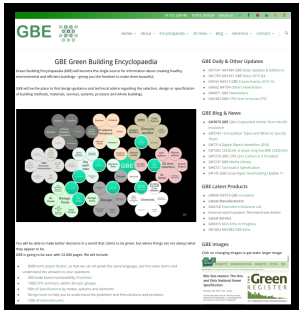

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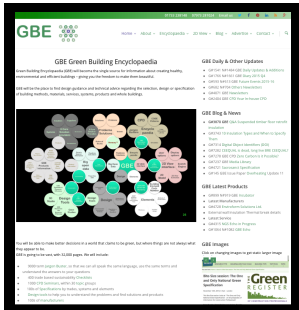
Construction Resources

Showroom Tour Green Materials & Construction



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This Lecture:

- Can be found on Green Building Encyclopaedia website
- Task Page:
- http://greenbuildingencyclopaedia.uk/?p=10502
- CPD/Lecture page:
- http://greenbuildingencyclopaedia.uk/encyclopaedia/files/cpd/construction-methods/construction-resources-cr/

Classification: CI/SfB:

- Table 1 (1-) to (2-) Elements of Buildings
- (16) Retaining walls, Foundations
- (21) External Walls
- (22) Partitions
- (23) Floors/Galleries
- (24) Stairs/Ramps
- (27.1) Flat roofs
- (27.2) Pitched Roofs
- (28) Frames
- Table 1 (9-) Elements of Civil Engineering
- Table 3 Construction products
- Table 3 Materials
- Table 4 Properties and Characteristics

Classification: CAWS

- Assemblies of many work sections
- Outer cladding (work section)
- Core Construction (work section)
- Inner lining (work section)

Classification: GBE 3D Studio:

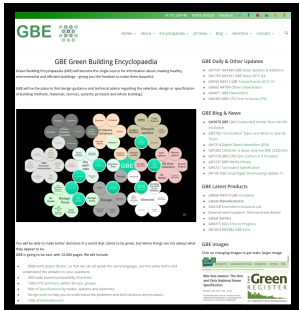
- BEACoN Building Element Assembly Code Number
- E.g. (21) H21/F10/K14 1
- (Wall) Timber weatherboarding/ masonry/clay board lining 1st instant

Classification: Uniclass 1 1997

- G Elements of Buildings
- H Elements of Civil Engineering
- L Construction products
- N Properties and Characteristics
- P Materials

Construction Resources

- Construction Resources (CR) still exists but as a smaller operation
- A considerable amount of knowledge was dispersed to various new organisations including constructors, water and energy consultants, architects, training providers, etc.
- The Showroom is gone, some of the mock-ups moved to CAT where they were destroyed by the weather
- But the memories remain
- This give a glimpse at some of the methods of construction promoted by CR



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New Wall Finishes

Construction Resources

Clay Boards
Reed & Clay
Clay finishes

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Clay Finishes

- Clay Boards: Reed & Clay,
- Insitu clay on reed
- Clay finish
- Dry and harden but do not set
- No time limits
- Easy repairs
- Less skill required

Construction Resources Showrooms Southwark London

Clay Finishes

- Can sustain high humidity where gypsum/ paper will harbour mould
  - Hygroscopic
  - Moisture Mass
  - Condensation avoidance
  - Mould avoidance
- Thermal mass
  - High density
  - Large surface area
- Electromagnetic radiation absorption
- Absorbs smells

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Clay finishes

- Mineral based dies
- Non-fade
- Bond to background
- No flaking
- Long life
- Durable
- Properties of clay plaster
- Vapour permeable

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Construction Resources
Tierrafino Clay Plaster - Ayers Rok 1kg
Construction Resources
Tierrafino Clay Plaster - Gomera Grey 1kg
Construction Resources
Tierrafino Clay Plaster - Gomera Grey 1kg

Natural ingredient Paints Stains Oils Waxes Polishes Sealers

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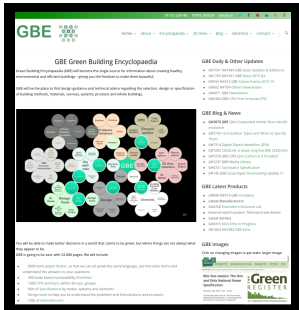

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Natural Paints

- No synthetics
  - VOCs if any are natural
- No poisons
- No chemical concoctions
  - No unexplored impacts or reactions
- No pollutants
  - Healthy career possible
- No Hazardous waste
  - Many compostable

Natural Dyes

- Natural dyes
- Mineral based
- Plant based
- Animal based
- Fade resistant
- Long life
- Add to base
- Mix your own colours

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Tapi Maxi Set £46.41
Carpet care set
Includes Tapigold & Tapi Clear
SORRY OUT OF STOCK
Tapi Clear
Broad spectrum carpet stain remover 0.25 litre £15.86
Tapisept 0.5 litre £20.92
Carpet odour remover
Tapi Contramott 0.5 litre £18.33
Moth spray for carpets
volvox
1-6101
Paint Stripper
volvox
1-6101
Paint Stripper
volvox
1-6101
Wallpaper Paste
100 g
volvox
1-6101
Wallpaper Paste
100 g
volvox
1-6101
Wallpaper Paste
100 g
Paint Stripper Abbeizer
0.5 kg £4.76
2 kg £8.66
5 kg £28.04
14 kg £48.22
Wallpaper Paste Tapetenkleister
100 g £2.73
500 g £12.30

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nt Procedure for Eco-impacts of Materials

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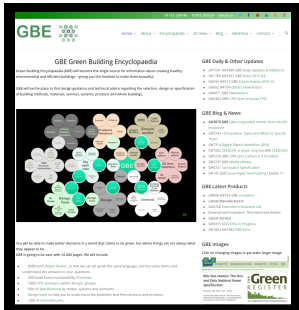
volvox



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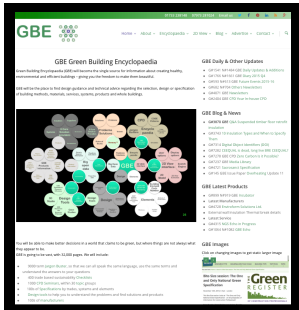
Display panels



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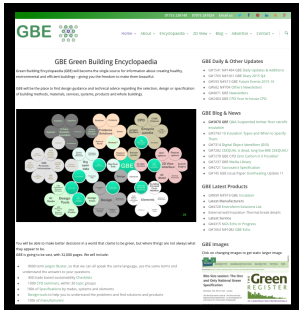
Furniture

Adaptable furniture with other uses through life

Timber furniture Safe Upholstery



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Thermal Insulation

Construction Resources

Thermal Insulation

Newspaper
Flax
Hemp
Sheep's wool
Cellulose

Construction Resources Showrooms Southwark London

Thermal Insulation
Cellulose fibre Recycled Newspaper and Magazines

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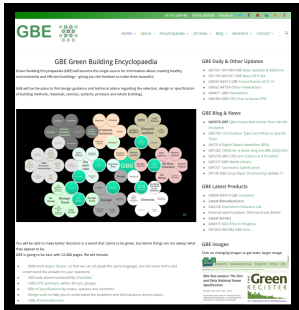

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Decrement Delay Thermal Lag

P10 Insulation

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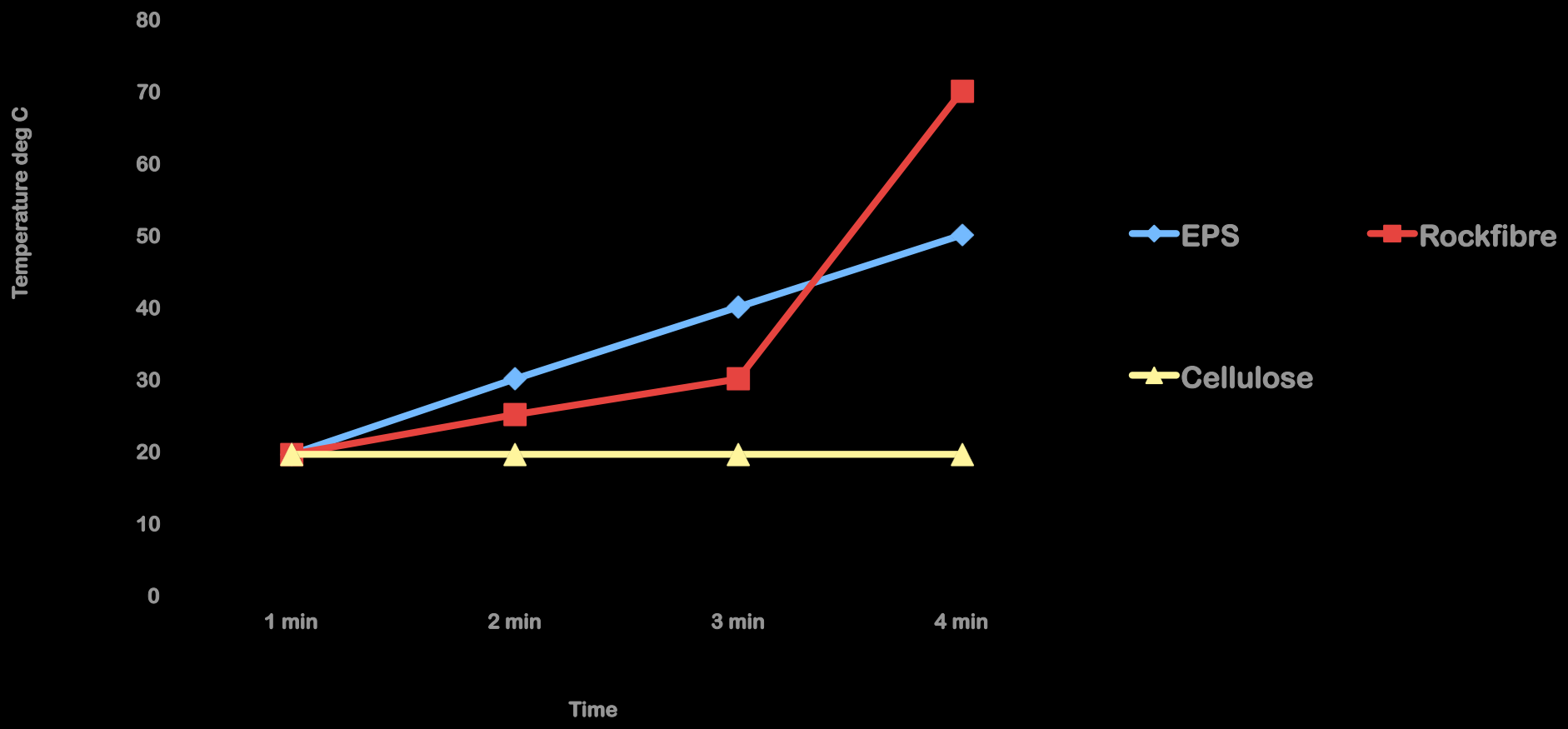
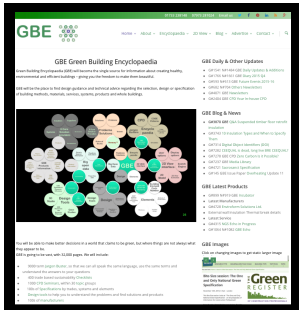
Radiant heat through 50 mm. of thermal insulation types over time



