

Natural Building Materials Palette

Bringing Carbon-beneficial Solutions to Buildings

Natural Materials:

Any material or product that comes from plants, animals, or the ground in a process of simple extraction.

Biogenic Materials

Wood (bamboo, cork, cellulose)

Fiber (hemp, wool, jute, kenaf)

Inorganic Materials

Stone (limestone, sand, glass)

Native metals (copper, iron)

Earth elements (clay, soil)

Natural
Materials
are best
when used
Responsibly!
-
Local
Equitable
Sustainable

Materials Palette:

Natural materials work together harmoniously to create a healthy, vapor-active system of high-performing assemblies.

Compounding Benefits:

*Use natural building materials throughout a building assembly to compound the carbon-benefitting properties of each material or product, to achieve a **Carbon Beneficial Building**.*

Hempcrete & Plaster

Carbon-beneficial Wall Assembly

Natural Materials:

Plaster

- Lime or Clay
- Sand

2x Stud Framing

Hempcrete

- ♦ Hemp Hurd
- ♦ Hydraulic Lime Binder

Wood Frame

Hempcrete

Plaster

Finish

Coat

Plaster

Base

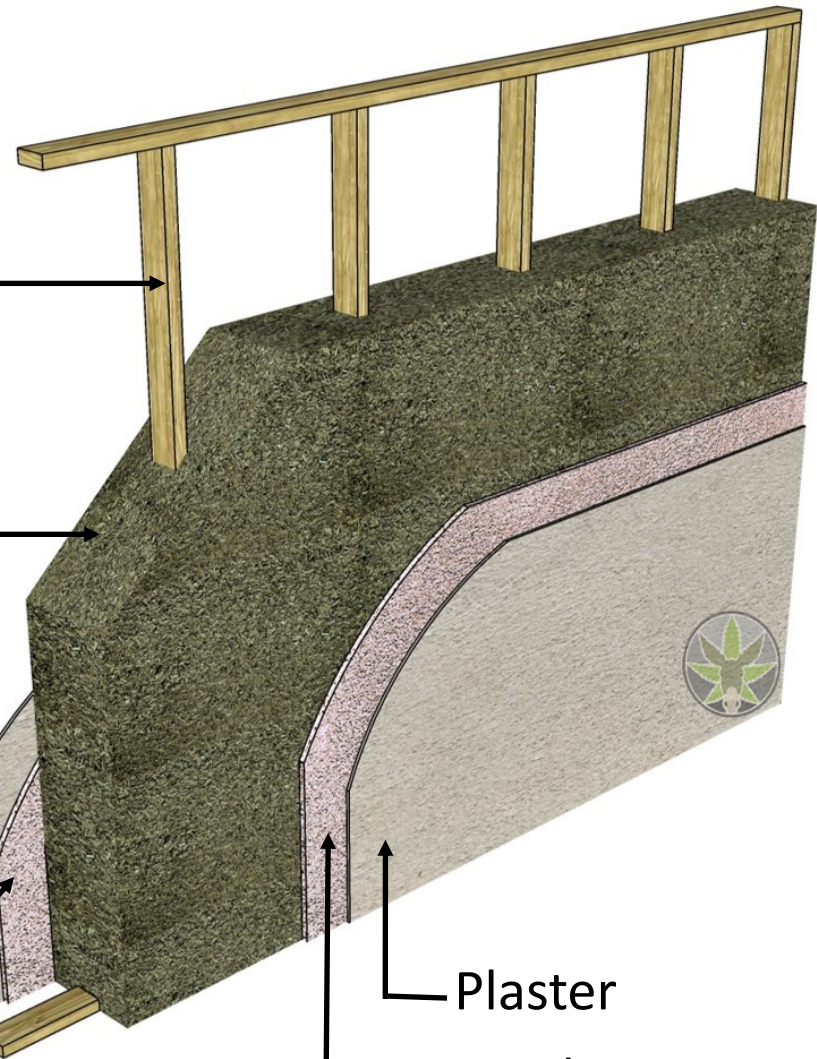
Coat

Plaster

Finish Coat

Plaster Base Coat

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Hempcrete & Clad / Plaster

Carbon-beneficial Wall Assembly

Natural Materials:

