Eckersley O'Callaghan

Private Houses

House of Four,
Hackney, London

Our approach

Since 2004, Eckersley O'Callaghan has developed a diverse portfolio of private housing projects, establishing close relationships with architects, designers and contractors throughout the UK and beyond. We employ a collaborative approach to ensure the design team works effectively in delivering innovative, cost effective solutions to produce beautiful homes which exceed the client's expectations.

Whether it is an extension, a remodelling, or a new build home, we add value through our attention to detail, commitment to sustainable design and experience on working on complex projects.

Our work encompasses all structural materials, including brickwork, steelwork, timber and concrete, and newer materials from engineered timber — Cross Laminated Timber (CLT), glulam and timber SIPs to the more bespoke Corten steel, and carbon fibre. We also draw on the diverse experience of our practice to incorporate the latest structural glass and facade engineering principles.

We have engineered extensive basements for Victorian terrace houses to spectacular contemporary dwellings, from a cascading, concrete-framed house on the banks of the River Avon, to an exposed coastal residence with an elegant steel and glass structure. Our team has overcome exceptional site constraints in negotiating party wall agreements, works adjacent to an active railway line, and on active landslip zones.

Our expertise in redeveloping heritage structures means that we have also been responsible for a vast array of refurbishment and extension projects. These have included the transformation of structures in conservation areas and the sensitive redevelopment of listed buildings.

200+
private
homes
projects

42+
private
homes
awards

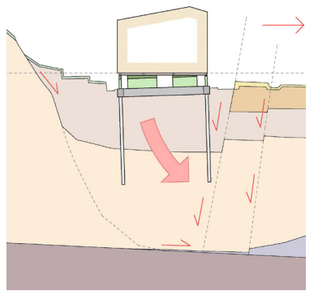
2023 Buildit Awards, Best Timber Frame Home, Shortlisted — Athlete's House
2023 RIBA South Awards, Shortlisted — Claywood House
2022 Structural Timber Awards, Low Carbon Project of the Year — Tarn Moor
2022 Construction News Workforce Award — Net Zero Team of the Year
2022 British Homes Awards, House of the Year — Claywood House
2022 RIBA South East Award — Island Rest
2021 RIBA Award — Tarn Moor
2021 British Homes Awards House of the Year, Over 2,500 sq ft — Claywood House

2020 British Homes Awards
Small House of the Year — Island Rest
Large House of the Year — Folding House
2020 Structural Timber Award, Finalist — Tarn Moor
2017 Best Contemporary Renovation/Extension, Homebuilding & Renovating Awards — Hurdle House
2017-2018 UK Property Awards — The Crow's Nest
2017 The American Architecture Prize, Architectural Design | Residential Architecture — The Crow's Nest
2017 RIBA South East Award — Ness Point
2016 Sunday Times House of the Year — Drag & Drop House
2015 RIBA National Award — Levring House

The Crow's Nest

01

02



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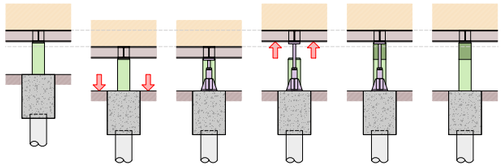


04

Location: Lyme Regis, Dorset
Client: Undisclosed
Architect: AR Design Studio
Date: Completed 2016
Value: Undisclosed
Services Provided: Structural Engineering

2018 Ground Engineering Awards — Shortlisted
2017 International Design Awards — Silver
2017 UK Property Awards
2017 The American Architecture Prize
2017 Structural Awards — Shortlisted
2017 Wood Awards — Shortlisted
2017 RIBA South West Award — Shortlisted
2017 The Sunday Times British Homes Awards — Shortlisted

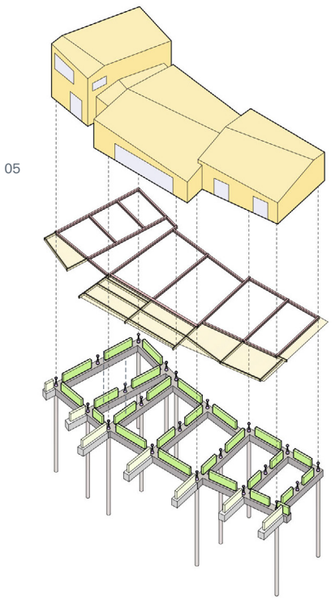
The owners of a house sitting in an active landslip zone on the clifftops of Lyme Regis were looking to extend the property. However, during the planning process, and following unprecedented rainfall in the winter of 2014, there was subsidence close to the building and the decision was made to replace it entirely.