Construction Resources Showrooms Southwark London (cellulose=wood fibre)



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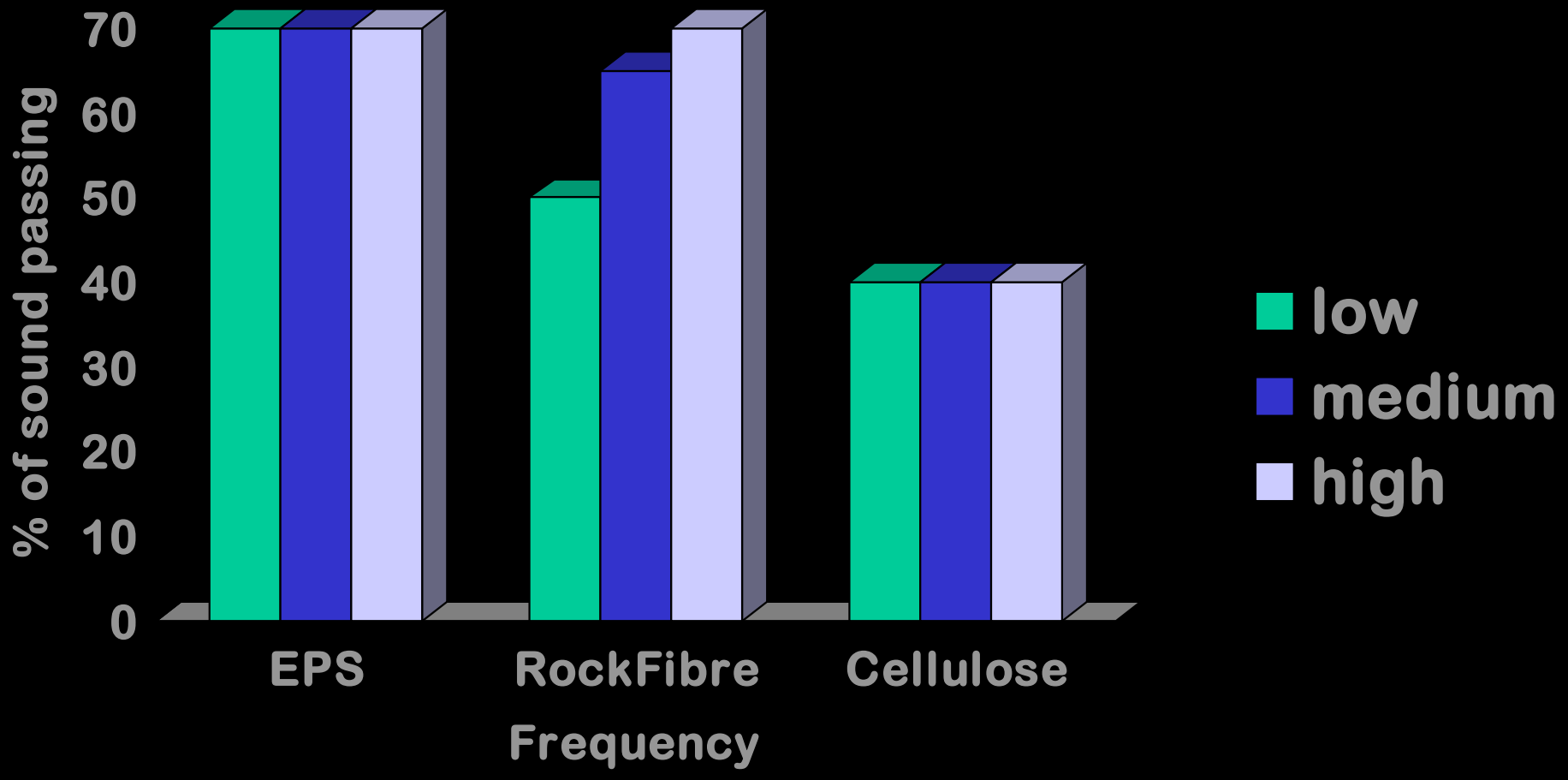
Acoustic Insulation

Dense wood Fibre

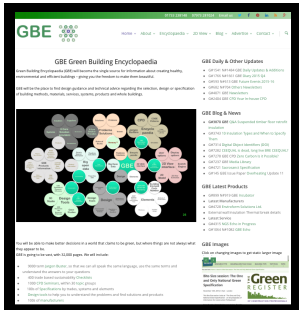
- High acoustic density
- Dense wood fibre insulation boards in:
  - Walls
  - roofs
- Improved performance compared to:
  - glass/rock mineral fibre
  - expanded polystyrene plastics insulation

Construction Resources Showrooms Southwark London

% of sound passing through insulation



Construction Resources Showrooms Southwark London Cellulose = wood fibre



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Victorian Building Eco Energy Upgrade

Construction Resources

Solid Wall Construction

9 in brick wall
Plastered internally
Cork insulation
In two layers
cross battens
To reduce thermal
Bridge through battens
Drylined
Skirting

- Eco Energy Refurbishment

Pitched roof Construction

Existing rafter zone insulated leaving 50 mm. ventilation zone Cross battens applied below rafters, batten zone insulated Plasterboard ceilings added

- Eco Energy Refurbishment

Suspended Ground Floor

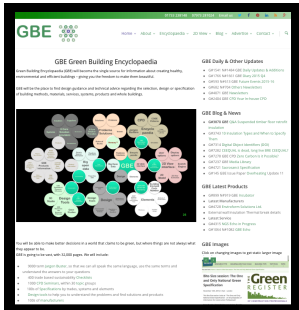
Battens to sided of floor joists
Board on battens
Insulation onto boards
Existing floor joist zone insulated

- Eco Energy Refurbishment

Suspended Upper Floor

Ceiling joists upgraded to floor joist
Joist zone insulated
Floor boards added
Ceiling linings

- Eco Energy Refurbishment



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20th C Building Eco Energy Upgrade

Construction Resources

Cavity Wall Construction

Existing masonry cavity wall,
Brick outer leaf,
block inner leaf,
Steel lintel
thermal bridge
plastered internally;
Insulate cavity
Internal insulation
Wrap lintel
Plasterboard dry lining

- Eco Energy Refurbishment

Pitched Roof Attic

Existing ceiling joists zone insulated
Insulation laid over ceiling joists at right angles

- Eco Energy Refurbishment

Ground floor

Take up existing floor
Lay new DPM
Loadbearing Insulation on DPM
Insulation upstand around perimeter
New eco-concrete floor,
Eco-concrete screed
High density insulation board
Floor finish

