Recognising the people, products and projects that demonstrate engineering excellence in the built environment

WINNERS’ BROCHURE

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It is no coincidence that the Building Performance Awards is considered to be one of CIBSE’s most high profile and prestigious set of accolades. Without exaggeration, building performance is one of the most important issues that must be tackled by this industry, this country and this planet over the next few decades.

The scientific evidence behind man-made climate change is overwhelming, but energy security in Europe is as uncertain as it’s ever been, and rising energy bills are squeezing already overstretched homes and businesses to the limit. As one of the major energy users on the planet, tackling waste and inefficiency in buildings is an obvious alternative to building yet more polluting sources of energy – the problem is demonstrating proven ways of achieving that aim.

That’s where the Building Performance Awards come in. That crucial focus on proven building performance, rather than designed or predicted performance, provides concrete evidence of progress, and celebrates the professionals who are making a difference in driving the industry forward.

But energy efficiency isn’t the only consideration in a high-performing building. The Building Performance Awards recognise that buildings are built for people to inhabit, and if it were uncomfortable or unpleasant to use, even the most efficient building possible would be a failure. These awards therefore take into account user satisfaction and comfort levels alongside efficiency whilst measuring a building’s performance.

By showcasing the best that there is to offer in terms of engineering innovation and excellence, we can demonstrate what is possible and inspire the whole industry to strive for better, more efficient buildings; creating new structures, refurbishing old ones and developing the products and structures to support them.

Building performance is at the heart of everything CIBSE does, and tonight we congratulate the nominees on reaching the top of an exceptional field, as well as the overall winners for making a real difference in leading the response to the problems our industry faces.

Nick Mead CEng FCIBSE
CIBSE President
Adveco Ltd. is the sister company to Adveco (AWP) Ltd, who trade as A.O. Smith Water Heaters in the U.K. and have over 44 years of expertise in the building services industry. Our ethos has always been to offer the very best products, services and support, prioritising our clients’ needs and delivering bespoke, practical solutions.

The recent launch of the Adveco Totem micro-cogenerator has brought market leading performance, offering the highest total efficiency on the m-CHP market plus ultra-low NOx and CO emissions at under 10mg/Nm³. These serve as strong advantages to meet current building regulations, and assist in receiving valuable BREEAM points.

Utilising on-site cogeneration is one of the most effective ways to reduce emissions outside of usage limitation. The recovery of waste heat from the Totem enables a 28% decrease in CO₂ emissions; equivalent to a reduction of 50 tonnes per year when compared to consuming the equivalent mains supply of gas and electricity. Additionally the free, high-grade heat recovered on-site can amount to running cost savings of over 25%.

Contact Adveco today for more information
Telephone: 01252 551 540   www.adveco.co
GET INVOLVED

Interested in volunteering for CIBSE? With 16 regions in the UK and 3 overseas; there are a vast number of roles in a variety of areas to choose from.

Examples of opportunities include:
• Volunteer at regional events, an excellent way to interact with CIBSE and other building services professionals
• Become a STEM ambassador to promote and inspire young people to consider a career in engineering
• Contribute to technical publications
• Become a professional interviewer for CIBSE membership

Both members and non members welcome; email: membership@cibse.org and find out how you can get involved.

CHAIR OF JUDGES
» Hywel Davies, Technical Director, CIBSE

» Jamie Agombar, Head of Sustainability, National Union of Students

» Alan Fogarty, Partner, Cundall

» Murish Datta, Head of Facilities Management and Plan A, Marks and Spencer

» Bill Gething, Professor of Architecture, University of the West of England

» Young Jackson, Director, Sustainability, University College London

» Foroutan Parand, Technical Director, AECOM

» Geoff Prudence, Chair, CIBSE FM Group

» Jeff Shaw, Managing Director, Lighting, Arup

» David White, Managing Director, Building Services Design

The awards focus on actual, measured performance, not just design intent or performance specifications.”
Imtech is one of the largest independent technical services providers in the UK and Ireland.

Our £400 million turnover business undertakes wide-ranging mechanical and electrical installation projects and maintenance contracts. Our 2,500 employees work across the UK and Ireland's infrastructure and built environment covering many sectors including commercial, retail, education and healthcare.

We want to be the most respected sustainable technical services business in the UK and Ireland. To achieve this we are organised into three broad work streams, engineering services, technical facilities management and systems integration. These demonstrate the breadth of our operations and the strength of our capabilities.

