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ANC | ACOUSTICS & NOISE CONSULTANTS

ACOUSTIC AWARDS

2016

ACOUSTIC AWARDS 2016

The ANC awards promote and recognise excellence among UK acoustic consultants. The Awards look for examples of work that display innovation, and originality in acoustic design or approach to a particular project. Work must have been undertaken in the last two years and the consultancy must be in operating in the UK although the project may be elsewhere.

This year the Awards are:

- **Architectural Acoustics : Commercial Buildings** — Sponsored by Armstrong
- **Architectural Acoustics : Education Buildings** — Sponsored by Ecophon
- **Environmental Noise** — Sponsored by ANV Measurement Systems
- **Sound Insulation** — Sponsored by Icopal
- **Vibration** — Sponsored by Bruel & Kjaer

The entries were reduced to a shortlist of 14 across the five categories and all those entrants requested to make a brief presentation on their project immediately before the Awards ceremony. An award was made for the best presentation by one of the shortlisted projects and this was determined by those attending.

The judging panels were made up of representatives from other professions, academics, consultants and other interest groups.

The judges included:

Sue Bird
ANC President (chair of judging panels)

Claire Barton
Architect

Juan Battaner-Moro
Solent University

Joe Cilia
Finishes & Interiors Sector

Stephen Dance
London South Bank University

Lisa Lavia
Noise Abatement Society

Daniel Lurcock
ISVR, Southampton University

Andy Moorhouse
Salford University

Howard Price
CIEH

Sean Smith
Napier University

James Talbot
Cambridge University

Rupert Thornely-Taylor
ANC Honorary Member

And sponsor representatives.

The Judges noted that they had not visited any of the projects or heard the results and so their decision is based on review of paperwork only. In a number of cases the projects are not built and so it is not possible to validate the results which has in some cases influenced the final decision.

ARCHITECTURAL ACOUSTICS : COMMERCIAL BUILDINGS

WINNER

Cundall

Virtual Acoustic Reality™ (VAR)

This project is a unique and cutting-edge tool for both clients and design teams and could transform building and infrastructure design with a combination of audio-prediction modelling and gaming-quality graphics. It involves the design and development of a portable, interactive audio and visual virtual experience. Acoustics is often referred to as a dark art. It is full of different notations and definitions and a lot of time is spent trying to convey the meaning of these to the design team and to clients. Acousticians specify products designed to control the reverberation time, but what does a reverberation time of 0.8 s actually sound like? When a contractor value engineers a design and noise levels increase by 5 dB, how will that change the sound?

VAR links a powerful 3D graphics programme with the CATT Acoustic software to enable clients and the design team to fully immerse themselves within a virtual world and be able to walk around the building, whilst listening to the audio signal change in real time.

The judges recognised that this entry was slightly different from what they had expected but it was very relevant to building acoustics. It was a fantastic tool to engage the client very early in a project about the importance of the correct acoustics. It would also be useful for the design teams to try different solutions before committing to a particular design and it helps to demystify acoustics and raises the bar in client engagement and empowerment. For innovation and contribution to acoustics and public perception, this is the award winner.

HIGHLY COMMENDED

Hoare Lea

United Kingdom Pavilion, World Expo 2015, Milan

The consultants undertook the design of acoustics, integrated audio-visual systems and a soundscape experience, with visitors following the dance of the honey bee through a series of landscapes and soundscapes. A 14-metre-cubed structure uses light and sound to connect the visitor to the activity of a real beehive, immersing the listener in an interwoven, meditative musical composition. Acoustic modelling was undertaken to understand the interactions during the design process. Designing an outdoor soundscape experience within a world expo site, wedged between motorways and the mainline railway, had the challenge of calibrating reproduced sound from the system on the listening planes against the ambient noise profile.

The judges noted that although a temporary structure, this project was able to play with the senses using acoustical elements. The designers faced a unique challenge of creating a soundscape that is informed by movement of bees hundreds of miles away, as well as providing a conference space. Both of these objectives were met with the client saying ‘the result has surpassed my expectations. The experience is truly immersive.’

