



straw-bale building



what is it?

It's a building technique that uses straw bales (or even hay bales) for walls – which can be load-bearing, or used to infill a timber frame. It was pioneered in the US mid-west in the 19th century by farmers whose only building material was the waste from their wheat crop. The buildings were intended to be temporary until conventional building materials were delivered. However, they found them to be solid, warm and comfortable, and many continued to live in them in preference to traditional houses.

Walls can be rendered with earth or lime to protect them from the elements (see picture). Three common misconceptions are that they are a fire risk, they can house vermin, and they are not durable. None is true.

US tests have found that even unrendered straw-bale walls are less of a fire risk than timber walls (rendered walls are no more flammable than bricks). Mice and rats are not attracted to straw as it is not a food source. They *are* attracted to holes though, but as long as walls are rendered, they won't house vermin. As for durability, there are 100-year-old straw-bale houses in the States. The wetter climate of the UK presents more of a challenge, but weatherproof rendering and a good moisture barrier means that there will be no problem, whatever the wall material. In theory, there is no reason why a well-built and



Redfield Community's straw-bale sheep shed before and after lime rendering.

rendered building with a solid roof shouldn't last for at least 100 years and possibly a lot more. Furthermore, any problems can be rectified very easily.

They're also cheap (bales cost around £3 each); easy and quick to build by non-experts; good soundproofing; they look good (like a cottage but at a fraction of the price); easy to modify; and each one is unique – no 'little boxes' with straw bales.



Baling needle: this home-made tool allows you to cut and re-bind bales to any size necessary to fit a gap or a corner.

what are the benefits?

- straw bales don't need to be fired like bricks, and don't need cement, both of which use a lot of energy and cause pollution and greenhouse gas emissions
- don't need environmentally-damaging insulation materials, as straw has a much higher insulation value than brick or concrete; also lower heating bills / reduced CO₂ emissions
- biodegradable
- natural material, can be locally sourced, and if used in combination with other natural materials like timber, earth, slate and lime, means no toxins or 'sick building syndrome'

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A 'persuader': another home-made tool, this time for gently persuading bales into the position you want.

what can I do?

If you intend to live in your straw-bale building, the first thing is to talk to your local planning officer. Getting planning permission depends on the local authority, the planning officer, and where you want to build, and not so much what you intend to build it from. There is nothing specific to straw-bale construction in the Building Regulations, but they certainly conform to criteria concerning health and safety, fire resistance and energy efficiency. Problems may arise either with neighbours or planning officials who are averse to anything new in their area. On the plus side, your ideas may fit in with your local authority's sustainability plans, especially regarding insulation levels and the use of natural materials.

When it comes to designing and building, there are many options for every part of the house. Foundations can be concrete, flint and lime, brick or timber pillars, or car tyres with

rammed earth (foundations don't need to be as deep as for brick houses). Roofs can be slate, tile, corrugated metal or bitumen, shingle or thatch. Floors can be concrete, earth or floorboards on joists.

Bales are laid with each course offset, like bricks, with hazel stakes pinning the bales together. Smaller bales can be made using a baling needle (see image). Recycled materials can be used, including timber, doors and windows. Frames can be inserted during the wall-building process, and doors and windows fitted later.

You can self-build entirely, invite lots of friends or hold an event, or get professional help with plumbing, carpentry or electrics. In any case, it's a good idea to read everything you can first, or attend a course.

resources

- lowimpact.org/strawbale-building for info, courses, links, books, including:
- Barbara Jones, *Building with Straw Bales*
- Bainbridge et al, *The Straw Bale House*
- MacDonald & Myhrman, *Build it with Bales*
- Bruce King, *Buildings of Earth and Straw*
- strawbalebuildinguk.com - Straw-bale Building Association
- lowimpact.org/online-course-straw-bale-building - online course
- strawbale.com – lots of useful articles



Lime-rendered straw-bale cottage with living roof.

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