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France (Channel Manche) England
CobBauge
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Design and CobBauge

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UNIVERSITY OF PLYMOUTH
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Design and CobBauge

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Background

Top architects declare 'climate emergency'

Bloomberg's London building is one of the most sustainable offices ever built | Credit: Foster + Partners

Winners of prestigious RIBA Stirling prize promise to design more climate-friendly buildings

Some of the UK's most prestigious architecture firms have declared a 'climate and biodiversity emergency', committing to shift their practices in response to focus on creating greener buildings.

The UK winners of the RIBA Stirling Prize jointly signed an open letter late last week calling on the wider architecture and construction industry to step up efforts curb its climate impact.

The built environment is responsible for around 40 per cent of the UK's total carbon footprint, and shifting to lower or zero carbon buildings is seen as critical for reducing the country's net greenhouse gas emissions to zero.

UK Parliament declares climate change emergency

1 May 2019

Share

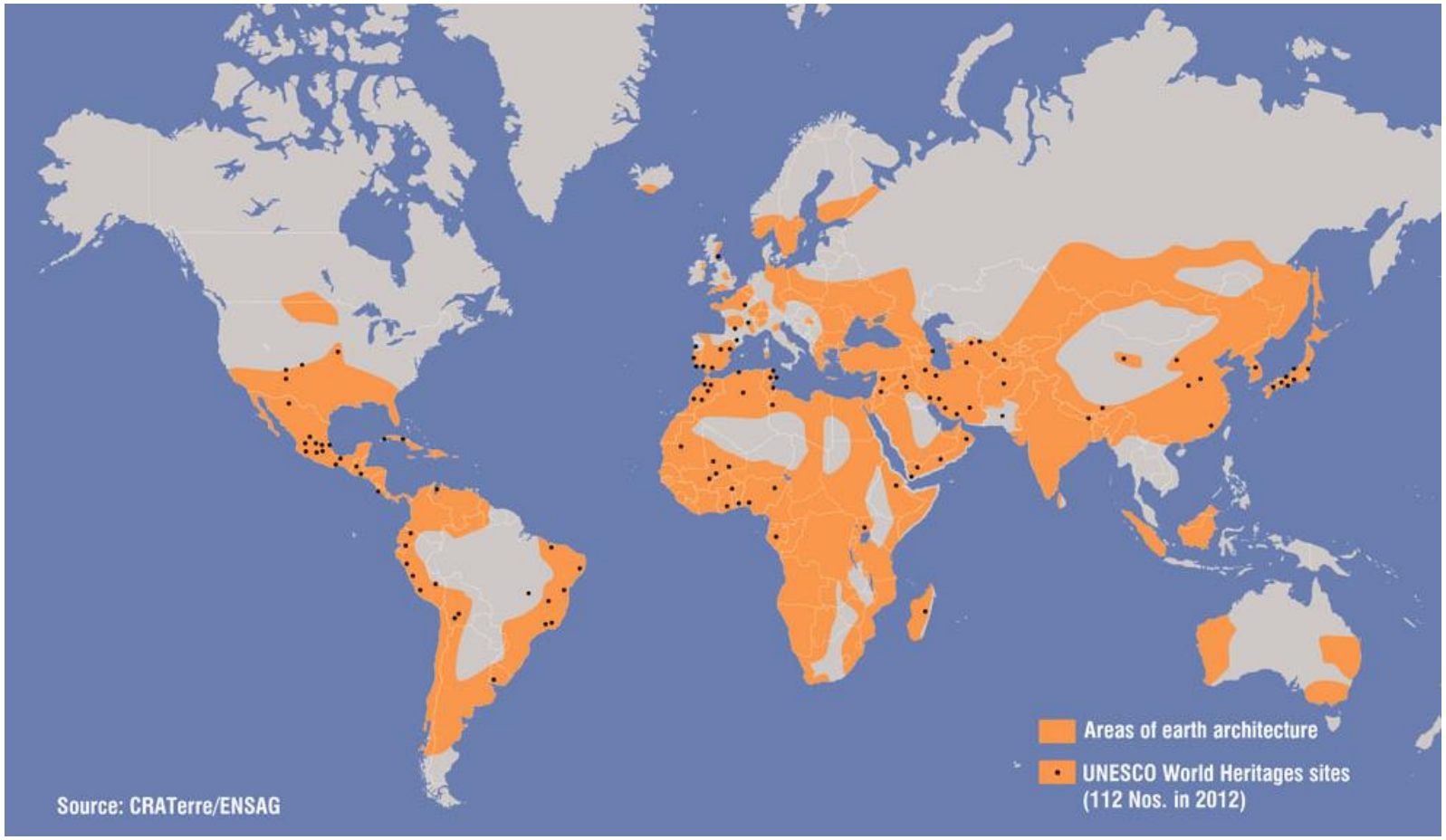
Climate change

MPs have approved a motion to declare an environment and climate emergency.

declares a climate emergency

- With the current climate emergency, low embodied energy buildings are more important than ever.
- The use of earth building techniques has strong ecological credentials.

Background



Earth building regions Worldwide

- This map shows regions with a history of earth buildings
- It is overlaid with UNESCO World Heritage Sites.

Background

Traditional earth house in Africa

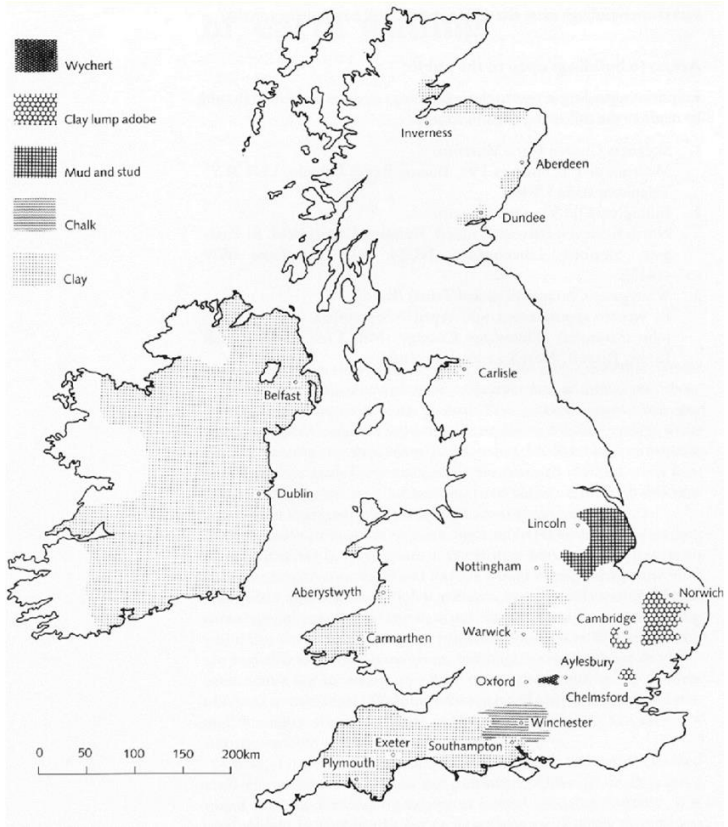
- Up to 30% of buildings worldwide are earth construction.
- Approximately 2 billion people worldwide live in earth buildings.