COMMENDED

BDP

Enterprise Centre, Norwich Research Park

Forming a gateway to the University, the building is a hub for joined-up low carbon thinking and acts as stimulation for the regional economy. The Enterprise Centre breaks new ground in sustainable design, reducing the carbon footprint through the supply chain and to the final material. The acousticians worked with architects to seek out low carbon materials that would perform the acoustic function whilst fulfilling key environmental criteria, all the while complimenting the architectural aspirations. The building utilises passive ventilation via sound attenuating louvers, augmented by mechanical ventilation during the winter months. Internal acoustic finishes utilise natural materials including demountable woodwool acoustic tiles and a spray on acoustic finish containing 85% finishes, assisting in achieving the building’s low embodied carbon.

The judges noted this was a small project with sustainability at its centre which achieved both Passivhaus certification and BREEAM Outstanding. It showed that acoustics and sustainable design can go hand in hand and they were impressed to see that such a high finish and required performance was obtained using local materials.

ARCHITECTURAL ACOUSTICS : EDUCATION BUILDINGS

WINNER

Adrian James Acoustics

Boardman House, Norwich University of the Arts

This project represents a successful and sensitive integration of acoustic and architectural design, which in is unusual in a historic building. Often in the conversion of listed buildings, the conservation constraints lead to severe compromises to, or in some cases complete abandonment of, the acoustic design. The building has already won a RIBA East Award and the Norfolk Constructing Excellence Heritage Award but more to the point, the staff and students are very happy with it.

Both the building and the brief were acoustically very challenging. Prior to the project, the basement housed a series of church meeting and function rooms, with the ground and first floors housing offices set around a large central two-storey meeting and worship space with a large glazed roof lantern, barrelled ceilings with stout cornices and a balcony with an ornate wrought iron balustrade. To provide good acoustics for study and teaching while remaining sensitive to the historic building fabric, required extensive use of innovative finishes such as spray plaster, monolithic rendered mineral tile ceilings and slatted timber finishes. The design also required meticulous detailing of sound-insulating wall and floor constructions, particularly separating floors. The result is a building which achieves good acoustic conditions in a largely 'invisible' manner.

The judges felt this was a really excellent achievement particularly given the modest budget available. An open plan space had been made to work successfully so that it that fulfilled its purpose and achieved a good acoustic performance. The challenges of doing this within a listed building made this even more impressive and it is an excellent example of architectural acoustics at its best.

HIGHLY COMMENDED

Arup (lead designer) and SRL

Swansea University Great Hall

The Sir Stanley Clarke Auditorium was conceived to occupy the existing Swansea University Great Hall building frame. Designing the auditorium to integrate concert hall acoustic requirements in line with the client's high aspirations and within a modest budget, was a challenge. The existing building frame implied significant constraints on the room geometry, and stringent limits on the building mass and imposed loads. A creative approach to the design of the acoustic finishes and substantial research into the design of successful precedent venues, delivered a great acoustic within the existing structural design.

Yet the University's aspirations nearly went unrealised as the original design was well beyond their financial reach. There was a very exacting specification in place to create the acoustic conditions required. It contained a mixture of objective numerical criteria and specific construction methods. In many cases, mitigation methods were also recommended for meeting the objective criteria. Cost savings had to be found which wouldn't discernibly affect the acoustic performance of the building.

The Judges were presented with two entries for this project and invited the consultants to accept a joint award which would recognise their respective contributions to the successful delivery of this scheme. They were impressed by the emphasis throughout on the quality of the design and the emphasis on maintaining that.

