

The Building Services Consultancy of the Year Award is presented to the consultancy which has demonstrated an outstanding contribution to the design or refurbishment of buildings to meet client expectations of performance, including occupant satisfaction, comfort and energy performance, throughout the life of the building.

Entries for this category should be based on the consultancy services delivered during the period **1 July 2012 to 30 June 2013**, and be accompanied by testimonials from clients and other partners such as contractors, and other participants in the supply chain.

Please complete the entry form below. The headings reflect the judging criteria and the judges will be looking for you to provide the relevant information under each heading.

**Entrant Details****Organisation name**

*As you wish the organisation to be referred to throughout the competition.*

Max Fordham LLP

**Entry Details****Summary**

*Please provide a synopsis of the organisation and its building performance, low carbon and energy efficiency objectives.*

We are engineers who are driven by sustainability in building design. It was our founding principle and it still guides us today.

Our aim is the delivery of beautifully engineered buildings: low-energy buildings that work for the people who use them. We believe buildings should respond to the environment in which they exist. That's our starting point and it drives the engineering approach, making sure that we embed principles of sustainability in everything we do.

Our approach looks at the whole building rather than seeing building services as separate, specialist installations. This also minimises risk. It's vital for us to understand the overall vision for a building – to sympathise with it, to interpret it through engineering. It's equally vital to pay detailed attention to air quality, light, noise, orientation, materials and systems. In that way we engineer comfort for people into buildings.

**Please outline how your entry meets each of the entry criteria – judges will be looking for information in each of the sections when assessing the entries:**

*Any documents, charts or photos can be referenced and included in your supporting documents.*

Investment in the recruitment, training and development of staff.

After Max Fordham established his Practice in 1966, he grew it by employing graduates. His aim was to mould young science graduates to seeing things differently, making them better engineers. It is a principle that has guided us ever since. We are proud to say we have recruited 30 graduates in the last 12 months, growing the Practice to more than 180 staff.

We recruit from a wide pool of talented mathematics, science and engineering graduates – nurturing their progress through to full equity Partnership. This approach safeguards our way of doing things – what we like to call Beautiful Engineering. It's what makes us different.

Our Learning and Development Operational Management Group oversee the Practice's commitment to training, ensuring that appropriate opportunities are provided for the personal and professional development for all our Partners and employees. This includes sabbaticals for study, work or travel. It extends to those who offer their services, pro bono, in the developing world, which the Practice supports through contributions to travel and accommodation expenses.

Our people are offered a high level of responsibility from their first day with us and we encourage them to take ownership of their own development. Our commitment to the quality of training opportunities for our graduates saw Max Fordham's training scheme successfully accredited by CIBSE, the IMechE

and the IET. Some of the panels that reviewed our developing engineers noted it was unusual to see such awareness of UK SPEC at this stage in their careers. Upon presentations from our developing engineers, some comments included that they were “a credit to Max Fordham and themselves”, that they are “the most articulate developing engineers. I haven’t seen better.” Two Max Fordham people have been finalists in the CIBSE Young Engineer of the Year Award, and the Practice won the Best Employer in the medium-sized firms category last year.

We recently undertook independent customer research and received some accolades from the respondents –

"They keep a high quality. They are known to be leaders in building services in their environmental approach. They attract a high calibre staff right from the first intake." *Architect*

"Very good, very capable, professional, approachable, and personable to deal with, nice people."  
*Client*

Processes to ensure the acquisition, development and transfer of knowledge and experience within the consultancy.

Every member of our Practice is encouraged to participate in knowledge sharing. Weekly opportunities for shared learning come in the shape of Lunch Meets, where members of the Practice, both senior and junior, have an opportunity to present in an open forum to their peers. Topics vary from the business of project management, lessons learned and innovative ideas, to practical sessions on technical aspects of engineering. These have proved important for opening discussions to how we approach engineering and client solutions, innovation, sharing knowledge and business practice.

Technical lectures are given internally by experienced engineers to encourage continuous professional development in core skills. We hold regular drawing workshops aimed at improving our engineers’ visual communication and perception. We have also established the MRI Team (Max Research and Innovation) with a dedicated budget to explore new ideas in a controlled environment. These ideas are then instituted on projects and monitored to form an innovation loop, where knowledge is shared and ideas can grow.

Use of new technology and applications, innovative building techniques or processes across lighting, heating, cooling or other services.

