

amazonails®
strawbale innovation

amazonails®

Hope Mill
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a complete design, build, consultation and training
service in sustainable and natural building

A not-for-profit social enterprise

the national trust 2006 footprint project

amazonails®

natural, local, sustainable materials.



windblown oak,
car tyres,
sheep's wool and straw

www.strawfootprint.org

**the national trust 2006
footprint project**

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good hat, good boots!

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advantages of straw the raw materials.....

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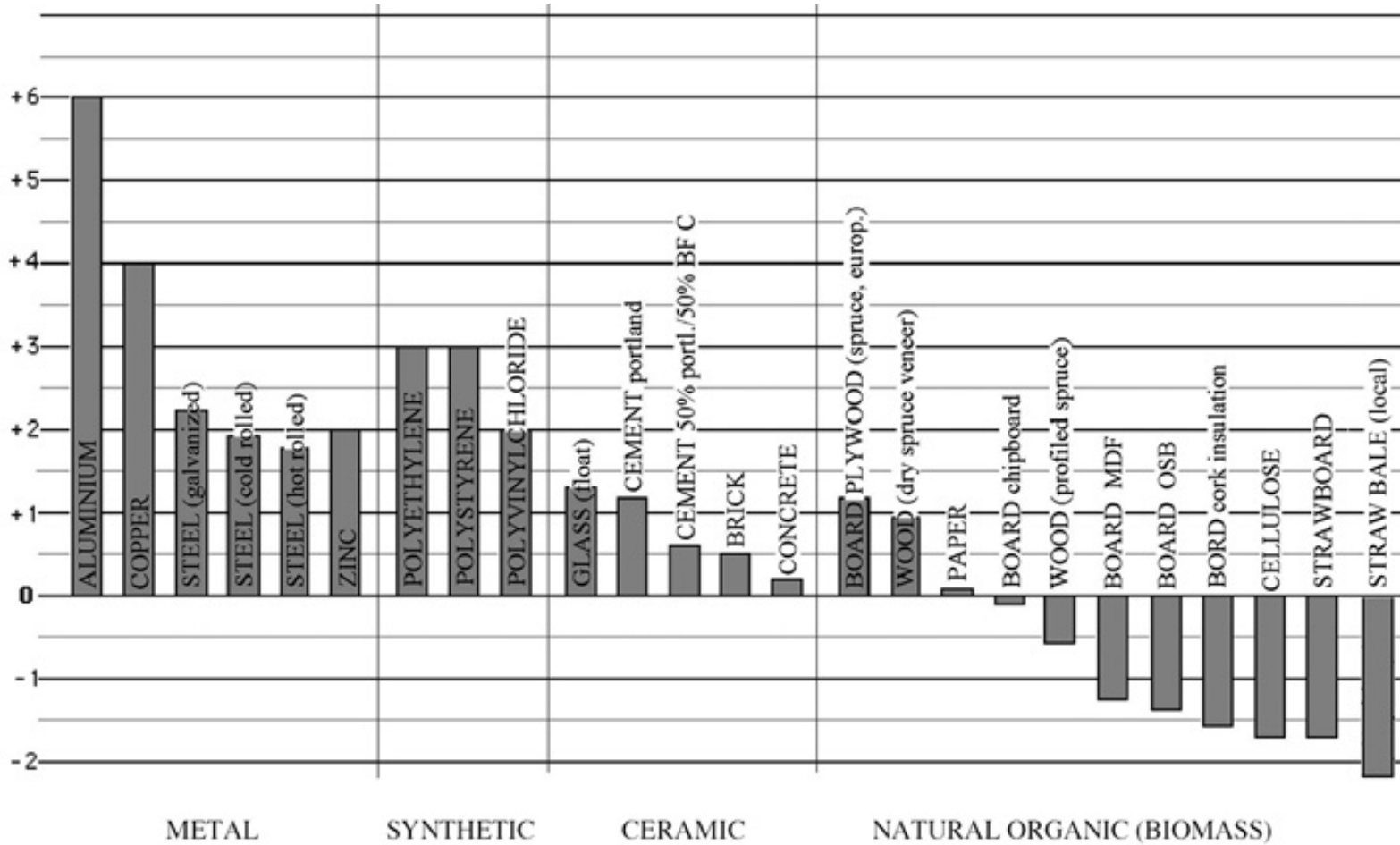


simple & cheap
energy efficient

bales of straw
coppiced hazel



net CO2 pollution [kg] emitted by production of 1kg of 25 common building materials



(MacMath, R., 2000, CARBON DIOXIDE INTENSITY RATIOS: A Method of Evaluating the Upstream Global Warming Impact of Long-Life Building Materials)

long-term carbon storage

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“the **average UK home** produces **50 tonnes of CO2** during its construction.”