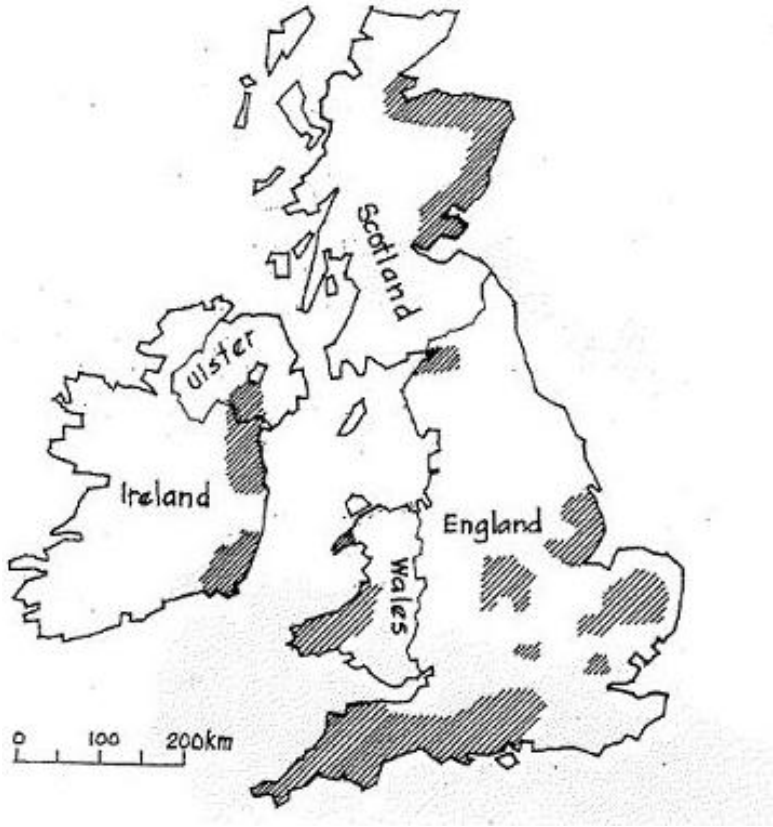
Background

Shibam, Yemen

- Historic cities have been made using earth construction for centuries
- Earth construction is a proven technology

Background





Earth building region types in the UK

Ireland – Cob

Wales – Clom (in situ)

Lincolnshire – Mud and Stud

East Midlands – Mud or unshuttered cob

East Anglia – Clay lump / abobe

Buckingham and Oxfordshire – Witchert

South and South-West England – Cob, Rammed earth and pise

Background

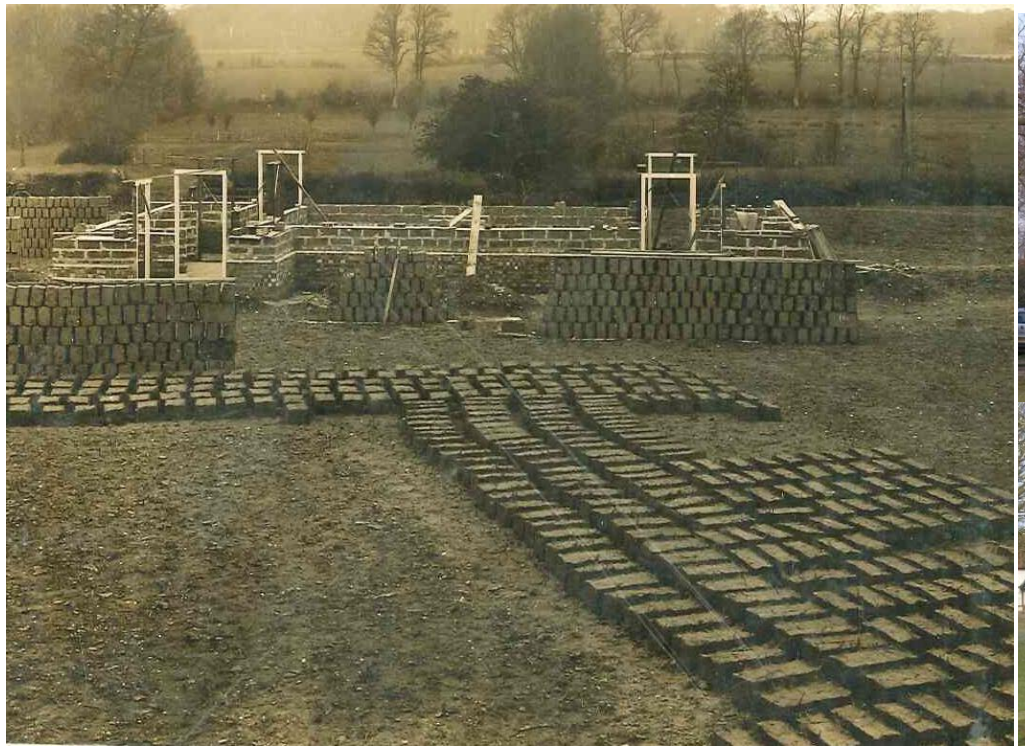
Cob houses in the South-West of England

South-West

- The South West of England has a tradition of building in cob.
- A traditional row of cob cottages can be seen to the left. The cob barn to the right is a modernised property.
- Even the modernised building looks hand made and crafted.

