

STRAW BALE BUILDINGS

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Green Design and the City

Historical Straw Bale Buildings



Nebraska, USA 1903



Alabama, USA 1938



Montargis, France 1921



Netherlands 1944



Nebraska, USA 1928

Straw Bales

- Grown annually in a variety of climates
- Already created as part of grain harvest
- Used to provide nutrients to soil
- Low embodied energy
- More sustainable than wood
- Great for insulation



Load-Bearing

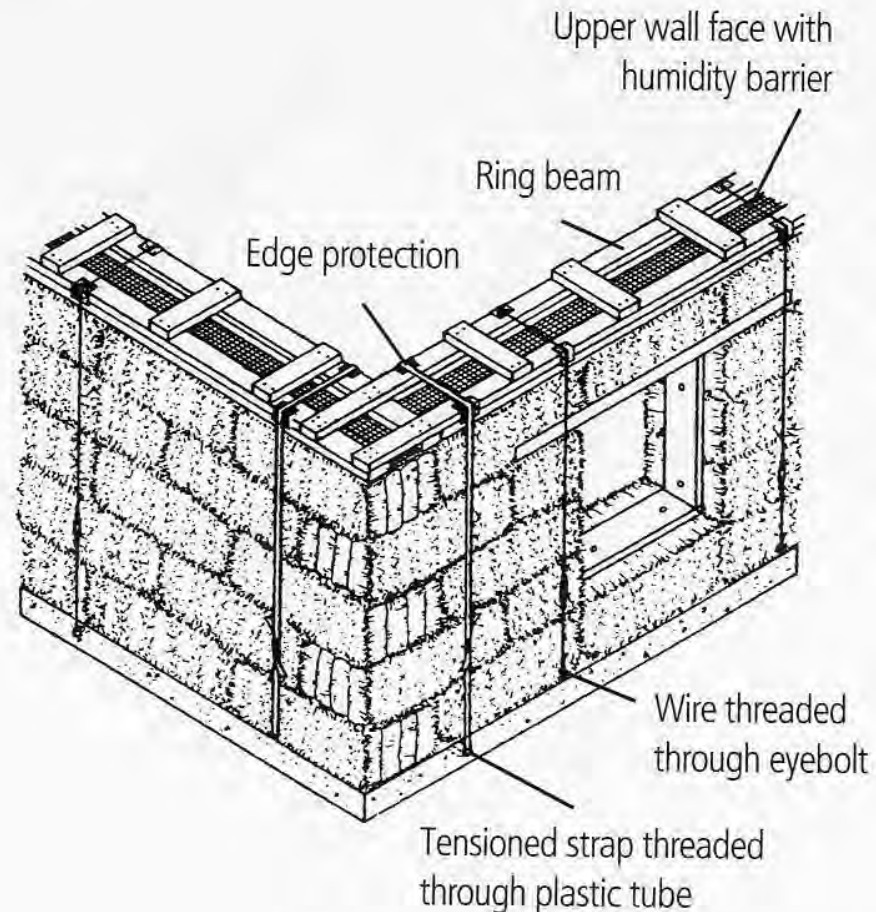
Able to support the weight of the roof

Uses less wood

Walls are fortified with internal or external pinning

Ring beams and tension straps are used to compress the walls

External pinning provides better support for horizontal loads, ex. wind

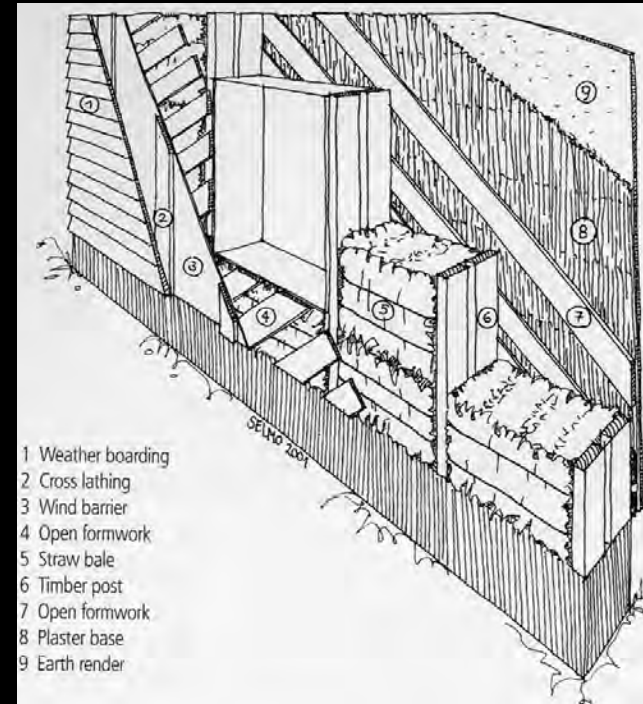
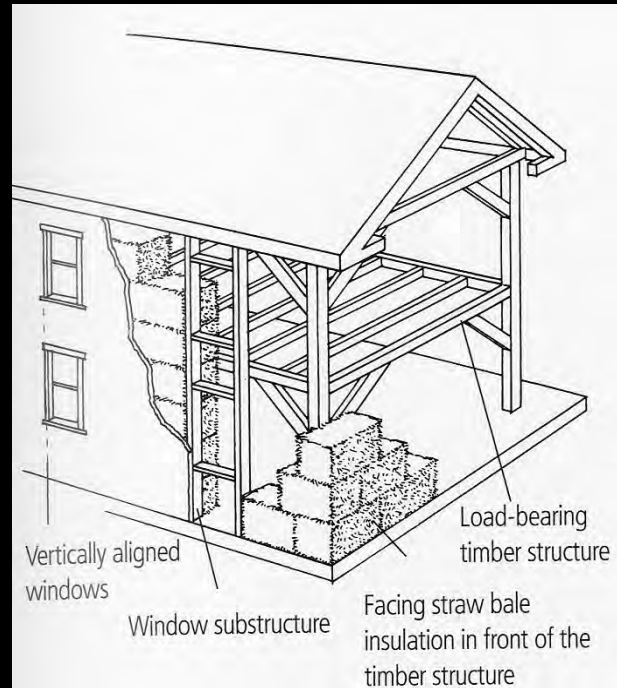


