

# Wood Works

Meredith Bowles explores timber structures at Westonbirt Arboretum by Invisible Studio and Glenn Howells Architects



## Left

Stihl Treetop Walkway designed by Glenn Howells Architects. The £1.7m structure is 284m long, between 1.9m and 3.7m wide, and up to 13.5m high.

## Below

Location plan showing Welcome Building, Treetop Walkway, mess building and machine shed. Westonbirt Arboretum holds 16,000 unique tree specimens, laid out in woods, rides, glades and downs that form a grade-one-listed historic landscape

## Below right

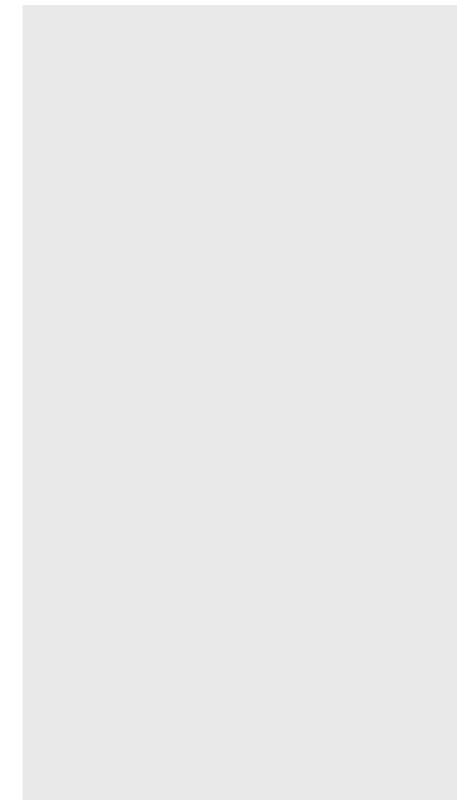
Mess building for staff and volunteer workers, with machine shed behind, both by Invisible Studio. The two adjacent buildings were designed in parallel following a competitive tender process, and built with a traditional contract and main contractor.

Westonbirt Arboretum was largely created by Gloucestershire landowner Robert Holford, whose family fortune was made supplying fresh water to London. He created an extensive landscape around his remodelled house, adding specimen and exotic trees and collecting orchids and shrubs from around the world. Three generations of the family continued the work, so that when the Forestry Commission took it over in 1956 there were 600 acres of grounds with 17 miles of paths. The estate is grade-one-listed, and the arboretum is nationally important, with 120 'champion trees' — the tallest or largest of the species in the country.

The arboretum now draws 350,000 visitors a year, and has recently been through a revamp to better accommodate them, including a new Welcome Building and treetop walkway, both designed by Glenn Howells Architects (GHA). These provide a new 'front' for the arboretum. Meanwhile, tucked away in the back, in the 'working' part of the estate, there are also two new buildings by Invisible Studio — a machinery shed and a workers' mess room. The brief for these buildings was functional and the budgets modest, but both explore the architectural use of home-grown timber, achieving much with little.

GHA's Welcome Building is a gently curving timber structure that divides the grounds from the car park, and acts as barrier as well as a gateway to the estate. It's a neat, unassertive, modern building designed to prevent incursion into the listed landscape, whose quality will necessarily be altered by the sheer number of visitors that the arboretum now attracts; with ever more people wanting to get between toilets, ticket office, and a restaurant some way into the park, the quantity of resin-bound gravel will inevitably increase.

The Treetop Walkway, which opened in April, adds another significant attraction to the estate's 'offer', improving access to parts of the landscape and allowing a close-up encounter with the forest canopy. Starting close to the Welcome Building, the walkway snakes its way across a valley to land almost 300 metres away in the woods. It's an elegant structure, restrained enough not to dominate the trees, gently sinuous, with canted striding larch legs that suggest movement and play.



**Below, right**

Welcome Building by GHA, completed in 2014; Welcome Building viewed from the walkway (phs: XXXXXXXX).

**Bottom**

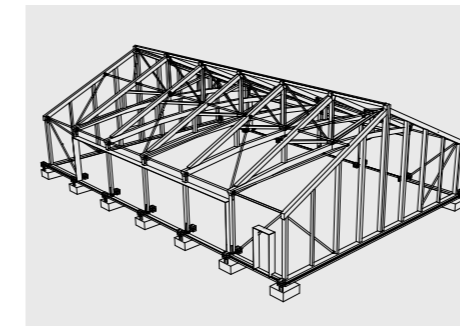
GHA made use of the site's topography to ensure that the sinuous treetop walkway is accessible at either end without use of lifts or stairs. The deck is supported by scissoring larch legs at 10.5m intervals, and widens at four points along the route. A 'crow's nest' loops around an existing tree (phs: XX).



Although its sloping deck expands out to create viewpoints, for the most part it is necessarily narrow. To my way of thinking it is a shame to be confined, with crowds of other people, within such a vast landscape, but the walkway will undoubtedly broaden the appeal of a visit to the arboretum and should encourage a wider exploration of its natural assets.

These additions to the public areas of the estate were brought about by former director Simon Toomer, a forester with a broad and persuasive vision for continued change and renewal. It was also under Toomer's guidance that Invisible Studio was chosen to design the machinery shed and mess room, with a proposal that combined invention, collective action and education. Designed alongside each other, they nevertheless have distinct characters: the tiny mess room evolved into a more overtly ambitious small building, while the machinery shed reserved its invention for construction rather than form.