Eckersley O'Callaghan engineered a structural solution for the new home to prevent future failure. A concrete foundation was cast into the ground with a series of strategically placed dwarf walls built on top of it. A structural steel frame was then laid on top of the walls to act as an adjustable raft in case of future movement. Beneath the frame, there are specific places for mechanical jacks to be positioned so that the house can be securely re-levelled.

21
jacking positions in the event of ground movement

Utilising reinforced concrete piles and grillage of ground beams, the foundations allow the building to sit lightly on the landscape while offering the necessary support in the event of movement due to landslip activity.

The lightweight timber frame superstructure is supported off the steelwork. Isolated steel elements exist in the superstructure to help create large open plan spaces and asymmetric roof profiles. This also provides framing for the sliding doors to give dramatic views over the clifftops and the sea beyond.



05

01
Structural steel frame laid on top of dwarf walls

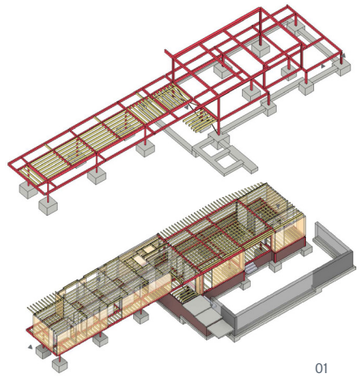
02
The Crow's Nest sits on the clifftops of Lyme Regis

03
Jacked building responding to block movement

04
Typical sequence for jacking process

05
Exploded diagram of structural solution

Island Rest



01

Location: The Isle of Wight
Client: James O'Callaghan
Architect: Strom Architects
Date: Completed 2019
Value: Undisclosed
Services Provided: Structural Engineering

2022 RIBA South Award
2020 British Homes Award — Small House of the Year
2020 Build It Awards — Best Self Build

Island Rest is a single-storey family retreat built on a sloping site that leads onto Wootton Creek. Eckersley O'Callaghan provided structural and civil engineering services for the project, which includes five bedrooms, a large open plan kitchen and living room, a swimming pool, and a boat house.

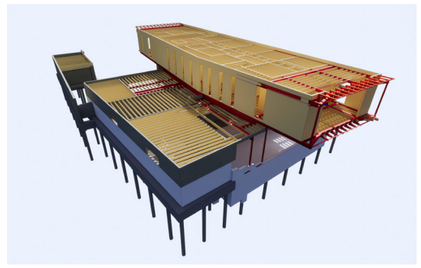
The topography varies considerably across the site, so half of the house has been elevated on slender external columns. Designed to reduce construction time and costs, the structural system consists of a primary steel frame that forms a raised ground floor 'strong deck', supporting a series of loadbearing timber stud walls. The ground floor and roof infill are all built with timber joists. Another level of steelwork was required on the largely glazed north facade to achieve 10 metres of column-free windows that give access to a level terrace and swimming pool.

Eckersley O'Callaghan completed structural analysis and design of the steel and timber framing, and design and detailing of the connections. We also designed the boathouse, a simple loadbearing masonry and timber infill building, and the underground drainage system.

An absence of nearby public sewers and an inconclusive percolation test meant drainage had to be designed for discharge into the sea. A sewage treatment plant has been incorporated at the back of the property, ensuring a quality of effluent meeting the requirements of the local Environment Agency.

01
3D structural solution

Claywood House



01

Location: Basingstoke, Hampshire
Client: Undisclosed
Architect: Ayre Chamberlain Gaunt
Date: Completed 2020
Value: Undisclosed
Services Provided: Structural | Civil Engineering

2023 RIBA South Awards — Shortlisted
2022 British Homes Awards — House of the Year

Claywood House, in the beautiful setting of Nately Scures is a new five bedroom low-carbon home designed to enable the newly wheelchair bound owner to live independently. The house gives expansive views out over the countryside with a large cantilevering first floor set at right angles to the ground floor box.
The shape of the building responds to the complex geometry of the topography and the site boundary and works with the slope of the site to reduce the visual impact to the surrounding area. The house is cut away to direct views across the garden and away from the former home.

We carried out the structural engineering for the house and outbuildings which features a large cantilevering living area and therefore, managing deflection of the structure was a key issue. The structure is typically a two-storey new build steel framed building with timber infill supported off blockwork walls at ground floor . Load bearing timber studwork and blockwork maximized to limit volume of steelwork required. The new building is fully accessible with a lift and provides facilities for the specialist care required by the client including a subterranean physiotherapy pool, gym and carer's suite which is founded on mini piles.