Source: Tim Padfield, Financial Times

Background



Early 20th century council housing, Garboldisham

The Crescent Council houses, East Harling

East Anglia

- Although though of as ancient, earth building in clay lump has a surprisingly short history dating to the 19th century.
- It became mainstream enough to build social housing in the 20th century as seen in the photographs.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How do we approach design?

Design Approach

- Hudson Architects has a design approach that is highly contextual, reflecting the vernacular in a historic sense.
- Materiality, tectonics, and the creation of a sense of place are paramount.
- Considering energy, comfort and health gives occupants better buildings today and tomorrow.

Source: Financial Times 2012

Design Approach

Le Petit Fort, Jersey

Eyrie, Harleston

Cedar House, North Elmham

Design Approach

Baggy House, Croyde

Local Cob House, Croyde

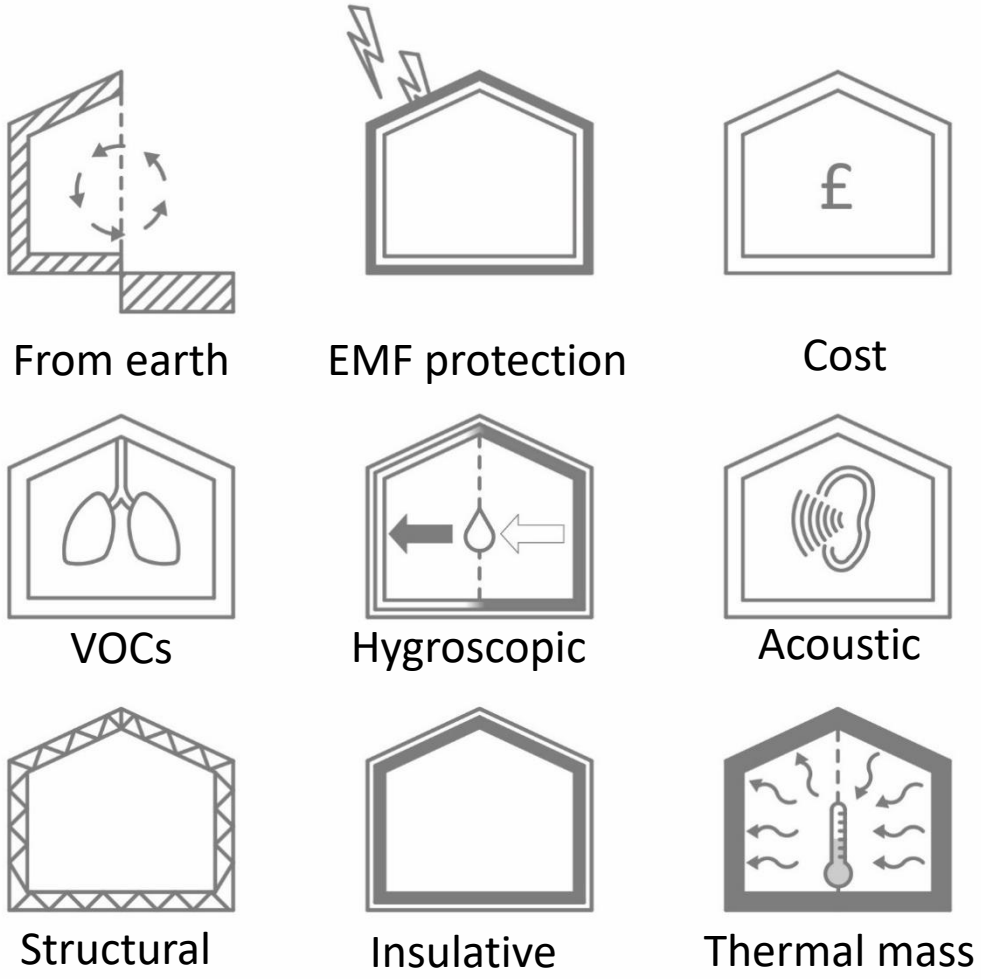
- Cob houses have provided valuable precedents within the design language of Hudson Architects in the past.
- Increasingly focus has been moving within the practice to design with low energy, healthy building techniques.

Why CobBauge?

CobBauge test sample

- CobBauge could be the innovation cob
- Could become mainstream bringing the low energy advantages of earth building to a bigger market.
- CobBauge can bring a host of advantages that are inherent to the type of construction.

Why CobBauge?