Max Fordham engineers seek a passive solution in the first instance, and are always mindful that sustainability has to be married with comfort. Providing a great internal environment starts with the building envelope. Daylight, views and access to outside must be balanced against solar shading and energy consumption, and solving this equation through the detailed design of the facade is the starting point for designing lighting. We integrate abundant natural light with an innovative, responsive and interesting artificial lighting scheme which will really enhance every corner of the project. At both Tate Britain and Musée D’art in Nantes, Max Fordham designed galleries which are primarily day-lit, but backed up with low-energy, artificial lighting. When we’re not specifying daylight as the preferred, sustainable choice, we use artificial lighting appropriately. This may mean using computational fluid dynamics or reverse ray tracing, or even building physical models and carrying out practical experiments, to test our understanding. For the Water Polo Venue at the London Olympics, Max Fordham carried out rigorous testing and analysis, using advanced computer simulations, scale mock-ups and even tested the reflections from choppy water at scale in a bath tub.

Building techniques and technology applications don’t come much more innovative than the Sahara Forest Project. This pilot to increase agricultural productivity in desert regions has led Max Fordham to successfully design greenhouse climate control systems and site infrastructure that has just produced its first batch of cucumbers. The project employs a combination of evaporative cooling using saltwater, desiccant dehumidification with solar regeneration, and concentrated solar power for electricity generation. We are in the process of negotiating its next development phase. The potential impact of this project is significant for global food security, as well helping to solve current energy crises we experience closer to home.

Over the course of many interesting project near bodies of water, we have developed significant expertise in using ground water or river water as a low carbon source of heating and cooling. At Tate Modern in London, a twin wheel desiccant air handling unit dehumidifies the air in summer. The desiccant wheel is regenerated by waste heat given off by the water cooled UKPN transformers on site. The supply air is cooled using water abstracted using the Thames river terrace gravel aquifer. In winter the desiccant wheel runs at a slower speed and acts as a moisture and heat recovery wheel, humidifying and heating the incoming fresh air. At the Hive library, Worcester (CIBSE New Build of the Year 2013) this practice has contributed to the public library achieving a 65% reduction in carbon

emissions below the levels set by Building Regulations. It has also achieved BREEAM 'Outstanding' with a score of 86.4%, the highest ever rating for a public library.

Our Acoustics team is further developing their understanding of low-noise ventilation design in performance spaces. They have returned to a number of our projects to make detailed in-situ measurements of airflow regenerated noise from bespoke, non-standard supply outlets. These measurements will be compared with predictions based on CFD simulations to improve the accuracy of our predictions for future designs. The team has also recently benefitted from work undertaken by a placement student from the Southampton Institute of Sound and Vibration Research - including the development of a software tool for quantifying plant noise tonality and improvements to our surround-sound listening room.

Specific energy management measures taken to improve the building performance.

Max Fordham engineer Tamsin Tweddell has played a fundamental role, working closely with BSRIA, in the development of the Soft Landings methodology, not just for Max Fordham projects, but for the industry. Our work on Keynsham Town Hall included writing contractual documents for our Soft Landings work, which was a first. The BSRIA *Guide to Procuring Soft Landings* was based on this experience. We have also been commissioned to write advice for how British Council for Offices (BCO) members should manage their energy data – to benchmark their performance. This will be in collaboration with Carbon Buzz.

We are also conducting reviews on the current market of tools available for building users to assess their energy use. We have conducted an analysis for internal purposes and we present the best option to our clients based on their energy reading needs, so that building users can understand and manage their energy use more effectively.

The introduction and use of collaborative tools and processes between your own and external members of project teams that has contributed to improved performance.

We have recently developed the Energy Tracker tool in collaboration with Feilden Clegg Bradley Studios. (Summary, see pages 2-4 of Supporting documentation). This is a resource for internal research, to produce customised charts for the management of data on individual Max Fordham projects or projects grouped into industry sectors. It produces a very detailed analysis to help evaluate the gaps in the performance of our buildings. It outputs project energy profiles that can be used to monitor and manage energy performance throughout the project design and in-use phases. The Energy Tracker plays its part in helping to explain to clients the difference between the different legislative energy models, e.g. EPC & DEC – due to factors like un-regulated energy use. It also helps explain the potential differences between predicted and actual energy use so clients can better understand the benefits of post-occupancy evaluation or Soft Landings on reducing actual energy consumption. We've just updated the Tracker to generate a template which converts energy data into a form ready for upload to CarbonBuzz.

