

Case Study - Fresh Sawn English Larch Structure



Saville Garden Visitor Centre, Crown Estate

Designed by Glenn Howells Architects for the Crown Estate with English Larch sourced on site from Crown Estate woodlands. The trees were selected & felled then logs were converted, machined and engineered for the gridshell structure.

Savill Garden, Sourcing Larch

The Sawmillers Perspective and Lessons for the Future

As sawmillers our fundamental function is to process the right timber into the right specification and grade to perform its intended use, in the most economic manner.

A simple statement truly tested in this project and worth examination.

General Observations

The specified grade of c16 is generally available in the trade and most UK grown softwood timber can be sawn in volume and visually graded off the saw to achieve this standard.

However the specification of c24, in particular that relating to ring width, is such that wastage can be very high and because it can only be graded visually, slows down the production process. UK sawmillers are therefore reluctant to offer c24 graded softwood partly because it is a distraction but also because the quality of timber required to produce it has to be high. As a result demand for c24 softwood is usually met by imported timber.

The quality of round timber required to produce high grade is not freely available in the UK because:

- a) Forest production over the last 90 years has been based on volume not quality, so wide rings and large knots.
- b) There is no real price advantage to the grower for slow grown timber.
- c) Conventional rotation lengths of 50 years cut trees just after they have reached their maximum annual increment. There is then no period of slow growth, laying down tight rings, from which c24 grade might be sawn.



Cocking Sawmills
Cocking
West Sussex
GU29 0HS

01730 816941
sales@englishwoodlandstimber.co.uk

The Right Timber

At Windsor the project was fortunate that there was a stand of European Larch grown on a longer rotation (p1934) from which logs could be sourced. Preliminary examination of ring density and average size of logs that could be achieved indicated that the timber would perform. Better logs could probably not be found in South East England, although there was a stand on Cowdray Estate that would have yielded good logs. On other private estates with a tradition of good forest practice there will I am sure be other stands.

Other than the quality of the round logs was the volume available from the same stand, where all the trees would have grown under the same conditions and therefore be expected to produce a consistent grade. Early in the testing process Larch was provided from a different wood. The sawn quality proved much poorer for a time casting doubt on the viability of the project. It is vital therefore that the sawmiller has confidence in the source and that the grower an appreciation of the importance of consistency.

Specification/Grade

Before the logs were crosscut we were able to explain to the foresters, whilst logs were still at stump, what length we wanted and point at which quality of the tree deteriorated beyond which they would not yield economically.

A 12' length was settled upon. This suited the sawmill machinery, would become a manageable size once cut and perhaps most critically minimise bowing off the saw. A particular problem with Larch. In this instance we were able to saw to two grades c24/c16, both however with the exclusion of sap. I cannot stress the importance of having both grades to mill against to maximise yield. In the final analysis there was a 40% sawn yield, of which half graded as c24 and half c16. If sappy sections were included total yield was near 50%.

On account of the exclusion of sap I do not believe this yield could have been improved upon and can therefore act as a benchmark for future projects. A smaller section size might have a marginal improvement on yield.

Grading had to be visual at all times with each piece examined coming off the saw and then stacked into either nominally c24 or c16. In making these quite quick judgements it was most useful to have an appreciation of subsequent treatment of the timber in the construction process. In this case to be regraded prior to cross cutting and finger jointed. This allowed for us to include sections where for example, one edge had a minor amount of sap or a dead knot. Otherwise these sections would have failed the grade and been rejected further reducing yield.

In the end I believe the overall grade achieved by nominal c24 was c36.

Summary

The success of this timber procurement demonstrates that UK grown Larch can perform to the highest engineered standards. However all elements of the supply chain from the design engineer to the man felling the tree must have an understanding of what is being asked of the timber.

The key points we must communicate in a time when local sources of timber are becoming more important are:

- Home grown Larch is available and does perform.
- Specifiers must have an appreciation for application and create design that works with its natural properties.
- Project managers need to understand the lead times required to source and deliver this high quality timber.

We can deal with all the other issues, after all we're only sawmillers!



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