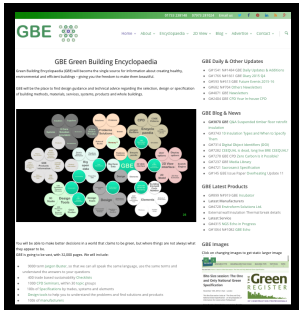
- Eco Energy Refurbishment

1960's insitu concrete tower refurbishment External walls

- Eco Energy Refurbishment

1960’s insitu concrete tower refurbishment Flat roof gutter

- Eco Energy Refurbishment



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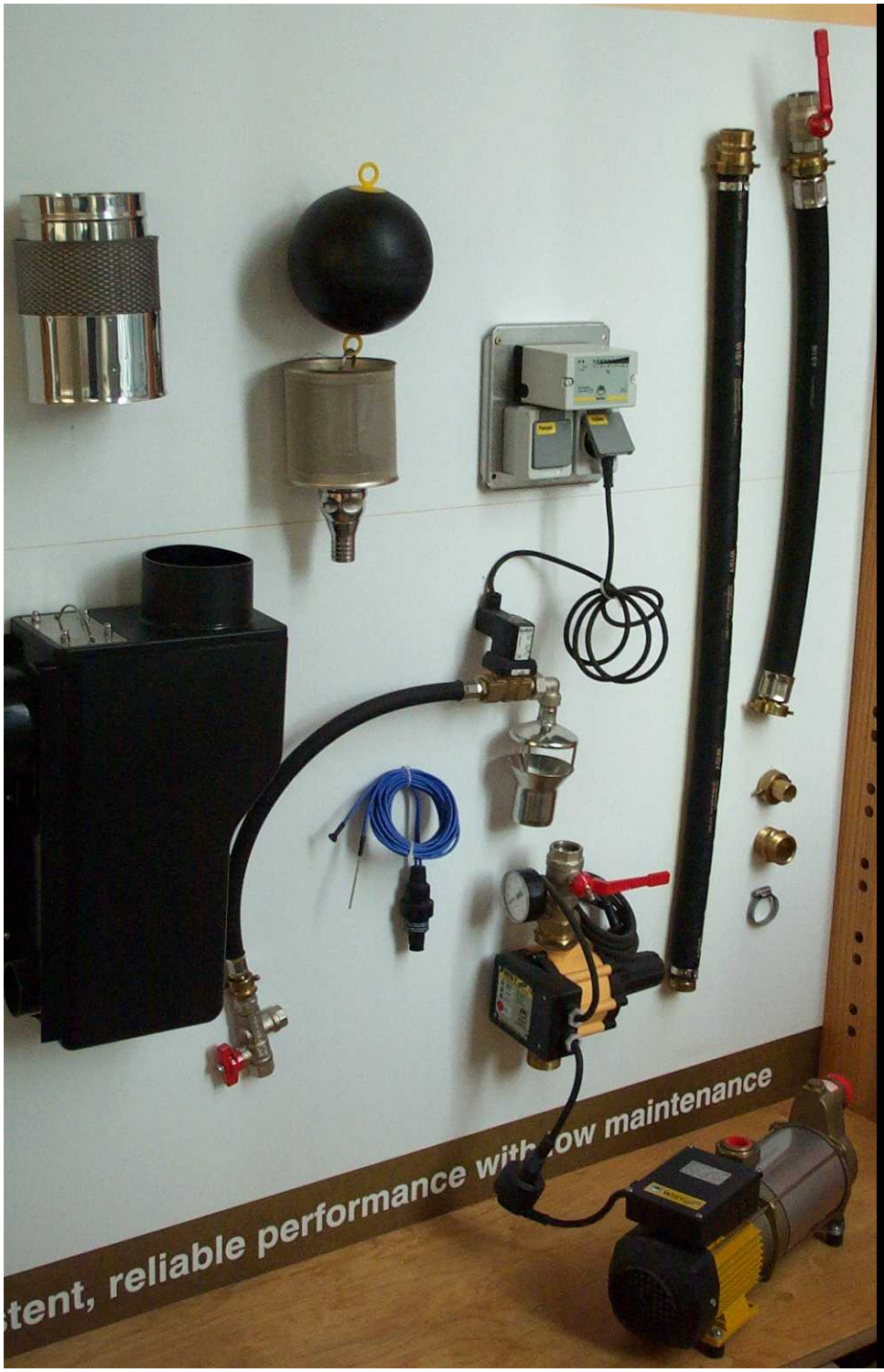
Services

Proximity Taps

- Activated by hand presence
- Water saving
- No bacteria transfer
- No soap scum to clean


Low Flush Toilets
2.5 LITRES
9 LITRES
Low capacity
Water saving
Quick refill
Faster turn round



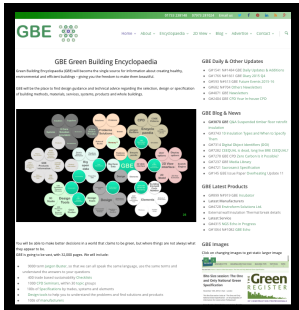
Rainwater Harvesting Kit:

Filtration

Sumbmersible pumps

Detectors

Main top-up



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New Walls: Timber

Construction Resources

EVT Enhanced Vapour Transfer

Hygroscopic insulation
maintain their performance
even when wet
Vapour and water released
when conditions permit
No need for VB Vapour Barrier
Use vapour permeable
construction
5:1 ratio vr inside:outside
ATL air tightness layer

Construction Resources Showrooms Southwark London

Thick walls, roofs and floors

We have a preoccupation with thin walls 300 mm. or less
Which drives the demand for energy intensive man-made petrochemical fossil derived CFC HCFC HFC HFA foamed plastic
O_3 Ozone Depletion
Greenhouse Gas Potential
300-600 mm. optimum insulation thickness

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Cellulose Fibre

Optimum:
300-600 mm. deep compound rafters with loose Cellulose fibre insulation
High density and high thermal mass
High thermal lag wood fibre insulation boards in walls and floors

Construction Resources Showrooms Southwark London

Thermal Mass

Thermal mass:
High thermal mass dense wood fibre insulation boards in walls and floors
Acoustic unfired clay bricks in floor construction
adds thermal and moisture mass
Stacked dowelled wood floor

Construction Resources Showrooms Southwark London

Timber Structure

- Compound rafters
- Cellulose insulation
- Acoustic brick floor
- Timber floor planks
- Wood fibre insulation
- Timber frame walls
- Timber batten clad

- Vapour balanced construction

Construction Resources Showrooms Southwark London

EVT Enhanced Vapour Transfer

Open joint batten cladding:
Durable FSC hardwood
Sloping top, drip bottom
Battens: Durable FSC hardwood
Galvanized steel guttering
Fired clay roofing tiles
Durable FSC softwood battens
Breathing wind tight layer underlay

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Thermal Mass

Thermal mass:
High thermal mass dense wood fibre insulation boards in walls and floors
Acoustic unfired clay bricks in floor construction or fired honeycomb blocks in walls and floors adds thermal mass

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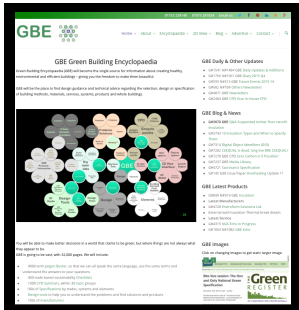

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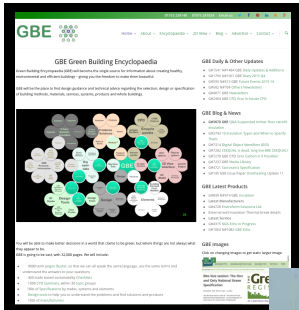

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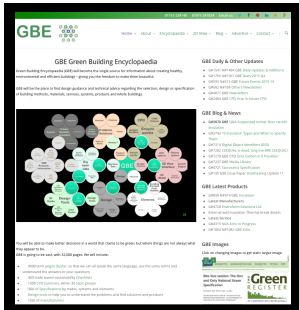

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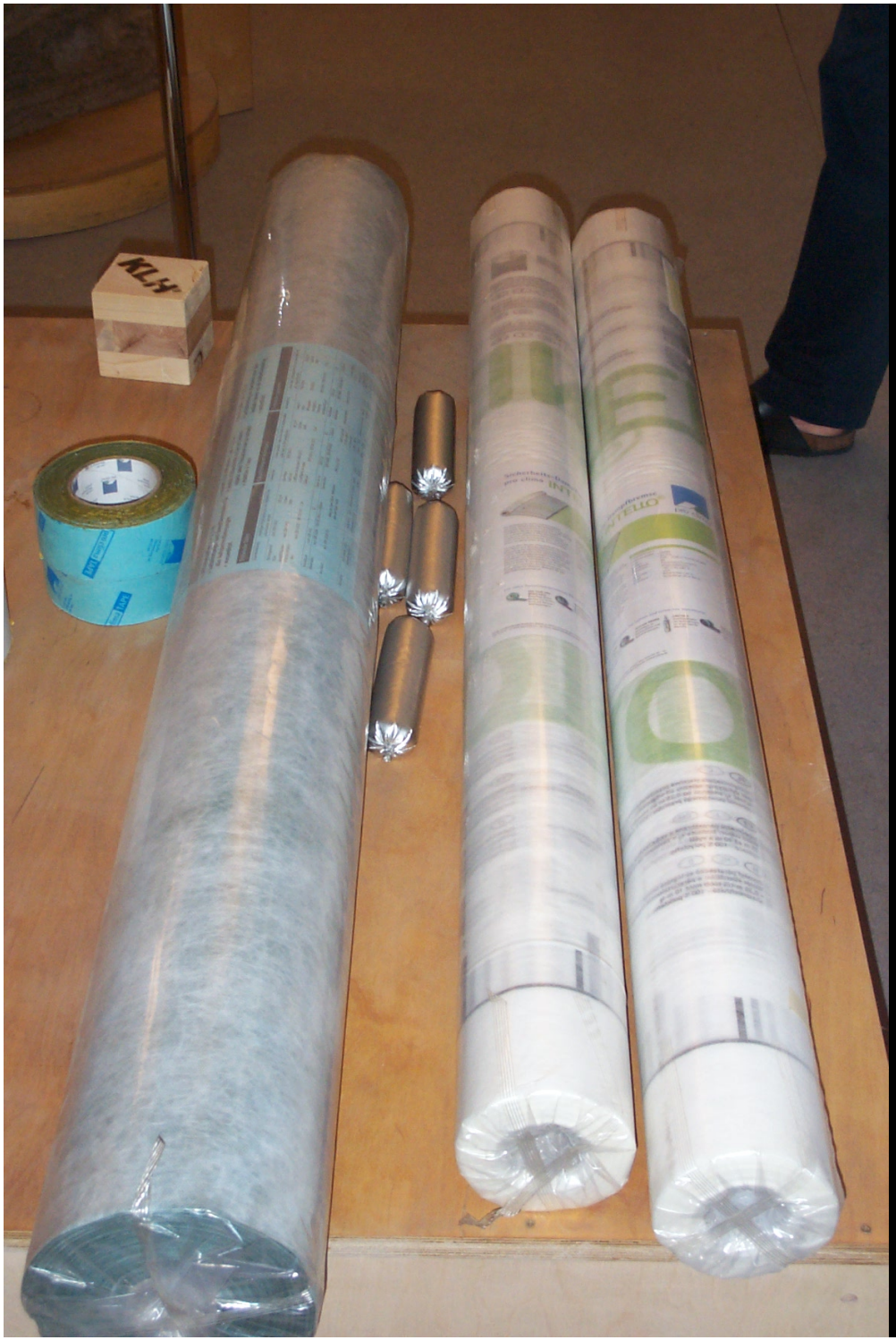

