GOOD DESIGN DOESN'T COST THE EARTH





Tackling the climate emergency is a pressing issue that affects the future of our planet and the future of the architecture profession. Now more than ever, there is global consensus that swift action must be taken to reduce carbon emissions. The built environment plays a significant role in the climate crisis and produces 40 per cent of carbon emissions. RIBA has declared a climate and environmental emergency and we have challenged our chartered practices to reach net zero whole life carbon by 2030.

Sustainability needs to be embedded into every building, from strategy to technical delivery, through to use.

The buildings featured here are fit for the future and have sustainability running through their core. Putting sustainability at the centre benefits the environment, the client and users – everyone wins.

Study these examples carefully, learn from them, and help create a better future.

Professor Alan M Jones RIBA President



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DESIGN MATTERS: GOOD DESIGN DOESN'T COST THE EARTH

The RIBA's 2030 Climate Challenge calls upon our chartered practices to reach net zero whole life carbon for new and retrofitted buildings by 2030, and sets out specific targets for operational energy, embodied carbon and potable water usage. We believe these are ambitious but achievable targets.

Currently, too many buildings do not meet promised energy efficiency standards. The RIBA is challenging our members to measure operational energy, which is the amount of actual energy used by a building. This will ensure that buildings are energy efficient and are also cost effective to run; warm in winter and cool in summer.

The construction sector needs to get better at using low carbon materials, reusing existing materials, and sourcing as locally as possible. This will reduce the amount of embodied carbon in buildings, another key aspect of the 2030 Climate Challenge. Embodied carbon refers to the carbon emitted from the processes associated with sourcing materials, fabricating them into products and systems, transporting them to site and assembling them into a building. It also includes the emissions due to maintenance, repair and replacement, as well as final demolition and disposal.

The 2030 Climate Challenge is a journey and whilst not all the projects featured here are net zero, they highlight the innovative measures that architects are taking to have a positive impact on the climate emergency.

Good design is key to creating sustainable buildings that safeguard the environment and have a positive effect on their users.

2030 CLIMATE CHANGE TARGETS



Reduce operational energy demand by at least 75% before offsetting.

OPERATIONAL ENERGY



POTABLE WATER USE Reduce potable water use by at least 40%.



EMBODIED CARBON Reduce embodied carbon by at least 50-70% before offsetting.

HEALTH AND WELLBEING Achieve health and wellbeing targets on temperature, daylight and indoor air quality.

TAKE THE 2030 CLIMATE CHALLENGE architecture.com/2030challenge



riba east Bushey Cemetery

Location

Bushey, Hertfordshire
 Architect
 Waugh Thistleton Architects
 Client
 The United Synagogue
 Contractor
 Buxton Building Contractors Limited
 Structural Engineer
 Elliott Wood Partnership Ltd
 Environmental / Mechanical & Electrical Engineer
 P3r Engineers Ltd
 Internal area
 644 m²

2018

RIBA East Award RIBA National Award RIBA Stirling Prize Shortlist



The buildings at Bushey Cemetery are very much part of their setting and, in 60 years when it is anticipated that the cemetery will be fully occupied, the buildings will be returned to the earth. and the site to the green belt. Built of rammed earth, this organic, locally sourced material defines the overall design and was chosen for its symbolic and practical sensitivity to the Jewish faith, echoing the traditional sentiment of the deceased being laid to rest in plain wooden caskets, 'returning to the earth'. This is an ancient building method that is natural, sustainable, durable and strong. Left exposed within the ceremonial spaces, the rammed earth creates a sombre, peaceful atmosphere. Oak panelling, earthen tiles and corten steel doors complete the natural, tactile material palette.



RIBA EAST

Courtyard House

Location ② Bury St Edmunds, Suffolk Architect Williams Griffiths Architects Client Private Client Contractor R & J Hogg Structural Engineer Andrew Firebrace Partnership Mechanical & Electrical Engineer Eng Design Internal area 320 m²

2019

RIBA East Award RIBA East Small Project Award



Courtyard House was the complete re-working of a dark, tired and uninspiring 1980's bungalow with separate garage. Intrusive surveys revealed that the existing house was originally constructed with no insulation below the floor or in the brick and block cavity walls. Strategic placement of new windows and roof lights took maximum advantage of natural daylight. In addition, a red cedar exterior, injected wall cavity insulation, new thermal linings to all walls and floors and a new highly insulated roof have improved the building envelope.