Research done by Carol Atkinson

one 16kg straw bale stores about 32kg of CO2

it takes 350 bales to build a typical 3-bed house

this building then **stores** about 12.25 tonnes of CO2 in its fabric.



Wihan 2007

advantages of straw - durability

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simonton house, nebraska 1908

advantages of straw - low fire risk

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tests done with BRE 2004

withstands fire 2hr 40mins

better than most modern materials

meets building regulations for
commercial buildings

can be used for party walls

advantages of straw

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very high thermal and sound
proofing performance

U value approx 0.13

insulation/building block &
surface for plaster – in one

availability of straw

		WHEAT STRAW (million tonnes)				Total Cereals	
	[Area]	[total]	[ploughed back in 40%]	[baled for farm use 30%]	[Baled for sale 30%]	[Area]	[total]
2007	1690984	5.92	2.37	1.78	1.78	2393073	8.38
2006	1709042	5.98	2.39	1.79	1.79	2387691	8.36
2005	1748414	6.12	2.45	1.84	1.84	2429363	8.50
2004	1865163	6.53	2.61	1.96	1.96	2609458.9	9.13
2003	1726562.5	6.04	2.42	1.81	1.81	2543047.9	8.90

DEFRA 2007

building regulations and the amazonails standard amazonails[®] design

	building regulations part L 1b	amazonails standard
wall (W/m ² K)	0.30	0.14
windows (W/m ² K)	1.80	1.80
roof (W/m ² K)	0.20	0.12
floor (W/m ² K)	0.20	0.20

typical straw bale house details

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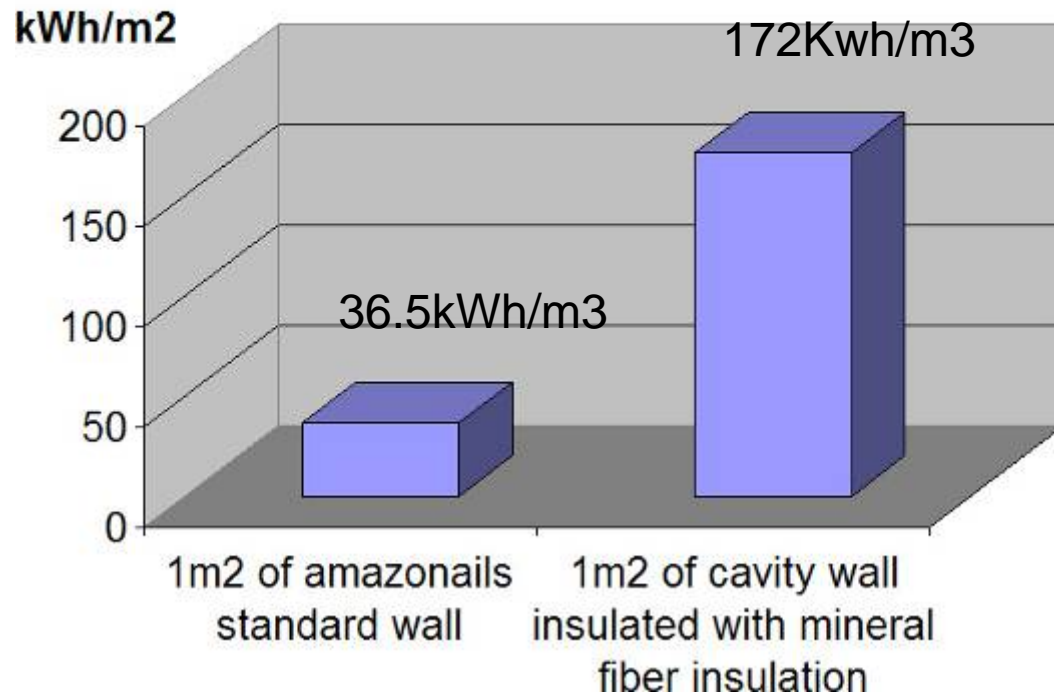
energy rating	materials	% volume of all materials
extremely high	(plastic straps, lead flashing, hinges, locks, handles, nails and screws, galvanized down pipe)	0.14%
very high	(double glazing)	0.09%
high	(OSB, external plywood, tyvek membrane)	2.19%
medium	(baler twine, floorboards, wooden gutters, cork underlay, celenit fibreboard, door/window frames, lime plaster, hessian)	7.34%
low	(local timber)	5.28%
very low	(strawbales, sheep wool insulation, hazel, clay plaster, cedar shingles)	84.95%

