Learning by doing

Architectural lecturer Dr Lucélia Taranto Rodrigues of Nottingham University sees the practical collaboration between students and the timber industry to design a ground-breaking all-timber eco-home as a valuable learning process for both.

Last year in the TTJ a series of authors pointed out the need to encourage younger people into the timber business, not only to bring innovation, but also to help demystify the industry. The University of Nottingham, through the Solar Decathlon Europe competition, may be contributing to the dissemination of the use of timber to hundreds of young architects.

The University’s Department of Architecture and the Built Environment is one of 19 finalist teams competing in the Solar Decathlon Europe. This is an international competition for universities from around the world; the aim, to raise awareness and advance knowledge on industrialised and sustainable homes, with particular emphasis on efficiency and energy self-sufficiency. The final takes place in Madrid from June 18-27, with Nottingham representing the UK.

Designed and built by students, the Nottingham H.O.U.S.E. (Home Optimising the Use of Solar Energy) will deliver a zero carbon sustainable design applicable to the UK context. It will be Code for Sustainable Homes level 6 compliant and has also been provisionally Passivhaus certified. While at first glance the design, which will work as a terrace or semi-detached, may not seem like a solar house, it is in fact almost entirely based around exploiting solar energy to provide a low carbon solution. The idea is also to make sustainable concepts for family houses more viable for the mass market. The way the students found to deliver this was to use timber throughout the project.

Early in the design process the method of prefabrication was decided, so construction and architectural expression were intrinsically linked. The H.O.U.S.E. is split into eight modules made of timber cassette panel structures, with joints left visible to express the method of construction and provide a sustainable story about efficient prefabrication.

The Saint-Gobain Group, including Pasquill and International Timber, supported the project with technical inputs and material supply, and materials were selected on a number of criteria to ensure they fitted with the architectural design of a family home, while also satisfying our sustainable ethos and logistical strategy.

Timber frame panels from Pasquill were selected for their green credentials and for being a form of carbon sequestration. They also ensure thermal bridge-free construction. These characteristics meant the house could be entirely prefabricated and erected very quickly, and that the project could be handled by the students in line with the aim of the project as educational tool.

FSC plywood is used throughout the house, both to continue the timber construction theme, but also to create a warm, friendly design. The plywood also serves to hint at the structure it covers by indicating module joints and beams, as well as forming a modern interpretation of the architrave to make spaces feel taller.

The house is clad in FSC-certified Chilean radiata pine Stellar ‘thermovood’, from International Timber. This has excellent durability, is a sustainable resource and another form of carbon sequestration. It also provides a vertical visual rhythm which enhances the aesthetics of the house and promotes a great backdrop for what happens within the courtyard. In the latter, residents can grow crops in timber planters, reducing their shopping bills and carbon footprint.

Learning tool

The Nottingham H.O.U.S.E. has been an exemplary learning tool. The design and construction have put students in touch with issues such as embodied energy, energy efficiency, user comfort, material selection, construction management and on-site implications of decisions made during the design stage.

The design was brought about through an architectural diploma studio at Nottingham which focused on zero carbon housing. Groups of fifth year and masters students were asked to produce designs not only for the Solar Decathlon, but that would also form part of a sustainable masterplan for a deprived area of Nottingham. Once the winning design had been selected, all the students came together to refine it. Next a second-year unit was enlisted to provide the labour, as well provide further design input. These students, and many others from different years, co-ordinated by University staff with a wide range of expertise, all volunteered. They did not necessarily have experience in timber construction but this has not been an impediment, more a motivation for more learning.

The enthusiasm of the students has been contagious. Some said they’d learned more in the few months constructing the H.O.U.S.E. than in the rest of their academic lives! The project won the Timber at Ecobuild Award, launched by TTJ/Timber & Sustainable Building magazine at the eco construction show in March, and the judges said the students manning the H.O.U.S.E. stand were “some of the best ambassadors timber and timber building could have”. Also at the exhibition, housing minister John Healey said “the students are making it happen in the way that perhaps traditional architects and builders wouldn’t because they are thinking afresh and bringing the innovation of bright young minds”.

Live projects such as the Nottingham H.O.U.S.E. can deliver what isolated lectures on sustainability and environmental design cannot. And the benefits from what the students have learned will filter through not only the University, but also industry and the community. With their acquired knowledge of timber credentials and construction, they will be at the forefront of the way ahead for the current and future architectural, construction and environmental professions.

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