RIBA EAST Goldsmith Street

Location
Sonorwich, Norfolk
Architect
Mikhail Riches with Cathy Hawley
Client
Norwich City Council
Contractor
RG Carter
Structural Engineer
Rossi Long Consulting
Environmental / Mechanical & Electrical Engineer
Greengauge Building Energy Consultants
Internal area
8,056 m²

2019

RIBA East Award RIBA East Client of the Year for Norwich City Council RIBA East Sustainability Award RIBA National Award RIBA Stirling Prize Neave Brown Award for Housing



The scheme at Goldsmith Street was masterplanned around sustainable principles from the outset to make best use of the sun. Streets are set out so the main elevations face south and north. benefiting from solar winter gains, whilst preventing summer overheating with simple shading devices over all windows facing south. The homes are all certified Passivhaus. Roof pitches are carefully modelled to avoid overshadowing in winter and internal layouts configured so that most habitable rooms face south. To achieve a very low heating demand, high levels of airtightness, thermal insulation and high-quality triple glazed windows are used to reduce heat loss. The energy efficiency of the homes means typical annual heating bills of £140 for a two-bedroom house, of which approximately half would be the standing charge.



RIBA EAST

Kintyre

Location St Albans, Hertfordshire Architect Tate Harmer Client Private Client Contractor Integrity Buildings Structural Engineer Cygnum / CTP Environmental / Mechanical & Electrical Engineer Ecoliving Internal area 220 m²

2019

RIBA East Award RIBA East Sustainability Award



Sustainability was the goal of Kintyre from the outset. The use of natural, recycled and local materials was prioritised, and the type of insulation selected is manufactured from recycled newspaper. The house includes state-of-the-art technology, including the latest multi-mode smart lighting, heat recovery units and thermal stores, an air source heat pump and PV solar panels. Should the building ever be demolished, the structural frame and insultation can be recycled or repurposed. Kintyre demonstrates great effort and skill in manipulating the building fabric and elements to reduce energy consumption.



RIBA EAST MIDLANDS Teaching and Learning Building

Location

S Nottingham

Architect

Make Architects

Client

The University of Nottingham

Contractor

Kier Consultants

Structural Engineers

AKTII

Environmental / Mechanical & Electrical Engineer

Max Fordham

Internal area

5,940 m²

2019

RIBA East Midlands Award RIBA East Midlands Sustainability Award RIBA National Award



The approach to sustainability was at the heart of the design for the Teaching and Learning Building from the beginning. The atrium was designed to naturally ventilate the building and achieve high levels of daylight. A robust palette of materials, including architectural masonry and cross laminated timber, were selected to ensure longevity, minimise waste and maximise resources. A delicate balance was struck between allowing generous amounts of natural light into the building and limiting the effects of solar gain. This balance has been achieved by having large areas of glazing located at optimum points on the façade, and high-performance solar control glass incorporated into the design.



RIBA LONDON

Bethnal Green Mission Church

Location Bethnal Green, London Architect Gatti Routh Rhodes Architects Client Bethnal Green Mission Church/Thornsett Group Additional Architect (Contractor's Architect) Capital Architecture Structural Engineer Price & Myers Environmental / Mechanical & Electrical Engineer OCSC Internal Area 2,100 m²

2019

RIBA London Award



The client was the key promoter for achieving high levels of environmental, social and economic sustainability, leading to the environmental performance being targeted in the planning application, and subsequently in the planning conditions and the tender documentation.

The design team focused on using a highly performing building fabric, with triple glazing and good levels of airtightness, as well as low energy systems, and paid attention to the quality of materials used.



RIBA LONDON Bloomberg, London

Location

City of London, London
 Architect
 Foster + Partners
 Client
 Bloomberg
 Contractor
 Sir Robert McAlpine
 Structural Engineers
 AKT II
 Internal area
 66,354 m²

2018

RIBA London Award RIBA National Award RIBA Stirling Prize



Bloomberg's new European HQ is a true exemplar of sustainable development. Its striking façade is defined by a structural sandstone frame, with a series of large-scale bronze fins that shade the floor-to-ceiling glazing and are an integral part of the building's natural ventilation system. The ceiling contains polished aluminium panels of 'petals' which perform multiple roles - light reflectors, cooling elements and acoustic attenuation which combine various elements of a typical office ceiling into an energy-saving integrated system. The building is also 70 per cent more water-efficient than a typical office building, with an on-site water treatment plant that allows the collection and reuse of rainwater from the roof and "grey water" from sinks, saving up to 25 million litres of water a year. This recycled water then feeds the airline-style vacuum-flush toilets, which use net zero mains water.