CobBauge Properties

- Earth is natural and available in abundance, its carbon footprint is very low. It is also easily reversible and infinitely recyclable.

- Its ability to regulate the hygrothermia of an interior space (hygrometric and thermal regulation) creates healthy and comfortable environments.

Why CobBauge?

Building Biology

- CobBauge works effortlessly with Building Biology's approach to better buildings.
- Building biology is an approach that incorporates healthy design principles in the design from the outset.

Why CobBauge?

Prefabricated rammed earth block made by Isofloc

- How can we make the most of cob in construction?
- Large prefabricated rammed earth blocks were created and transported.
- Large prefabricated blocks could reduce construction times.

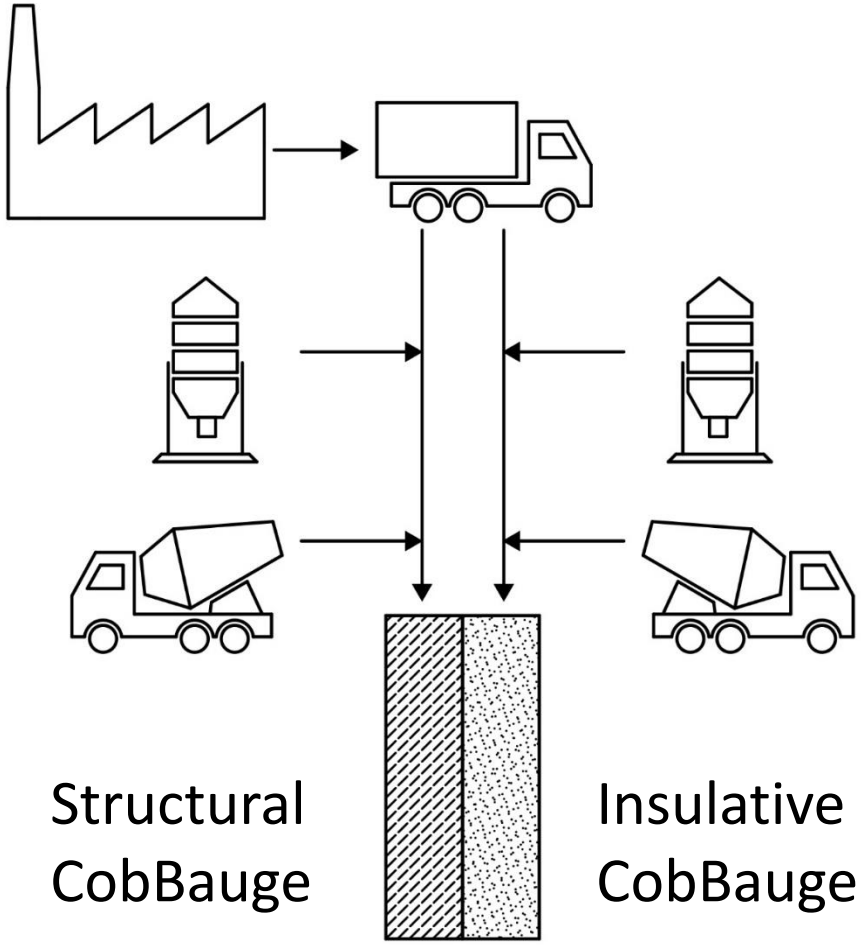
Why CobBauge?

H.G. Matthews earth block suppliers

Modern earth block home under construction

- How could it become mass market?
- These new prefabricated clay lump blocks can be bought easily within the UK.

Why CobBauge?



Structural CobBauge

Insulative CobBauge

Prefabrication?

Onsite mixing?

Off site mixing?

- Learning from others, for example the concrete industry
- CobBauge has the potential to be either or all of these construction methods
- Mainstream is the goal

Design References

University of Nanterra, France - TOA Architectes Associés

- Initial design of the University Building in Ile de France
- The perimeter walls of the school and the courtyards as well as the interior walls of the hallway serving the classrooms on the ground floor and the 1st floor, will be build of raw earth.