COMMENDED

Adrian James Acoustics

NMRB (now named the Bob Champion Building)

The consultants were appointed at Stage C of a design and build contract with the brief to ensure that the building would not only be acoustically fit for purpose, but acoustically excellent. The contractor had rightly identified that the acoustics would be critical to a successful overall result, but until this point acoustics had not been considered at all. The end result is an architecturally and acoustically excellent building that is unusual – perhaps unique – to achieve such high quality and innovation in a contractor-led design team. The project is an example of how a contractor, architect and acoustician can work together to develop and deliver an innovative and integrated acoustic design on a modest budget.

This was a great project in respect of the collaboration between the team and showed that a D&B framework can achieve results. The judges liked the way the acousticians had picked up the brief and set their own agenda convincing other parties of the importance of acoustic features that might otherwise have been value engineered out of the final building.

ENVIRONMENTAL NOISE

WINNER

Bureau Veritas with Crossrail and CSJV

Crossrail Bond St: Contract 412

Bond Street Station is one of the most sensitive sites on the entire Crossrail route in terms of noise and vibration. The Western Ticket Hall is surrounded by residents and a number of sensitive commercial properties, including an antique emporium housing valuable objects that are susceptible to vibration. In contrast, the Eastern Ticket Hall is based in a predominantly commercial area. Despite these significant challenges, CSJV C412 were one of the first contractors to be awarded a 'world class' score in noise and vibration performance.

A detailed suite of objective performance measures were defined in order to measure contractor's performance in construction noise management, covering factors considered critical to success. These measures formed part of Crossrail's Performance Assurance tool (PAF) which sought to minimise impacts on people. This is quite different from controlling or minimising noise levels. Community response to noise is strongly influenced by people's attitudes towards the noise creator. In the context of construction noise people are more likely to tolerate the noise if they consider that the noise is necessary and that all reasonable steps are being taken to control and minimise noise impacts (ref BS5228). The PAF places as much, if not more, emphasis on community engagement and communication as it does on the physical aspects of controlling and minimising noise emission from the works.

The judges scored this highly in terms of complexity and managing the project. The application of established best practice to the control and mitigation of noise was critical in this sensitive location and the performance measures could be a real step forward in this field of work.

HIGHLY COMMENDED

Arup

A14 Cambridge to Huntingdon (C2H) Improvement Scheme

The proposed A14 highways scheme represents substantive innovation that has secured development consent quickly and will deliver significant improvements in the health and quality of life of many thousands of people and materially improve the noise environment around the social infrastructure (e.g. schools, public open space) in several communities. It is the first highways scheme under National Policy Statement for National Networks (NPSNN) and the Government decision letter advises that the assessment method is robust. The project represents the 'new' excellence for Highways England.

The judges noted this project had taken acoustics forward and established new methods that would lead to a change in DMRB and possibly might ultimately result in a change in government policy. As the project is not yet complete it was not possible to see how effective it had been in practice and this influenced the decision to give it highly commended status.

COMMENDED

Bureau Veritas with National Grid

Hinkley Point C Connection Project

The consultants worked closely with noise specialists and engineers within National Grid on their largest overhead line NSIP project subjected to the DCO regime to date. A bespoke assessment methodology was developed to assess operation noise associated with the new high voltage conductors, which only generate noise (corona discharge) under certain meteorological conditions and is wholly dependent upon the respective tower/conductor arrangement. Using sound power data calculated by National Grid, the consultants produced noise propagation models of the overhead line route, and developed an assessment methodology that followed the principles of BS4142, but accounted for potential impacts during wet conditions when higher noise emissions typically occur. The assessment methodology also had to be clear and understandable to lay readers, with feedback sought at six consultation stages and at Issue Specific Hearings.

In evaluating this project, the judges noted that it was highly specific and whilst the new assessment method made a valuable contribution to acoustics, it was perhaps not widely transferable. They however recognised that it deserves commended status for its work in developing the analysis of corona discharge into practical graphical methods that assist in public engagement and system optimisation.

