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# Nissen Richards Studio COMPLETES Hartdene Barns



## A FORMER DAIRY FARM TRANSFORMED INTO NINE LUXURY, CARBON NET ZERO HOMES, BUILT TO RIBA CLIMATE CHALLENGE STANDARDS

Hartdene Barns is a stunning, newly-completed collection of nine luxury, carbon-net-zero eco homes, set within forty acres of land within an Area of Outstanding Natural Beauty (AONB) in the UK's green belt, close to the villages of Hartfield and Cowden on the border of West Kent and East Sussex. The development was designed by architects Nissen Richards Studio for Q New Homes. The whole-life carbon assessor regulating the project declared the properties to be 10-15 years ahead of the majority of new-builds, per floor area, stating early on in the process that the Hartdene Barns development 'will easily be among some of the most environmentally friendly houses in the entire UK.'

The houses are clad in striking charred larch and come complete with a wide range of energy-efficient features, including air source heat pumps, solar photovoltaic panels, extensive insulation, MVHR systems and electric car charging points. The Hartdene Barns development of highly-sustainable homes was also designed to meet RIBA Climate Challenge 2025 criteria.

*'This has very much been a design-led development and it's been a huge pleasure to work on – as well as huge learning curve for everyone involved'* Jim Richards, Director of Nissen Richards Studio commented.

*'Working with distinctive forms and silhouettes, meeting challenging sustainability targets, whilst providing generous and inspiring internal spaces that capture views of the surrounding landscape has been a delicate high-wire act, but the final buildings are all we hoped for. They have a sense of place and a notable link to the past, but the modern incarnations of these former agricultural buildings are also built to the highest specification to provide buyers with luxury, low-carbon homes.'*

### Q New Homes

Q New Homes is an ambitious private residential property development company operating in South East London and across the home counties of Kent, Surrey and Sussex. The company is owned and led by brothers Damien and Michael Wynne, the driving forces behind the Hartdene Barns project. Their unwavering commitment to the creation of high-quality housing breathes new life into underutilised sites, providing much-needed homes and transforming complex and challenging sites into captivating opportunities. Damien and Michael also act as both developer and main contractors on all projects to ensure complete quality control from concept to completion.

Damien Wynne, Director, Q New Homes, commented on Hartdene Barns:

*'The dwellings all have their own special architectural moments that set them apart from the norm and demonstrate our attention to detail and our willingness to embrace design excellence, with support from our long-standing relationship with Nissen Richards Studio.'*

### The Site

The site is a former dairy farm which had been in the same family for several generations until the death of the last farmer in 2017. Over the last years of the 93-year-old's tenure, the farm had fallen into a state of disrepair, ending up as a series of rather dilapidated agricultural buildings and lean-tos.

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- Jim Richards, Director of Nissen Richards Studio

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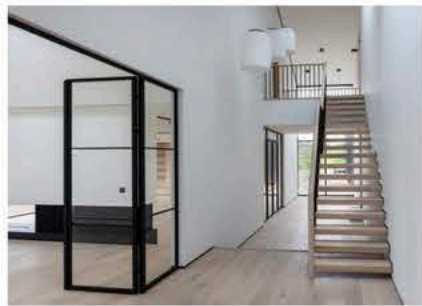
Whilst some former farm buildings were demolished as part of the new vision, enabling the opening up of a central courtyard, as well as creating views out towards the landscape beyond, much was also retained, with the shape of the new-build dwellings dictated to a large extent by the existing agricultural structures.

The development features properties with distinctive curved roof forms, ranging from 3 to 6-bedrooms, with the largest measuring 6,500 square feet. Each has a private garden area and a separate allotment allocation, whilst one also has a pond in its grounds, whose shape was originally formed by a World War 2 bomb crater.

**The Architectural Vision**

When Q New Homes purchased the Hartdene Barns site, planning permission was already in place for a scheme created by a firm of local architects, which sought to retain ten buildings (nine former agricultural buildings and a farmhouse), whilst demolishing some of the smaller, peripheral structures.