Wood Siding

1x Furring Strips

*Lime or Clay Plaster (*or an airtight & vapor-permeable membrane)*

2x Stud Framing

Hempcrete

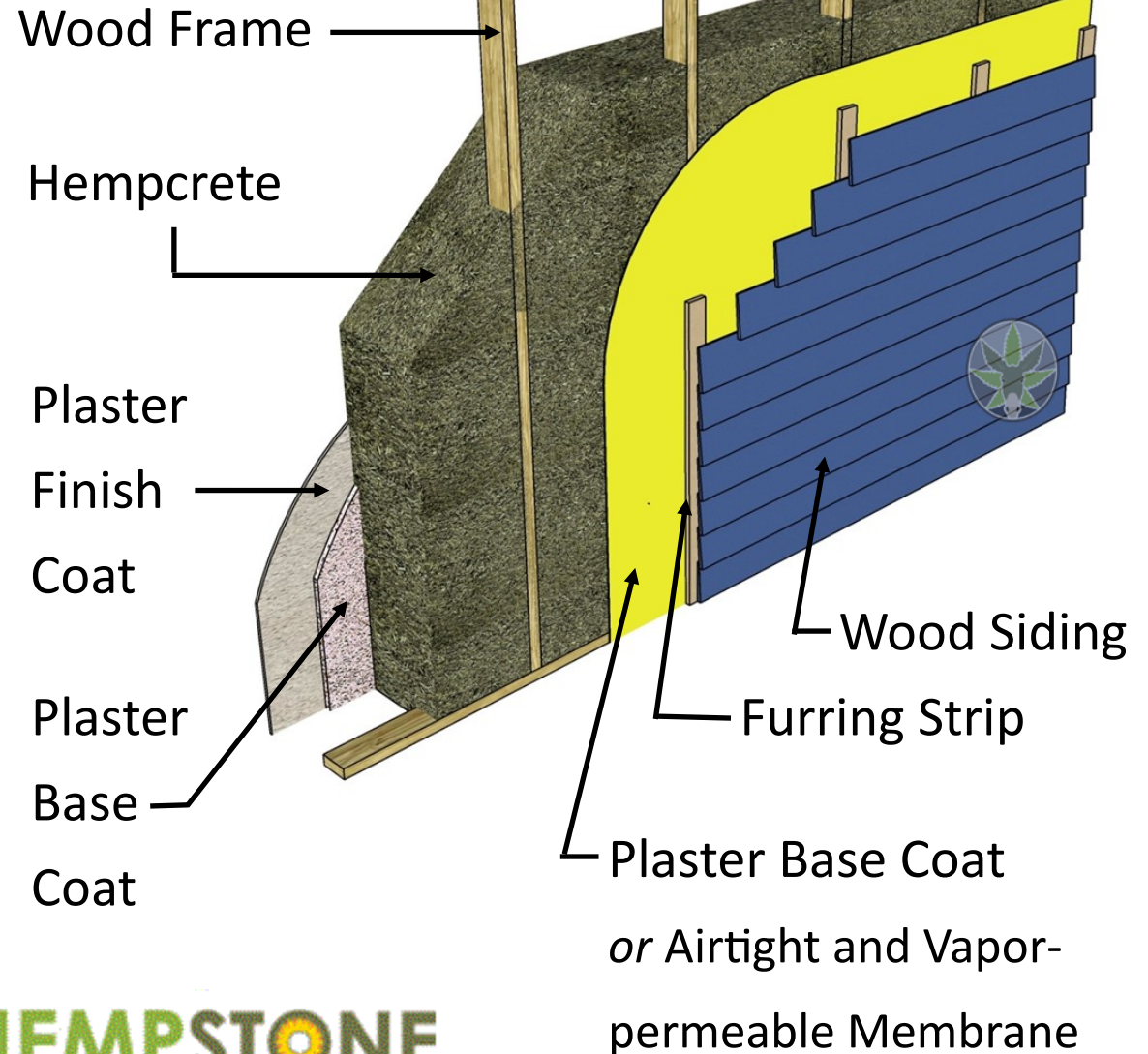
- ♦ *Hemp Hurd*

- ♦ *Hydraulic Lime Binder*

Plaster (Finish and Base Coats)