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Airtightness

- Membranes
  - Paper + Cellulose
    - ProClima DB+
  - Polyolefin
    - ProClima IntelloPlus
- Tapes
- Sealants
- Adhesives
- Grommets

STEKO
Load-bearing timber blockwork

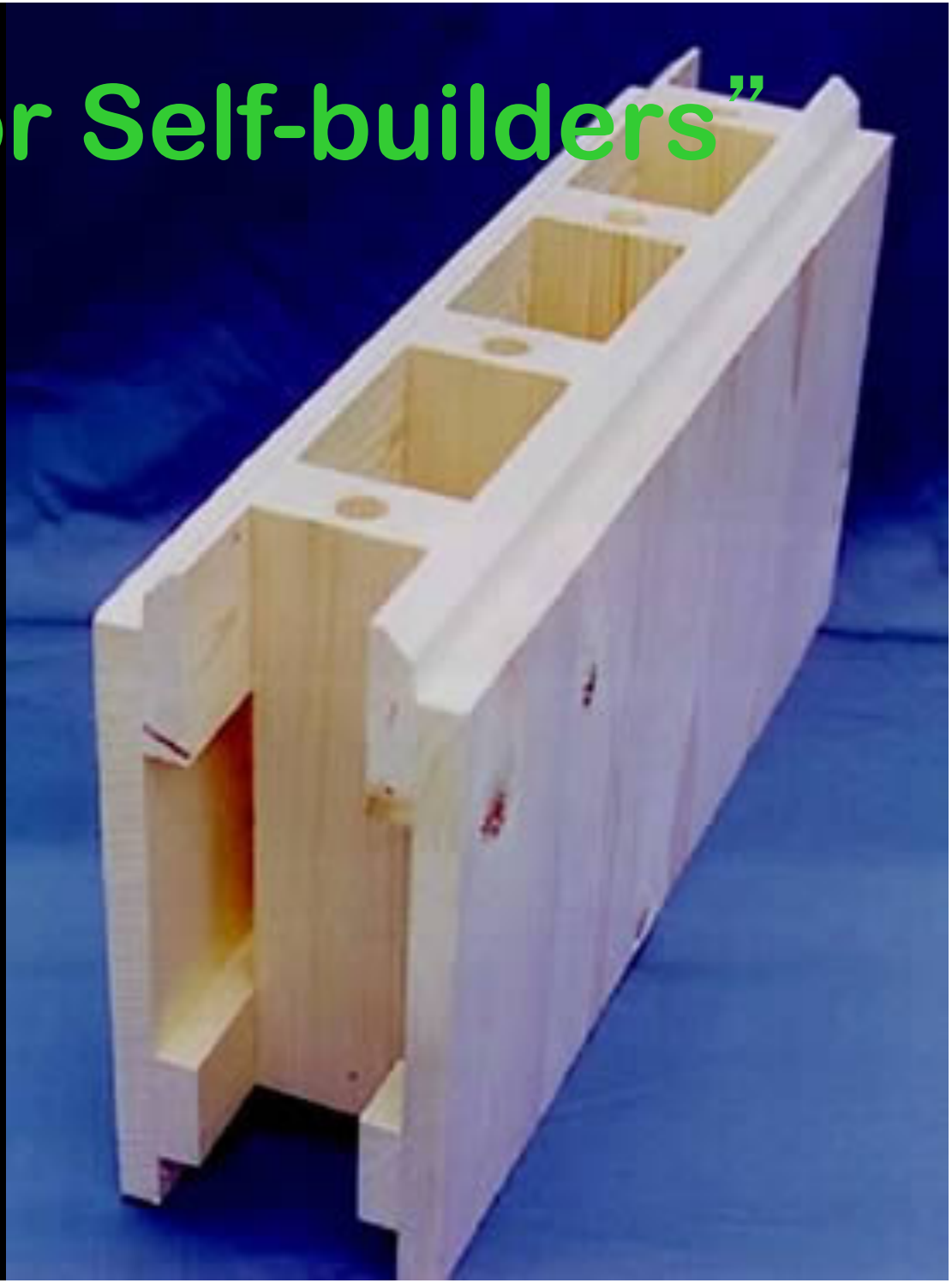
Construction Resources Showrooms Southwark London

STEKO

Load-bearing timber blockwork

Steko “Lego for Self-builders”

- Waste from plantation thinning
- Carbon negative
  - Carbon sequestration
- Dry Construction
- Self-build unskilled construction
- Fast construction (3 day house)
- No waste on site (designed)
- Accommodates services
- Accommodates thermal or acoustic insulation
- Lightweight 6kg (children too)
- Load-bearing (designed to 7 stories)
- Internal and external walls
- 160 mm. modules



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Construction Resources fact sheet 34

Steko blocks

Timber block wall construction system

Steko is a rapid construction system that uses large hollow timber blocks that simply slot together. No glue or other fixings are needed to complete a load-bearing wall construction. The system enabled two people to build an attractive house in just three days, complete with internal and external walls, two floors, cellar, attic and roof.

- Very fast construction
- High quality building every time
- Buildings can be rapidly designed
- Faster to construct than bespoke timber-frame buildings
- Walls are loadbearing and space forming
- No glue or other fixings are needed
- No drying-out time is required
- Beautiful internal surface finish
- Requires a breathing type of external cladding
- Uses off-cuts of timber from rapidly renewable sources

Construction Resources is proud to have introduced the Steko timber wall system to the UK which is the first export market outside its native Switzerland.

Steko blocks are made from cross-glued boards and have horizontal and vertical interlocking parts.

Starting from a level timber base plate, the blocks are simply stacked on top of each other row by row, each block locating accurately onto the block below by means of integral locating dowels. A Steko top plate finishes the wall construction. The system is much faster to construct than bespoke timber-frame buildings.

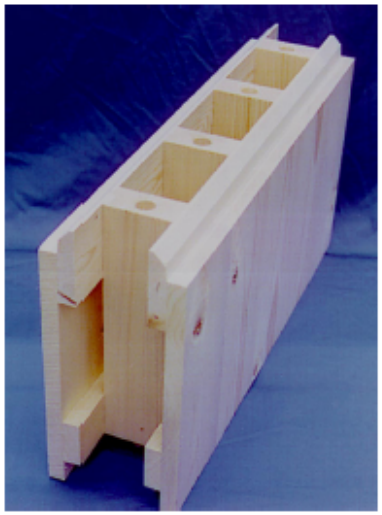
Specially designed blocks cater for corners, wall ends and to line windows and door apertures.

Electrical services can be run within the vertical voids of the finished wall. The voids are then filled with isofloc cellulose insulation which is dry injected into the cavity.

Internal finish The all-dry construction method means that internal trades can start work as soon as a roof is in place. The planed timber finish for the internal walls can be left exposed but there are many other options, for example, clay boards can be fixed and plastered with Tierrafino to give a beautiful textured wall.

External finish Steko block walls filled with cellulose insulation exceed current Building Regulation requirements. However, if desired, a better thermal performance can be achieved by the addition of external insulation, such as wood-fibre insulation boards (see Gutex Thermowall and Gutex Multiplex Top - fact sheet number 25). These can be clad with timber boarding or lime render to provide the required natural 'breathing' external cladding.

Design The horizontal grid of 160mm and vertical grid of 80mm gives maximum flexibility and allows buildings to be easily designed. The blocks are not glued together which means that, once constructed, buildings can be easily adapted and extended to suit occupants' changing needs. Steko walls easily combine with standard timber floor and roof constructions, and with any windows and doors.



Precision made The timber blocks are made from precisely machined off-cuts of timber from rapidly renewable sources. Such fine tolerances have only become possible with the introduction of computer -controlled machine tools.

This ingenious building system has turned timber, the most traditional of materials, into a high tech and very rapid method of building construction that has enormous potential.

Construction Resources

16 Great Guildford Street London SE1 0HS Tel 020 7450 2211 Fax 020 7450 2212 email info@ecoconstruct.com

Steko blocks

Product Data

Height	240 / 320mm
Length	160 / 320 / 480 / 640mm
Thickness	160mm
Weight of standard block	6.5 kg (160 x 320 x 640 mm)

including isofloc cellulose thermal insulation filling:

Weight of wall	45 kg/m² of wall area
Density of wall	280 kg/m³
U value with isofloc filling	0.42 W/m²K
Thermal conductivity with isofloc filling	0.073 W/mK

(above) The blocks are easily cut and adapted to meet design details.

(top right) A building under construction showing 3 storey load bearing Steko walls.

(right) This wall being constructed at an exhibition was very rapidly built using the Steko system.

(below) This completed room gives away few clues as to how it was built - and the blocks provide an attractive finish that needs little further treatment.