Imtech has intelligent engineering capabilities and solutions that deliver real benefits to our clients.

Digital Engineering & Off-Site Manufacture
Our Digital Engineering team optimises the delivery of our projects by using BIM from the earliest stages of the design period. This enables us to reduce uncertainty and to ultimately create efficiencies throughout the preconstruction and build process.

Health and safety is our number one priority and by using prefabrication we have reduced our Accident Frequency Rate to half the average industry rate.

Prefabrication is utilised on the majority of our projects and Imtech has:
- continued to ensure minimal disruption to players and visitors during Anfield Stadium’s main stand extension
- reduced the overall programme by 30 days at a large-scale retail distribution facility in Bolton

Site Management in the Cloud
Imtech uses tablet-based electronic site management on projects across the country, resulting in paperless sites, snag-free installations, optimised efficiency and smooth collaboration at all stages of our projects.

Value Engineering
Our teams have a systematic and structured approach to determine potential for capital savings and can enhance the value of our projects.

Substantial capital savings have been made on the Olympic Stadium Transformation Project by identifying recyclable equipment during the reconfiguration works. The team also reviewed the technical systems to improve the technologies used and to enhance the engineering solution.

Imtech understands how to use innovation to create value for our clients, their advisors and the market.

We achieve operational excellence by embracing and implementing the latest technologies, within a project, where they add value. From the early stages of each project, our teams take time to understand its intricacies and develop the right solutions. This ensures our work is delivered efficiently, cost effectively and to the high standards we set ourselves.

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Follow us on LinkedIn or visit our website for the latest news, contracts, photos and events.

www.imtech.co.uk
Like a phoenix from the ashes, the new £27 million Everyman Theatre has risen triumphantly from the site originally occupied by its much-loved, but ailing predecessor. The reborn theatre, which opened in 2014, features outstanding energy efficiency, maximised with the help of the building’s fabric and, in particular, its dramatic façade which employs sophisticated active solar shading. To boost environmental performance still further, the auditorium uses natural stack ventilation, minimising the energy consumption of fans and ventilation equipment. This is supported by a mechanical system to cope with peak loads. Low energy lighting and controls complete the energy saving measures of this iconic building. The theatre has achieved an Excellent BREEAM rating as a result of these measures.

At the outset, the challenge for m&e engineer Waterman Building Services (WBS) was to provide a low energy theatre with a naturally ventilated auditorium in a particularly challenging location – the crowded university and cathedral quarter of Liverpool. The theatre auditorium couldn’t have large opening windows or louvres because of traffic noise/daylight breaking in and show noise breaking out. On top of this, there was a need to dissipate upwards of 115kW of internal gains while maintaining internal air quality.

The most innovative element of the design process was the simulation of the natural ventilation processes which analysed the auditorium’s environmental conditions using building-wide dynamic simulation modelling and then refining the results with computational fluid dynamics.

Another innovation was the natural ventilation’s control system. An array of actuator-controlled dampers has been fitted within the basement plenum and the high-level auditorium plenum. A method of control was devised that enabled both sets of dampers to be interlocked, with banks of dampers capable of being opened and closed proportionally to match the internal air temperature and air quality conditions.

Finally, the building management system incorporates an energy metering and logging strategy that enables Everyman staff to review, record and store energy and resource data including lighting load, CHP energy produced, mains cold water usage, harvested rainwater usage and gas consumption.

**WINNER:**
Everyman Theatre, Liverpool
Waterman Building Services

**PROJECT TEAM:**

It’s a wonderful world, let’s keep it that way.

Every member of the Remeha family shares the same simple design. That’s why they’re so easy to use and install. They also share many common traits: proven quality, outstanding reliability and exceptional efficiency. So whichever model you choose, whether the output is 9kW or 1202kW, you’re assured of maximum energy and carbon savings. Plus, you will have the back-up of the best support team in the business. Find out more about the Remeha family at remeha.co.uk or call us on 0118 978 3654.

**CIBSE Building Performance Champion Award**

**Sponsored by:**

Waterman commercial

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BCM reviews the potential options for the building in terms of fabric, glazing, orientation, servicing strategy and renewable energy. This approach generates valuable graphical information on carbon emissions, running costs and capital costs for each option which are then appraised with the client.

