

A case for UK-grown cedar

When choosing timber for building, it can be difficult to obtain supplies of affordable or ecologically sourced timbers that have a natural durability thus enabling them to be used for exposed work. In the absence of such resources, the tendency has been to use treated timber in an attempt to ensure the longevity of our buildings.

Self builder **Jerry Clark** describes an ecological option open to us

For those of us in the eco-building movement timber treatment is a great problem. We are left trying to find suitable treatments to protect our buildings from the ravages of insect and fungal attack. The arsenic and chromium laced pressure treating process is a no go area, and who knows what toxic compounds are contained in most timber preservatives. Almost all of which are claimed by many campaign groups to be carcinogenic, and are certainly a threat to any life form that comes in contact with them, which is just what they are designed to be. Boron based products are a good substitute, but finding a source of ready to use timber treated with boron is not easy. This leaves the chippy or builder no choice but to apply the protection him (or her) self, adding considerably to the time required and difficulty of execution of any building task involving timber. Well, some of us have found a way around all of this - we have discovered the joy and simplicity of working with a timber, which for all intents and purposes, does not need any treatment. The timber comes from a tree called Western Red Cedar (*Tuja plicata*). "But that comes

from old growth forests in Canada!" I hear you cry. Not necessarily - read on.

I was first introduced to the idea of using western red cedar by Keith Hall, who has used it extensively in his building renovations at his home in Carmarthenshire (also home to the AECB office). I had asked him how to go about obtaining a supply of timber treated with boron preservatives. He suggested that I might like to use cedar, which would get around the problem of looking for treated timber. He told me of a local supplier in nearby Pembrokeshire. Keith's house renovations involved a virtual rebuild of an old farmhouse, retaining only the main external walls. He used cedar for all the roof structure, and for timber studding and external cladding on an extension to the original building. One look at the cladding was enough to get me hooked!

My own project involved the renovation of a pair of ex-army timber prefabs, of unknown age, which had been installed in tandem at their present location in 1976. We purchased the building in late 1999, along with about six acres of land, and made our renovation plans during the ensuing winter. Having had to keep two wood-burners going almost constantly to avoid hypothermia, I was determined to complete most of the renovation and insulation work during the following summer. So in early spring 2000 we took delivery of around nine cubic metres of sawn western red, fairly freshly extracted from a plantation near Haverfordwest.

The renovation involved replacing the roof and extending the thickness of the external walls in order to allow for greater quantities of insulation than the 4cm of rockwool in the old walls. The new wall structure was inspired by the Segal style, supported by posts resting on new concrete pad foundations at intervals around the previously existing structure. With purlins in place between the posts, the new roof was constructed, involving assembling 'A' frame trusses in situ. Although the parts

were cut to shape in advance of lifting them to roof height, this was still quite a heavy job, as green western red has a very high moisture content, and I didn't have the time to allow it to air-dry. The structure went together well, helped by the minimal movement in the cedar, especially good considering many of the timbers had dried on one side and not the other. Sawing was easily achieved using a 22" jacksaw, and the timber took nails well, splitting generally only occurring if nailing close to the end of a small section timber. The roof used mainly 6 by 2 timber, with trusses spaced at 600mm centres (when will we stop using metric and imperial units in the same breath?).

The existing wall frame was supplemented with successive horizontal and vertical layers of studwork to bring the insulation void up to around nine inches. The interior was panelled with Duplex plasterboard, the exterior with Bitvent to which were fixed vertical battens to take the horizontal waney-edge cedar cladding. Dried and planed cedar was used for internal reveals and architraves, imparting a pleasant smell to the interior from the aromatic oils in the wood. Windows and doors were made from reclaimed pitch pine, a much harder and heavier wood than cedar, and thus better able to take the wear and tear associated with these components.

The following winter (now finally over) we had the benefit of nine inches of granulated cork in the walls and fifteen inches of Ecofibre cellulose in the roof-space. This kept us so cosy we rarely lit more than one wood-burner, and then not until mid-afternoon having let it go out late the previous evening.

Pleased as we were with the external appearance of the refurbished building, we have since added a conservatory and verandah (another two cubic metres of timber). Cedar was used for all the timber requirements except for the verandah decking, where local larch was chosen for

its greater hardness.

The Cabin was hit by hurricane force winds on more than one occasion last autumn, and has had a calculated 3.5 tonnes of snow sitting on top of the five tonnes of slates, and all with no perceptible ill effects, which is more than can be said for some other nearby structures.

The tree

Western red cedar originates on the western coasts of North America, particularly British Columbia in Canada and Washington State in USA. The tree is an erect growing conifer with a single upright shoot at the top, and foliage comprising flat branchlets with scale like leaves, as distinguished from the needle type leaves on most commercial conifers. Old growth forests in America have western reds in

excess of 350 years old, growing to a height up to seventy-five metres and a girth exceeding seven metres. You would be right to avoid timber imported from these areas, as apart from the environmental implications of long distance transport, there is still a widespread policy of clear-felling vast swathes of natural old growth wilderness, with all that implies for the ecological communities based around these forests. Many of the North American timber companies are starting to get their act together, and are beginning to think about what sustainable harvesting means, but they still have some way to go.

