

The Surprising Qualities of Wood in Engineering.

In collaboration with ICF

The Society for the Environment (SocEnv) was very pleased to collaborate with the Institute of Chartered Foresters (ICF) to host a seminar at Edinburgh's Napier University in November. Focusing on the 'Qualities of Wood in Engineering', members from the ICF, together with Chartered Environmentalists and their colleagues gathered at the stunning timber grid shell Lindsay Stewart Lecture Theatre at Edinburgh's Napier University, before being transported to another part of the university campus for some hands on testing of UK timber.

Dr Dan Ridley-Ellis, principal Research Fellow at Edinburgh Napier University, conducted a tour of the testing facilities to demonstrate two types of equipment used to assess the strength of UK timber for use in construction and engineering. The grade-determining properties of timber are strength, stiffness and density and for UK spruce, it is stiffness that governs the grade.

The strength of timber can only be measured destructively but it is correlated with:

- Stiffness
- Density
- Knots
- Grain e.g. ring width (rate of tree growth & radial position)
- Species
- Origin

Stiffness can be measured non-destructively, by measuring vibration, or by bending and also correlates with density, knots, grain species and origin. Density can be measured with a balance or by using x-rays and also correlates with stiffness, knots, grain, species and origin. Delegates were given two demonstrations, using equipment to test 'acoustically' for stiffness and 'destructively' for strength and stiffness.

The first test demonstrated a hand-held grading device (MTG Brookhuis) to measure the resonant frequency and calculate dynamic stiffness. This method was fast and measured the whole piece of wood.

The second test – a destructive test, was well worth waiting for. Using a Zwick testing machine to exert gradual bending of the piece of timber at the position assessed to contain the worst defect. The method is relatively slow but provides direct measurement of strength and stiffness that can be used (as part of an extensive testing programme) to calculate dynamic stiffness thresholds for use in grading timber. A video clip taken of the test demonstrates how the UK Sitka wood slowly bends – under the increased pressure being applied, until it finally breaks under 900kgs after several seconds of satisfyingly loud cracking noises.

Delegates then returned to 'the Egg' lecture theatre for a seminar by Dr Dan Ridley-Ellis; he explained in detail the various scientific methods used to assess the strength of UK timber and the variations between different grades and how they translate to various uses for UK timber within engineering. The seminar was followed by a brief introduction to the 'Grown in Britain' campaign by Chartered Forester Dougal Driver CEnv, the CEO of 'Grown In Britain'. Dougal gave an overview of the aims of the campaign and an update on its success and plans for the future. www.growninbritain.org

The evening ended with a networking session over canapés and drinks with an opportunity for delegates to meet new colleagues working in many different sectors, from forestry management to wood science and academia.