- ♦ *Sand*

- ♦ *Lime or Clay*

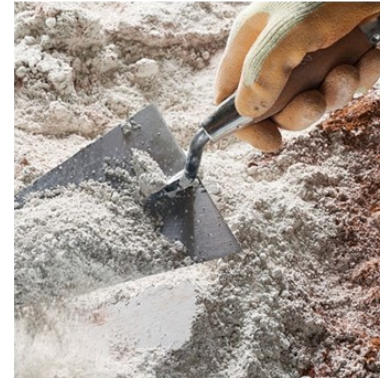


Hempcrete Composition

Hempcrete —

Hemp + Lime + Water

- ◆ *Hemp Hurd*
 - ◆ *Building-quality Hurd*
- ◆ *Lime-Based Binder*
 - ◆ *Hydraulic lime*
NHL or PHL/FHL
 - or
 - ◆ *Hydrated Lime*
+ Pozzolan
Formulated or Tested
- ◆ *Water*



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Hempcrete - Hemp Hurd Sourcing

Manufacturers and Suppliers

Dunagro, Netherlands

HempStone - MA, US

hempstone.net/

Kanabat, France

Americhanvre - PA, US

americhanvre.com/

Plains Hemp, Manitoba Canada

plainshemp.ca/

Valley Bio, Ontario Canada

valleybio.com/

No USA manufacturers yet provide building quality material.



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Hempcrete - Lime Binder Sourcing

Manufacturers and Suppliers

Vicat Natural Cement, France

HempStone - MA, US

hempstone.net/

LCG, France

Hempitecture - ID, US

hempitecture.com/

St Astier Batichanvre, France

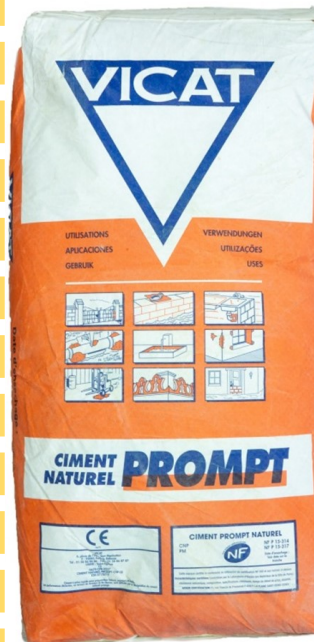
Trans Mineral - CA, US

limes.us/

Radical, UK

americanlimetechnology.com/

***European Binders:
Proven and Tested***



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Hempcrete - Lime Binder Sourcing