The key stipulation of the existing permission was that the new dwellings should retain the majority of the structural frames of the existing farm buildings, so that the houses would echo their previous forms and retain a sense of place.



Q New Homes then appointed architect Nissen Richards Studio, with whom they had already worked on several residential developments, to develop the vision further.

Nissen Richards Studio kept to the proposed building footprints but created new internal layouts and radically-altered the homes' external appearance to feature darkened, charred timber and dark multi bricks rather than the pale timber originally proposed. The practice developed the scheme further and resubmitted the plans to amend the planning permission, whilst retaining the original structures and respecting the footprint of the initial consent. The new designs offer a more contemporary appearance both externally and internally and also reflect the sensitive environment the buildings sit within.

Planning Consent for the development involved 25 conditions - 12 of which were pre-commencement, relating to ground investigations, archaeology, environment and ecology, as well as more standard conditions.

**Low-carbon Construction**

The development has adopted a high standard of environmental design, utilising special fabrics, plant enhancements and green technology to maximise energy savings. The buildings were constructed using structural insulated panels (SIPs) with a mixture of glulam and steel beams, together with low-carbon concrete. Former concrete slabs and pathways were removed and crushed for use as hardcore, helping ensure a build with very low embodied carbon.

Sustainability is also embedded in the fabric through the use of eco-friendly materials. The house structures are

made of lightweight timber, as opposed to heavy, carbon-intensive masonry. Weight-bearing SIPs also help to save money and reduce the scheme's carbon footprint. The floor structures feature metal web joists, which have been manufactured off-site and use less timber to achieve the joist strength and loading capability required, providing easy access for mechanical and electrical services thereby, whilst also making them more labour- and cost-effective.

The structurally-insulated panels by SIPs Eco consist of a foam core sandwiched between two rigid facings, which reduce embodied carbon by 40% compared to traditional masonry construction. SIPs also create an unbroken, thermally-efficient envelope around each dwelling, enhancing the performance of green technologies and minimising cold bridging. Each home is also cocooned in insulation, fortified by an internal wrap vapour control layer and an air seal that ensures airtightness. The homes will also feature fireplaces that burn bioethanol—a renewable energy source derived from food.

**Materials Palette**

A rich palette of high-quality materials has been utilised for the development, which seeks to reflect the agricultural aesthetic of the original barns, augmented with a contemporary sensibility. The buildings' exterior features black standing seam zinc roofing; dark black spruce charred

cladding; charred timber (spruce) board; black aluminium powder coated window and door frames; Michelmersh Selected Dark brickwork and clear glazing.

*'The process of charring timber makes it an extremely stable material that won't shrink or move'* Jim Richards commented. *'It also has a very long lifetime and doesn't need upkeep. It's an expensive process to go through, but very effective in the long run, making it a really high-performance external cladding material.'*