The house incorporates a ground source heat pump, a 12kw Photovoltaic array and a mechanical heat recovery ventilation system. Further, the building envelope is extremely well insulated and airtight thereby creating a highly sustainable new building.

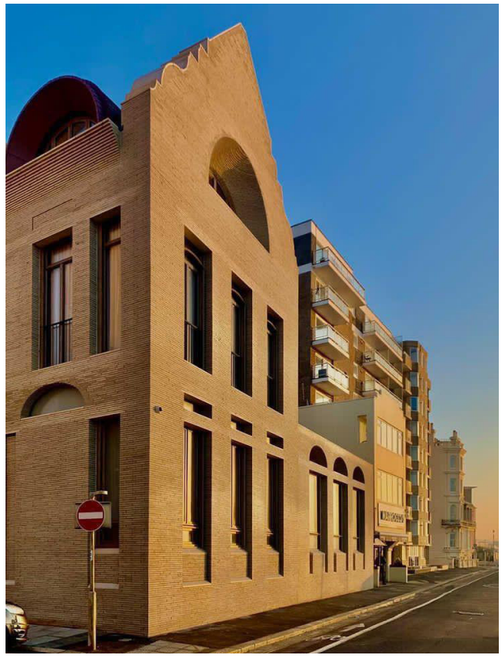
01
3D timber structural model

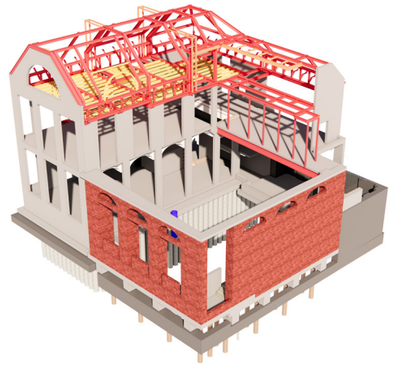
It was an invaluable lesson to work with Eckersley O'Callaghan from the very first concept, as it really helped to shape the design and make a better building.

Andy Ramus
Director, AR Design Studio

The Crows Next
Dorset, UK
AR Design Studio

Medina House





01 02

Location: Hove, East Sussex
Client: Undisclosed
Architect: Pilbrow & Partners
Date: Completed 2020
Value: Undisclosed
Services Provided: Structural | Civil | Facade Engineering

The new Medina House is a reconstruction with a modern twist of a dilapidated iconic Women's salt water pool & laundry building on Brighton's famous King's Esplanade seafront. The new home now features a facade of predominantly White Petersen brick, a new RC structure incorporating remnants of the former building, and a beautifully detailed, doubly curved signature arch which lifts the reconstruction of the building into the modern era. The steel-concrete composite floor is supported only at facade lines

We carried out the structural, civil and facade design for the new buildings on the site which comprises a three-storey building with a large pitched and hipped roof and the original Dutch gable facing the seafront and a large, covered courtyard. The structure of the new building is primarily reinforced concrete with a steel and timber crown and has been designed to be integrate remnants of the former swimming pool vaults

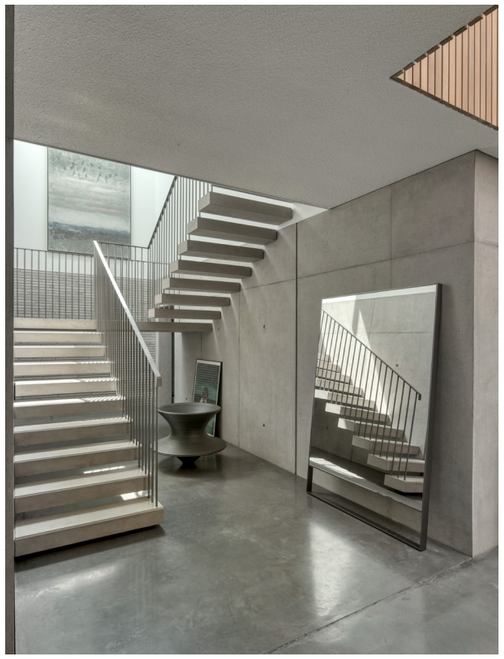
At ground floor level, we designed a reinforced concrete corbel which is capable of carrying the whole facade. To ensure the architectural aspiration was maintained, we carried out an in-depth analysis to minimise the number of movement joints required for the structure. We have also designed a 7m high free-standing garden wall with non-load-bearing concrete arches and tall opaque glass windows.