Construction Resources

16 Great Guildford Street London SE1 0HS Tel 020 7450 2211 Fax 020 7450 2212 email info@ecoconstruct.com

8.27 x 11.69 in

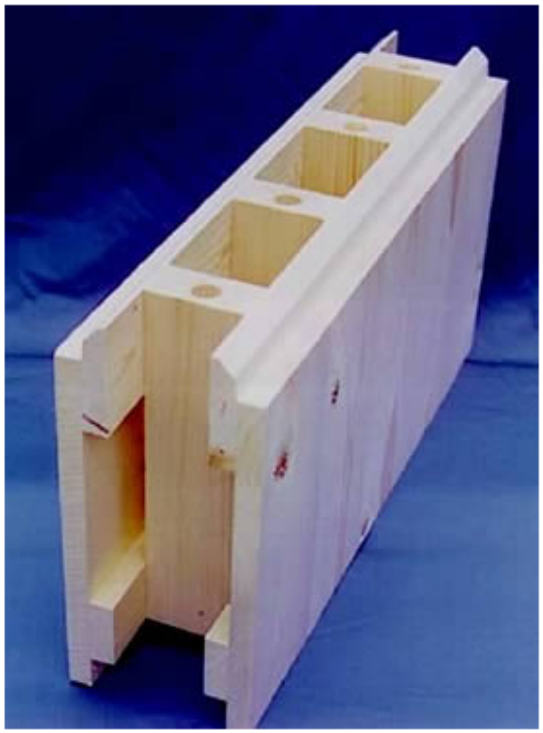
1 of 2

Done Internet

Steko blocks

masonry, blocks, wood, interlocking, load-bearing

Steko is a rapid construction system that uses large hollow timber blocks that simply slot together. No glue or other fixings are needed to complete a load-bearing wall construction. The system enabled two people to build an attractive house in just three days, complete with internal and external walls, two floors, attic and roof.

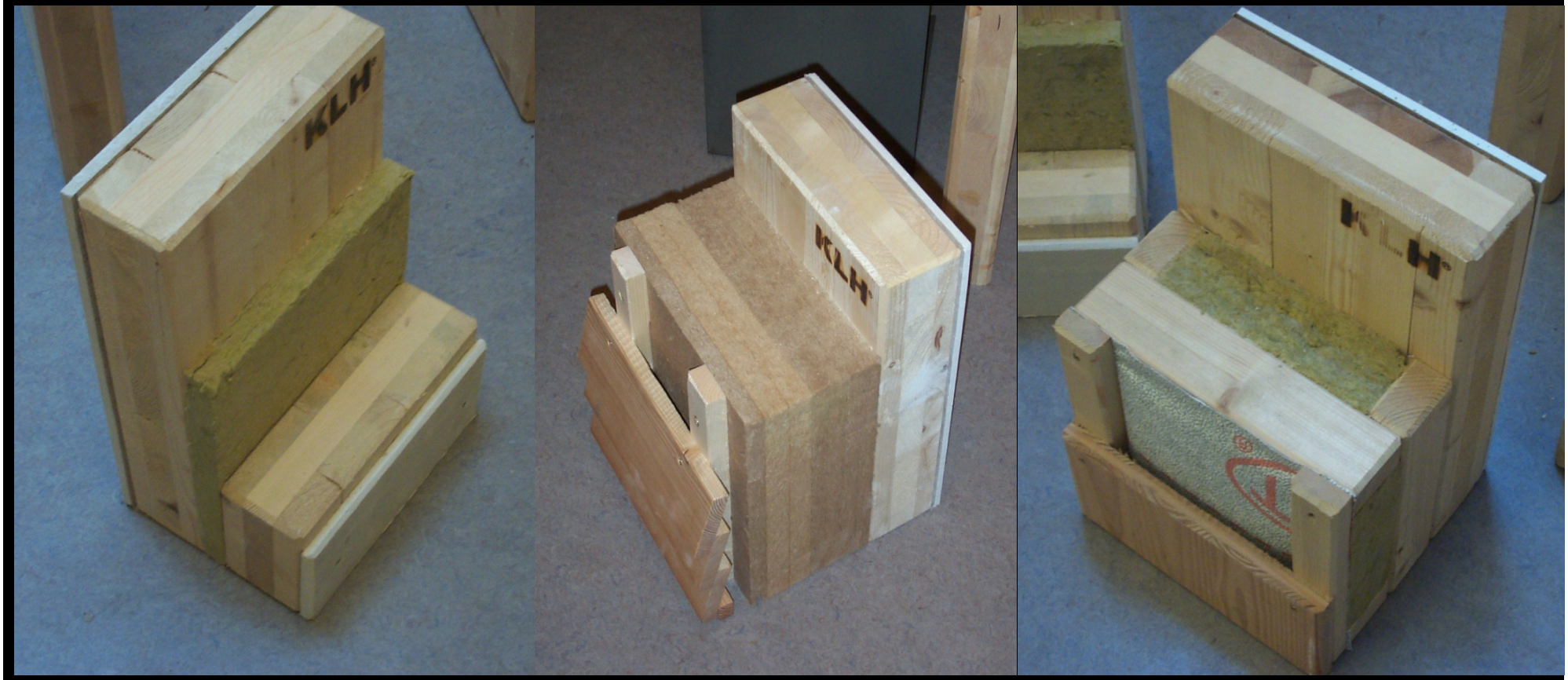


greener than:	n/a				
standards:	n/a				
BRE Ecopoints:	unrated				
downloads:	brochure (488k)				
specification:	• G21 LOAD-BEARING MODULAR TIMBER BLOCK WALLING • G21 Load bearing modular timber block walling: Steko				
recycled content:	n/a				
cost commentry:	n/a				
manufactured in:	Germany				
manufacturer:	Steko	Germany	+49 7131 - 70407	●	www
suppliers:	Construction Resources	London	020 7450 2211	✉	www
other links:	alternative products				

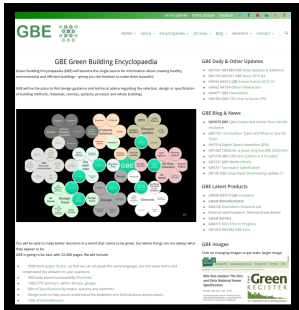
Cross Laminated timber shear walls floors and roofs

Cross Laminated timber shear walls floors and roofs

Cross Laminated timber walls



Cross Laminated timber shear walls



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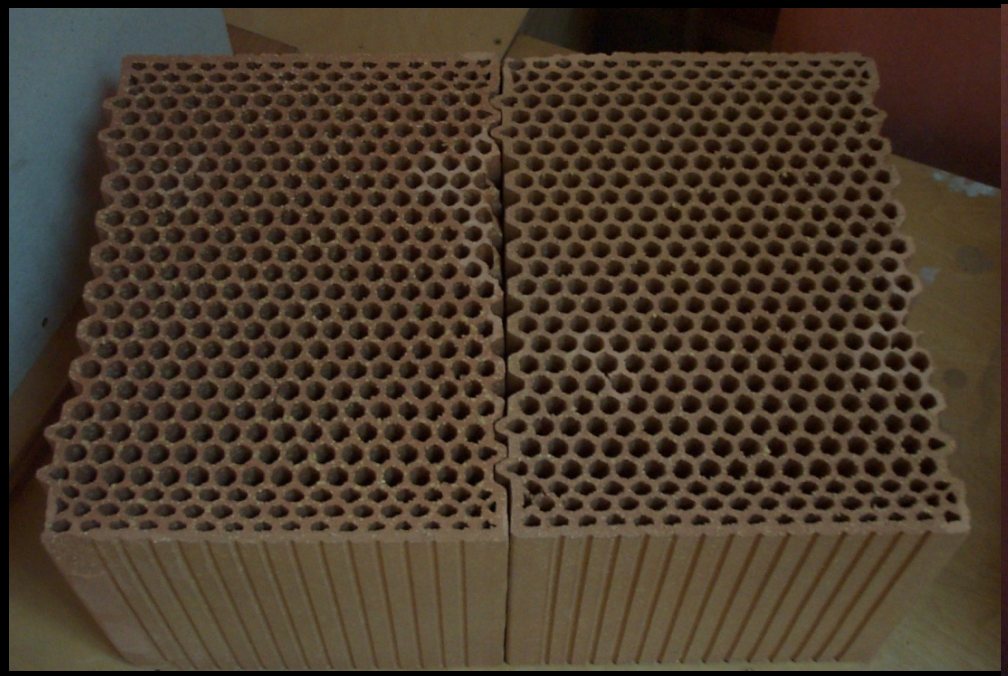
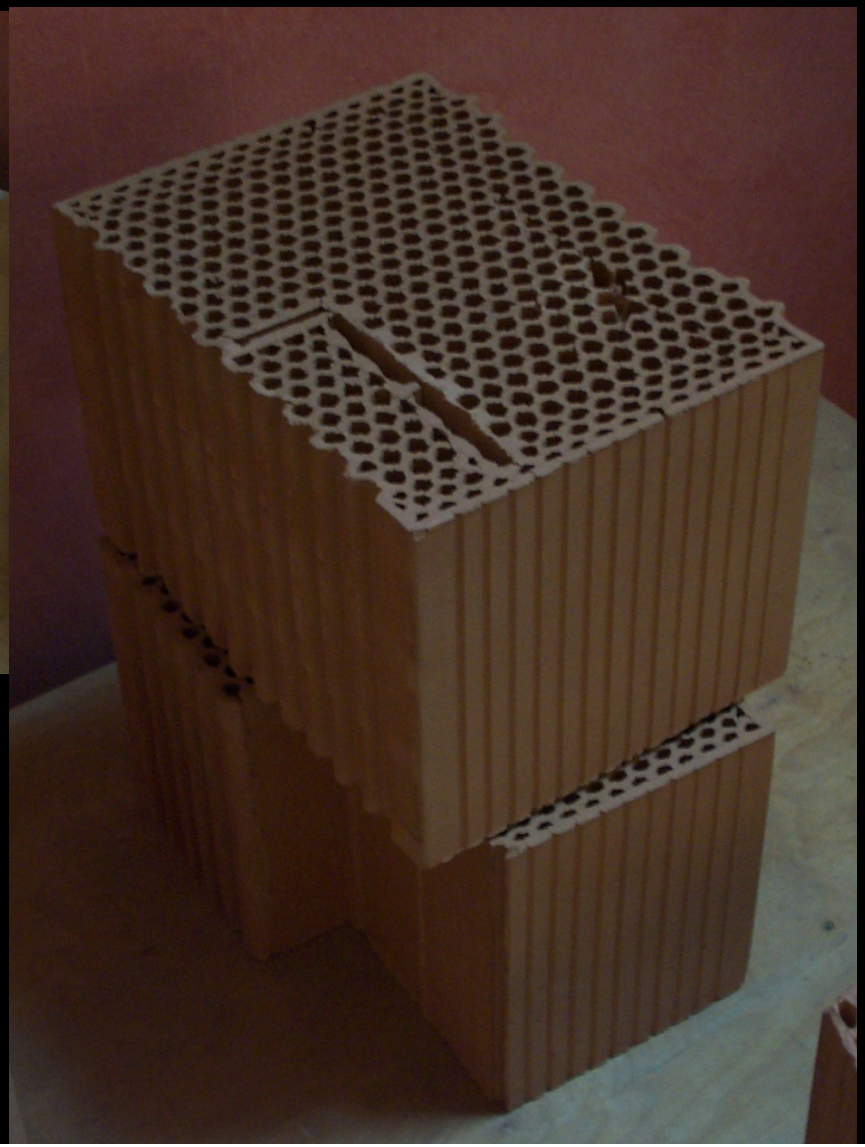
New Walls: Masonry