Max Fordham engineers have also developed a tool to better understand the contributing factors to greater-than-expected energy use in new buildings by creating the Energy Risk Register. The register is being piloted on the Keynsham Town Hall project – the aim being to attain an 'A-rated' DEC on this project. The Register identifies the elements of design which are at risk to poor in-use performance. Risks can arise from design, construction, commissioning, poor expectations management and building operations. This is partially informed by our post-occupancy experience; all members of the project team contribute, including the clients' facilities management staff. This has also evolved into the Operational Risk Register, and is being used for other projects.

Environmental specification/purchasing policy.

Our environmental credentials are writ large into the fabric of our Practice. Max himself was listed at number nine in BD magazine's list of Britain's environmental pioneers. It is an inheritance we take very seriously, and it's one we try to emulate in our own offices.

To this end, we always preference sustainably sourced products and office supplies and we concern ourselves with the end life of what we use. We hold an EMS rating of ISO 14001 and have written an assessment of environmental impact for purchasing guide to procurement of certain stock.

Low carbon, energy efficient and building performance accreditations.

We hold 3 Green Leases of our 5 offices.

We have a team of 9 Max Fordham staff who are licenced BREEAM assessors. We have two EPC (non-domestic), one EPC (domestic), two DEC and one LEED accredited specialists.

2013 – The Hive, Worcestershire - New Build Project of the Year (Value over £5m), achieved BREEAM ‘Outstanding’ with a score of 86.4%, the highest ever rating for a public library.  
2013 – Toffee Factory, Newcastle - New Build Project of the Year (Value up to £5m) - shortlisted  
2012 – Brockholes Visitors Centre – New Build Project of the Year (private Sector)

Evidence of the practical use of building performance measurement tools such as DECs, CIBSE TM22, Soft Landings or other post occupancy evaluation tools and Carbon Buzz.

Max Fordham worked on a TSB funded 2-year building performance evaluation of The Woodland Trust's new headquarters in Grantham. A draft TM22 energy audit has been completed and submitted to Carbon Buzz and we are engaged in on-going trials of TM22's latest draft revisions. At The Woodland Trust, dominant server room energy use has led to the instigation of IT workshops to reduce their impact. A Building User Survey, conducted with an unprecedented high response rate, indicated good overall user satisfaction and provided valuable feedback on controls and acoustics. We provided detailed feedback to project stakeholders from seasonal surveys of the building in operation and reported on this at the BCO conference. In line with Soft Landings principles, we time these visits with the contractor's seasonal commissioning and provide a bridge from design team to occupiers and design knowledge transfer to the facilities staff. The work has led to another TSB project exploring the performance of the concrete radiators, validating their performance in practice against the modelled design approach.

Again, like the Energy Tracker, fine tuning of building controls to optimise this system has been a positive result for building users. The learning outcomes have been fed into subsequent projects and will continue to inform work on site for projects such as Keynsham development, where a similar composite frame is currently being built.

Encouraging clients to commit to exceed minimum standards for their projects.

Max Fordham created the Sustainability Matrix, a five-part pull-out in consecutive issues of the Architects' Journal. Published and circulated internationally in 2010, The Matrix is a continually evolving communication tool that helps to clarify the sustainability ambitions of a project before design commences. Our team use best practice as a starting point and explore ideas and pre-conceptions to foster enthusiasm for greater sustainability targets through a series of facilitated workshops. These workshops and the Sustainability Matrix tool have been commissioned by Heritage Scotland and London's Southbank redevelopment. Both these and many other projects have been extended their reach beyond mere 'best practice' as a result of our work with them.

"We found the workshop to be a hugely valuable exercise. Though it was a challenge to organise such a wide range of participants, it gave us a unique opportunity to explore requirements from all angles. I would thoroughly endorse such an exercise at the start of every project." – Guy Ralphs. Former Bursar, Merchant Taylors' School, Middlesex.

Use of a thorough, systematic commissioning process to ensure that a new or renovated building operates efficiently and to the original performance specification from when it is first occupied and in use.

Soft Landings is a collaborative approach affecting all stages of the process, from briefing, through design and construction, and continuing for a period after the building is occupied to ensure that it is operating to its full potential. Through Soft Landings, the needs and experience of building managers and occupants are specifically taken into account as the project progresses.

