

Green Dot Awards 2011: The iCon Innovation Centre

Background and contact information about your company

1. Background

Consarc are a long established design practice with a dynamic young workforce of architects and designers led by Directors Liz Pickard and Tom Bell. Based in a collaborative working multi tenanted hub near the St Pancras International station we are in easy reach of all of the UK and Europe.

In 2010, the practice was selected as one of the '40 under 40' best emerging practices in Europe. In the same year it reached the shortlist of the UK Young Architect of the Year.

The range of projects we are involved in currently includes corporate workplace and luxury resort and urban hotels, Listed buildings, station infrastructure and regeneration.

We are a niche award-winning practice. Our BREEAM Excellent low-carbon £7.5M Innovation Centre for the East Midlands Development Agency and Building Research Establishment has been completed on site in Daventry (2011). This project has won several prestigious awards including the Green Apple Award in 2010 and the EMCBE Constructing Excellence Environmental sustainability award in 2011.

To quote Building Magazine 26.08.2011 in the 4 page article entitled 'The Beginning of Something Beautiful'. *"These days, 'green building' is often synonymous with ugly architecture'. One project trying to prove otherwise is the iCon Innovation Centre in Northamptonshire. With a carbon footprint of only 12.2kgCo2/mw and a bold architectural identity, is this the sign of a new era for eco? "....."The icon is good, cost effective architecture with extraordinary environmental credentials. Moreover, in its luscious timber screen, it has moments of real drama and excitement. Everybody knows building of the future will have to be more environmentally sensitive The real challenge is achieving this while consistently delivering high quality design as well. iCon sets a realistically attainable benchmark that others would do well to follow".*

We won the Best UK regeneration project in the British Construction Industry Awards for a new station and pedestrian bridge for Docklands Light Railway, shortlisted for the Prime Ministers Better Public Building Award. We have also won an international competition for a Construction Industry Innovation Centre & Community Facility – a design that was selected from over 80 anonymous entries. We have completed award winning large-scale commercial projects for corporate and public sector clients. From our new build headquarters for Ipswich Borough Council – a scheme that won Best Corporate Workplace at the British Council for Offices Awards to the complex relocation of Knight Frank to new headquarters for 1000 staff in London and the design and build of the first five star hotel in Manchester for Rocco Forte Hotels, a £33M 170 bed luxury hotel. We can demonstrate an understanding of the property needs of some of the largest organisations in the UK. We are architectural advisor to Brent Council on the development and design of their new £90M Civic centre. This building forms the central community function at the heart of the Wembley master plan. Consarc wrote the brief, created feasibility studies and options, identified through detailed analysis a site for purchase, collated the business case and directed an OJEU procurement process for the selection of a large multi-disciplinary team. Anna Woda, client at Brent Council said of our role "All their work led back to our affordability argument, without which the project would have been totally impossible. Consarc was crucial in helping officers and members see the true potential of the project and Liz Pickard's role pivotal." We remain advisers on the architectural development of the building and clients architect post novation.

Consarc also won Best Altered Building for our subtle new build insertion into the Georgian central conservation area of Leeds by CABE/Leeds City Council. Speaking at the awards ceremony Keith Bradley of Fielden Clegg Bradley said "This type of architecture is extremely close to our hearts and is exactly the kind of honest and understated architecture that every town needs much more of. By reinventing whilst respecting the Georgian facade the overall effect is complementary. The rear elevation, rather than acting as a 'back' to the development gives a whole new second face to the rear street context".

Our central ethos, of evolving exceptional architecture for people and places through collaboration with our clients, the industry and with talented staff is central to our working method.

2. Contact Information

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Detailed explanation of the entry

Consarc Architects were named winners of this two-stage open competition organised by the Building Research Establishment (BRE)/RIBA for the design of a new exemplar innovation hub and office building in Daventry. The 4000m² building includes 54 incubation units for start up businesses, a public exhibition space, conferencing facilities for 300 people and a café area.

1. HOW THE ENTRY IS MANUFACTURED AND DELIVERED TO YOUR CLIENTS

1.a) The design approach

The design responds to the site orientation and level changes providing a variety of amenity spaces and acts as a 'kick start' development for the larger area as identified in the Regional Economic Strategy.