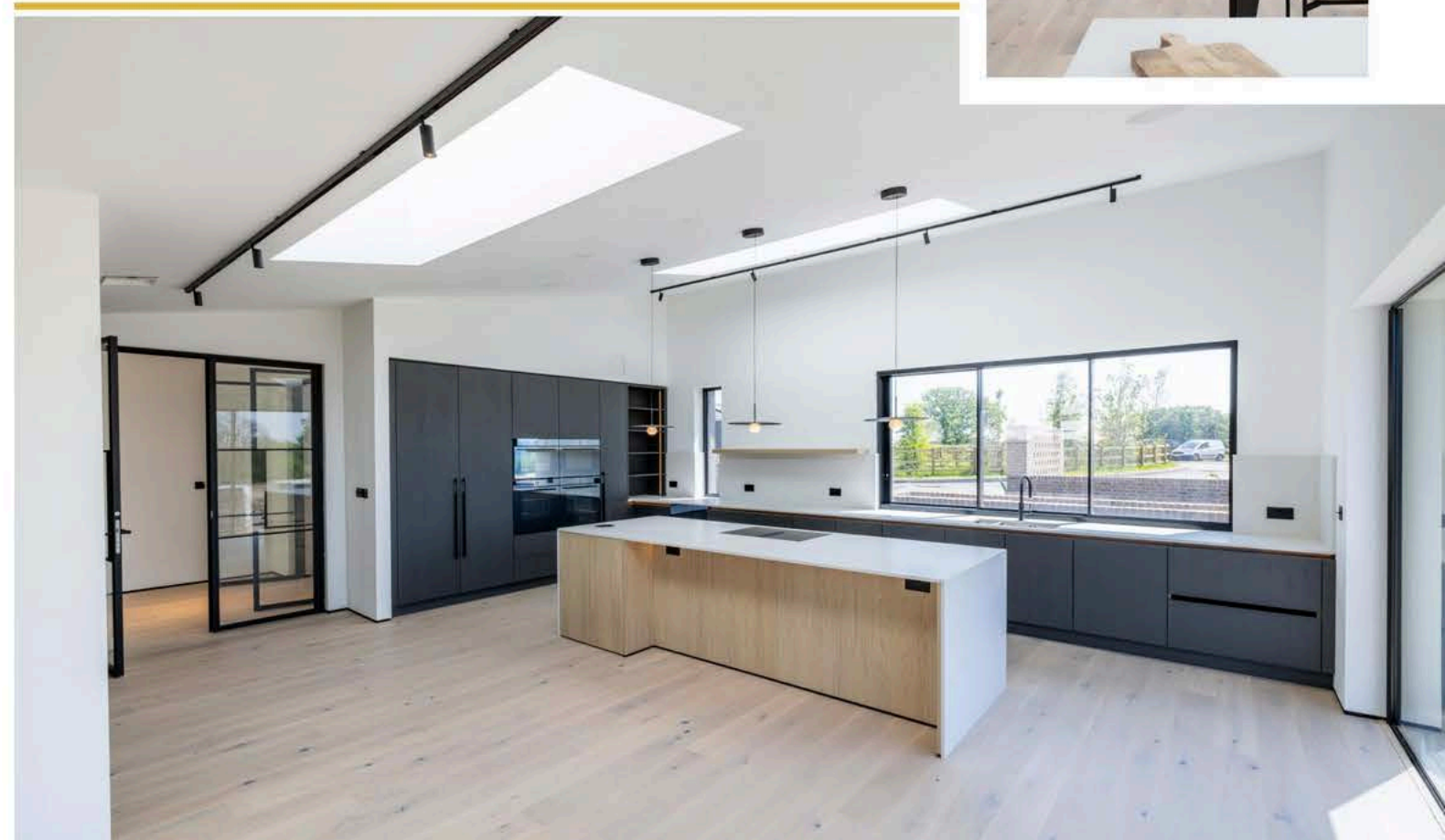
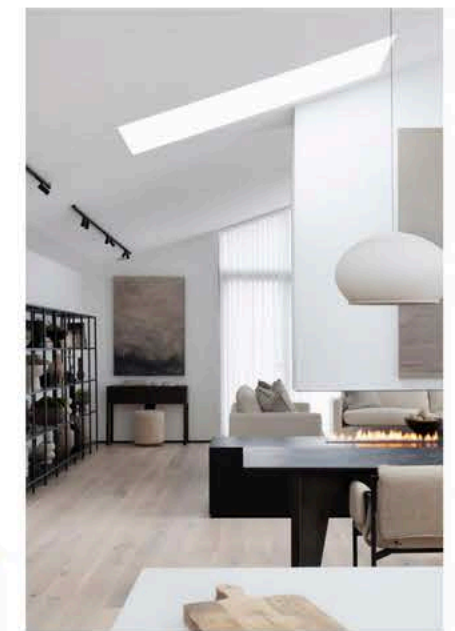
A variety of cladding patterns has been utilised across the site to highlight entrances and feature areas. The variations add tactility and break up the large-scale elevations of the new homes. The family of patterns also helps create a unique design for each dwelling, whilst also unifying the overall scheme. It includes ship-lapped vertical boarding with varying widths of boards and rectangular boards and alternating vertical fins with open joints. Large glazing is used wherever there are large views - which are incredible in many instances - with smaller windows where the view is towards common areas.