The external wall and facade of the building has been designed in predominantly loadbearing white Petersen bricks which emulate the uneven finish of hand made bricks, however, there are 38 different types of brick in total. To get the effect of the signature, doubly curved arch above the feature window on the main elevation, a precast concrete lintel was modelled in 3D and then painstakingly cast with the negative of the brickwork pattern ready to glue the brick slips to its face.

01
Facade comprising of 38 types of white Peterson bricks

02
3D structural model

Glade House



Location: Weybridge, Surrey
Client: Undisclosed
Architect: AR Design Studio
Date: Completed 2020
Value: £5m
Services Provided: Structural | Civil Engineering

Glade House is a contemporary two storey new-build development located in Weybridge, Surrey. The structure comprises a reinforced concrete podium base supporting a steel frame above, with engineered timber joists forming the infill for the flat roof. Visual concrete is a defining feature of the design, showcased by a cantilevered reinforced concrete staircase that creates a striking focal point within the main circulation area.

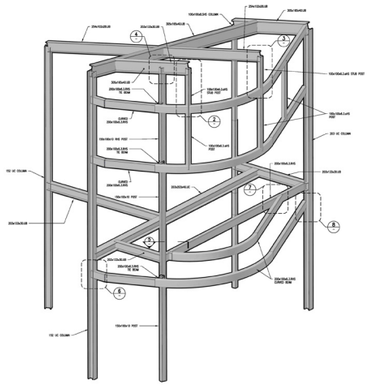
We provided structural expertise in detailing the visual concrete finishes and specifying bespoke concrete mix designs for internal applications. Architecturally, the building embraces its connection to the surrounding garden through expansive ground floor glazing and cantilevered podium-level sections, which were achieved through careful structural analysis. This included ensuring the tight tolerances required for the concrete flat slabs to accommodate sliding glass elements and cantilevers.

To enhance the relationship between indoor and outdoor spaces, hybrid structural solutions were implemented. Architectural steel circular columns at ground level provide support for the concrete flat slab above, contributing to the sense of openness and integration with the landscape. External masonry walls were also designed to run seamlessly from inside to outside, forming key architectural elements.

Thermal detailing was carefully coordinated with the architect to meet modern thermal performance standards while allowing the structure to maintain its seamless transition between interior and exterior spaces. Following the demolition of the previous building on-site, a new drainage system was introduced, including connections to the existing sump chamber and discreet slot drains parallel to the glazing. These features effectively manage water run-off while maintaining the separation between internal and external floor levels.

Ness Point

01



02

Location: Dover, Kent
Client: Undisclosed
Architect: Tonkin Liu Architects
Date: Completed 2017
Value: Undisclosed
Services Provided: Structural Engineering

2019 BD House Architect Award
2017 RIBA South East Award
2017 Grand Designs House of the Year — Shortlisted

The design intent for Ness Point was to replicate the appearance of the cliffs on which the new home sits.

The sinuous form of the masonry walls and the double curvature of the roof plane are formed primarily from simple adaptations of traditional masonry and timber construction. It pushes the limits of what can be formed with these construction methods and posed a complex challenge to both us as engineers and to the contractor on site.

A steel frame facilitates a large curved window to the main living and bedroom spaces.

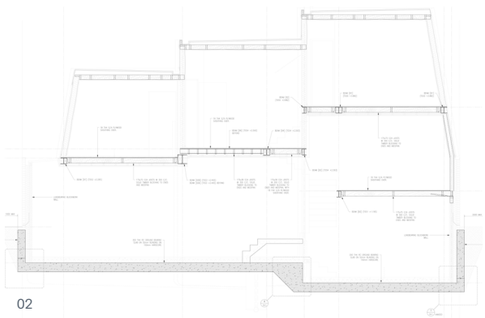
The internal structure is a load-bearing timber frame which supports a green roof. The walls also accommodate sliding partition doors, and hidden service risers by virtue of being split into parallel lines of studwork. The structure also incorporates a reinforced concrete basement.

01
Steel frame to facilitate large curved window

02
Steel frame drawing

House of Four

01



02

Location: Hackney, London
Client: Undisclosed
Architect: Undercurrent Architects
Date: Completed 2017
Value: Undisclosed
Services Provided: Structural | Civil Engineering

Eckersley O'Callaghan provided structural and civil engineering services on this new private residential property in Hackney.

Built on a tight urban site on the contaminated ground of a former garage site, the project sinks a three storey residential dwelling into the ground to keep within rights of light envelopes of the surrounding houses.

