TOWERING TIMBER

Waugh Thistleton is creating Europe's tallest all-timber residential building in East London. *Oliver Lowenstein* paid a visit

A nine-storey timber residential tower under construction in Hackney, East London, suggests a route to carbon-neutral, and even carbon-positive construction. London-based practice Waugh Thistleton's 24 Murray Grove, or The Stadthaus, uses a massive wood-panelling system from Austrian firm KLH for its entire load-bearing structure. If Waugh Thistleton has done its homework correctly, the Stadthaus will be the tallest all-timber residential building in Europe when it completes in October. This £3 million, 29-apartment housing block (comprising 19 private sale units, nine affordable tenancies and one shared ownership) for Telford Homes saves 306,150kg of carbon in the construction process compared to a steel and concrete building, according to Waugh Thistleton. Furthermore, 181.360kg of carbon was captured in growing the trees for the timber. As a result, Hackney planners waived the London Plan's requirement for 10 per cent carbon reduction through on-site renewable energy generation.

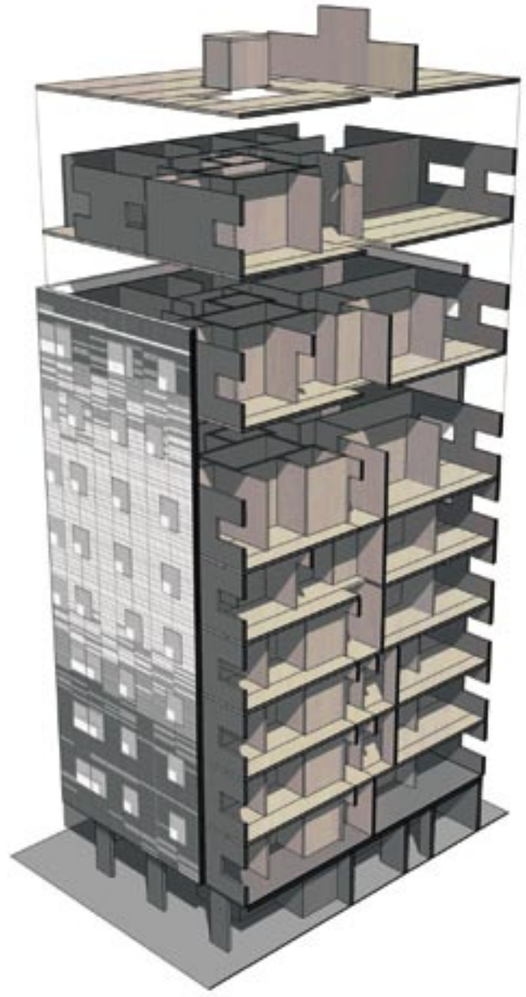
The scheme has been made possible by the KLH prefabrication system, which, although relatively new here, is common across Europe. KLH opened its British office three years ago, on the back of de Rijke Marsh Morgan's Kingsdale School sports and music hall building in West Dulwich, south London. Edward Cullinan Architects is currently using the material on a visitor centre for the Royal Botanic Garden, Edinburgh. KLH's principal competitor, Finnforest Merk, has provided cross-laminated panelling systems to projects such as White Design's Dalby Forest Visitor Centre in North Yorkshire, recipient of the Prime Minister's Better Public Building Award in 2007.