The appraisal process uses the latest dynamic simulation modelling techniques linked with Revit and BIM processes to engage with clients and help them to understand the implications of different building solutions. Often, by using this process, BCM is able to guide the client to a solution that has a high value, but low capital costs.

But the company refuses to rest on its laurels. Its relentless drive for continual improvement incorporates a feedback process that includes a review of its collaboration with the client and design team. Its feedback system has revealed that not a single client in the past five years has rated it any less than 'good' in any category.

“...You could really feel the passion coming from BCM...”

WINNER: Beverley Clifton Morris (BCM)

BCM is resolutely committed to sustainability and low cost, low carbon building solutions. Established in 2002, this inspiring consultancy takes a holistic view of building design, incorporating fabric, glazing and services, to provide high quality strategic advice to its clients.

It has also undertaken research with government innovation agency Innovate UK to develop life cycle costing techniques using building information modeling (BIM) to boost building performance.

This enlightened consultancy regularly reviews and plans relevant training that precisely fits its individuals’ and the company’s needs. Its training scheme is run under the auspices of the Institution of Mechanical Engineers e-MPDS (Monitored Professional Development Scheme) and was recently re-certified for a further three years with no remedial actions and with recognition of its good practice.

BCM has developed a bespoke design process that uses BIM workflows and processes to deliver energy advice and designs to its clients. To achieve this, it takes a strategic approach to the energy and carbon emission aspects of the building design, and how these interact with the building fabric and building services.

Proud sponsor of Building Services Consultancy of the Year (up to 100 employees) Award at the CIBSE Building Performance Awards 2016

FINALISTS:
» Steven A. Hunt and Associates
» SVM Consulting Engineers
OUTSTANDING CONTRIBUTION TO THE DESIGN OR REFURBISHMENT OF BUILDINGS TO MEET CLIENT EXPECTATIONS OF ENERGY PERFORMANCE

WINNER:
Hoare Lea

With 614 training days recorded for 2014, towards achieving Chartered Engineer, Incorporated Engineer and Engineering Technician status, Hoare Lea is clearly committed to professional development and supporting its people.

Its home-grown graduate exchange programme offers graduates the valuable opportunity to raise their interdisciplinary awareness by encouraging a holistic approach to building design through secondments with architects. To date this popular scheme has placed 104 graduates with architects including Broadway Malyan and Stride Treglown, and received 93 of their graduate staff in return.

This progressive consultancy maintains and develops a knowledge-base, an online repository for standard documents such as specifications and report templates; policy and guidance material and in-house developed design tools.

Hoare Lea demonstrates a collaborative approach to learning, creating opportunities to share knowledge across all its offices internationally and across the industry. But its ambitions don’t stop there. It is also investing £225k over four years for the advanced manufacturing of homes, focusing on MEP and digital engineering to develop offsite manufactured MEP sub-assemblies.

It also invests over £125k a year into its research programme and, to further strengthen its resource, it has established an outsource facility in Pune, India employing more than 50 people.

JUDGES’ COMMENTS

There was richness to the Hoare Lea entry… it had real pizzazz!

WINNER:
Hoare Lea

FINALISTS:

AECOM
Arup
Atelier Ten

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**RECOGNISING THE ACHIEVEMENTS OF A FACILITIES MANAGEMENT TEAM DELIVERING OUTSTANDING BUILDING PERFORMANCE**

**WINNER:**
Sirius Building, Canberra, Australia
Mirvac Group

Mirvac has the unique distinction of being the first organisation ever to attain an Australian six star NABERS Energy rating without the use of GreenPower. The rating was achieved for a large grade A office building called the Sirius Building in Canberra, Australia, which Mirvac owns and operates.

The 46,147m² building opened in 2010 and, over the first four full years of operation, achieved a consistent year-on-year reduction in gas and electricity use of more than 20%. This level of performance improvement requires outstanding focus and complete commitment.

The facilities management (FM) team have not only maintained the six star rating over three rating years, but have also further improved the performance over that time. The judges were particularly impressed with the range of FM measures taken to maintain consistently high levels of performance.

While the NABERS energy rating focuses on energy, achieving a high star rating also requires a great deal of effort to provide an effective and comfortable overall working environment for the building occupiers.

To reduce electricity consumption, Mirvac has invested in the latest technology including LED lights with integrated microwave occupancy sensors and a chiller plant optimisation system to enhance chilled water plant performance. An 80KW solar photovoltaic array has also been installed.