The structure consists of a reinforced concrete lower ground floor box, with load bearing blockwork and brickwork walls above.

The unusual geometry of the open plan, staggered internal space upper levels are formed of a steel frame with infill timber joists. The steel and timber framed roof is similarly achieved through simple use of these traditional materials.

01
Infill timber joists

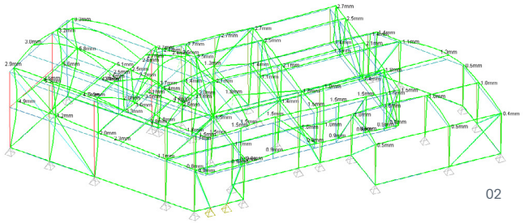
02
Section

2023 RIBA South Awards — Shortlisted
2022 British Homes Awards, House of the Year
2022 RIBA Awards — Shortlisted

Claywood House
Basingstoke, Hampshire
Ayre Chamberlain Gaunt

Drag & Drop House

01



02

Location: Totteridge, London
Client: Private
Architect: Ashton Porter Architects
Date: Completed 2016
Value: Undisclosed
Services Provided: Structural Engineering

2016 BUILD News — Best North London Contemporary House
2016 Sunday Times House of the Year — Finalist and Commendation
2016 Manser Medal — Longlisted

Drag & Drop House is a new-build contemporary family home in North London providing 700m² of accommodation.

The project responds to a sloping site with a two-storey elevation to the rear and a stepping three-storey elevation to the front. The rear of the house embeds itself into the landscape and a series of gabion walls provide a transition from the landscape into the main living spaces. A lower ground floor level is created by cutting into the sloping ground with a new retaining wall to the rear of the site.

The structure comprises a concrete basement box supporting a two-storey steel frame clad in timber. The scheme includes unobstructed internal open spaces and wide frameless glass sliding door entrances, revealing an open corner facing the rear garden.

Eckersley O'Callaghan were challenged to engineer the structural steelwork to achieve the cantilevers and transfers around the perimeter. The house also features bespoke staircases with glass balustrades and cranked stringer supports.

The project was delivered within a tight programme. We produced construction information for the steelwork package, an alternative to a concrete solution, in a period of a month.

01
Structural steelwork

02
Deflection analysis model

The Lodge

Location: Winchester, Hampshire
Client: Private
Architect: AR Design Studio
Date: Completed 2024
Value: Undisclosed
Services Provided: Structural | Civil Engineering

Eckersley O'Callaghan provided structural and civil engineering services for the extension and renovation of a detached country house in Winchester, UK.
The project includes a single-storey side extension wrapping around the east elevation of the existing home and the conversion of a detached garage into a habitable annex.

The existing house, a two-storey masonry cavity wall structure with timber floors, required careful modifications to create a seamless connection with the new extension. This addition provides open-plan dining and living spaces enclosed by large glazed sliding doors, enhancing the relationship between indoor and outdoor environments.

To meet the architectural vision, our team developed a detailed structural model using Robot Structural Analysis to verify load paths and forces in key elements. The extension features a steel beam cantilevering over circular hollow section columns, with a roof constructed of timber joists and plywood decking. Foundations for both the existing and new structures were assessed to ensure they accommodated additional loads and changes in load paths.

The garage conversion, which introduces large glazed openings, required carefully designed transfer steel elements to manage deflection limits and ensure compatibility with the sliding glazing. These new spaces transform the property into a modern, open-plan home with enhanced communal areas for family living.

Burlescombe

01

02

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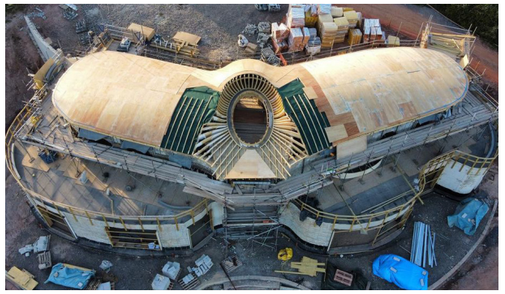
04

05



06

Location: Burlescombe, South Devon
Client: Undisclosed
Architect: Michaelis Boyd Architects
Date: Completed 2022
Value: £4.5m
Services Provided: Structural Engineering

01 | 03
Undulating copper-clad roof under construction

02
Construction of Burlescombe's curved masonry walls

04
Raw stones awaiting their place in the masonry walls

05
Proposed timber box gutter, a practical solution avoiding the need to bend large solid timber trimmers around the curved building

06
The doubly curved roof supported by glulam beams, bowled out by skatepark specialists

07
Structural plan of Burlescombe

4
traditional building materials used for the structure

This new-build, contemporary home project is located on a countryside site in South Devon. Despite its significant scale, Burlescombe is designed to nestle into its countryside site, with a form echoing the gentle curves of the landscape and natural materials chosen to blend with the surroundings throughout the seasons. The house features natural stone walls and a dramatic undulating copper-clad roof, replacing the owners' existing family home.