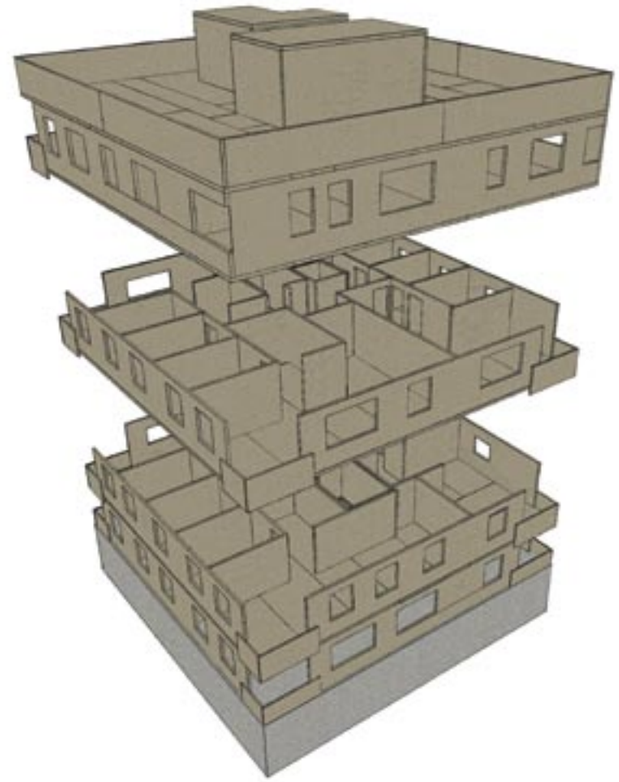
Use of timber in lift shafts, unknown in Europe, is a first, the architect says

The choice of structural timber panels, says Waugh Thistleton director Andrew Waugh, emerged from conversations with engineer Techniker. Techniker's project engineer Matt Linegar explains that avoiding proportionate collapse has been the primary technical challenge for higher-rise timber structures. Linegar found neither research nor precedents nor regulatory guidance in Europe or the UK. At Murray Grove, Techniker has designed considerable redundancy into the panel system by tying and overlapping the cross-laminated wall and floor elements while retaining standard KLH fittings. This previously uncharted engineering territory is now being added to the UK Building Regulations in annexe form, Linegar says.

When Waugh Thistleton proposed timber, the client listened attentively. With Hackney's planners also receptive to the idea, Techniker developed the feasibility study, modelling acoustic separation issues for walls, lifts and services. Wall depth and performance testing requested by the client involved a test rig in Austria. For project architect Kirsten Haggart, one of the most time-intensive tasks was checking the plans before they went to the KLH factory in Austria, where each panel was cut by CNC-routers and then loaded on to a lorry. Importing engineered timber from Austria is a long eco-haul, one Waugh acknowledges. 'It's ridiculous that we don't have our own timber from Scotland, but there aren't any companies,' he says.

Speed of construction is remarkable. When I visited two weeks ago, the building had reached the fifth floor. KLH panels make up all the building's interior walls and floors; KLH's four German contractors have completed each floor in three days. Timber will only be exposed in the common areas, so residents won't physically experience the timber in their apartments, where it will be hidden behind plasterboard. According to >>

