

DOUGLAS FIR HOUSE

SMALL PROJECT



PROJECT

Location:

London

Wood supplier:

Emanuel Hendry

Architect:

Christian Brailey Architects

Client:

Faye Johnson and Christian Brailey

Main contractor:

Miles Builders

Fabrication and joinery:

Emanuel Hendry

PRODUCTS

Solid Canadian Douglas fir and 18 mm Canadian Douglas fir plywood

PERFORMANCE

Estimated operational energy: 1.3 t CO₂/yr





INTRODUCTION

Masterfully reconfiguring and extending a studio flat at the rear of a converted Edwardian house in North London, this project by Christian Brailey Architects is a unique celebration of the characteristics and craftsmanship of timber.

From the outset, the extension was viewed as a single piece of cabinetry crafted from a single material – Canadian Douglas fir. Chosen for its tightly grained straightness, strength and stability, these qualities enabled an elegant and efficient use of slim profiled timber, internally and externally.

The highest levels of carpentry were achieved with the extension being entirely prefabricated and erected in workshop conditions by a team of skilled carpenters in Devon. The extension's timber structure, along with all the timber doors and windows, was then disassembled, transported, craned-in and erected on site within a matter of days.

Large windows, mechanical ventilation (with heat recovery) and underfloor

heating have been added to the existing studio, which is located in the Muswell Hill Conservation Area. Rather than a full-width rear extension, the design takes an identical massing but locates it along one side of the garden and sinks down, thus reducing its impact on the host building and neighbours.

The overall studio footprint has been increased by 50%, providing a new bedroom and the ability to create a further bedroom for family growth. Placed at the end of the extension, the new bedroom sits immersed within the garden, with a large picture window and bench seat furthering the connection. The timber ceiling with exposed beams creates a restful sleeping area, and Douglas fir plywood wardrobes act as a division between the bedroom and dining room.

Ingenious solutions have been found throughout to maximise space and storage. Impressive ceiling heights are achieved in the open plan living space, where smooth cool concrete and raw plaster complement the warm swirled

tones of the exposed timber. The doors and windows are traditionally oiled to keep their natural colour and offer a contrast to the silvered external cladding.

Conceived as an extension to the garden rather than the house, the timber extension nestles into the landscape of the private garden and woodland park of Alexandra Palace beyond.

SUSTAINABLE DESIGN

The existing studio flat was uninsulated and in a state of disrepair, with high levels of damp and black mould. However, architect and landscape designer duo Christian Brailey and Faye Johnson could see that opportunity lay in the property – in its ‘good bones’ and the abundant overgrown garden.

With their new design, the property has been transformed into a beautiful, low energy home for Brailey and Johnson. The central hub of the old studio has been opened into a kitchen-living-dining space split across two levels. This space forms an L-shape that flows into the new extension and maximises the light – crucial for a north-west facing aspect. The kitchen has been repositioned and replaced with an expansive, cast concrete worktop above deep Douglas fir plywood units, lit from above by a three-meter long rooflight. The split level creates a welcome division between the cosy living space and practical, double height kitchen.

The entire thermal envelope has been upgraded with high performance double glazing, airtight membranes and natural wood fibre insulation, chosen for its breathability, acoustic and thermal properties. MVHR provides fresh air throughout the building without losing heat. Together, these features all contribute to the flat’s low energy consumption, calculated at just 1.3 tonnes of CO2 per year.

The garden has been levelled and landscaped, maintaining a balance between wildlife and socializing. Maximising limited space, the garden has been designed to act as another room during the summer. A purpose-built Douglas fir bench and barbecue station creates garden storage, and generous seating is created at the rear of the garden. Rainfall is captured from the new extension and redirected to the garden via perforated drains and soakaway to water plants.



“By going down the prefabricated route, and making in workshop conditions, we were able to push the design and maximise the small footprint of the building. For example, the structural timber ring beam could tie into the head of window which then turned down and created the door frame for the secret sliding door as well hiding a pocket for a curtain. It is this level of detail, from superstructure, to cladding, to window details that elevates the design of the extension to completely transform the property.”

Christian Brailey,
Architect, Christian Brailey Architects.

ENGINEERING

The structural frame for the extension is entirely solid Douglas fir and is fully revealed internally. No steel was used in the extension. Douglas fir was chosen as the structural timber species for this project for its stability and straightness.