These modifications are expected to reduce the property’s greenhouse emissions by 100 tonnes a year and achieve a simple payback period of six years with current electricity prices, while also providing a buffer against future energy price hikes.

Operationally, several initiatives have been implemented to assist the FM team to monitor building performance actively. These include daily building usage profiles emailed to the FM team, and night audits undertaken to minimise out-of-hours energy consumption and to identify new initiatives. This approach has pinpointed scheduling inefficiencies, helped optimise sensor lighting periods and highlighted opportunities for lighting upgrades.

Energy consumption has been cut by a remarkable 32% from the first full year of operation in FY2011 to FY2014. This equates to an enormous $107,844 per year saving in energy costs using current energy pricing and a potential capital value uplift of $1,467 million if the full impact of energy cost savings and outgoings reduction is realised in the property valuation (using the capital rate of 7.35% from June 2014).

Over the remaining 10 years of the lease, the energy efficiency work should represent a saving of $1,078 million before factoring in any forecast energy cost escalations.

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**PROJECT TEAM:**

Building owner: Mirvac Property Trust / Building occupier: Commonwealth of Australia Government Department of Health and Ageing / Mechanical / electrical engineer: ACES

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**FINALSISTS:**

- Aston Go Green, Birmingham – Aston University
- Broadgate Estates London Portfolio – Broadgate Estates
- International Commerce Centre (ICC), Hong Kong – Kai Shing Management Services

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EndoTherm can be installed in just 10-15 minutes, is completely organic and non-corrosive, and even has slight inhibitor properties. All the numbers surrounding the EndoTherm energy saving central heating additive from Endo Enterprises are particularly impressive. For example, it has been independently proven to save 15% on heating bills and it is 100% organic, giving it an exceptionally low carbon footprint. On top of this, in the past 12 months, there have been multiple EndoTherm trial installations serving as case studies and savings have averaged at 17.5% (compensated with Degree Days) during that period. EndoTherm is versatile, being designed for any wet heating system from traditional systems to ground and air source heat pumps, and solar thermal. The technology can also work to improve the energy efficiency of chilled water systems.

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Although there have been attempts to save energy by changing the physical chemistry of the water in a heating system before, none, according to Endo Enterprises (UK), have reached the same levels as EndoTherm.

And further developments are afoot with Endo Enterprises (UK) advancing the field of boundary layer thermodynamics, working with a number of universities around the country to develop the science behind the product.

WINNER:
EndoTherm
Endo Enterprises (UK)

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We believe building boilers requires a personal touch.
Which is why we sent our robots packing.
The power of outstanding collaboration is brilliantly demonstrated at John Lewis in York, the first department store in the world to receive BREEAM Outstanding certification.

By working closely with its energy technology suppliers and consultants, John Lewis, York has slashed its absolute carbon emissions by a massive 43.8% compared to the benchmark, almost 14% more savings than the original expectation.

John Lewis has been working with low carbon consultant Lateral Technologies for the past 16 years. For the last seven years, Lateral Technologies has been using the IES Virtual Environment (IESVE) building performance analysis suite to analyse the operational efficiency of John Lewis stores.

In 2012 IES Consulting joined the team to bring its IES-SCAN technology which allowed Lateral Technologies to take operational monitoring and energy management to the next level. IES-SCAN takes data directly from the building management system (BMS) and refines it with the design model to highlight any performance gaps.

Controls company Next Control Systems also joined the team around this time and was responsible for extracting data from the BMS system to share with IES and Lateral Technologies.

Together, this close-knit team assisted John Lewis in the creation of its York store – its most sustainable to date – and is helping the retailer achieve its target of reducing carbon emissions by 15% across all its stores by 2020.

A number of processes were put in place to ensure the team worked as effectively as possible. For example, Next Control Systems set up an automated email system which emailed data out to Lateral Technologies and IES on a daily basis in a suitable format for uploading to a 3D model.

IES provided the secure cloud server on which to host the data collected by Next Control Systems. The IESVE 3D model was then able to be shared between all parties.

Tasks, data exchange formats, project goals and standards were all agreed on from the outset of the project, enabling an integrated workflow that was critical to achieving the project requirements.

The IES 3D model was used collaboratively by the whole project team throughout the building’s development, from concept to schematic and detailed design onto commissioning and monitoring.