Manufacturers and Suppliers

Ecologic Platinum

Limeworks - PA, US

limeworks.us/

Niagara PHL by Graymont

Graymont - OH, US

Local masonry supply

American Lime Technology

US Heritage Group - IL, US

usheritage.com/

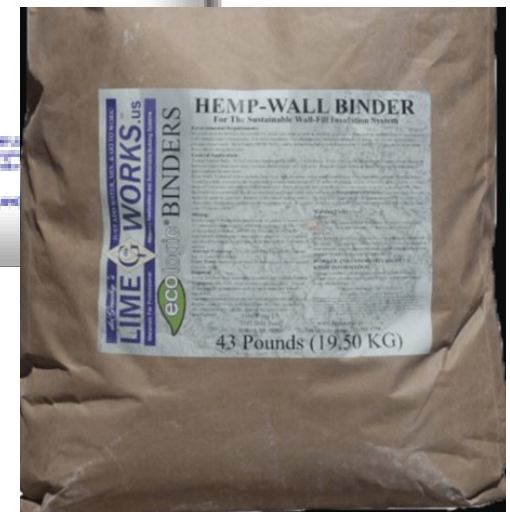
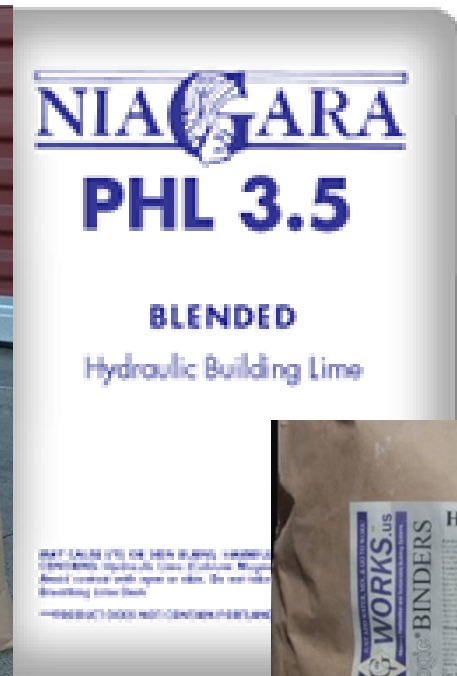
Fifth Element

Hempire - CA, US

hemptraders.com/

bulkhempwarehouse.com/

*American Pre-
blended Binders:*



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Hempcrete - Lime Binder Sourcing

Pick 1 Lime + 1 Pozzolan

Type S Lime

Type N Lime

High Calcium Lime

Pumice or Scoria, volcanic rock

Metakaolin, burned clay

Brick or Terracotta Dust

Calcinated Shale

Marble Dust

VCAS, glass

Silica Fume, electric arc furnace

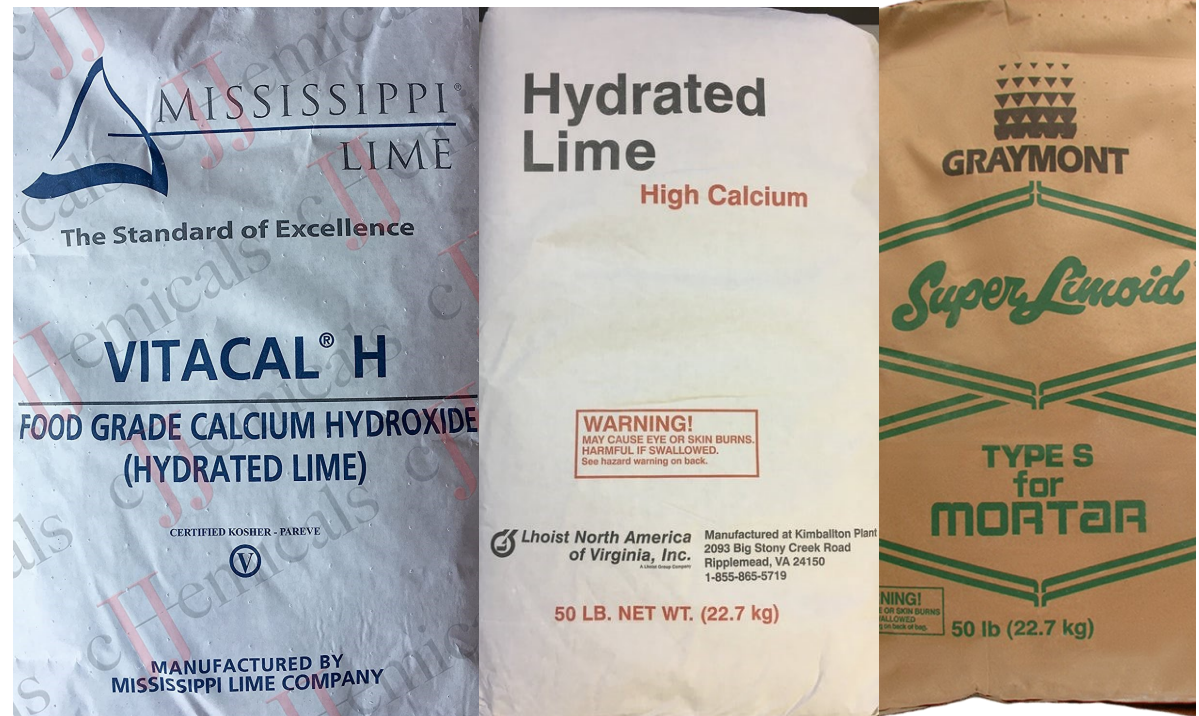
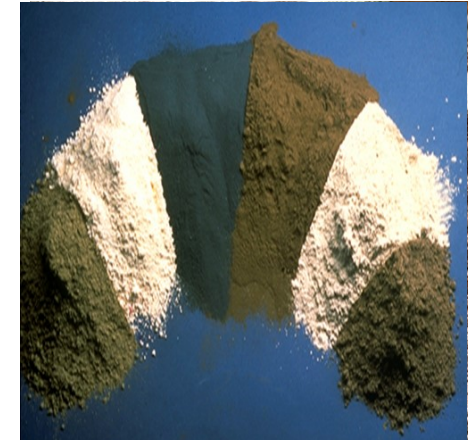
Blast Furnace Slag, steel