For both buildings, Invisible Studio's Piers Taylor teamed up with Charlie Brentnall of timber frame contractor Carpenter Oak, with whom he had worked on similar structures on the Architectural Association's Design & Make programme at Hooke Park, Dorset. Their proposal involved working with volunteer labour, and using only timber felled at the arboretum. The mess room was part-funded by a £600,000 grant from the Wolfson Foundation (with the remainder raised mostly through donation), and the research and educational aspects of the proposal fulfilled some of the criteria for funding. Teams of volunteers worked on the construction, and students organised through the Carpenters Fellowship worked with Brentnall on the traditional framing of the large barn. The strategies for the two buildings evolved through exploration of the timber that the estate had to work with: green larch, oak trees felled four years previously, and Corsican pines felled specifically for the building.



**Above, right**

The machinery shed, designed by Invisible Studio, took advantage of the large Corsican pine trees available, which yielded 300x425mm timbers up to 20m in length to form truss ties.

Close collaboration between architect, engineer and contractor allowed efficient use of available materials, including the incorporation of timbers with low strength grades.

A lightweight roof covering and large openings in the facade result in high wind-generated uplift forces on the roof, requiring timber connections that are a hybrid of traditional techniques and modern steel components (phs: Andy Matthews, Piers Taylor).



**Below**

Mess room designed by Invisible Studio, constructed with timber from the arboretum. "One of our interests is how imprecise materials can be used to make a precise building", says architect Piers Taylor (phs: AM).

Early design sketches for the big shed show the 20-metre span formed from a curved Belfast truss, and later by trussed portals. But the discovery that it would be possible to use single 20-metre lengths of pine to make simpler trusses, and that these would be £100,000 cheaper, prompted Taylor and Brentnall to change tack. The resulting kingpost truss is both straightforward and impressive; the designers believe that these are the largest single lengths of structural timber in the country.

The timbers were worked by hand on site in an act that connects this building to a long history of timber building. Their large size – together with the lightweight roof, which provides little resistance to wind uplift – required steel joints designed by engineer Buro Happold rather than traditional framing methods. The result looks slightly odd; the steel is present but not expressed, so that the traditional timber housing looks as if something is missing.

The cladding makes use of the rest of the tree; after the structural sections were cut, the remainder of the trunk was milled to make boards of varying widths and depths that are set vertically with air gaps between. But this building really is about the roof, and segmented industrial doors at the sides allow the large covered space to open fully to yards on both sides. The forestry workers told Taylor that for their machinery shed they didn't want any "arty-farty nonsense", and the building is anything but. It feels like a timeless space, and delightfully free from affectation.

The mess room provides rest space for staff and volunteers, and sits in contrast to the shed as a playful presence in the back yard. The north entry is under a low overhang, accessed via a simple ramp from the yard, while the polycarbonate-faced south elevation rises up to suggest both a chapel in a wood or an archetypal house and something less familiar. With the all-over cladding reaching the ground in a skirt, this hovering moth of a building seems ready to take flight.

Inside, the well-lit timber-lined space is a far remove from the kind of nondescript staff room that might usually serve the purpose – it's one that should make the arboretum's staff and volunteer workers feel especially valued.

Construction is generally straightforward, with larch studs, oak joists and plywood lining, but Taylor has tweaked the forms and subverted traditional details to make a building that draws attention to itself, signalling its elevation above the merely ordinary. Oak cladding is deliberately left uneven in a sort of contemporary waney edge. It's a case of making art out of expedience, as milling the boards straight would have added cost.

Built with a traditional contract but with a team of over 30 volunteer labourers, the details are sometimes unevenly applied, and perhaps there was simply too much for one little building to take on. But the fact that Taylor pushed hard for a small-budget building to deliver more than one might expect is all to the good – this is a building that will lift the spirits after a long day in the woods. ↗

**Project team**  
**Treetop Walkway**

**Architect**  
Glenn Howells Architects  
**Structural engineer**  
Buro Happold  
**Interpretation design**  
Outside Studios  
**Main contractor**  
Speller Metcalfe  
**Client**  
Forestry Commission

**Selected suppliers**  
**Treetop Walkway**

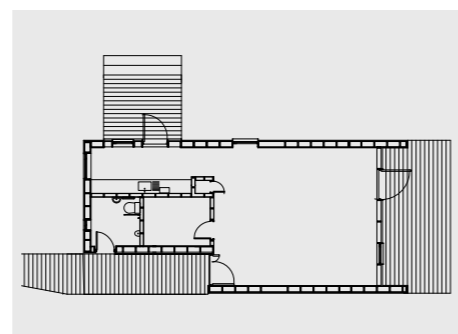
**Column shipwrights**  
Ventis, Brasker Masten  
**Decking, handrail**  
CTS Bridges, Russwood  
**Timber treatment**  
Norclad  
**Cable-net mesh**  
Carl Stahl  
**Steelwork**  
SH Structures

**Project team**  
**Mess and shed**

**Architect**  
Invisible Studio  
**Engineer**  
Buro Happold  
**Contractor**  
Carpenter Oak  
**Client**  
Forestry Commission

**Selected suppliers**  
**Mess and shed**

**Polycarbonate**  
Poly-Pac  
**Insulation**  
Celotex  
**Industrial doors**  
Assa Abloy  
**Flooring**  
XXXXXXX



**Above, right**  
Mess room interior views; south-facing elevation in timber and polycarbonate (phs: AM)