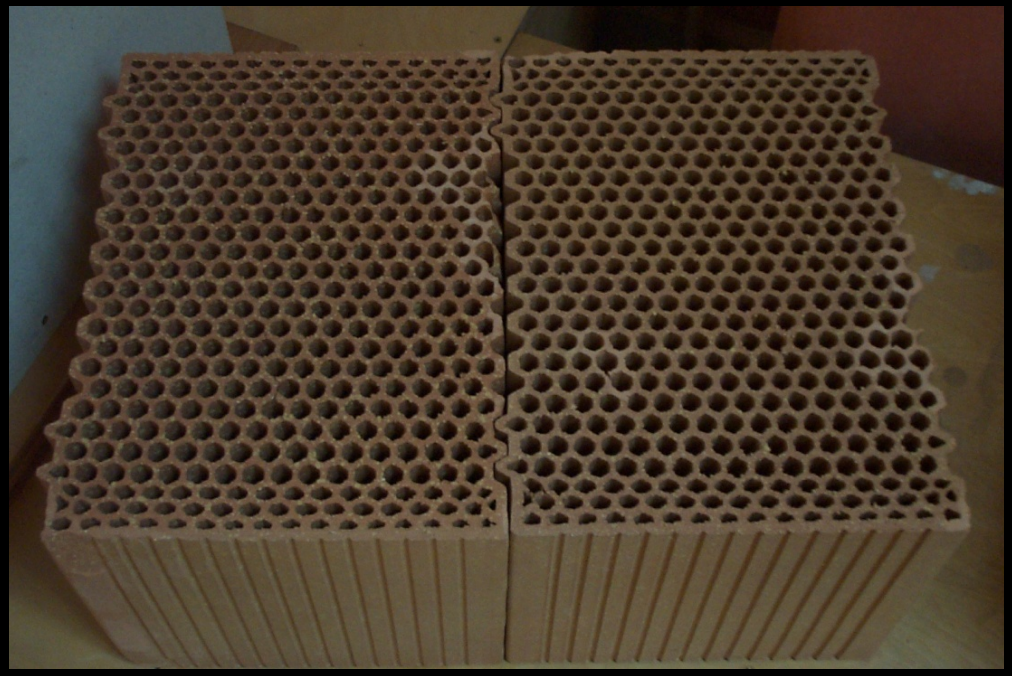
Construction Resources

Cellular fired clay blocks





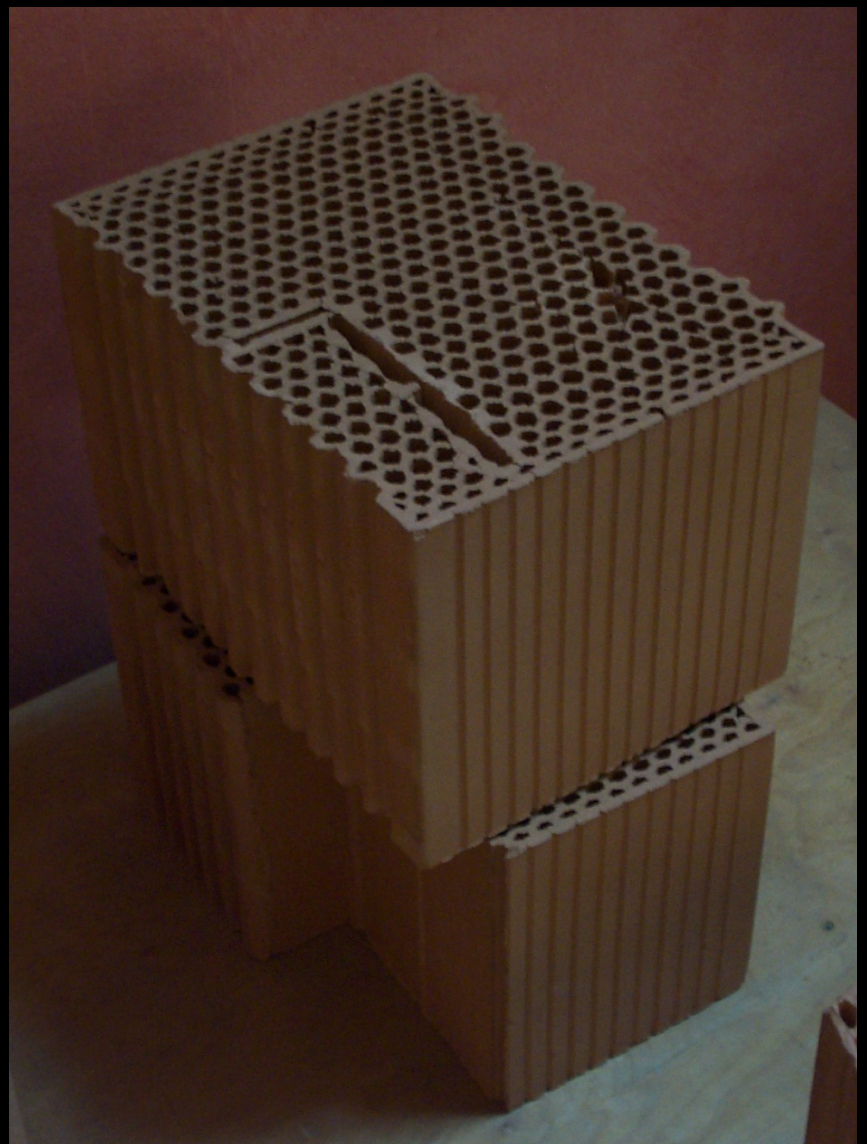
Cellular fired clay blocks



- Abundant Mineral: clay
- Fired clay
- Cellular insulation
- Long conduction path
- Interlocking dry purpend
- Mortared bed joint
- Thermal mass
- Acoustic mass
- Decrement delay
- Moisture Permeable

Cellular fired clay blocks

- Knock out pieces
- Allow conduit runs
- Form corners and interlocking



Thermal Mass

Thermal mass:
Fired honeycomb blocks in walls and floors adds long term thermal and acoustic mass
Clay board adds short term thermal mass
Not a high load capacity