Fly Ash, coal

Biochar

Experimental Mixes:

Hydrated Lime + Pozzolan



Caution: Due diligence is required when using pozzolans!

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Natural Plaster Composition

Lime Plaster — Sand + Lime

Clay Plaster — Sand + Clay

- *Sand*
 - *C144 Mason sand*
- *Hydrated Lime*
 - *Type S or High Calcium*
 - *or Hydraulic Lime*
 - *NHL or PHL 2.0, 3.5, 5.0*
- *or Clay*
- *Natural Fibers (optional) to increase tensile strength.*
 - *Plant fibers*
 - *Animal hair*



Natural Plaster - Material Sourcing

Lime Plaster — Sand + Lime

- *Sand*
 - *C144 Mason sand*
Local quarries or masonry supply
- *Hydrated Lime*
 - *Type S or High Calcium*
Local quarries or masonry supply
- *Hydraulic Lime*
 - *NHL or PHL 2.0, 3.5, 5.0*
Local masonry supply

Specialty Lime Plaster Suppliers

limeworks.us/

usheritage.com/

limestrongartisan.com/

Optional: Add Natural Fibers

Plant fibers

- ♦ *Straw*
- ♦ *Cattail*
- ♦ *Hemp*

usheritage.com/

Animal hair

- ♦ *Horse*
- ♦ *Goat*

limeputty.us/

Clay Plaster — Sand + Clay

- *Sand*
 - *C144 Mason sand*
Local quarries or masonry supply
- ♦ *Clay*
Local quarries or excavators

Packaged Clay Suppliers

americanclay.com/

nmclay.com/aliz

portolapaints.com/

Hempcrete Wall & Roof Build Up

Carbon-beneficial Wall & Roof Assembly

Natural Materials:

Lime or Clay Plaster

Hempcrete

1x Battens

2x Stud Framing

Hempcrete Blocks

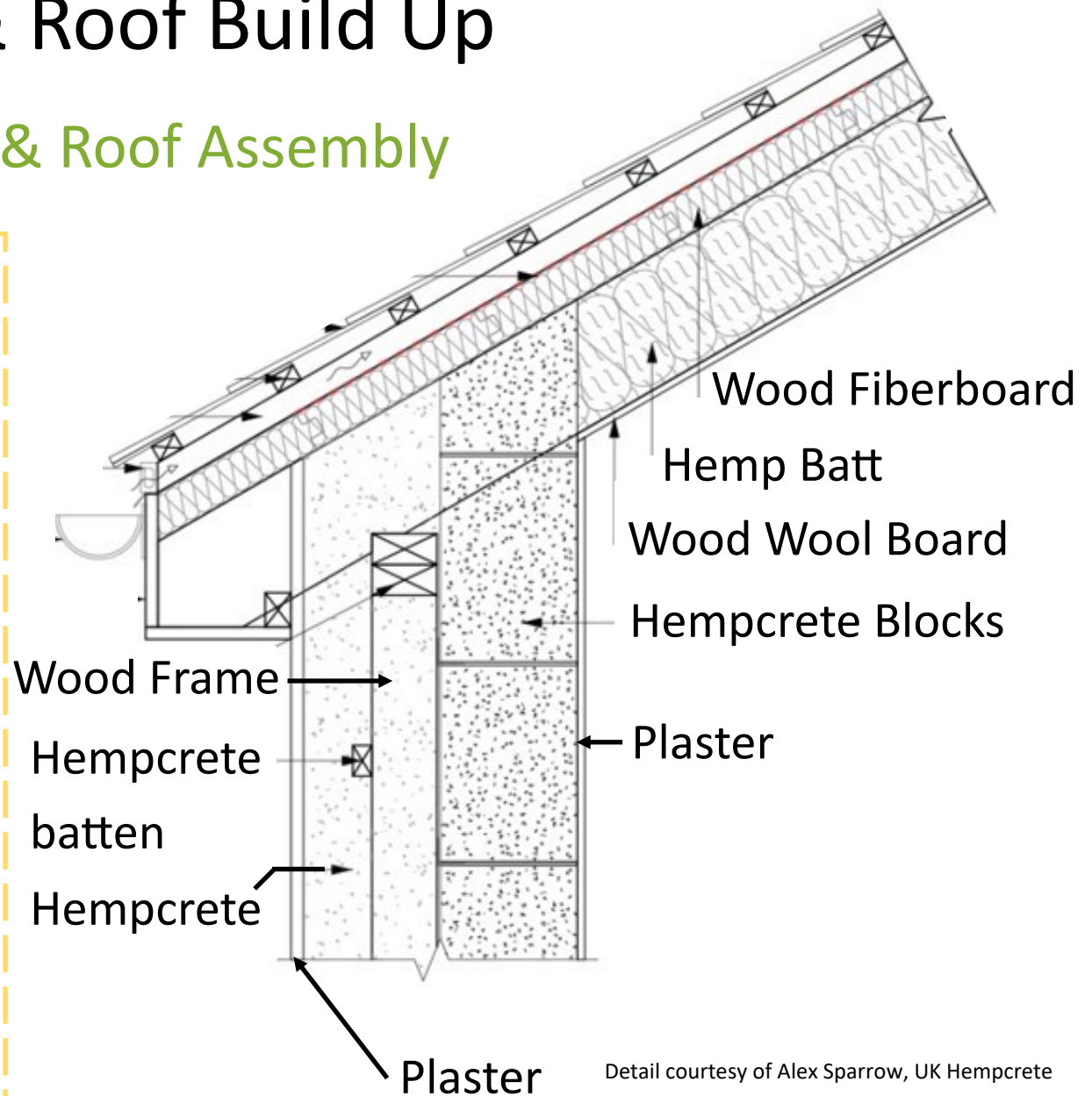
Lime or Clay Plaster

Wood Wool Board

*Hemp Batt or Cellulose or
Hempcrete*

Wood Fiberboard

Wood Trim



Detail courtesy of Alex Sparrow, UK Hempcrete

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Natural Batt Insulation Materials