Where appropriate we stay engaged with projects once they have been handed over, to oversee further commissioning and fine tuning. As an example, the performance brief for the refurbishment of the Hayward Gallery was to meet the criteria of the Government's Art Indemnity Scheme. To achieve this, we worked collaboratively with the Facilities Manager and Controls Specialist over a 2 year period to monitor, review and optimise the environmental controls. We also helped to customise the BMS interface to facilitate improved management of the plant.

More recently, we are working with CIBSE award-winner The Hive, Worcestershire's, facilities management team to monitor energy use and help optimise performance of the building to achieve the low energy design intent.

We're currently carrying out a business plan to carry out post-occupancy evaluation on all projects and engaging our young engineers to be involved, as part of their development and to improve their

engineering.

Evidence of client and occupant satisfaction with completed projects.

We commissioned an independent, external research agency to carry out customer research on our behalf. People and organisations that we have worked with previously, that we work with currently, and that we have never worked with were questioned about their attitudes to Max Fordham. They included architects, end clients, project managers and main contractors. Our customers were interviewed and the questions were based on a mixture of qualitative and quantitative questions. The purpose for the research was to get an in-depth understanding from our customers on our technical performance and customer satisfaction so we can take necessary steps to improve our service and ensure we are meeting the needs of our customers. The report was completed in February 2013 and it was extremely positive, although there are areas identified for improvement. It was part of the agreement that no names are attributed to the quotes so as to remain honest. There are quotes from this research inserted below, as we believe these quotes provide robust supporting evidence.

Our research agency found overall satisfaction among our customers to be high by industry standards, with an overall score of 8 out of 10 compared with the industry standard of 7.6.

We asked our customers about our approach and philosophy and how they think this makes a difference to their buildings. Quotes include:

"From a client's perspective you have got a building that feels a lot more complete and integrated, is a lot more polished as a building." *Client*

"You get a better end product, better value potentially; you get a building that is better for the occupants' well being with better maintenance and running costs." *Architect*

"When their innovative approaches come to fruition the client becomes aware that the building surpasses their hopes and aspirations." *Architect*

"It is a refreshing approach to meet and exceed the client's needs and expectations. We like the fact that they are environmentally aware and had this at the centre of what they did." *Client*

We are very proud of the fact that our clients are overwhelmingly satisfied with our work. 72% of our new work comes from existing clients, and more than 84% of architects we work with have worked with us previously. Some of these relationships have been established over decades, some over years, and they are central to the thriving nature of the Practice.

"They approach the Engineering Design from an innovative point of view; each project is individually tailored to site and client brief." *Architect*

"They are very well organised and their process structure is very well thought through, and this shows in their designs." *Architect*

"Multi-disciplinary skills set them apart, you can get an engineer who can talk as a multi-disciplinarian across several engineering services and not just one." *Project Manager*

82% of our customers have recommended Max Fordham to others.

Examples of applying the advice that you provide to clients within your own business.

Back in 2008, the Practice commissioned an internal Zero Carbon report with a view to improving the environmental performance of our offices. (Results, see Supporting Document page 1)  
The report identified a number of possibilities that we presented to our landlord. Since then, we have successfully collaborated with our various landlords across the UK, and have successfully entered into Green Leases for our London, Bristol and Cambridge offices. These will provide a mechanism for both parties to challenge each other to improve the environmental sustainability for the entire complex and all its suppliers.

As a result of obtaining these, there have been a number of significant improvements to our London

office such as the installation of secondary glazing and insulation which analysis by our engineers has proved to have reduced heating consumption and enabled us to respond more effectively to weather variations. Further to this there have also been photovoltaic panels installed. We were pleased to play an active part in reviewing the proposals for these improvements and continue to monitor and analyse their effects. These will create a significant immediate improvement; however as a naturally ventilated 150 year old building, there remains room for improvement and we are keen to use our understanding and experience to improve further.

A benefit of the Green Leases that we have put in place is that they provide a future framework for sharing information, such as our recently commissioned DEC certificate, and setting goals for further improvement in collaboration with our landlord.

We are fully aware that our own behaviour is just as important as technological solutions and so we run extensive research into our own carbon output, how we function as individuals and as a workplace – such as how we travel to and from work, what proportion of energy we consume in the office, how we can improve that, how we can make our buildings and choices to perform better. Our Cambridge and Edinburgh offices have also been reviewing how they use their buildings and put in place a number of measures which have improved their environmental performance for several years.

We are proud to have implemented a policy that whenever a lease is entered into or renewed, we will always seek to make it a green lease to use as a framework for using our experience and know-how to improve our workplaces.