Primary school





Project information

Completion date:	September 2015
Building type:	School
Location:	Knowle Road, Mellor, Stockport
Client:	Mellor Primary School
Architect:	Sarah Wigglesworth Architects
Structural Engineer:	Rhodes and Partners
Main contractor and external joinery:	MPS Construction
Structural timber supplier:	Constructional Timber Manufacturers Ltd
Timber cassette supplier:	McVeigh Offsite Ltd
Internal Joinery:	Image Joinery
Timber supplier:	Vincent Timber
Timber elements:	Structural frame, external cladding, deck
Timber species:	FSC and PEFC Certified European larch, PEFC Certified Canadian Western Red cedar, FSC Certified birch faced ply

Introduction

Mellor is a small village not far from the Stockport / Manchester conurbation yet on the edge of open country and the Peak District National Park. Its primary school, looking out over woods and fields, has a 'Forest School' ethos, which holds that learning through the the outdoor environment is key to helping children build resilience, resourcefulness and an ability to work together. It is an ethos closely reflected in its new extension, designed by Sarah Wigglesworth Architects. Like a 'tree house in the woods', the extension is a cluster of timber-clad pitched roof forms set on a deck which extends into the landscape. It offers a series of exciting and stimulating spaces, both indoors and out, that supports the forest school curriculum. The design was the result of close liaison between client, project partners and the local community.

Timber is the dominant material used in the extension, chosen for its qualities of low energy, robustness and sustainability; it also reflects the school's 'Forest School' philosophy and allows the building to sit comfortably within its green belt setting. Walls are clad with cedar shingles and vertical cedar boards, while tree-like glulam frames support the roofs internally and canopies externally, making visual connections between internal and external spaces. The school, set on the outskirts of the village, is a 1990s single storey building designed to an open plan layout with its main entrance and playground on the south side. In order to provide uninterrupted access to the main entrance throughout the build, the extension is located on the north side of the school, where the ground slopes steeply downwards into a woodland landscape. This presented a challenge, but also an opportunity to transform the classroom experience; to accommodate the slope, the extension is built on a timber deck looking out into the woodland, establishing the concept of the classroom as a 'tree house'.

The extension has allowed the school to expand to single form entry. The new accommodation consists of a series of indoor and outdoor spaces; an additional classroom, a special educational needs room, a library, an extended hall, new toilets, and a wellington boot and outdoor equipment store. The new classroom and library enjoy views out into the surrounding tree canopy. Covered external deck areas can be used as outdoor classroom space as well as for informal play. A key external feature is the habitat wall a thickened wall on the east elevation which is constructed as a framework to accommodate different types of biodiverse habitats for birds, insects, small animals and plants.







Ground floor plan of new extension



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Section through new extension showing glulam structure



Perspective diagrams of glulam frame



Key

- 1 classroom
- 2 SEN room
- 3 store
- 4 covered timber deck as outdoor classroom / external play space
- 5 existing school building
- 6 Western red cedar shingle roof covering
- 7 structural timber cassettes

- 8 180 x 315mm larch glulam portal frame member
- 9 75 x 150mm self-supporting larch strut
- 10 timber frame roof structure
- 11 140 x 315mm larch glulam portal frame member
- 12 composite GRP roof covering to external deck / playspace
- 13 insulated timber deck
- 14 glulam frame legs fixed to steel support shoes / concrete pad foundations

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The use of timber

Timber is used as both structure and cladding and the timber elements are largely exposed. The structure consists of two rows of glulam portal frames set either side of a traditionally constructed timber framed structure which acts to brace the two sets of portal frames. The glulam portal frames extend beyond the external walls to support a lightweight canopy set on a spacious timber deck.

The first row of glulam frames abuts the existing building and houses the library and a corridor. The timber framed central section encloses toilets, store, boiler and SEN room. The second row of glulam frames, just over 7 metres wide, houses a large new classroom and a spacious covered external play space.

The glulam structure rests on a highly insulated suspended deck/floor supported by beams and the glulam frame columns which extend below the deck and are fixed to steel support shoes on concrete pad foundations.

The glulam frames, designed, manufactured and supplied by Constructional Timber of Barnsley, are 180×315 mm and 140×315 mm GL24H European larch members; they are connected with galvanised steel flitch plates bolted with exposed hexagonal bolts. All the frames have additional self supporting 75 x 150mm glulam members fitted assymetrically to suggest the form of a tree.