RIBA LONDON

Location

Lambeth Civic Centre and Town Hall

Brixton, London
 Architect
 Cartwright Pickard
 Client
 Lambeth Council & Muse Developments
 Contractor
 Morgan Sindall
 Structural Engineer
 Curtins Consulting
 Environmental / Mechanical & Electrical Engineer
 chapmanbdsp

2019

RIBA London Award



-

Lambeth Council's new civic quarter is centred around the refurbishment of the Edwardian Grade II Listed Lambeth Town Hall and the construction of a new build Civic Centre. Original fixtures and fittings were restored, including brass door fittings, marble, stained glass, vaulted ceilings, chandeliers and windows. The building was upgraded to include an insulated green roof with solar panels. The project has also reduced the Council's core office buildings from fourteen to two, saving taxpayer money and cutting the Council's carbon footprint by two-thirds.

RIBA LONDON

The Bartlett School of Architecture

Location Soloomsbury, London Architect Hawkins\Brown Client University College London Contractor Gilbert Ash Structural Engineer Curtins Consulting Internal Area 8,900 m²

2017

RIBA London Award



The Bartlett School of Architecture, UCL, redeveloped its original home of Wates House, which was constructed in the mid 1970s. Located in the Bloomsbury Conservation Area, the design utilises the original concrete frame's capacity to provide strategic extensions, while completely reconfiguring the interior: the structure was stripped back to expand the available space and the building was wrapped in a new brick façade. The project's sustainable design focus was to reduce whole life carbon emissions by optimising the balance of embodied carbon and in use energy emissions.



RIBA LONDON

The Sekforde

2018

RIBA London Award RIBA London Sustainability Award



This project involved the full restoration of a Regency period pub, the construction of a new mixed use 3 storey building adjacent, and a glazed link forming a clear divide between the old and new.

The combination of ground source heat pumps, and an innovative heat recovery system drawing heat from the (Clerken) well water in the ground results in renewable energy heating for the pub and lodging, and air cooling and conditioning for the kitchen and beer pump rooms. An ice feature, displayed below a panel of walk on glass in the middle of the basement dining room, was incorporated as a visible display of the heat recovery and air-cooling process implemented as part of the restoration and development of the Grade II Listed building. This has resulted in lower electricity bills, less damage to the environment, and no fan units fixed to the face of this sensitive façade.



RIBA NORTH EAST Hauxley Wildlife Discovery Centre

Location Dow Hauxley, Northumberland Architect Brightblue Studio Client Northumberland Wildlife Trust Contractor Brightblue Studio Structural Engineer Pittilla Bell Consulting Ltd

2018

RIBA North East Award RIBA North East Sustainability Award RIBA North East Client of the Year



The use of local materials in Hauxley Wildlife Discovery Centre was outstanding. Locally guarried stone was used in the structural gabions, clay from roadworks nearby was used to create the rammed earth flooring and straw bales from local farms were used for the walls. This has resulted in a zero concrete building that significantly reduces embodied carbon and provides a healthy internal environment. In terms of process, this was an architect led design and build project delivering a deep green building with significantly less cost and community involvement including over 26,000 hours given by volunteers. The restored and recreated habitats interconnect the landscape so visitors can have one of the best wildlife viewing experiences.

(14) DESIGN MATTERS



RIBA NORTH EAST

Janet Nash House

Location

Durham

Architect

FaulknerBrowns

Client

City Electrical Factors

Contractor

Sir Robert McAlpine

Structural Engineers

Curtins Consulting

Environmental / Mechanical & Electrical Engineer

Desco
Internal area
3,645 m²

2019

RIBA North East Award RIBA North East Client of the Year RIBA North East Building of the Year



Janet Nash House benefits from a comprehensive sustainability and wellbeing strategy specially tailored to reflect the client's corporate agenda. The primary cladding materials are both recycled and recyclable. The porcelain cladding to the northern façade includes 52% recycled content and each slab is 100% recyclable. This philosophy extends to the internal finishes where post-consumer recycled solutions have been used. This includes acoustic felt made with recycled drink bottles. The site's 6,000sqm enhanced ecological zone offers a greatly improved ecological environment to sustain and promote biodiversity in the area. The pre-cast concrete frame structure provides a hybrid solution working both as structural frame and environmental control system.