The project showcases curved geometries throughout, including glulam beams for the upper roof, curved slab edges, and reinforced concrete (RC) walls.

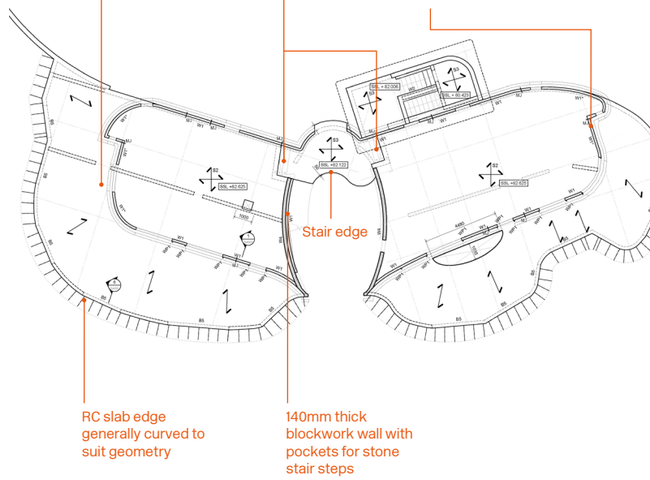
Eckersley O'Callaghan were involved from concept design at RIBA Stage 2, to completion, developing the structural typology, lateral stability, and design of slabs and retaining walls. Utilising all four primary construction materials, concrete, masonry, timber, and steel, the project required creative structural solutions to meet evolving architectural requirements.

EOC were tasked with designing the new-build structure, including foundations, superstructure, roof, external works, and drainage design. Challenges included varying ground conditions and strict local authority requirements for the drainage design, which our team successfully managed.

Structurally, two key aspects are the doubly curved roof supported by glulam beams and a thin reinforced concrete transfer slab on the first floor. The house is partially embedded in sloping ground with retaining walls within and outside the footprint.

A combination of advanced analysis methods and simple calculations were used to justify the structure's components and their connections. Hand calculations, details and experience informed the design, alongside a long-term cracked analysis of the concrete transfer slab, steelwork and timber design using automated spreadsheets.

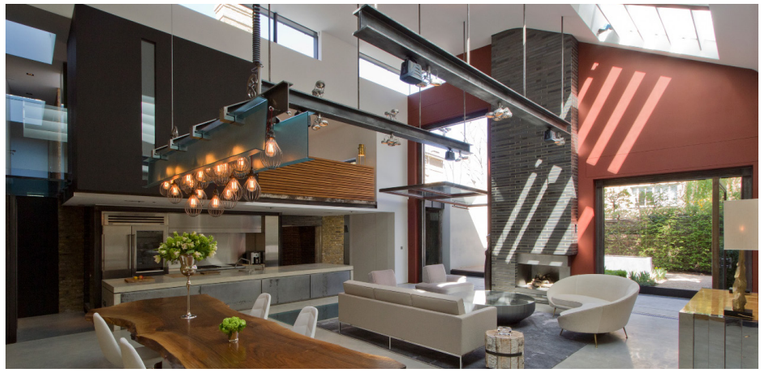
07



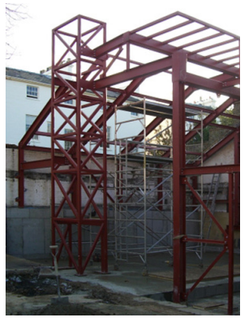
2016 BUILD News — Best North London Contemporary House
2016 Sunday Times House of the Year — Finalist and Commendation
2016 Manser Medal — Longlisted

Drag & Drop House
London, UK
Ashton Porter Architects

Warwick Place



01



02

Location: Little Venice, London
Client: Undisclosed
Architect: Wells Mackereth
Date: Completed 2011
Value: Undisclosed
Services Provided: Structural Engineering

2011 The Daily Telegraph British Homes Awards — Interior Design Award

A collection of old buildings in Little Venice, London, which was used as a factory for many years, has been transformed into a private residence.

