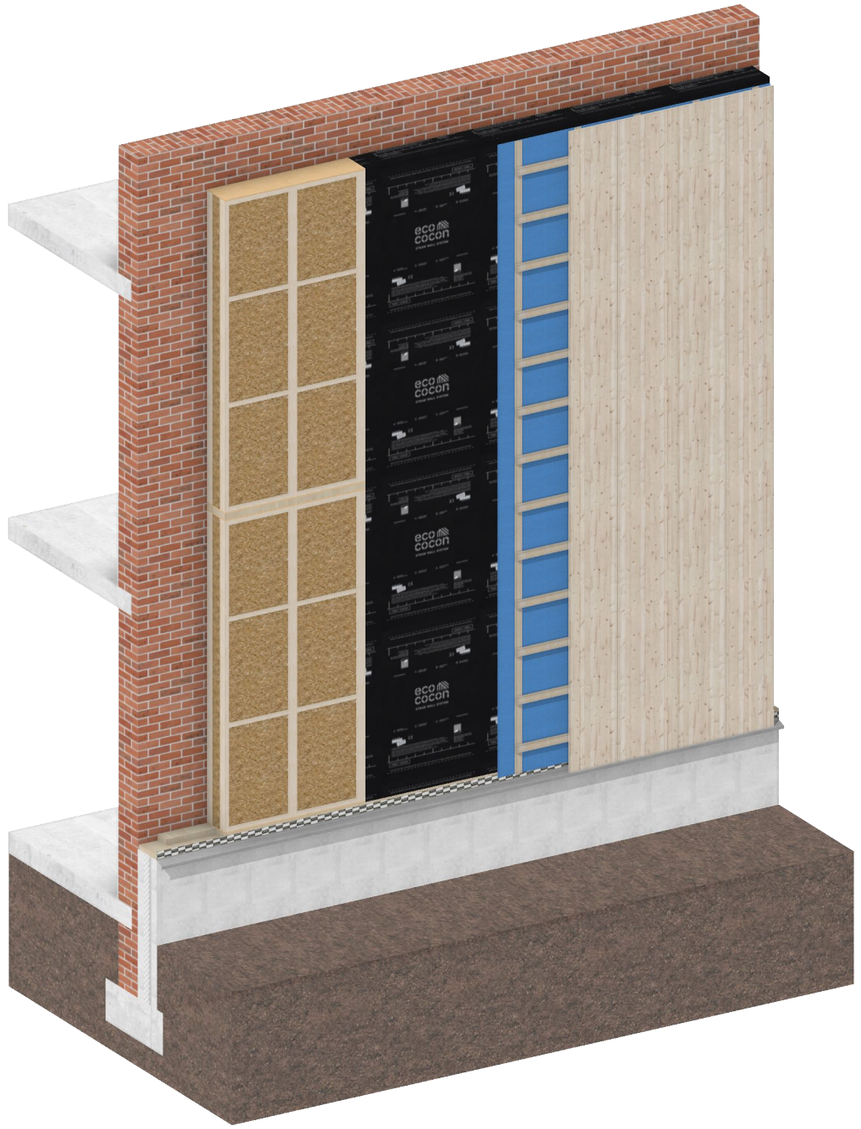
Benefits & Performance Summary

Retrofitting existing buildings improves energy efficiency, slashes operational costs, and reduces carbon emissions without the waste of total demolition. Key benefits include increased property value, enhanced occupant comfort (better heating/cooling/ air quality), and improved structural safety, while reducing the environmental impact of new construction. Upgrading existing buildings rather than building new can also reduce overall construction time and costs.

EcoCocon walls minimise additional load on the existing structures, when combined with new foundations.

The relatively dense, superior natural insulation improves energy efficiency and occupant comfort.

The timber-straw wall system is suitable for various external finishes.



CASE STUDY

Virgen de las Viñas Civic Center

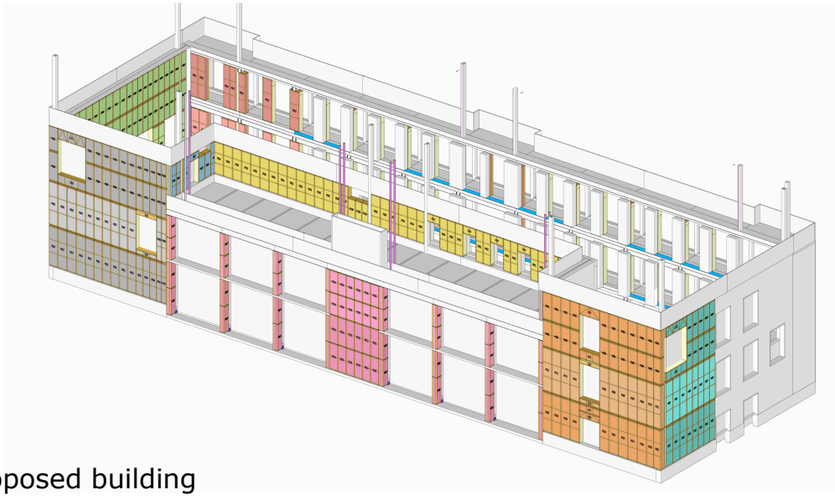
Energy-efficient renovation and expansion of an existing 3-storey building in Aranda de Duero for use as a training center, offices, and cafeteria.

The building redefines the concept of bio-based construction by bringing together design, innovation, and public administration.