**PROJECT TEAM:**
- Building services engineer: Lateral Technologies and Solutions / Building owner / occupier: John Lewis / Other: Next Control Systems (controls company), IES (software/technology provider and consultants), Airedale (chiller Manufacturer)

**WINNER:**
John Lewis, York
IES / John Lewis / Lateral Technologies and Solutions / Next Control Systems

**JUDGES’ COMMENTS**
“Amazing carbon and energy results; they really stepped up to the mark – all credit to them for cleverly using data to inform design.”

**F I N A L I S T S:**
- Bolton Market, Bolton – Beverley Clifton Morris (BCM) and Willmott Dixon
- Barclays CPMO – Realys (part of ISG Group) and Barclays

**Sponsored by:**
RS MRO Procurement
British Land is passionate about its work in this area and, as a result, claims to have achieved greater reductions than any other UK real estate investment trust. What's more, it has delivered these reductions while maintaining excellent user approval.

In 2015, the business achieved energy reductions across 8.4 million sq ft of retail and office space – an area large enough to contain more than 190 football pitches. It has also delivered 3.5 million sq ft of new offices, shops, homes and cinemas rated BREEAM Excellent for sustainability since 2009.

But the company has gone even further. In 2015, lessons from its energy management programme informed the development and launch of a new sustainability strategy, with new targets to drive further positive environmental, social and commercial results.

Working closely with local managers, each individual property has a tailored Environmental Action Plan and automatic metering in premises alert managers when energy use exceeds agreed thresholds.

Building on the success of its efficiency initiatives, British Land is now partnering with occupiers to pilot features that promote wellbeing and productive working. It is also exploring opportunities to increase on-site energy generation and associated revenue, while continuing to focus on improving operational efficiency and occupier costs.

The judges were really struck by the quality, range of approaches and portfolios shown in this hard-fought category, but it was the stellar environmental performance of British Land that won it the top prize.

British Land marked a major milestone in its ground-breaking portfolio energy reduction programme in 2015 with the achievement of a particularly challenging target to reduce landlord energy by 40% compared with 2009, as well as the launch of a sustainability strategy to drive further environmental, social and commercial results.

This is likely to have a huge impact on the UK’s environmental performance because British Land is one of Europe’s giants. Its properties are home to more than 1,200 organisations ranging from international brands to local start-ups. Around 60,000 people work across its office portfolio and its retail sites receive an astounding 350 million visits per year.

The company’s efficiency programme has saved occupiers a whopping £10 million since 2009 and cut carbon by 60,400 tonnes – equivalent to the annual emissions from 9,300 homes.

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British Land is one of the largest independent technical services providers in the UK, with extensive expertise and experience in engineering services, technical facilities management and systems integration, delivering innovative sustainable solutions through digital engineering technology.

Imtech is one of the largest independent technical services providers in the UK, with extensive expertise and experience in engineering services, technical facilities management and systems integration, delivering innovative sustainable solutions through digital engineering technology.

To be the most respected...
CMR Controls manufactures low air pressure and air volume measurement sensors and control systems for standard air conditioning, clean rooms, sterile laboratories, containment facilities, and fume cupboard extract systems.

DPM PRESSURE SENSOR
Panel Mount Pressure or Velocity Transducers with remote alarms, analogue and digital interfaces. Traceable calibration certificates supplied as standard.

AIR MANAGEMENT SYSTEM
A complete turn-key system to control room pressure to +/-1Pa. Fume cupboard face velocity to 0.5m/s at high speed and provide pressure to +/-1Pa. Fume cupboard face extract air especially from fume cupboard extract ducts. Traceable calibration certificates with remote alarms, analogue and digital interfaces. Full PID stand alone controls with BMS interface.

CAV AND VAV DAMPERS
Accurate air flow measurement with the unique CMR Venturi built into the airtight shut-off damper to control room pressure or constant volume.

PPS EXTRACT DAMPER
Poly-propelene control and shut off valve incorporating the CMR Venturi Nozzle. This is essential when dealing with corrosive fume ventilation to control room pressure or constant volume.

DPC CONTROLLER
Fast and accurate controls to drive high speed dampers or invertors. Full PID stand alone controls with BMS interface.