The original stable block was retained whilst most of remaining the site, including a large workshop building and other ancillary buildings, was demolished.

We engineered the complex steel framing required for a large double height extension creating a spectacular main space.

A new basement was excavated beneath to form a cinema space which involved the design of retaining walls, underpinning and framing to stabilise existing structures and dealing with foundation movements around trees

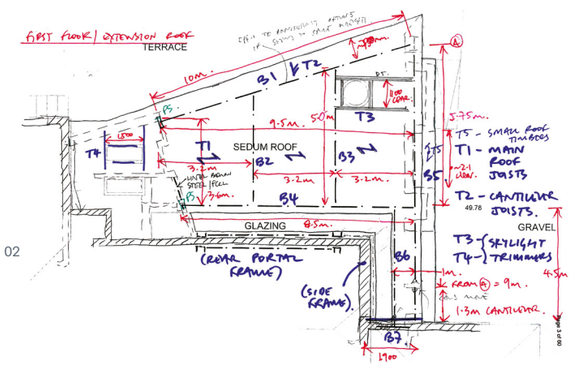
Working closely with the Architects, we also designed unique features such as cantilevering bed platforms, a 5m high automated 'cat flap' door and even chandelier structures.

01
Original stable block

02
Complex steel framing for double height extension

Highlands

01



02

Location: Framfield, East Sussex
Client: Undisclosed
Architect: Ashton Porter Architects
Date: Completed 2017
Value: Undisclosed
Services Provided: Structural Engineering

2018 British Home Awards, Best Extension — Finalist
2018 George Clarke Medal — Finalist

The Highlands project comprised of a rear extension to the Grade II* listed house. This involved internal reconfiguration and framing to facilitate the removal of the existing rear walls and internal walls to create a large open plan area with minimal supporting structure.

We engineered the concealed steel framing required for a extension (L-shaped on plan) to create a spectacular column-free living space. Large steel picture frame structures hidden behind the finishes allowed the existing rear wall to be removed to allow for a better transition between the existing and proposed spaces.

Working closely with the Architects, we ensured the large expanses of glazing, both to the rear and side elevations and also within the roof, were uninterrupted by structure to enable the extension to have a very delicate interface with the existing building and landscaping beyond.

The extension was completed with aluminium cladding panels to create a light, bright space.

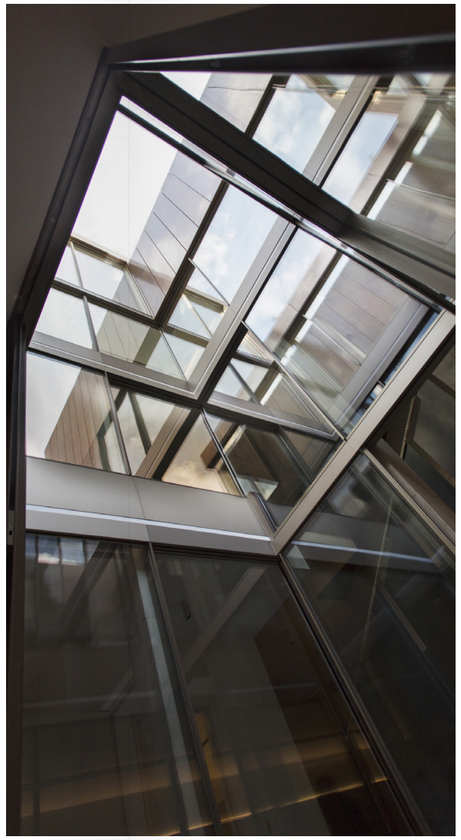
01
Existing site area of listed house

02
L-shaped extension plan

Tarn Moor
Liphook, Hampshire
Adam Knibb Architects

2022 Structural Timber Awards — Low Carbon Project of the Year
2021 RIBA Award
2020 Structural Timber Awards — Finalist

Levring House



01

02

03

04

Location: Bloomsbury, London
Client: Undisclosed
Architect: Jamie Fobert Architects
Date: Completed 2013
Value: Undisclosed
Services Provided: Structural Engineering

2015 RIBA National Award
2015 RIBA London Regional Award
2015 Camden Design Award
2015 Blueprint Awards — Highly Commended
2015 WAN House of the Year — Shortlisted

01
Central glass encased courtyard

02
Concrete ceilings and walls connect the double-height spaces

03
Contiguous retaining wall

04
Basement occupying full footprint of building

05
Detail of brick support

Located in Bloomsbury on the former site of a vehicle maintenance garage, the project involved the erection of a four-storey family home, including a basement level.