The glued laminated timber (GLT) and cross-laminated timber (CLT) structure is combined with EcoCocon exterior walls, drastically reducing embodied carbon.

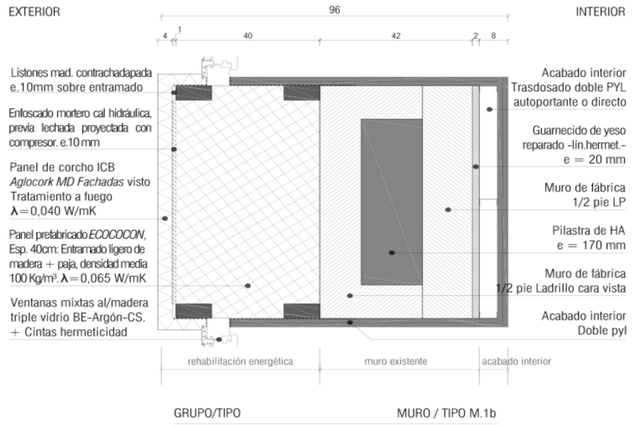
The walls, fully assembled on-site, are combined with CLT systems. Completion is planned for 2026.

Location: Aranda de Duero, Burgos, Spain
Client: Aranda de Duero City Council
Architect: Meta 2020 + Estudio Bher
Typology: Public building/ vocational training school
Construction: 2025-2026
Total Size: approx. 3300 m² floor area



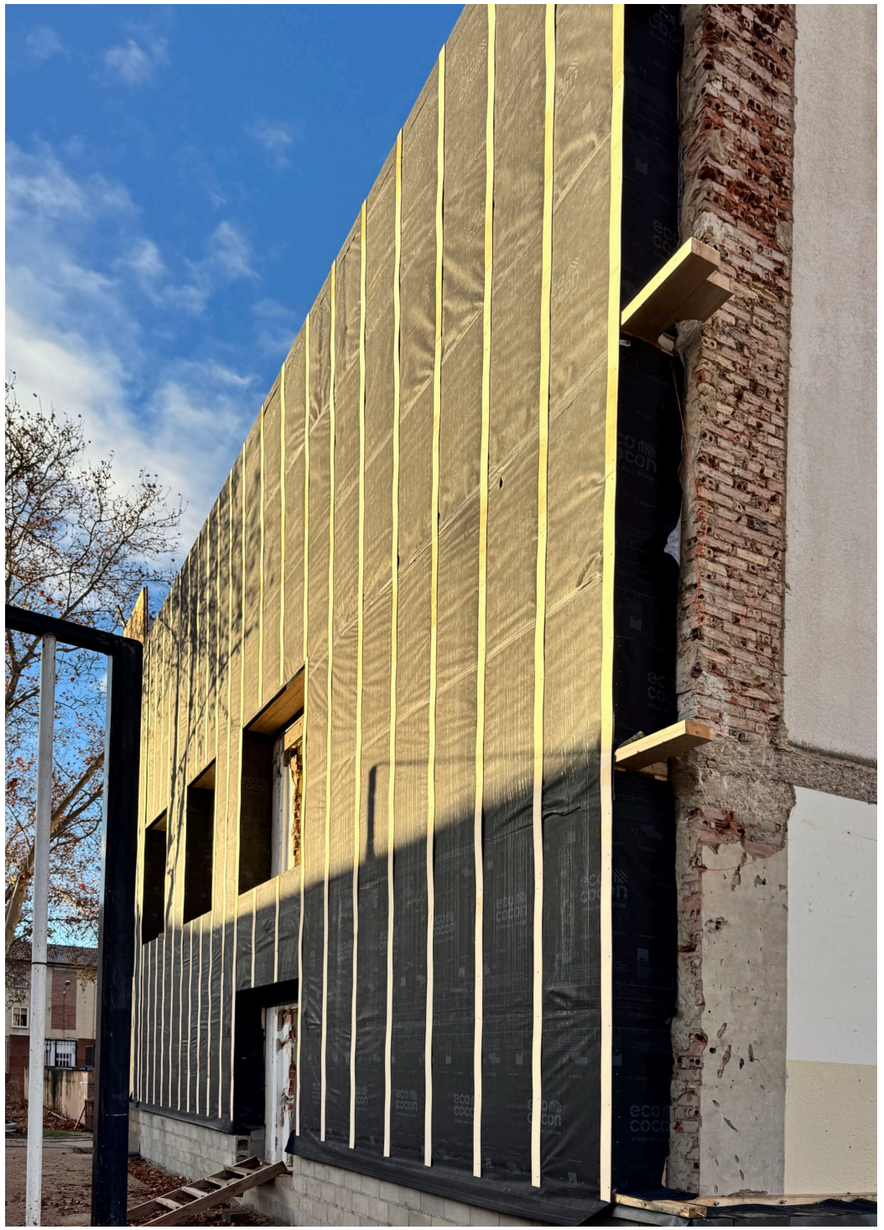
Top: 3D view of the proposed building

Above: Axonometric view of Panel Project, wrapping elements are highlighted in colour



Top: Architect’s detail drawing of EcoCocon panel wrapping the existing uninsulated wall

Middle and right: EcoCocon panels installed to the outside of existing walls



Top: Overall view of the main building elevation, with EcoCocon wrapping and additional balconies constructed from CLT and glulam frame

Right: EcoCocon panels wrapping the existing gable wall