PROJECT TEAM:
Client: WWF / Architect: Atelier Ten
Contractor: Wilmott Dixon / Electrical contractor: DES Electrical

WINNER:
WWF – Living Planet Centre, Woking
Atelier Ten

A stunning, highly integrated building, WWF’s £20 million Living Planet Centre in Woking uses natural daylight wherever possible to reduce its dependence on artificial lighting and minimise energy usage.

Where natural daylighting is impractical, the artificial lighting scheme draws upon commonly available elements such as efficient luminaires and lamp sources, DALI dimming and controls, daylight harvesting and occupancy sensing.

The principle office space in this brilliantly-designed building is over two levels - a lower level beneath a mezzanine podium level – each space requiring a different lighting treatment.

The office space at the springing point of the ceiling to give some gentle brightness to the lighting to be truly integrated.

The open plan office space at podium level is extensively illuminated by daylight from large rooflights. This is supplemented by carefully integrated downlights within the diagrid itself, which are linked via a DALI control system to multiple photocells which are used to dim lighting zones automatically with available daylight. Bespoke inclination adaptors match the varying angles of the curved ceiling and allow the lighting to be truly integrated.

Behind the diagrid at night to reduce contrast between the downlights and the ceiling. The daylight design ensures an average daylight factor higher than 2% in all naturally daylit spaces. The building achieved a much sought after BREEAM Outstanding rating with a score of 90.6%.

JUDGES’ COMMENTS:
“...What really stood out was the great use of daylight.”
In 2012, Nottingham Trent University (NTU) acquired this former council registry office built in 1887. The building had suffered several unsympathetic refurbishments as well as sustaining damage in World War II. NTU set itself the challenging task of carrying out a full refurbishment of the Grade II listed property to minimise energy use and carbon emissions in line with the university’s goal of reducing overall carbon emissions by 48% by 2020.

To ensure the building met the needs of the users whilst significantly reducing carbon emissions, NTU undertook a full review of the building and its existing services. It assessed the heating, lighting and ventilation requirements; and managed the installation and also carried out thermal and CFD modelling to confirm the proposed design would work as intended.

A natural ventilation strategy was adopted to take advantage of the building’s tall ceilings and allowed building users to control their own environment.

Modern offices and meeting rooms were carved out from an existing warren of rooms, with glass walls installed for natural daylight optimisation. Occupants were impressed with the ‘modern feel’ of this new space and the ‘good amount of natural daylight’, one occupant stating that the open plan layout allowed for more collaborative working.

To minimise carbon emissions, the heat to the wet radiator-based heating system is supplied through a 150kW Hargassner biomass pellet boiler and connection to the Nottingham District Heating Scheme. The building’s artificial lighting is a mix of high frequency T5 and LED fittings, and glass partitions between rooms allows light to spill from one room to the next.

Energy consumption is 50% lower than if no works were carried out so the project has cut energy costs by around £10,000 per annum. NTU will also benefit from an additional income of between £15,000 and £20,000 a year from the Renewable Heat Incentive associated with the biomass boiler.

**WINNER:**

50 Shakespeare Street
Refurbishment, Nottingham
Nottingham Trent University

**PROJECT TEAM:**

- Building services engineer: Mark Godfrey/ Ash Hey Allop / Building owner, occupier, project manager, quantity surveyor, architect, interior designer, mechanical/electrical engineer: Nottingham Trent University / Contractor: Mellor Bromley and Nottingham Trent University / Investment / property company: Nottingham Trent University / Developer: Nottingham Trent University / Facilities manager: Nottingham Trent University / Other: Rolton & Gleds

**JUDGES’ COMMENTS**

“This project had a very good focus on energy efficient design, coupled with metering strategy and engagement with occupants.”

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**PROJECT OF THE YEAR – COMMERCIAL/ INDUSTRIAL**

RECOGNISING THE NEW BUILD OR REFURBISHMENT OF A COMMERCIAL OR INDUSTRIAL BUILDING THAT MOST EFFECTIVELY DEMONSTRATES HIGH LEVELS OF USER SATISFACTION AND COMFORT WHILST DELIVERING OUTSTANDING MEASURED BUILDING PERFORMANCE

**WINNER:**

50 Shakespeare Street
Refurbishment, Nottingham
Nottingham Trent University

**FINALISTS:**

- One Embankment Place, London – ChapmanBDSP
- Foundry, London – Cullinan Studio
- 101 Park Drive, Abingdon – Elementa Consulting (member of Integral Group)

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WINNER: Everyman Theatre, Liverpool
Waterman Building Services

WBS devised an innovative hybrid controls strategy to provide mixed mode ventilation with heating and cooling using an air handling unit (AHU) located within the inlet plenum. The AHU provides the auditorium with the main source of heating in winter, but also has cooling coils capable of tempering the incoming fresh air during peak summer conditions.