The key environmental feature is the very low CO₂ emissions of 12.2 Kg of CO₂/m²/yr. The building's compact form, high levels of insulation and centralized un-heated street, reduce fabric losses to a minimum. The mixed-mode ventilation system prevents overheating in summer with 10 to 15 ACH of natural ventilation, but a highly controlled 1.3 ACH prevents heat losses from over-ventilation in winter.

The exhaust air heat pump achieves a heating COP of 5.5 during the winter period. Using the EAHP to recover heat from the exhaust air instead of a more traditional heat recovery ventilation system, enabled the entire mechanical supply air system to be omitted. The recovered heat goes into a radiator system instead. Using the heat pump also met the local "renewable" target saving around £200,000 photovoltaic installation.

Other environmental features include the high efficiency fittings, movement sensors and daylight controls to reduce the use of lighting energy, the rainwater harvesting, its timber construction and the phase changing materials fitted in the office ceilings to prevent overheating.

Adaptability of space is crucial; in a bid to extend its maximum lifetime, the building is capable of lending itself to changing functional and spatial needs and includes flexible start up offices, IT services, rentable meeting rooms and central facilities such as a reception, a social break out space and a restaurant. The building also features flexible conference and exhibition spaces that can be used by the local community for events and performances.

1.b) The site

The site forms the anchor of a new basin regeneration site for Daventry town. The site slopes quite dramatically across the short section of the building and a new canal, canal path and basin is planned on the south side of the building. A busy trunk road runs immediately adjacent to the building and the building itself faces a large roundabout junction.

Of early concern was the Green transport plan and consideration of how people would physically arrive at the site. Despite enthusiastic backing from the Council for an automatic personal rapid transit (PRT) system to connect to town centre it was clear that, as Daventry does not have a mainline train station and bus routes are predominantly rural-based services, the majority of users would arrive by private vehicle.

A large multi storey car park existed immediately across from the site (serving the Council offices) and this was under-utilised. As such a negotiation was reached for the Council to allow visitors and tenants of the iCon to use 100 of these existing spaces, removing the need to build excessive new parking on the site, which borders green fields. By using the natural slope of the site we carefully integrated 32 car parking spaces with 6 dedicated disabled or mother and child bays into a secure undercroft. These spaces lead directly into the stairwell and lift lobby, which takes people directly into the central heart of the scheme, arriving in the centre of the street. Extensive and easily accessible bicycle parking is located at both ends of the building and at both key entry levels.

1.c) The building

The building itself acts as two separate buildings, with quite separate and distinct functions that are cross supporting connected by an unheated but covered 'street'. Entrances to these 2 building are from within the street, giving clear legibility by always orienting back to this space. Entry to the building can be gained at both ends of this street, which was intended to act as a public route, although for security the clients have chosen to operate one main entrance until the site and pedestrian route become established. A small piazza leads to the primary entrance and this is gently ramped to enable level and even access for all to the building. Upon entry the buildings and their use are clearly legible.

Ahead of the visitor an open stair and lift shaft allow quite an efficient movement to all the floors. Adjacent to the primary entrance sits a publically accessible café area which itself opens out onto the piazza on sunny days. All toilets are freely accessible at the ground floor and within the office or 'incubator' building toilets and showers for the office tenants are provided at both ends of the building at every level.

1.d) Community

Throughout the design stage of the project, and until effectively the completion of the building local user groups including neighbourhood policing teams, youth groups, schools and local societies, perhaps the most engaged being the Daventry Choral society, as well as the local business community through the highly managed iNet conferences, were involved in discussing the scheme and numerous presentations and feedback sessions were completed. As a result of this, changes were made to incorporate special needs and ultimately the client invested separately in providing acoustic attenuation measures to the conference space to enable a level of theatrical and orchestral performance.

As part of the Public Consultation process we met with a number of local interest groups including the Daventry Armature Dramatic Society, the local School and Daventry Coral Society. All of which saw the iCon as an exciting opportunity to benefit the public as well as the end user tenants.

As a direct result of this collaboration the design team were able to make a number of adaptations to the design at RIBA Stage D to improve public access and alternative use capacity without an uplift to the budget or programme these included:

- The substitution of fixed seating for retractable bleacher seating within the conference hall
- The Introduction of lighting rails and the adaptation of the furniture store facilities to provide an alternative back stage area suitable for amateurs dramatics.
- The reconfiguration of a number of incubator offices to provide alternative use as green room / changing facilities.
- Adaptation to the conference hall finishes to improve and vary the acoustic performance of the space.