After comparing samples provided by joiners and wood supplier, Emmanuel Hendry, Canadian Douglas fir was selected over Scottish as it is slower growing, meaning the timber is much tighter grained and therefore stronger, straighter and with little to no knots. This allowed for the tall proportions of doors, enabled slimmer cladding profiles, and meant that less timber was required overall.

New foundations were required for the additional floor area of the extension - these were concrete trenches as specified by the structural engineer. The floor level

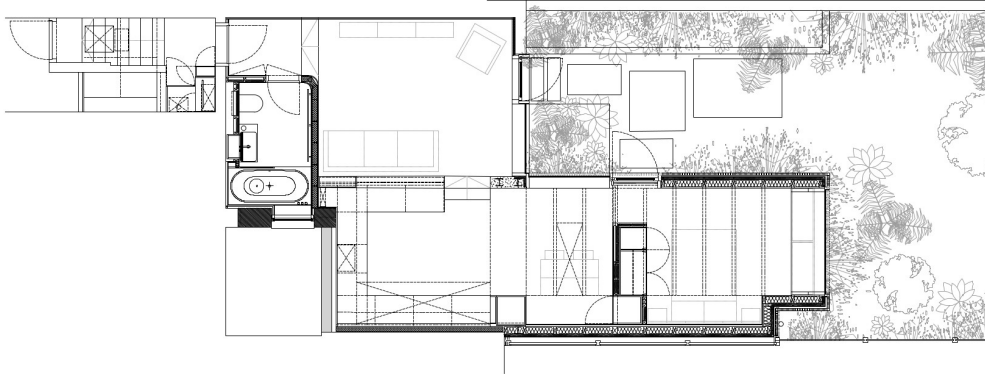
was dropped by 1.2 metres in some areas of the existing footprint but this did not require any underpinning as the existing foundations were very deep due to being on a hill. The depth of these existing foundations were discovered during opening up and informed the design.

To protect the sunken structure from issues with damp, high performance vertical DPC membranes were used both internally and externally.

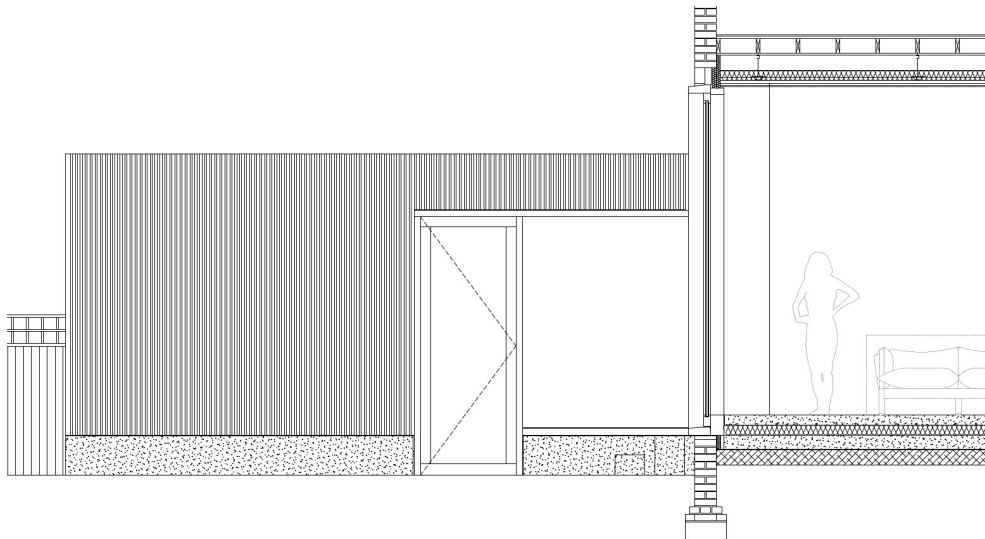
The extension is seamlessly clad in pre-weathered Douglas Fir fins that have been treated using a new generation of environmentally friendly timber treatments. Mimicking and accelerating the natural fossilisation process, natural substances such as silicon compounds penetrate the wood fibres and transform them into stone - making the treated timber about 10% fossil and 90% wood.

The fossilisation occurs primarily on the surface of the wood, encapsulating the wood fibres and making them inaccessible to rot fungus - without killing the fungi. As fossil (silicon) is non-combustible, effective flame-retardant properties are also achieved with this treatment.