Atkinson 2008

low embodied energy

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comparison of 2 wall assemblies with approximately equal superinsulating qualities and their energy embodied in 1m2



from research carried out by Carol Atkinson

www.homegrownhome.com on a house built to amazonails standard

air tightness in strawbale houses

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	Building Regulations	AECB Silver	amazonails standard
air permeability (m ³ /h/m ²)	10	3	1.56

Atkinson 2008

**grand designs eco-home of the year
award 2008**

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Penwhilwr, Wales built
2003-7

UK's first 2-storey
loadbearing strawbale
home



**sworders salerooms 1100 m²
stansted mountfitchet 2007**

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glulam trusses

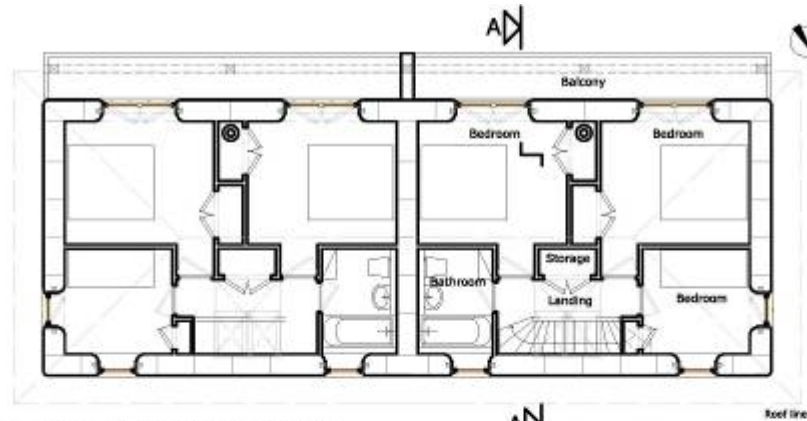


cedar shingles,
compressive frame,

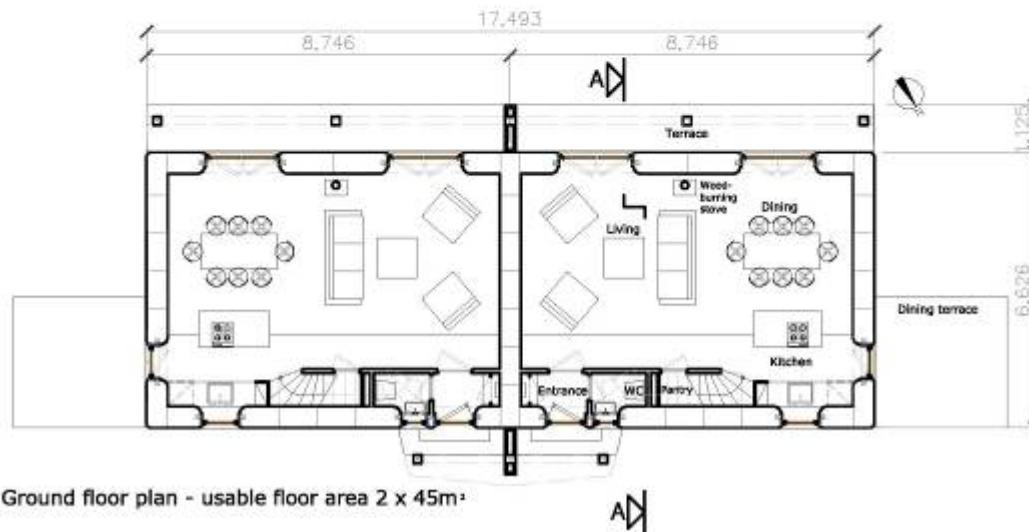
uk's largest strawbale building

strawbale council housing

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First floor plan - usable floor area 2 x 45m²



Ground floor plan - usable floor area 2 x 45m²

strawbale council housing

we will research:

- heat loss -- thermal imaging
- airtightness
- internal air quality
- radon dispersal
- moisture transfer through walls (15 sensors)
- monitor energy use (requires residents agreement), e.g. fuel bills/how much wood burnt
- life cycle analysis
- energy requirements.
- happiness and satisfaction of tenants.

strawbale council housing

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Research quoted is by Carol Atkinson www.homegrown.com