As a result of these interventions, the iCon building has already hosted a number of alternative events since it opened these include: A Fiori Musicali music concert, A night with the Daventry Brass Band, the 'We are the Future' Exhibition, Performances from the Daventry Music Centre with over 300 young performers' in attendance, Daventry Players Drama group and a Martial Arts Demonstration by the Tanigawa Dojo.

2. HOW IT FUNCTIONS AND ITS INTENDED USE

2.a) The Buildings

The two separate buildings that form the iCon are named the Incubator and the Showcase. The Showcase acts as a community sponsored conference centre where events like judo, music events, art projects and sustainable conferences have already taken place. It also acts as a networking base and contains a 300 person tiered auditorium for conferences, meeting rooms that can be hired and breakout –exchange spaces, public café and wcs. The incubator building has 54 variably sized business suites for flexible rentals for local businesses. Visual contrast is an immediate theme as one enters the building- with lime green doors and dark greys proving contrast and branding.

The Incubation units are small office containers based within the main part of the building. They have been designed as flexible spaces to allow them to be separated into small units, or joined to create larger spaces in response to business growth. The spatial arrangement of the scheme has been designed to mirror the intellectual processes of the iCon. Incubation units are contained to the North of the site shielded from traffic noise.

2.b) The ‘Street’

Adjacent to these and at the heart of the design, is a dramatic ETFE covered exhibition street. ‘The Street’ is an area in the centre of the building which is open plan, treble height, and provides exhibition space for all of the small businesses to use to showcase products and development in the building. This links the business units to the conference and exhibition centre. The façade facing ‘The Street’, potentially allows the showcasing of products and development within the business units and each floor within the business unit block has a central glazed section facing outwards to the public realm which can be used to exhibit similar material.

2.c) The Façade

The external street façade is a curved highly insulated and acoustic surface with expressive timber fins. It is possible for the façade’s variable colours to respond to the internal workings of the building. It can be programmed to respond to energy usage or the comparative success of each of the units (gauged by a specialist method of assessment called ‘iCon’, devised and championed by the University of Northampton) and therefore directly reflects to the public the usage and success of the building, and the companies within it. This Showcase façade is constructed from sustainable timber. It is envisaged the façade will perform two major functions utilizing LED lighting. By day the façade will showcase imagery relevant to iCon energy use, providing a public narrative of the centre’s sustainable credentials.

3. HOW THE ENTRY EXHIBITS EXCELLENCE IN SUSTAINABILITY AND ENVIRONMENTAL RESPONSIBILITY

Through the Apache IES thermal modeling, a confirmed CO₂ target in use of 12.2kg/CO₂ per annum has been achieved at design stage. The industry standard (CISBE Benchmark) is 40 CO₂/kg/m²/year, which puts the iCon building in the top 2-3% of offices in the UK.

The building has achieved a BREEAM Excellent rating at completion.

Central to our approach as architects is to combine both passive and specialist solutions to achieve a building that is extremely low in its carbon production. At the iCon this has been delivered through:-

Appropriate site response and Orientation: The building layout and form responds in a highly contextual way to the site. Its orientation minimises heat loss while maximising access to fresh air and daylight. The building is designed as two low-storey efficient buildings buffered by a covered but unheated space that also acts as a joining street between the two buildings.

A Light Footprint: All ground works have been designed to effectively enable no earth to be moved from the site.

Site Ecology: We have undertaken through a specialist ecologist a detailed survey of existing flora and fauna. By integrating a bio diverse roof onto the building and dedicating zones in the soft landscape as protected biodiversity zones, we can protect existing species and attract several new species to the site.

Energy Retention: Super Insulation and Air tightness: The building is designed to achieve an airtightness a rate of 7m³/m² against a 10m³/m² under the Regulations. The iCon uses a timber frame construction with insulation between the studs, but also has a further skin of insulation that goes all around the outside of the building, running in front of the studs and reducing cold bridging to be less than half the typical figure for a new building.