The climate in the tree's indigenous range is similar enough to that in parts of Britain for foresters to have imported seed early last century in an attempt to grow the tree here. It was found to be

it is now possible to obtain timber from homegrown western red cedar.

The timber

Freshly sawn western red cedar is pale reddish brown in colour, weathering to a silvery grey with exposure to rain and sunlight. The wood is soft, its resistance to compression and indentation being similar to noble fir, and about 70% of the resistance of Douglas fir. The cedar is very light in weight, having a specific gravity of around 0.35 when air dry, compared with the 0.45 SG of Douglas fir. Comparative workability is important when considering labour costs, and western red has a CW of 1.8, almost exactly the same as Douglas fir and the ubiquitous European redwood. The figures for stiffness and bending strength are around 15 - 20% less than those for European redwood (I could list the actual figures here, but there are four different parameters associated with bending strength, and a lot of complicated units!). Further descriptions of the timber include high strength to weight ratio, straight close grain and coarse texture. The timber dries well if not cut too thick, and is exceptionally stable in use, having a comparatively small amount of movement in varying conditions of humidity, and insignificant cupping and bowing. Tests carried out by the Forestry Commission in 1955 found that the mechanical properties of homegrown timber were slightly superior to those of wood imported from Canada (1).

When tested for suitability as a structural timber, the Forestry Commission graded well over half of the western red cedar tested as a general purpose timber (Grade III), with a substantial quantity suitable for general structural use (Grade II), a proportion distinctly higher than for other minor species tested (1). If in doubt about its suitability for any particular structural purpose, the timber should either be tested or the specified cross-sectional dimensions increased to compensate.

The property of greatest importance for our purposes is its good durability. The wood contains aromatic oils which resist insect and fungal attack, leading to possible longevities in excess of 75 years for untreated exposed timber, as long as the timber is in a position to dry out when it has been wet. However, this is one property on which homegrown timber falls slightly short of imported - homegrown has been rated as moderately durable as against the rating of durable for Canadian timber (1).

The timber is also said to have exceptional insulation values due to its light weight. The total lack of resin in the timber means you won't get seeping out of the knots like you do with some other softwoods. The knots are also live, meaning they don't fall out and weaken the timber like those of European redwood.

One thing to be aware of is the high acidity of the timber, which tends to accelerate the corrosion of certain metals in contact with it - with unprotected iron the wood develops a black stain and the iron tends to corrode. To get around this it is important to use hot-dipped galvanised nails, or even copper in some circumstances.

Uses

Traditional uses include greenhouses and conservatories - many of the expensive Victorian style conservatories manufactured today are made of imported western red cedar. The Victorians usually painted these structures, but this is likely to have hastened any deterioration due to moisture trapping. This should not be such a problem on modern equivalents where microporous coatings are usually employed. As previously intimated, the timber is fine for structural work as long as care is taken with calculating cross-sectional dimensions. External cladding is another major application where the durability of the timber comes into its own, having good resistance to all the weather can throw at it. Boards



Jerry Clarks homegrown cedar clad home 'The Cabin' under construction

at its best in the heavy texture lowland soils in southern England, where about 2000 hectares of plantations now exist in Forestry Commission woodlands, with an unknown plantation area in private hands. Although only planted in the 1950's, the tree grows so rapidly that many of these plantations are already being harvested, so



'The Cabin' after completion

is taken to use sharp blades and allowance is made for the softness of the timber. For instance, it would be rather foolish to use it for flooring, especially if any traffic from stiletto heels is anticipated.

The future for homegrown cedar

Due to its durability, there is likely to be a ready market for high quality sawlogs from homegrown western red. As previously stated, the area planted with western red in this country is quite small, and it has been said that the Forestry Authorities are discouraging its replanting in favour of other commercial types such as Douglas fir. This is mainly because of the lack of a market for small-dimension cedar due to its high acidity causing corrosion problems at pulpmills (1). Some of us who have used the timber, and happen to have some spare land, have been sufficiently inspired as to

the value of the timber to plant a few trees ourselves. However, unless sufficient demand is generated, we may well see the demise of our homegrown stocks of this timber without any major attempt at replacement for the future.

Jerry Clark

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Welsh Timber - sawn western red cedar (Richard Wells) 01646 636935

References:

- (1) Forestry Commission Bulletin No.49 - The Potential of Western Hemlock, Western Red Cedar, Grand Fir and Noble Fir in Britain (1974)

can be moulded, or simply used waney edged to give a handsome rustic effect. Weathering will turn the boards silvery grey with time, but brushing with linseed oil will preserve the original red-brown colour. In North America a major use of western red cedar has been for shingles, a good substitute for slates in a land with

plenty of forests but a dearth of good roofing stone. Due to the fissile nature of the timber it cleaves easily, making it simple to use for this purpose. Cedar shingles are now available made in England from local stock (see below). Western red also lends itself to interior woodwork and joinery, taking a fine finish as long as care

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