RIBA NORTH WEST

A Restorative Rural Retreat for Sartfell

Location

S Isle of Man

Architects

Foster Lomas

Client

Private Client

Contractor

Organic Construction Solutions

Structural Engineers

Conisbee

Environmental / Mechanical & Electrical Engineer

XCo2

Internal area
300 m²

2019

RIBA North West Award RIBA North West Sustainability Award RIBA National Award RIBA House of the Year Shortlist



The design principal for Sartfell is centred around a rigorously considered response to the local landscape and climate on the Isle of Man.

Using local quarried stone to construct the outer walls which wrap around a thermal mass of concrete the house boasts zero carbon energy consumption. A hay based biodiverse green roof with native plants completes the impressive list of environmental criteria executed with aesthetic mastery.



RIBA SOUTH

Lark Rise

2019 RIBA South Award



Although carbon was emitted in its construction, the buildings future maintenance, repair and eventual replacement will be completely free of carbon emissions, offset by the building's lifetime grid exports of surplus solar energy. Lark Rise acts as a micro renewable power station, drawing 97% less energy from the grid than the average UK home. This project unlocks the possibility of turning homes into micro power stations and the exciting potential to enable the UK to be fuelled entirely by renewable energy. Through combining a fabric-first, Passivhaus approach - utilising super-insulation without cold-bridges, draught-free construction, high-performance triple glazing with insulated frames, and a heat recovery ventilation system, Lark Rise is the first of its kind



RIBA SOUTH Thames Tower

Location
Beading
Architect
Architect
Client
Landid Property & Brockton Capital
Contractor
Bowmer & Kirkland Ltd
Structural Engineer
Peter Brett Associates
Mechanical & Electrical Engineer
Ramboll UK Ltd
Internal Area
23,470 m²

2018

RIBA South Award RIBA Sustainability Award



The building that sat in this place before Thames Tower was a stumpy and outdated 1980s office in dire need of repair; hardly fitting for such a prominent location. But the development team chose not to completely demolish it. Instead they stripped it back to its concrete frame ensuring the embodied carbon was preserved. Through creative engineering they succeeded in adding a further four floors to it, at the same time as completely re-imagining the interior and exterior. This is a model of creative sustainability.



RIBA SOUTH EAST Hill House Passivhaus

Location

Locat

2019

RIBA South East Award RIBA South East Sustainability Award RIBA South East Small Project of the Year Award RIBA National Award



Hill House is a successful self-build housing project which achieves the best in low-energy house standards. Using excellent thermal performance, exceptional airtightness with mechanical ventilation providing pre-heated fresh air, the result is a dwelling that requires little additional energy for heating. Hot water is generated with an air source heat pump and additional space heating can be provided through a sealed wood burning stove. A restrained palate of materials references the woodland setting with the external walls and roof wrapped in western red cedar.



RIBA SOUTH WEST

Location Taunton, Somerset Architect AHR Client UK Hydrographic Office Contractor BAM Civil & Structural Engineer Hydrock Mechanical & Electrical Engineer Hydrock Internal area 11,000 m²



The new headquarters for the UK Hydrographic Office has been designed to the client's progressive brief and follows the Government Soft Landings process. The client and architect committed from the outset to open plan working and natural ventilation. The prioritisation of daylight was important for the wellbeing of staff; to achieve this full height glazing with operable ventilation panels, external solar shading and internal glare blinds were installed.

2019

RIBA South West Award RIBA South West Client of the Year RIBA South West Sustainability Award



RIBA WEST MIDLANDS

Collaborative Teaching Laboratory

Location Birmingham Architect Sheppard Robson Client University of Birmingham Contractor Morgan Sindall Plc Structural Engineer Curtins Consulting Environmental / Mechanical & Electrical Engineer Couch Perry Wilkes Internal area 6,700 m²

2019

RIBA West Midlands Award RIBA West Midlands Sustainability Award RIBA West Midlands Project Architect of the Year Award for Alex Smith RIBA West Midlands Building of the Year Award



The Collaborative Teaching Laboratory at the University of Birmingham serves 14 science, technology, engineering and mathematics subject groupings. Innovative methods of construction and materials focused on the user experience and energy efficiency, such as developing a new benchmark in fume cupboards that allows simultaneous use by two students. A building of this type would typically have incredibly high energy usage, but through a whole raft of integrated design decisions including high levels of airtightness, solar panels and linking to the universities district heating system, it has been able to achieve an excellent level of energy efficiency.