Construction Resources Showrooms Southwark London

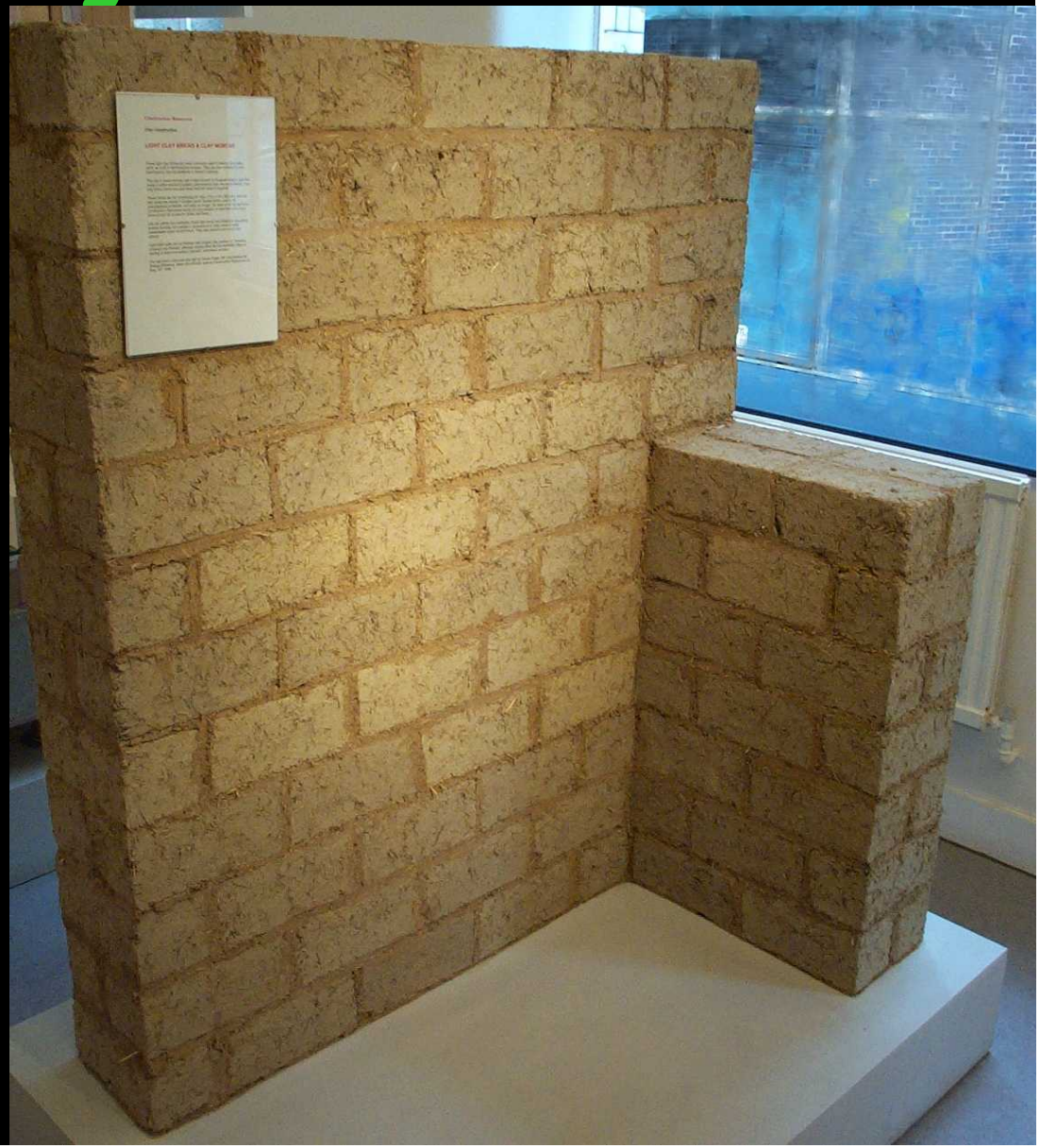
Unfired clay and straw

Unfired clay

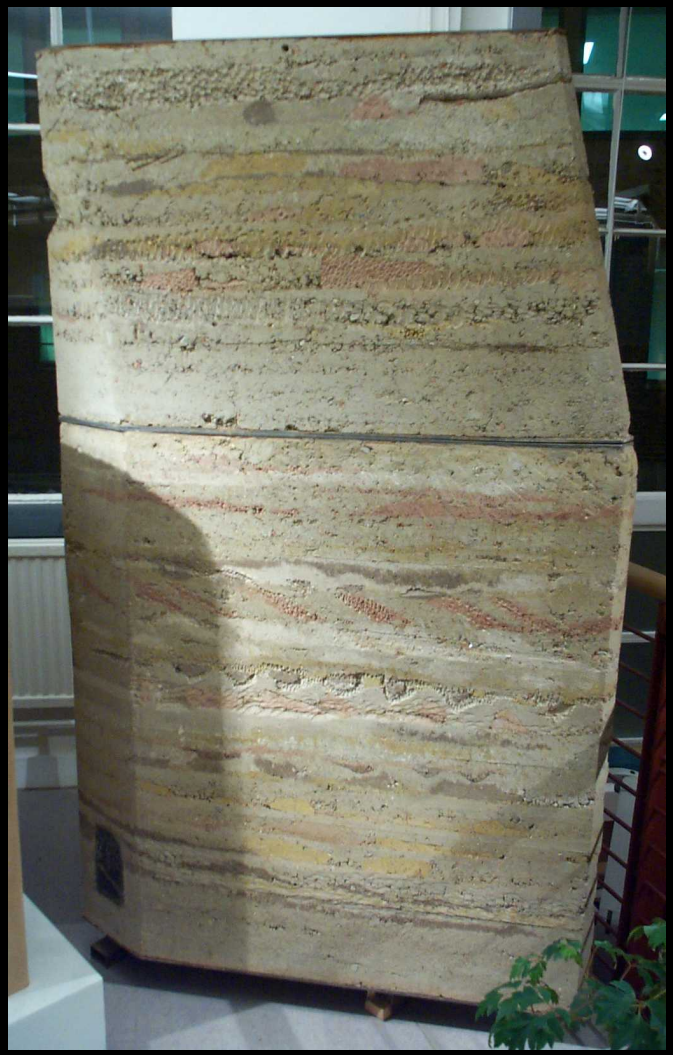
- Hollow extruded clay
  - Lighter weight
- Interlocking profile
  - Acoustic and airtight
- Dry or slip clay joint
- Hygroscopic
  - Moisture mass
- Thermal mass and lag

Unfired clay and straw

- Simple solid block
- Straw for reinforcement and hygroscopicity
- Clay mortar purpend and bed joints



Rammed Earth Walls



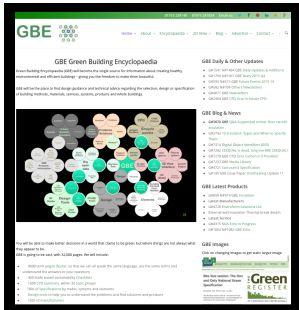
any shape
many ingredients
colours & textures

thermal mass

Load-bearing
but dynamic

Rammed Earth Walls

- Abundant and Natural
- Recipe can be determined on site
- Thermal, Acoustic & Moisture mass
- Fire resistant
- Load-bearing
- Absorbs radiation, smells and moisture
- Hygroscopic
- any shape
- many ingredients, colours & textures
- Sculptural & Artistic opportunities
- Waste disposal back to earth
- Recyclable & Reusable
- Needs temporary formwork



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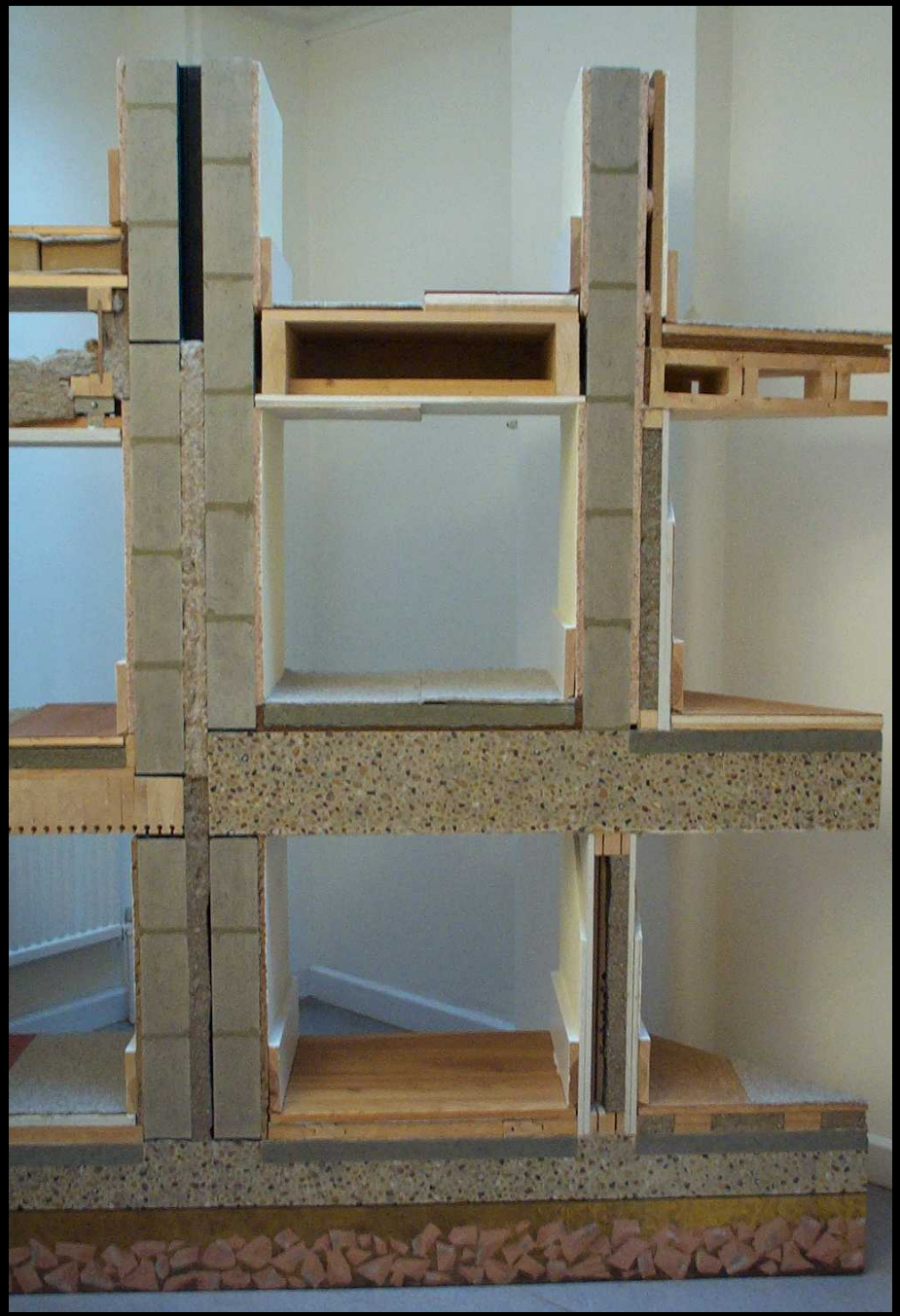
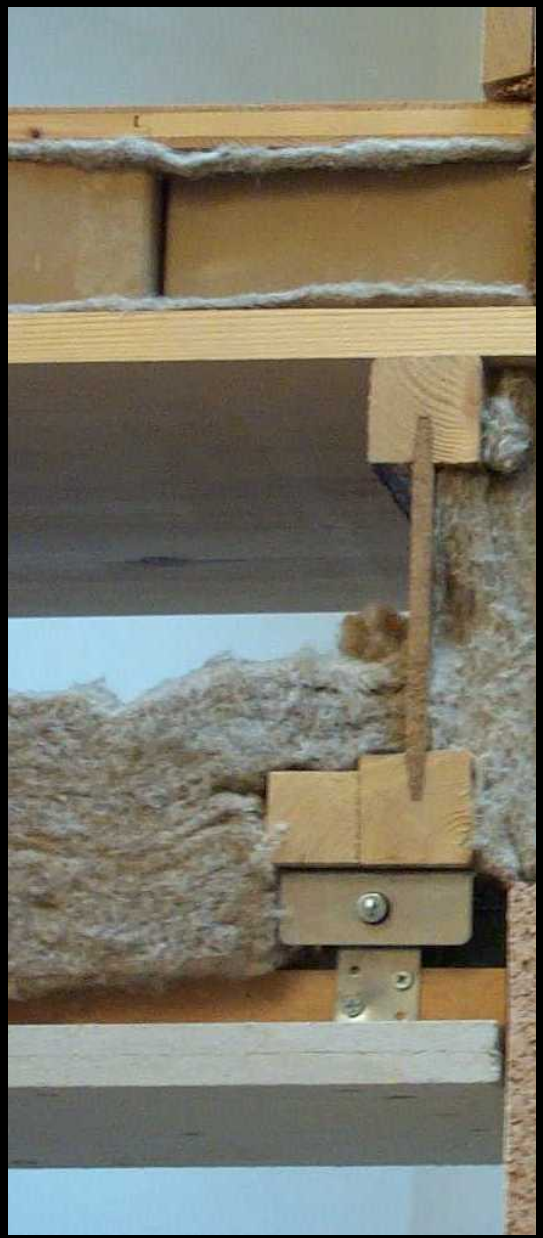
Acoustic Construction