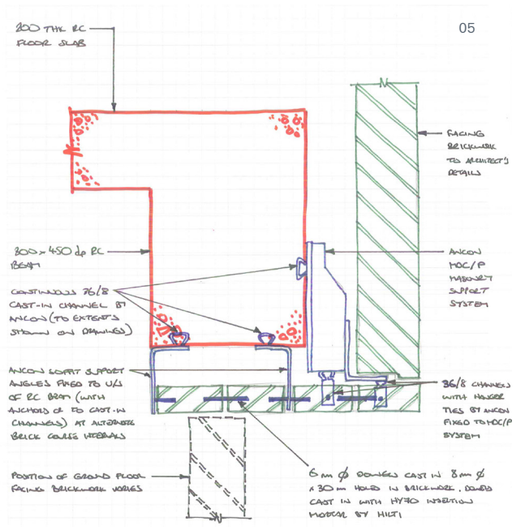
The structure is designed with a reinforced concrete frame and has a contiguous piled retaining wall used to facilitate the excavation adjacent to the roads and neighbouring properties. The basement retaining structure is provided by a combination of waterproof concrete and external tanking, used to keep the basement dry.

The basement occupies the full footprint of the building and contains a 14m swimming pool lined with marble and break out area. A studio flat is also located at this level. The upper levels contain the main living areas as well as work spaces. An internal courtyard brings light beaming down into the basement space, terraces at various levels and an integral garage.

The use of reinforced concrete is expressed in exposed downstand beams and floor slab soffits throughout. A feature stair wall and columns around the lightwell are also constructed of exposed fair faced concrete.

The concrete frame is augmented with Dutch handmade brick facades and bronze cladding to balustrades, roof pod structure and garage and entrance doors.

180m
dug into the ground to use ground heat as a sustainable heat source for the swimming pool



05

Tarn Moor

01

02

Location: Liphook, Hampshire
Client: Undisclosed
Architect: Adam Knibb Architects
Date: Completed 2021
Value: £600,000
Services Provided: Structural Engineering

2021 RIBA Award
2020 Structural Timber Awards — Finalist

01
Low embodied carbon footings and renewable energy sources via solar panels

02
Natural flint cladding with lime mortar

03
Embodied Carbon calculated using our EOC ECO_2 tool

04
Glulam timber frame superstructure

Located in picturesque countryside, Tarn Moor is a two-storey home that has been designed to minimise its environmental impact. The sloping site allows the building to sit within the landscape. Eckersley O'Callaghan provided structural design and below ground drainage design for the project, coordinating with several suppliers to integrate MVHR, solar panels, insulation and low carbon materials throughout.

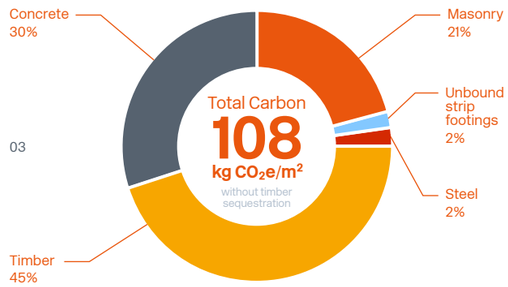
The first floor of the property features the main living spaces, with an open plan kitchen, lounge and dining space benefitting from views out through large southfacing windows and access to a balcony that runs the length of the building.

A strong desire to lower embodied carbon and achieve high thermal performance has influenced every aspect of the design. The team has carried out extensive exploration of environmentally sustainable structural solutions.

Use of cement has been minimised wherever possible, with GGBS replacement concrete used in all elements. The foundations have been reduced to pad foundations, with unbound fill strip foundations between.

The primary structure is a glulam timber frame, with an exposed gull-wing glulam roof and tapered main beams. The roof features a sedum covering and integrated solar panels. Our team collaborated closely with the timber fabricator to ensure all connection details achieved the architectural intent.

2022 Structural Timber Awards
Low Carbon Project of the Year



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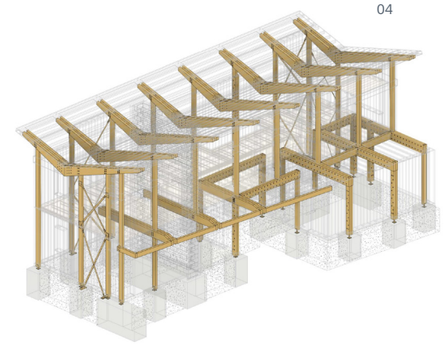

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