RIBA YORKSHIRE Mercia School

9,725 m²

2019

RIBA Yorkshire Award



Built on a former landfill site, Mercia School is a striking high-quality secondary school and sixth form. The use of enhanced basic construction technologies was employed to make the building as energy efficient as possible; this includes improved wall and roof insulation. The building also utilises natural cross ventilation via the opening façade and exhausts air via roof lights. A minimum of 10 per cent of energy is provided by renewables and one wing of the building features a wild flower green roof.



RIBA YORKSHIRE

Location

Merrion House

Leeds, West Yorkshire
Architect
BDP
Client
Town Centre Securities
Contractor
BAM
Structural Engineer
BDP
Environmental / Mechanical & Electrical Engineer
Hoare Lea
Internal area
21,803 m²

2019

RIBA Yorkshire Award RIBA Yorkshire Sustainability Award



The remodelling and extension of Merrion House is an exemplar of sustainable refurbishment. Originally completed in 1974 the building needed significant remodelling to meet the Council's new ways of working and sustainability targets. The existing structure was retained, and new thermally efficient cladding was installed. This simultaneously reduced demolition waste whilst reducing heat loss and utilising solar gains, resulting in less of a need for heating and cooling loads. LED lighting, presence detection, low water-use sanitary fittings and localised water heating also provided greater energy efficiency and reduced water demands. The reconfiguration has allowed the Council to embrace flexible working resulting in 2,200 employees operating out of a 1,900 desk environment. The building is always therefore working to its maximum capacity, making it more efficient in its energy use and allowing the consolidation of 13 of their existing buildings into just four.



RIBA YORKSHIRE The Great Tythe Barn

Location

3 Skipton, North Yorkshire
 Architect
 Pearce Bottomley Architects
 Client
 Bolton Abbey Estate
 Contractor
 Universal Projects (UK) Refurbishment
 Structural Engineer
 Mason Clark
 Environmental / Mechanical & Electrical Engineer
 Silcock Leedham Consulting Engineers
 Internal area
 788 m²

2019

RIBA Yorkshire Award RIBA Yorkshire Conservation Award



The Great Tythe Barn is a Grade II Listed building on a Scheduled Ancient Monument that had become underused over the years. The building was refurbished with changes to the building envelope to improve its thermal performance, providing a comfortable environment whilst reducing energy use. Materials used in the refurbishment were both sustainable and suitable for the historic fabric – local stone, natural paints, limecrete floor slab, foamed glass aggregate insulation and reclaimed timber cladding. Due to this detail, the upgrades have been carried out with minimal visual impact on the original. Underfloor heating has been installed below the existing stone flagged flooring and insulation has been added between the original roof rafters both for thermal insulation and also to reduce noise break out to nearby residences. The conservation work on the project is exemplary.



RIBA YORKSHIRE

The Weston, Yorkshire Sculpture Park

Barnsley, South Yorkshire
 Architect
 Feilden Fowles Architects
 Client
 Yorkshire Sculpture Park
 Contractor
 William Birch
 Structural Engineer
 Engineers HRW
 Environmental / Mechanical & Electrical Engineer
 Skelly & Couch
 Internal area
 673 m²

2019

Location

RIBA Yorkshire Award RIBA Yorkshire Client of the Year Award RIBA Yorkshire Building of the Year Award RIBA National Award RIBA Stirling Prize Shortlist



The approach to the visitor centre and gallery at the Yorkshire Sculpture Park was to reduce the energy demand through efficiency and good design.

The project includes sustainable features including green roofs, heat pumps to provide hot water and an unusual passive humidity buffer which avoids the use of humidification or dehumidification which is traditionally used in control systems in many galleries and museums.

^{RSAW} Ysgol Trimsaran

2019

Welsh Architecture Award RSAW Sustainability Award



Ysgol Trimsaran was designed jointly with Carmarthenshire County Council and is one of the first Passivhaus school buildings in Wales. The architect and client have worked tirelessly to deliver an environmentally friendly and healthy school using off-site construction and Welsh timber, which is renewable, low carbon, low maintenance and cost-effective. The school was designed with a fabric-first approach to make sure the building will perform optimally in the face of climate change. The building is saving around 80% on their energy bills thanks to the Passivhaus design.

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