The external walls and roofs of the extension are lined with structural timber cassettes; they are made up of a vapour control layer, an internal lining of 18mm OSB infilled with LVL I-beams and 240mm thickness of mineral wool insulation, an outer lining of 15mm OSB clad with breather membrane, vertical counter-battens and 38 x 38mm sw battens. These support Western red cedar shingles and 145mm wide Western red cedar boards, tongued and grooved and laid vertically. The pitched roofs are also clad with Western red cedar shingles and the canopy roofs are clad with composite GRP rooflight panels.



A covered deck just outside the new classroom is used for lessons and as an informal play area.



The glulam portal frame structure is clearly visible in the library.

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The Habitat Wall

A gable wall on the east elevation has been transformed into a 'Habitat Wall', a series of timber-framed box-like compartments which are filled with a wide variety of recycled and found materials to accommodate different types of habitats for birds, insects, small animals and plants. There are also spaces for planting and for bird and bat boxes.

The Habitat Wall acts as an unusual type of rainscreen; the box-like compartments are individual frames of 225 x 50mm treated softwood vertical and horizontal 'shelves', shaped to form a sill with a drip, fixed to a 22mm OSB backing panel and coated with liquid waterproofing. The compartments were fabricated and then mounted, section by section, onto a series of metal split battens which create a ventilation gap. The metal split battens act simply as restraint; the compartments are self-supporting and the load is taken down to a timber beam at the base.

The wall behind comprises a series of LVL I-beams insulated with 380mm thick straw bales and lined externally with breather membrane and sheathing.

Pupils were invited to develop their own concept drawings for how the wall might appear and, during construction, worked alongside teachers, parents, the local community and the Sarah Wigglesworth Architects' team to fill the compartment spaces. The architect drew sketches to show the construction of each compartment and how material could be fixed to the substrate. The materials used included: reclaimed offcuts of timber; half logs, fixed to timber battens; and log ends, either stacked or screwed. Half logs were also fixed as a frame around the three 'windows' in the gable wall which reveal the straw bale insulation. Plastic and terracotta pipe, cut-off plastic bottles and bamboo tubes were stacked to create an 'insect hotel'. Small plant pots were fixed to other compartments and planted with species to attract wildlife. Finally a series of timber bird and bat boxes were installed, designed following recommendations by the RSPB and the Bat Conservation Trust.



The 'Habitat Wall' provides different habitats for insects and small animals.



Sample pages of a booklet by the architect to help the school with the Habitat Wall construction.

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Detail section through Habitat Wall



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Additional self-supporting glulam members fixed to the exposed structure of the new classroom suggest the form of a tree.



Walls are lined with a rainscreen of cedar shingles.

Sustainability

The new extension adopts a highly sustainable and low energy building services design approach. Innovative construction techniques such as straw bale insulation and materials with A+ or A ratings helped to reduce U values and minimise the carbon footprint. All timber used is either reclaimed or FSC / PEFC Certified. The glulam frames are European larch FSC and PEFC Certified. The Western Red cedar shingles and cladding are also PEFC Certified and come from British Columbia, Canada. Internal joinery includes FSC Certified birch faced ply.

The 'habitat wall' is designed to evolve through the seasons and the involvement of children and community members in sourcing materials for this structure formed part of the school's plan to develop ways in which the building can be used as a demonstrative tool for learning about sustainability and their natural environment.

Awards

2016 RIBA Award, North West Region

2016 RIBA Award, North West Region, Eleanor Brough, Project Architect of the Year

2016 Structural Timber Awards: Judge's Choice and Best Education Project

2016 RIBA Stephen Lawrence Prize (shortlisted)

2016 Wood Awards (Highly Commended)

2016 Education Business Awards: Best School Building (highly commended)

2016 Education Business Awards: Environmental Practice Awards (highly commended)

2016 Building Magazine Awards: Best Small Project (shortlisted)

2016 RICS Award (shortlisted)

2016 RICS Regional North West Award: Design through Innovation category (shortlisted)

2016 RICS Regional North West Award: Community Benefit category (shortlisted)



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Our aim

To provide members with the highest quality information on timber and wood products to enable them to maximise the benefits that timber can provide.

What we do

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TRADA

- **t** +44 (0) 1494 569601
- **f** +44 (0) 1494 565487
- e membership@trada.co.uk
- w trada.co.uk



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Chiltern House Stocking Lane Hughenden Valley High Wycombe Buckinghamshire HP14 4ND UK t +44 (0) 1494 569600 f +44 (0) 1494 565487 e bookshop@exova.com w exovabmtrada.com