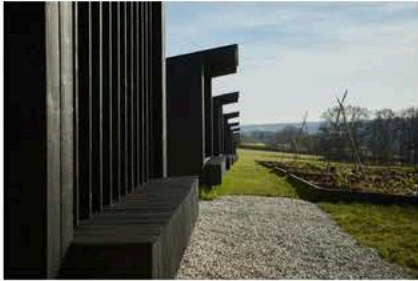
In contrast to the dark exteriors, the property interiors are light, bright and filled with natural tones. The neutrality of the interior design creates a luxurious backdrop for prospective owners to inhabit and personalise. The design principle inside is to express the forms through, for example, vaulted high ceilings, whilst full-height, glazed Crittall-style doors create a connection between

the primary living spaces and entrance hall. Stairs, some light and some solid, reflect the various internal layouts of the properties. The staircases feature a crafted handrail with metal balusters and either slatted or solid timber balustrades. A slatted wall sits next to any 'floating' stairs, along with a wall-mounted timber handrail.

The palette for the kitchens utilises a combination of rich materials, such as quartz worktops, alongside timber. Feature fireplaces have been utilised across the houses to help divide and spatially organise the large open plan kitchen, living, dining spaces. They create a warm focal point within each space from which furniture can be organised and laid out.

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The master bedrooms feature light and neutral colours expressed through timber bespoke joinery and natural fabrics. Beds are orientated towards large windows to maximise views out to the surrounding landscape. There's a neutral palette to the bathrooms with contrasting dark tapware. Large format tiling and textured small tiles create feature walls and distinguish different areas within the room. The bathroom tiling ranges from white for master bedrooms to dove grey for secondary bedrooms and green for guest WCs.

### RIBA Climate Challenge

*'This was the practice's first ever project to adopt the standards and requirements of the RIBA Climate Challenge, which was an exciting opportunity, but also presented significant challenges we needed to overcome'* Jim Richards commented.

*'We needed to balance sustainability with cost and practicality, while bridging any 'knowledge gaps', particularly with regard to the approach needed to reduce embodied carbon and its direct connection with supply chains – and with the sourcing of low carbon materials.'*

Nissen Richards Studio worked to meet the project's low operational energy targets by considering both regulated and unregulated energy consumption, regardless of the source. To do this, they adopted a hierarchy that started with a 'fabric-first' approach to minimise energy demand, followed by the use of efficient services and low-carbon heating, prioritising ways of maximising on-site renewable energy generation.

*'Meeting potable water use targets was definitely more challenging than anticipated'* Jim Richards added. *'While we met the 2025 target of 105 litres through careful specification of appliances and fittings, we found that the 2030 target of 75 litres was only achievable with rainwater harvesting and site-wide water recycling. As a result, future projects will need to incorporate these strategies at an earlier stage in the process to reduce potable water consumption.'*

### Project Funding

The project was financed by a specialist low-carbon loan, a financial instrument designed to connect property developers working on sustainable projects with investors looking to put money into green schemes. The funders in this case are Atelier, who signed up for the RIBA Climate Change Challenge 2025 and 2030. As a condition of the funding, Q New Homes were required to undertake

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a whole-life carbon assessment of the project.

### Local Habitats

The landscaping and planting across the site aim to support and enhance local habitats. Careful consideration has been given to the chosen plants, with native species selected to support and benefit local wildlife. The 6,500-acre Ashdown Forest is also close by, offering unrivalled open space in the South East of England. The Forest is at the heart of the High Weald Area of Outstanding Natural Beauty and has national and international protection because of its wildlife.

### Eco Luxury

*'This project proves that you really can push the boundaries of sustainability and still create homes that are luxurious'* Jim Richards concluded. *'The forms and silhouettes of the old Dutch barn, the dairy, the hay barn, cottage and so on in the new buildings give a sense of place, and create a reminder of its past, but the modern incarnation is very much about providing high-spec, luxury eco homes.'*