Non-Load-Bearing

Straw bales are used to fill in spaces within support frames

Straw bales are used strictly as insulation

Easier to fix if decay occurs within the walls



Straw Bale Walls

Straw bales are covered in layers of plaster

The plaster helps to protect against fire and moisture

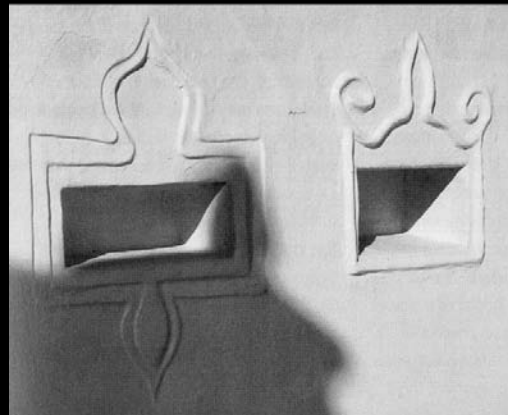
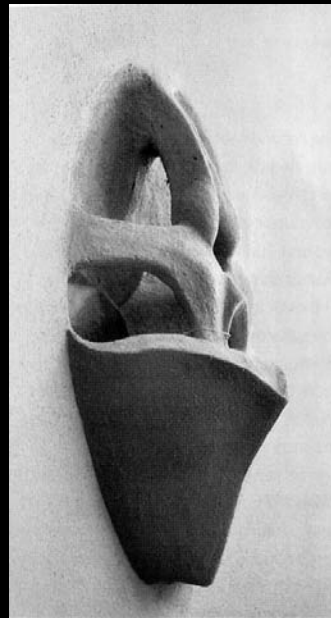
Suitable for earthquake prone areas

Plastering walls is a very time and labor intensive process

Decays faster in humid climates

Thicker walls means a larger foundation and roof

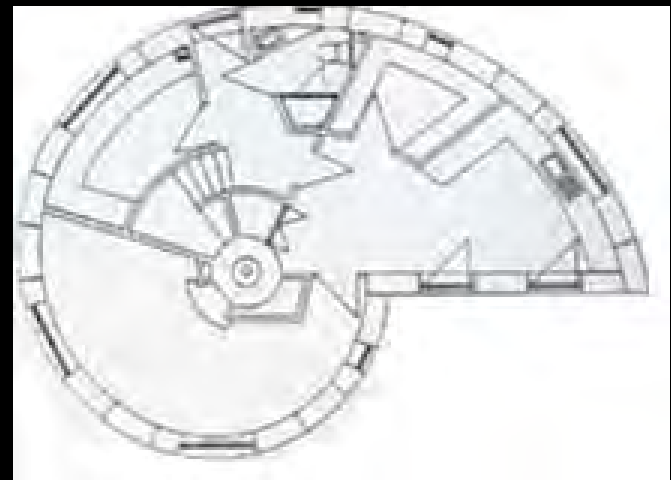
Issues with planning permission and capital aspects



Examples

Castlebar, County Mayo, Ireland

- The Spiral House
- First two-storey straw bale house built with permission in Europe
- Load-bearing walls
- Completed 2002
- Approx 110 m²



Dobernsdorf, Burgenland, Austria

- Single family home
- Non-load-bearing straw bale insulation
- Timber post-and-beam structure
- Completed 2000
- 150 m²



Questions

Work Cited

□ Text sources

- Chiras, Daniel D. *The New Ecological Home :The Complete Guide to Green Building Options*. White River Junction, Vt.: Chelsea Green Pub. Co., 2004. Print.
- Magwood, Chris, Peter Mack, and Elisabeth Ohi. *Straw Bale Building : How to Plan, Design & Build with Straw*. Gabriola, B.C.: New Society Publishers, 2000. Print.
- Minke, Gernot, and Friedemann Mahlke. *Building with Straw : Design and Technology of a Sustainable Architecture*. Basel ; Boston: Birkhäuser, 2005. Print.
- McGill, Nadia. “ADRA Straw Bale Housing Becomes an Eco-Friendly Solution for Post-Earthquake China”. Thomas Reuters Foundation. 06 August 2009. 09 November 2009. <<http://www.alertnet.org/thenews/fromthefield/219487/124959584572.htm>>
- Palmer, Kim. “Project Might Bailout Bale Construction’s Image”. Star Tribune. 10 October 2009. 10 November 2009. <<http://www.startribune.com/lifestyle/homegarden/64963602.html?page=1&c=y>>

□ Picture source

- Minke, Gernot, and Friedemann Mahlke. *Building with Straw : Design and Technology of a Sustainable Architecture*. Basel ; Boston: Birkhäuser, 2005. Print.