

NATURAL BUILDING TECHNIQUES

Natural building techniques are methods that are “greener” than modern manufactured modes of property construction. Typically drawing on older, traditional forms of home building, these techniques emphasize the use of materials, practices and aesthetics that are not ecologically destructive, are sensitive to the natural and cultural surroundings in which the property is sited, and focus on skills and resources that are locally sourced and economically viable, particularly for those who are unable to afford to purchase homes in the modern, “unnatural” property market. Below are some of the natural building techniques that are undergoing something of a revival today.

Adobe

One of the oldest natural building techniques, adobe involves creating a building material with earth and water – sometimes with straw added – which is then dried in the sun. Typically the adobe composite is formed into uniform shapes and then used like conventional bricks, but it can also simply be layered over time to create a structure. The best results come from adobe made from earth with at least 20 percent clay by volume, with the remainder being primarily composed of sand. This provides strength as well as good thermal mass for temperature regulation, although adobe does benefit from the utilization of some insulation; traditionally a double wall with an air space fulfilled this role, but today applying an insulation material to the exterior is more common.

Cob

Cob is similar in technique to adobe, but with more straw is added to the mixture. Also, rather than being formed into uniform bricks, cob is generally used in irregular “cobs” that are applied by hand to build up the structure. While this makes the technique more labor intensive than some other natural building techniques – indeed, in the past, the cob material was typically mixed by laborers’ feet – it does allow for freedom in the shape of the property. Altering

the proportion of straw in the cob mixture will affect its insulating properties and strength, with cobs containing a greater proportion of straw used for interior dividing walls.

Earthbags

As the name suggests, Earth bags are fabric or plastic sacks filled with earth that are then used to create walls. In terms of housing construction, Earth bags are a relatively new technique, but they have been used successfully as flood barriers and for military defenses for some time. As such, Earth bag homes are sturdy and very good at protecting the inhabitants from the elements. Because the sacks – whether the traditional burlap or more modern polypropylene variations – will eventually degrade over time, permanent structures constructed with Earth bags will need plastering with a suitable material, such as a lime-based plaster.

Straw Bales

Straw bale house construction is among the cheapest of all natural building techniques. Straw is often considered a waste product by farmers and burnt in the field, so using it in construction is also a good way to reuse something that may otherwise be destroyed. And because it is an annual crop, straw is a renewable resource. Planning regulations typically mean that straw bales are used as a highly effective insulating infill for a timber or steel frame house, rather than being freestanding, load-bearing walls themselves. Straw bale houses are comparatively quick to construct, but care must be taken to allow the straw to breathe, otherwise moisture can collect in them and cause them to rot.

Bamboo

Bamboo has long been used as a construction material in tropical climates in Asia, Central America and South America. It has great integral strength, meaning that it can be used for structural applications as well as decorative elements. The use of bamboo does rely on specialist knowledge, as joinery techniques used in timber construction do not work well with the unique character of bamboo; however, as long as it is sourced from a sustainable supply, it offers a greener alternative to timber construction, as wood becomes scarcer.

Cordwood

Rather than a species of tree, cordwood is a term that refers to the length of pieces of wood used in the construction technique. Unlike more conventional timber methods, cordwood uses short lengths of wood, comparatively small in diameter. The best way to conceive of it is to imagine using firewood for construction. The logs are bound with a mortar, either cement-based or cob. Cordwood is a relatively quick technique, and typically uses timber that has been deemed worthless by conventional timber construction. Planning restrictions typically require cordwood to be used as infill – it does have good insulating qualities – within a timber or steel frame.

Rammed Earth

Rammed earth uses a soil mixture that has at least 20 percent clay content. The earth is also wetter than comparative techniques such as adobe, with a moisture content of around 10 percent. The earth is tamped down in layers – traditionally by hand but increasingly by machinery – of between six and eight inches thick. The walls of a property built using rammed earth are usually

around a foot wide. This provides great strength as well as taking advantage of the material's excellent thermal mass. The material's ability to reabsorb and release heat makes it ideal for temperate climates (those in warmer climates may want to consider insulating the exterior to prevent temperatures rising uncomfortably high). The thickness of the walls gives a quiet interior and a sense of longstanding solidity. Indeed, rammed earth dwellings have been dated back to the period when the Great Wall of China was constructed (around 200 BC). All these techniques can also be used in hybrid form, with two or more being combined to create a dwelling. For instance, an individual may design a house that uses rammed earth on the south side of the property and straw bales on the remaining three sides, thus using the unique properties of both techniques in the positions most suited to them given the prevailing climatic conditions. And when combined with "green" options in terms of heating and water delivery – such as solar panels and rainwater harvesting – natural buildings techniques offer arguably the construction methods most in keeping with the principles of permaculture.