Manufacturers and Suppliers

- *Hemp Batt*

NatureFibres, Quebec Canada

globalwholesale.biz/

- *Wood Batt*

Steico, Poland and France

globalwholesale.biz/

Gutex, Germany

foursevenfive.com/

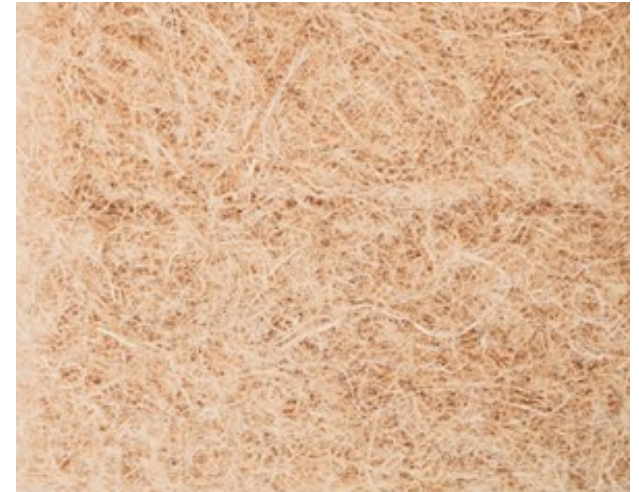
- *Cellulose (recycled material)*

Local insulation/building supply

- *Wool Batt*

Black Mountain Insulation, US

blackmountaininsulationusa.com/



Coming Soon (2021-2022):

US Wood Batt and Fiberboard

Go Lab, Maine

golab.us/



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Natural Fiber Boards

Manufacturers and Suppliers

- *Wood Wool Board*

Tectum by Armstrong, US

armstrongceilings.com/

Cardinal Acoustics - Ohio, US

cardinalacoustics.com/

- *Cork*

Thermacork, Portugal

ecosupplycenter.com/

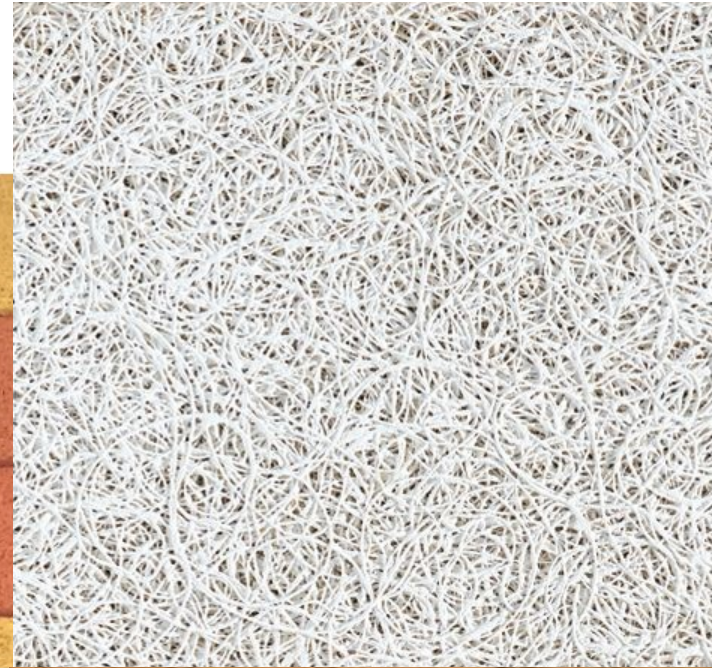
- *Wood Fiberboard*

Steico, Poland and France

globalwholesale.biz/

Gutex, Germany

foursevenfive.com/



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Hempcrete Floor & Foundation

Carbon Conscious Materials Detail

Recycled & Natural Materials:

Insulated Structural Block

Lime-Sand Screed & Finish

(can embed underfloor heating)