Design References

- Oriented to the south to be bathed in light, most rooms with permanent occupancy make the most of passive solar inputs.
- Earth walls were chosen for acoustic and thermal comfort, air quality and good energy management

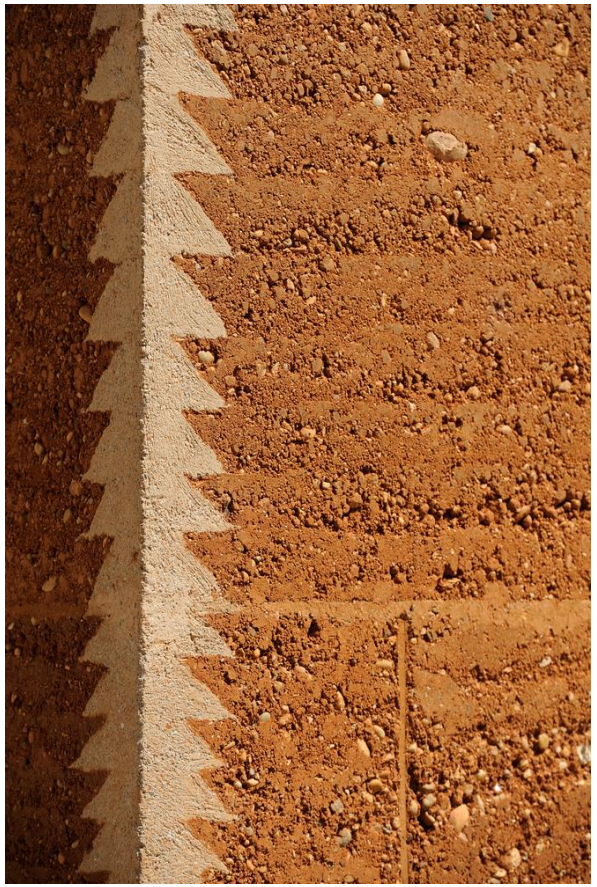
University of Nanterra, France - TOA Architectes Associés

Design References

Local Services Building in the rural area of Marsac-en-Livradois - Architect Boris Bouchet

- The National Prize for Architecture in Raw Earth was awarded on 31 May 2013 in France for this project in Pise
- This contemporary aesthetics renew the vernacular image often associated with earthen constructions.