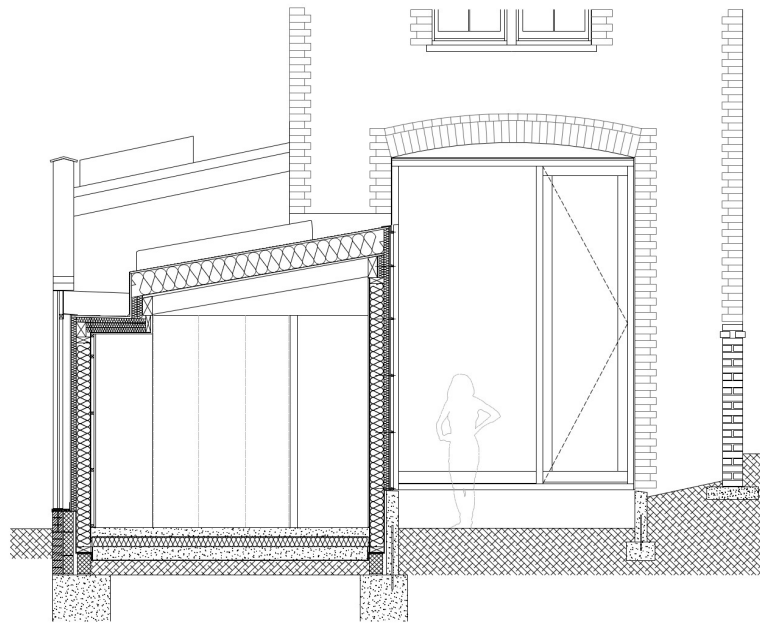




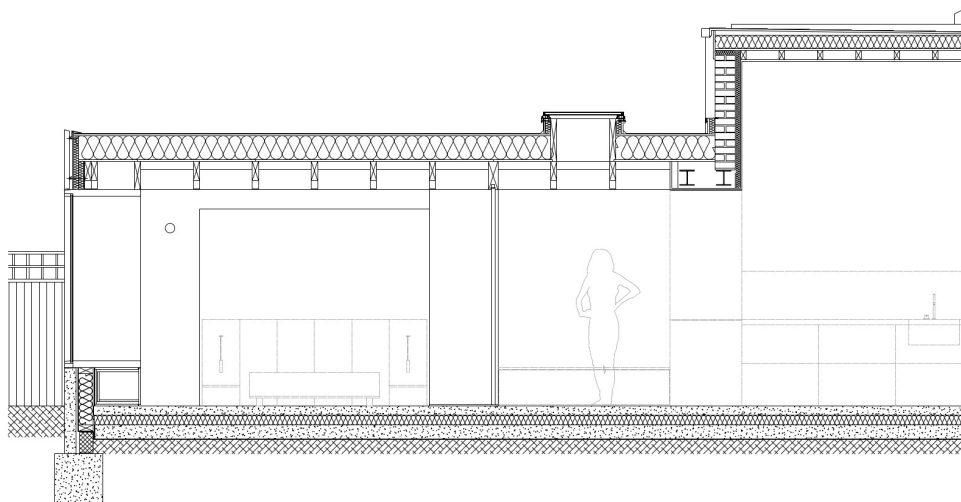
Ground floor plan



Section A



Section B



Section C

CONSTRUCTION

The extension structure was prefabricated and erected by Emmanuel Hendry's small team of highly skilled carpenters in their workshop in Devon. Designed using Vectorworks CAD software, the structural frame, stud panels, windows, doors and cladding panels were fabricated over approximately six weeks. More than one hundred disassembled pieces were then delivered to site in packs of beams, for the structural frame, stud panels and pre-made joinery units. The packs needed to be able to fit onto a lorry, and were a maximum of 2.4 metres wide, of various lengths.

Using an exceptionally long HIAB crane, the building pieces were craned from the roadside, over two gardens, onto the site. This saved needing to bring everything through the front door of the flat to the back garden. With a team of three carpenters, Emmanuel Hendry installed everything onsite over a period of approximately three weeks.

Acting as architect, client, project manager and labourer, this is the first completed project launching Christian Brailey Architects. The close and generative collaboration between the design and fabrication teams, which involved design meetings on site and in the workshop, enabled the highly integrated design to be so skilfully and successfully realised even amid the Covid pandemic.







Timber Development UK was formed in 2021 by the merger of the Timber Trade Federation and the Timber Research and Development Association. After combining the membership of these organisations, Timber Development UK has more than 1500 members extending all the way from sawmill to specifier.

By bringing together the entire timber supply chain we aim to provide our members with the highest quality information, technical guidance and training to safely specify and design the timber structures of tomorrow, and create lower-carbon, higher quality, healthier and safer buildings using timber.

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