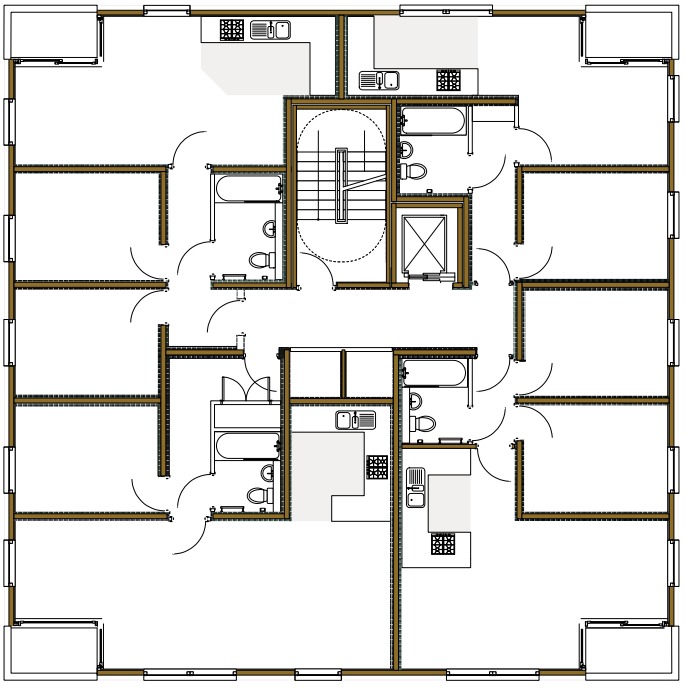


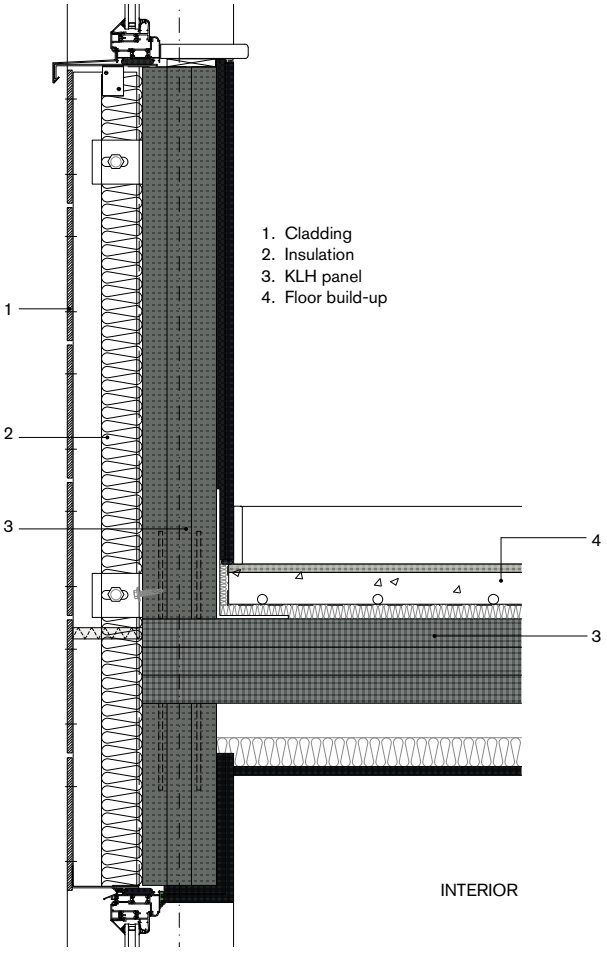


Left Isometric showing panels and Eternit cladding
Below Diagram showing KLH panels for lift shaft and walls

Opposite page Construction of floor two (*below*), and floor five (*above*). Each floor has been assembled in less than a week

Clockwise from right
Murray Grove; Fifth-floor plan; Wall section; Construction view of cross-laminated panels secured with steel angle brackets





KLH director Karl Heinz Weiss, wall lining is also the fashion in Austria and Germany. Use of timber panels for the lift shaft, unknown in Europe, is a first, according to Haggart. For the building exterior, the architect has chosen Eternit cladding panels, made from 70 per cent waste timber. The panel layout will be based on sunlight and shading patterns recorded by the architects in the surrounding area.

Waugh Thistleton is specifying KLH again on a synagogue in East London

'Pioneering this technology in Britain is really exciting for us,' says Waugh. Waugh Thistleton is specifying KLH again on a synagogue in East London's Victoria Park (where it will be exposed internally) and a 12-unit housing scheme in Ealing, west London. Techniker's Matthew Wells is looking at the possibility of building to 14 storeys. Beyond that, timber becomes structurally problematic due to long-term movement, says Wells.

What's surprising is the lack of precedents to this project in the woodier parts of Europe, principally for regulatory reasons. Austria prohibits timber housing above five floors. Finland only started to allow three-storey timber buildings after fire regulations were updated in 1997. For the moment, the irony remains that the UK, a country with hardly an engineered wood sector to its name, is producing the tallest cross-laminated timber high-rise across the continent. ■

Predicted annual CO_2 emissions: 28.69kg/m^2