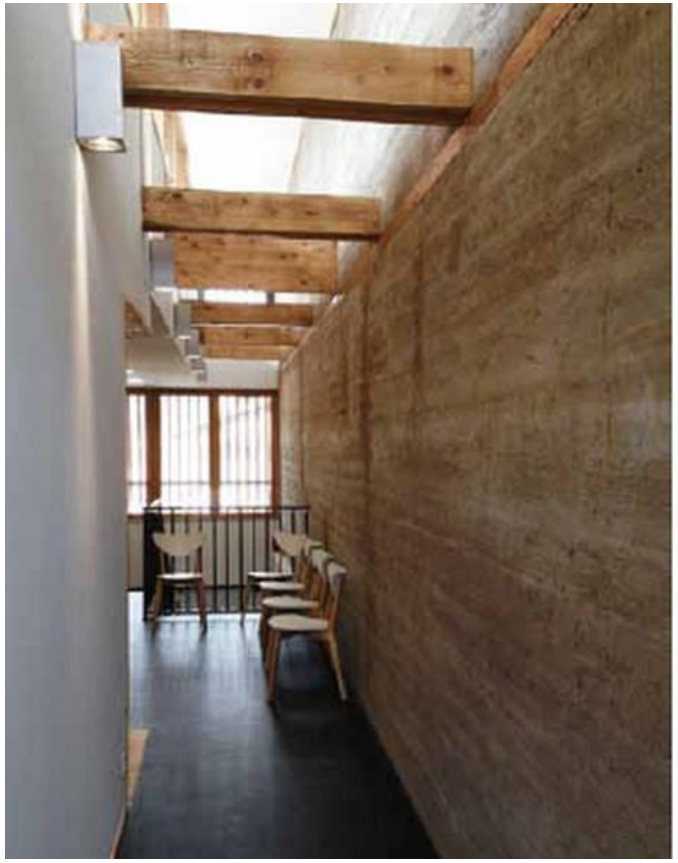
Design References

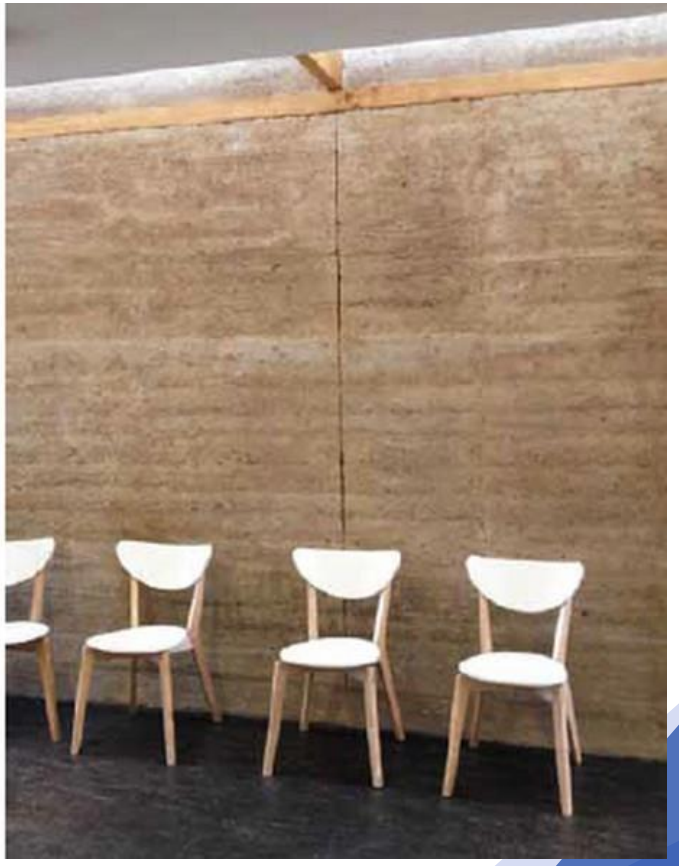


- Here the large prefabricated blocks create a unique aesthetic when combined with the sill and lintel details.

Nursery School at Roches de Condrieu - Brenas Doucerain Architectes

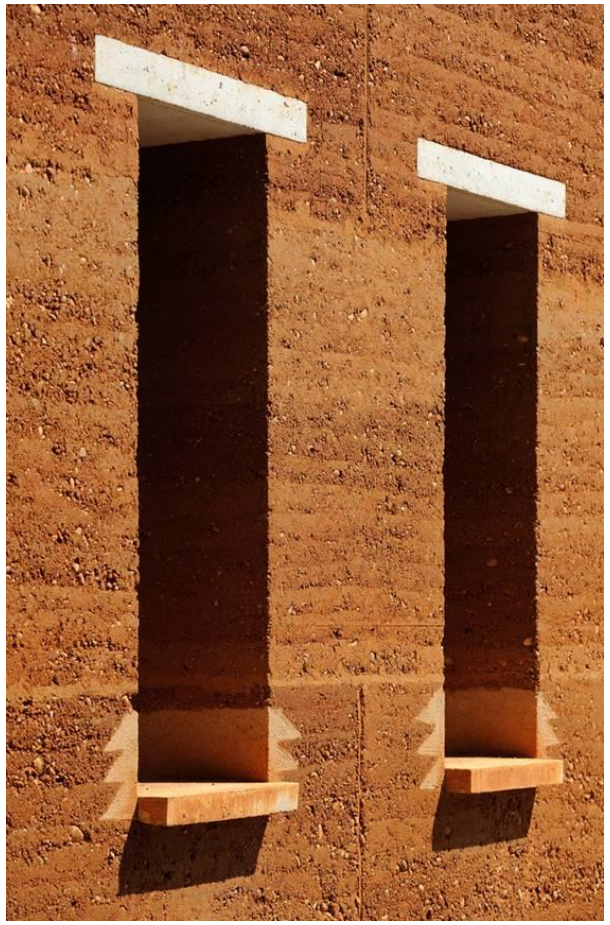
Design References





Interior Design

Design References



Windows

Design References






Roofs

Projects

Earth House, Foulsham

This home has high aspirations including:

- Low embodied energy
- High indoor air quality
- Stable temperatures due to high thermal mass
- Good thermal performance
- High levels of air tightness

Thank you

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CobBauge
European Regional Development Fund

ENVIRONMENTAL BUILDING RESEARCH WITH PLYMOUTH UNIVERSITY

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FOSTERING EARTH BUILDING IN THE UK AND IRELAND

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