The strategy relies on a series of set-point initiation points which change the functionality of the auditorium ventilation from natural to mechanical ventilation through to mechanical cooling.

Energy efficiency is further enhanced through the building’s fabric, and in particular, its dramatic façade which comprises of a series of 105 movable solar shading panels. Each panel, with an image of a person cut into it, is arranged around central pivots and is adjustable to decrease the cooling energy demands of the building.

A comprehensive commissioning programme, developed in consultation with the design team, client and their facilities team, provided training and introduced the client to their new building.

Although architecturally stunning, winning the UK’s most prestigious architecture award – the RIBA Stirling Prize – in 2014, the new Everyman Theatre in Liverpool is essentially a black box.

This presented Waterman Building Services (WBS) with a big test – how to provide a naturally ventilated system to a theatre auditorium, which, by its nature, can’t incorporate large opening windows or louvres because of the danger of traffic noise/daylight breaking in and show noise breaking out.

Combine this with the requirement to dissipate upwards of 115kW of internal gains while maintaining internal air quality within a central city location, and you begin to see how challenging the project really was.

The concept for the Everyman Theatre building was to develop a modern theatre on the site previously occupied by the original theatre.

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PROJECT OF THE YEAR – PUBLIC USE

RECOGNISING THE NEW BUILD OR REFURBISHMENT OF A PUBLIC USE BUILDING THAT MOST EFFECTIVELY DEMONSTRATES HIGH LEVELS OF USER SATISFACTION AND COMFORT WHILST DELIVERING OUTSTANDING MEASURED BUILDING PERFORMANCE

WINNER:
Wilkinson Primary School, Wolverhampton
Architype with E3 Consulting

Wilkinson Primary School suffered a devastating arson attack in 2010. However, the new school that has, quite literally, been raised from the ashes is an exemplar of sustainability and 21st Century school design, bringing delight and a safe environment to 420 pupils and their teachers.

This is Architype’s most recent Passivhaus school and the product of continuous improvement and lessons learned from involvement in three previous such schools.

In construction, preference has been given to recycled and reclaimed materials to reduce the overall embodied carbon of the building.

A fabric first approach and the use of central heat recovery ventilation help reduce the heating demand to less than 10% of a conventional school.

Wilkinson Primary School operates a mixed mode ventilation strategy which means classrooms benefit from CO2 levels five times lower than regulations, aiding wellbeing and concentration. This view is supported by teacher observations of improved performance and attention of students. In the summer months, the building’s internal environment is maintained using a passive fabric first approach and there is no reliance on mechanical cooling except in the WC areas and kitchen.

To maintain this comfortable and productive environment a robust natural ventilation strategy is required with cross ventilation in the classrooms enhanced via attenuated air paths into the central hub. This is provided via manually opening windows and secure night vents at a reachable height so the occupants have full control; high level windows in the hall and circulation spaces are controlled by the BMS with manual override.

In winter, excellent thermal performance and exceptional air tightness with mechanical ventilation minimises the demand for heat to a single 90kW gas boiler.

A shading strategy has been developed with close collaboration between Architype and E3 Consulting Engineers to minimise summer solar gains while maximising beneficial winter solar gain and not impacting daylight levels.

Daylight dimming is used in the classroom to reduce lighting load. Daylight switching with passive infrared sensor is used in the circulation spaces to ensure the lighting is not left on when the space is adequately day lit.

Wilkinson Primary School achieved an A rated EPC without the need for renewables.
WINNER: Clapham Retrofit, London
Arboreal Architecture

An imposing 170-year old Grade II listed Victorian townhouse in Clapham has undergone a ‘deep retrofit’ to become the first listed building in England to meet the AECB Silver Performance Standard.

The retrofit design objectives for the four-storey semi-detached masonry building were to:
• Sensitivey restore the structure and fabric of the house respecting original features.
• Open up the dark lower ground floor into a light-filled stepped courtyard.
• Thermally upgrade the house following English Heritage retrofitting best practice.
• Create a comfortable home fit for the future.