Superstructure Choice & The Thermal Mass Challenge: A truly sustainable building should be constructed from materials that contribute to carbon capture and create minimal CO₂ in their production. Timber, sourced from properly managed renewable sources is the clear choice to reduce this impact. However timber suffers from being 'lightweight' in thermal mass terms. To compensate for this, we have increased the ventilation flow rates through the spaces and incorporated the use of Phase-Change Material boards on the ceilings, giving the timber the same effective properties of concrete through minute wax beads that melt and solidify according to temperature.

Use of Sustainable Construction Materials: We have reduced to an absolute minimum the high embodied energy materials such as steel, glass, aluminium or concrete. We have also sought to reduce 'freight miles' through a combination of careful re-use/recycling of material on or near the site and local sourcing. The timber specified for the cladding is coppiced sweet chestnut, an indigenous UK species from the Southeast area. All timbers on the project are from certified sources that form part of the Forestry stewardship schemes. Within the street, recycled boards are used as the internal street wall finish and English kirkstone form the street floor finish.

Ventilation: The building is primarily passively ventilated – with windows in the façade and large ventilators on the roof, pointing in the opposite direction to take advantage of effective cross ventilation. These "windows" on the roof are linked to the rooms by large airshafts that present very little resistance to airflow. This arrangement of opposite-facing windows to the same room gives about 7 times the conventional ventilation rate.

Daylight & Daylight-linked dimming: The High ceilings and high windows allow daylight to penetrate further into the offices. A photocell in each light fitting is provided. In shallow plan offices such as those proposed, lighting energy is reduced from the typical by over 60%.

Lower resistance pipe and duct design: Through doubling the diameter of a duct or pipe the frictional resistance to flow reduces to 1/16th; likewise the pump energy, or fan power. Consequently significant energy savings can be achieved by a modest increase in pipe and duct sizes. This forms a core part of the mechanical specification.

Exhaust Air Heat Pump: An exhaust air heat pump (in contrast to an air-to-air heat exchanger) is installed at the Icon, which moves heat from the (warm) exhaust air being expelled from the occupied spaces into the buildings hot water radiant heating system.

Water Consumption and Reuse: The ICON building uses grey water run off for irrigation of the biodiversity green roof, flushing of all wcs and a SUDS (Sustainable Underground Drainage System) is installed.

Building Contractor & Supply Chain: The successful contractor was located within 15 miles of the development ensuring links with local site labour and midlands based companies will be strong.

Phase Change Material: Plasterboard incorporating Du Pont PCMs have been installed in the ceilings of several of the incubator units. These boards work by melting and re-freezing to respectively absorb or release heat. This "phase-change" can store far more energy than can be stored by just heating a material up by a few degrees. The phase-change material has been designed to melt at around 23 deg C, so that when the office starts going above this temperature the melting phase-change material absorbs large amounts of heat to reduce any further temperature rises in the room. It provides thermal mass in winter to store passive solar gains and reduce heating bills, but also captures night cooling during the summer to limit daytime overheating. Fundamentally, it means one can have a *structurally lightweight* building that is *thermally heavyweight*.

3.b Ethical & Operational Issues

We have sought to avoid any criticism of green-wash by integrating inappropriate or commercially unviable technologies to create visible external indicators in an attempt to create a public 'feel-good' factor. For every £1 spent on better thermal insulation the building has saved as much CO² as an equivalent £3 spend on a windmill, £5 on combined heat and power or £10 on photovoltaic panels.

We have achieved a high level of serviceability and adaptability in the building. While it is difficult to predict future developments in energy use and policy, there is, we believe, a balance of 'loose fit' and easy adaptability. This is, for example, far easier to achieve in a high ceilinged workspace above 2.75m, as built.

Ultimately by removing the ETFE roof (a lightweight construction) the building can adapt for future warming of the climate and be either replaced with an open roof or a retractable one to enable different levels of adaptability.

As well as recycling paper, newspaper, cardboard, plastics, metal food tins, ink and copier cartridges, the end user monitors incoming resources against recycling outputs to assess the proportion of waste actually recycled and promotes awareness and initiatives to all tenants and building users.

The building is actively being monitored through a Northampton based PHD student and considerable monitoring equipment has been located around the building. Annual figures in use should start to be realized around June 2012.

The iCon is a new type of publically funded building, which actively promotes economic sustainability for local boroughs via the promotion of an Innovations Network or 'iNet'. There are 4 iNets in the East Midlands. The iCon building forms the Sustainable Construction iNet.