- *Hydraulic Lime*

- *Sand*

Insulating Gravel

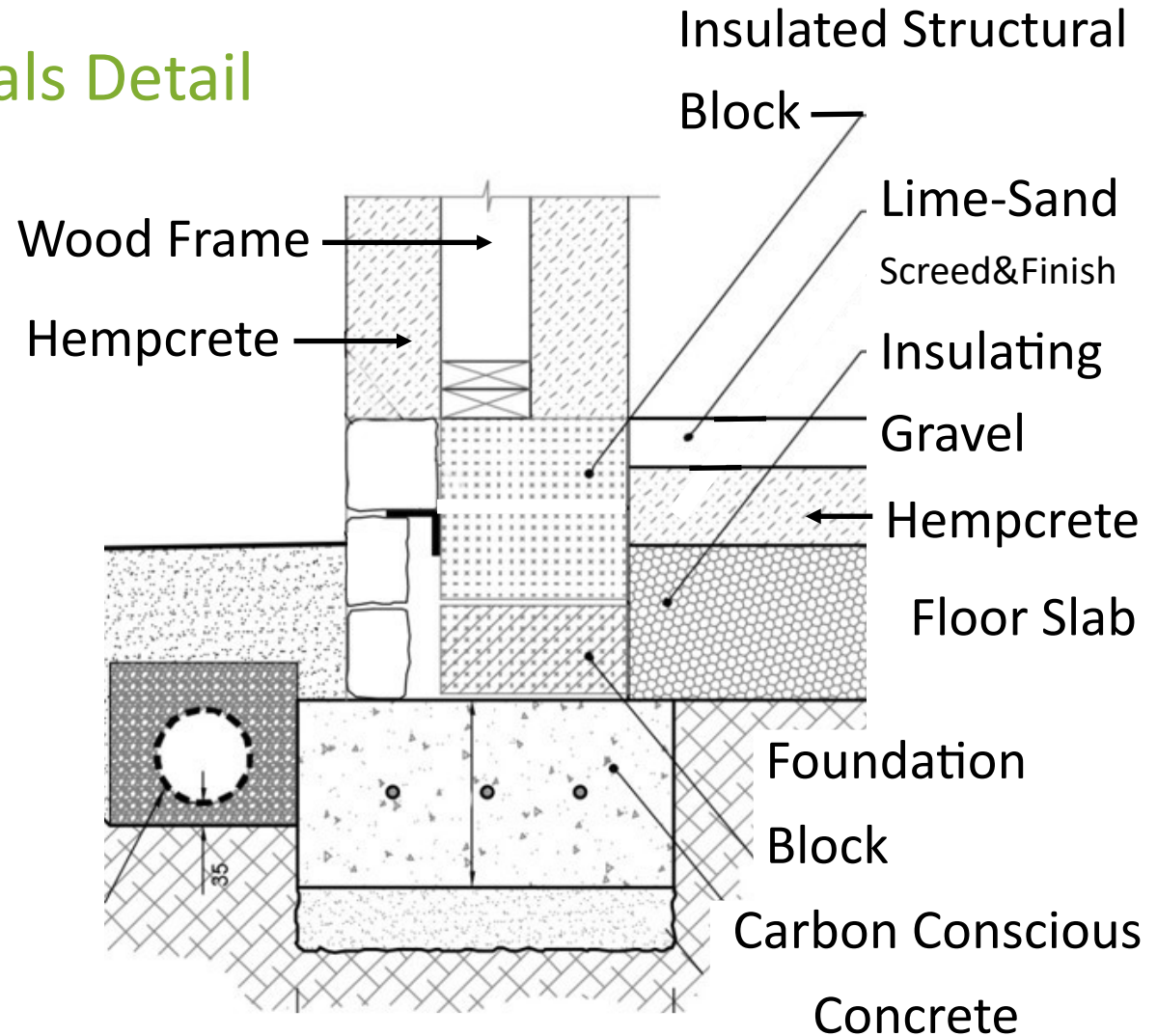
Hempcrete Floor Slab

- *Hemp Hurd*

- *Hydraulic Lime Binder*

Carbon Conscious Concrete

(block and pour)



Detail courtesy of Alex Sparrow, UK Hempcrete

Carbon-Conscious Floor & Foundation Materials

Manufacturers and Suppliers

- *Structural Glass Block*

Foamglas, US and Europe

www.foamglas.com/

- *Insulating Gravel*

Glavel, Germany and Vermont

www.glavel.com/

Aero Aggregates, Pennsylvania

aeroaggregates.com/

- *Lime-Sand Screed & Finish*

- *Sand*

- *Hydraulic Lime*



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Radically Responsible Architecture

Bringing Carbon-beneficial Solutions to Buildings



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Sales, Delivery, Training,

Consulting and Construction

Natural
Materials
are
Radically
Responsible
-
Local
Equitable
Sustainable

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