Construction Resources

Different Acoustic solutions to walls and floors
Cavity and solid walls and lightweight partitions



Acoustic Separating Floor



- Floor board/Sheet
- Isolation felt
- Acoustic massive unfired clay bricks laid loose
- Perimeter coconut fibre upstand
- Isolation felt
- Floor deck/sheet
- I-Joist stiff floor structure
- Acoustic insulation in void
- Acoustic insulation at floor edge
- Isolation suspension fixing
- Dense Cellulose fibre reinforced gypsum board ceiling

Acoustic Party Wall

- Blockwork cavity wall
- Isolation rubber strip in place of mortar positioned mid floor depth to minimise flanking sound
- Airtight plaster on both faces of room walls
- Acoustic insulation in party wall cavity, extends into floor zone

Acoustic Intermediate Floor

- Carpet
- Cork/rubber crumb or wood fibre sheet acoustic underlayment
- Or Rubber sheet
- Floor board/Sheet
- Softwood joists
- Close to party wall but spaced off with wedges
- Noggins to support ceiling joints
- 2 layers dense cellulose fibre reinforced gypsum board ceiling

Intermediate Floor

- Veneered timber panel floor boarding
- wood fibre sheet acoustic underlay
- wood fibre board acoustic/ thermal insulation
- wood fibre sheet acoustic underlayment and upstand
- Stacked wood floor with acoustic absorbent slotted soffit
- Isolation rubber strip in place of mortar positioned below and above solid timber floor to minimise vibrations transfer from floor to wall and minimise flanking sound

Intermediate Wall

- Blockwork cavity wall
- Isolation rubber strip in place of mortar positioned below and above solid timber and insitu concrete floors to minimise vibrations transfer from floor to wall and minimise flanking sound
- Insulation in cavity to minimise flanking sound

Intermediate Floor

- Carpet
- Screed could contain recycled aggregates and GGBS cement
- Damp and vapour proof membrane
- coconut fibre sheet acoustic underlayment and upstand
- Insitu concrete floor with fairfaced soffit
- Isolation rubber strip in place of mortar positioned below and above insitu concrete floor to minimise vibrations transfer from floor to wall and minimise flanking sound

Acoustic Intermediate Floor

- Ceramic floor tiles
- 2 layers of underlayment
- Floor board/Sheet
- Softwood joists
- Close to party wall but spaced off with wedges
- Noggins to support ceiling board joints
- 2 layers dense cellulose fibre reinforced gypsum board ceiling

Acoustic Internal partition

- Single leaf blockwork
- Plastered & Skirting
- Parge coated for airtightness
- Dense wood fibre board drylined on dabs
- Plaster skim & Skirting
- Battens acoustic insulation between
- Dense cellulose fibre reinforced gypsum board

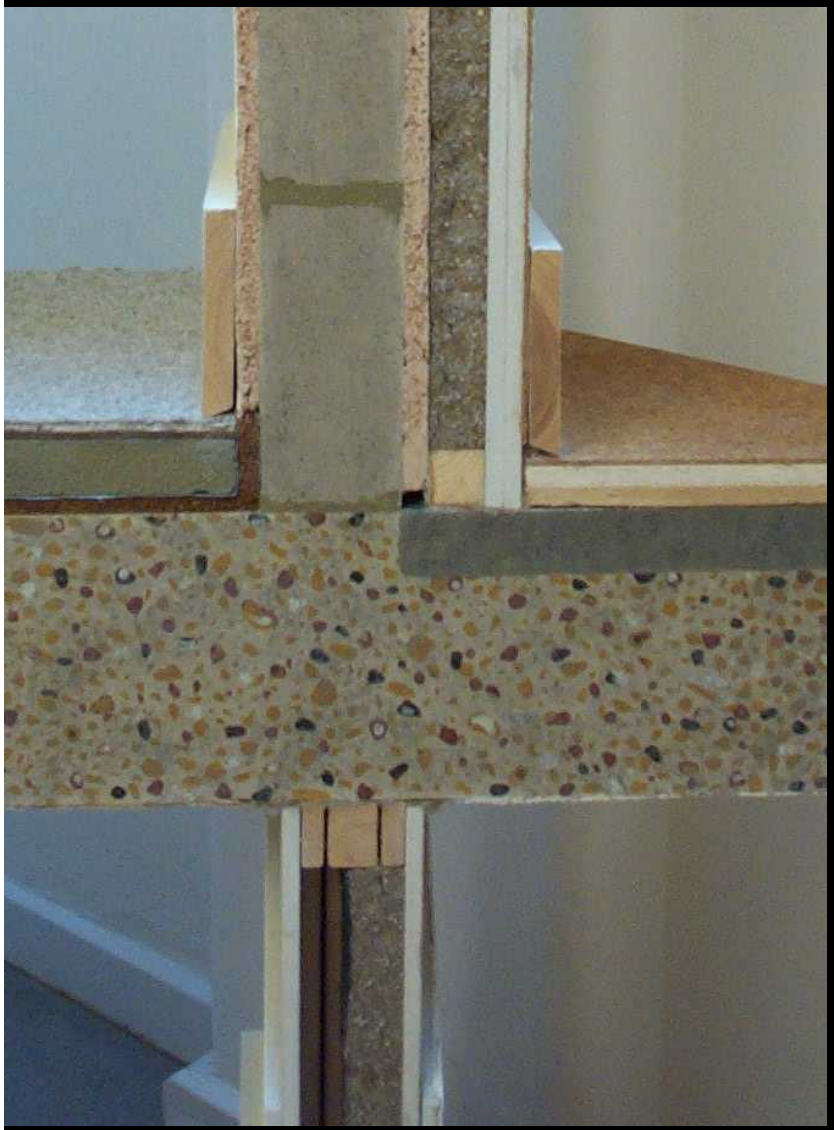
Acoustic Intermediate Floor

- Carpet
- Underlayment
- Floating Floor board/ Sheet
- Acoustic insulation
- interlocking Hollow timber beam floor
- Acoustic insulation at wall abutment
- Exposed soffit

Acoustic Suspended Floor

- Carpet
- Screed could contain recycled aggregates and GGBS cement
- Damp and vapour proof membrane
- coconut fibre sheet acoustic underlayment and upstand
- Insitu concrete floor with fairfaced soffit

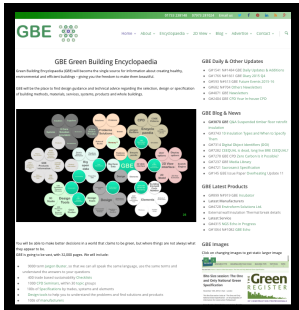
Acoustic Partition (below)



- Multi layered timber framing acoustic isolation
- dense cellulose fibre acoustic insulation between battens
- dense cellulose fibre reinforced gypsum board

Acoustic Suspended Floor

- Carpet
- 2 layers of underlayment dense cellulose fibre reinforced gypsum board
- Monolithic topping could contain recycled aggregates and GGBS cement
- Insitu concrete floor with fairfaced soffit
- Acoustic bridge through partition



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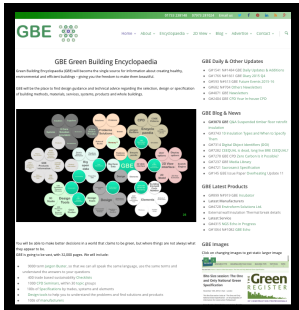
New Walls: Transparent

Construction Resources



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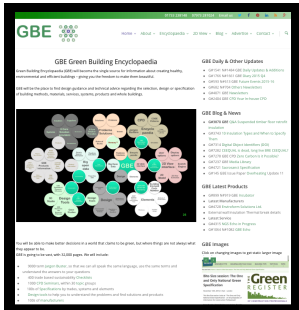
Timber Curtain Walling



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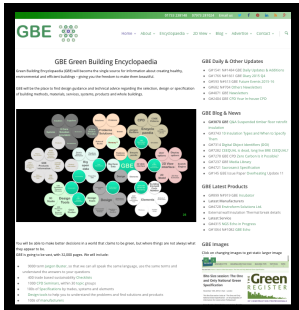
Solar Wall



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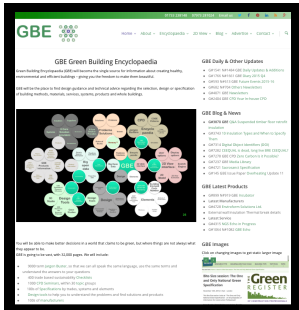
Feedback

- These files are created by generalists with a big dollop of green flavour
- These files are updated from time to time
- We are not experts so from time to time these file may get out of date or may be wrong.
- If you feel that we have got it wrong please let us know so we can put it right



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