Following consultation with English Heritage and the conservation officer, the condition of the building’s fabric was investigated, as were key elements of historic significance and the existing thermal performance. Before design proposals were developed, measuring and monitoring expert ArchiMetrics carried out airtightness and thermographic surveys, U-value measurements and interstitial moisture monitoring to deepen the project team’s understanding of the building and allow a ‘finer grain’ of design and specification.

The key technical innovation in the project lies in its approach towards the specification of the internal insulation to the roof, floor and walls. Nine key insulation materials (including woodfibre, aerogel and cellulose) were installed, responding directly to localised historic fabric and performance requirements.

Other energy efficiency technology installed included LED lighting, solar thermal panels, Stelrad radical radiators, MEV ventilation and double-glazed secondary glazing.

Using Passivhaus methodology, the estimated space heat demand of the 170 sq m building has been cut by more than 75% from 180kWh/m²/yr (5,631 kgCO2e) to 40kWh/m²/yr (1,251 kgCO2e). Air leakage has been reduced from 9.6ach to 1.8ach. Measured actual gas energy use for the year from January 2014 (9,146 kWh) was under the predicted energy demand of 9,619 kWh.

Since the building has been occupied, its internal temperature has remained at 20°C and the internal relative humidity has stayed within 50-60%. One occupant reported that the ‘even temperature and humidity made the housing extremely comfortable to live in’.

RECOGNISING THE NEW BUILD OR REFURBISHMENT OF A BUILDING IN THE RESIDENTIAL SECTOR THAT MOST EFFECTIVELY DEMONSTRATES HIGH LEVELS OF USER SATISFACTION AND COMFORT WHILST DELIVERING OUTSTANDING MEASURED BUILDING PERFORMANCE

JUDGES’ COMMENTS
‘This is a ground breaking project that shows what can be achieved with existing stock. The entry provided evidence of a mind-blowing set of work, really cutting edge.’

PROJECT TEAM:

HIGHLY COMMENDED:
Girton College, Cambridge – Max Fordham

FINALISTS:
LILAC, Leeds – SSoA, Sheffield University and Faculty of Architecture, Wroclaw University of Technology, Poland
Dewenthorpe Phase 1, York – Studio Partington
In its first year of operation, the imposing David and Lucile Packard Foundation headquarters building in Los Altos, California exceeded all expectations, meeting its zero energy target three months early and becoming a net positive generator of energy.

Elementa Consulting performed MEP engineering, commissioning, and post occupancy verification and tracking of the building performance to ensure Net Zero Energy operation for the building.

At the heart of this exceptionally green two-storey office building is an extremely efficient chilled beam heating and cooling system and a high efficiency air source heat pump with thermal storage. Highly efficient systems together with the building envelope reduce energy demand by 60% over code baseline, while the remaining required power is supplied by onsite photovoltaic power generation. The building operates in natural ventilation mode for half the year. Thermal energy storage, chilled beams, dedicated outside air systems, fully dimmable lighting fixtures, and circuit-by-circuit power monitoring are some of the facility’s novel features.

Post-occupancy feedback shows 97% of occupants are satisfied with the building overall, and thermal comfort satisfaction ranks in the 96th percentile.

The success of the design was measured on several fronts. The current in-operation energy use is 68.76 kWh/m²/year, and this is expected to decrease further as enhanced commissioning continues.

The building confirmed its net positive energy status in 2013, generating 418 MWh of electricity in the first year of operation with on-site photovoltaic rooftop panels. It consumed just 351 MWh of electricity and zero natural gas.

All this has led to the building earning coveted ‘Net-Zero Energy Certification’ through the International Living Future Institute, a LEED Platinum rating from the US Green Building Council, and an ASHRAE Technology Award.

**WINNER:**

David and Lucile Packard Foundation Headquarters, California, USA
Elementa Consulting (member of Integral Group)

**PROJECT TEAM:**


**FINALISTS:**

- Shopping and Entertainment Centre PROSPECT, Kiev, Ukraine – CD International Building Services Engineers
- American University of Sharjah (AUS), Campus Service Centre, Sharjah, United Arab Emirates – Cundall
- Holiday Inn Express, Orchard Road, Singapore – Intercontinental Hotels Group

**HIGHLY COMMENDED:**

- Sirius Building, Canberra, Australia – Mirvac Group
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