SOUND INSULATION

WINNER

Mach Acoustics

Steiner Academy, Frome

The project posed a number of challenges, namely a material with inherently poor sound insulation performance (Cross Laminated Timber) and a design with a strong aesthetic that exposes the CLT as much as possible. The consultants were required to improve the accuracy of their sound insulation models so to determine where CLT could be exposed and where it needed to be dry-lined. This required detailed reviews of construction data as well as calibration of modelling to on-site testing of similar CLT structures. The result is a project that meets all the proposed sound insulation targets with a minimal impact on the architectural vision.

The CLT elements of Steiner Academy Frome proved to be a challenging aspect of the acoustic design. In order to achieve the high sound insulation targets required for the various teaching spaces, on-site test data of other CLT projects was used to calibrate Bastian models. Input was provided to CLT thicknesses, slab breaks and minimal wall linings to allow the CLT structure to be as exposed. To determine the amount of flanking each CLT slab would provide the varying stiffness qualities of the CLT structure was assessed so to gain a more accurate understanding of the buildings acoustic behaviour. This information was entered into a spread sheet model using the guidance given in BS12354 and semi mirrored with the results provided by Bastian.

The judges considered this to be the most innovative entry and were impressed by the performance obtained using CLT, especially as the brief had required this to be kept exposed. Acoustic designs such as these and use of natural materials demonstrates how consultants can work with low carbon materials to enhance the public profile of the acoustics.

HIGHLY COMMENDED

Apex Acoustics

Vermont ApartHotel, Newcastle

This project is an example of consultancy work spawning research that inspires entirely novel solutions. It involved refurbishment of Listed buildings, formerly comprising commercial and residential accommodation, into a luxury aparthotel comprising two penthouse suites and 11 double apartments. The pioneering and innovative work concerned the development of a suitable floor detail for this project. This has extensive potential applications in new-build timber flats as well as refurbishment projects; it is proven to offer the highest Class of impact sound insulation under the ISO Acoustic Classification System currently under development. This represents a significant advance on current lightweight timber frame floating floor technology, which cannot achieve this performance.

The judges noted that the project has delivered significant sound insulation in a complex site exceeding the clients brief and providing an isolated screed floor solution in a refurbishment project. Given the number of low frequency impact noise complaints that are made, this is an area that deserves more research and the adoption of novel solutions such as these. The judges also applauded the use of academic literature as part of the work undertaken by the consultants.

COMMENDED

Peninsular Acoustics

Kingsway Music Rooms, University of Chester

The brief was to prepare specifications for three ‘soundproofed’ rooms to enable rock bands to practise and perform at the same time as other ‘noise-sensitive’ activities in adjacent spaces. An initial survey of the 1960’s building revealed that the area planned for the main ‘performance space’ was a suite of classrooms which were to be knocked into one room able to accommodate performers and audience totalling 100 people, adjacent to the lecture theatre. The project had very challenging sound insulation requirements, a critical and demanding client, limitations imposed by the construction having to be built on a suspended beam and block floor at first floor level, the novel floating floor, the very short build time and the limited budget.

The judges agreed that the performance achieved was impressive and although it looked a conventional project it had an interesting twist to it. They welcomed the significant client input and noted that projects such as these which deliver substantial sound insulation, with a restricted budget and in a complex site demonstrate the important contribution by acousticians. Finally the judges were pleased to see an entry from a sole practitioner that showed all sizes of consultancies can produce award winning projects.

VIBRATION

WINNER

RBA Acoustics

Queen Street, London

The scheme involved the conversion of two adjacent existing office buildings within an exclusive area of Mayfair within Central London into a series of high value apartments. The site is located above the London Underground (Jubilee Line) and, consequently, was affected by high levels of groundborne noise and vibration due to underground train movements. The solution developed involved a mixture of various techniques for reduction of building vibration and despite the significant restrictions to the building, achieved reductions of 15dBA to the previously existing groundborne noise levels.

The building was Listed, severely restricting the available options. Furthermore, the site lay directly above one of the tunnels and so there were major concerns about the potential for excessive additional loading associated with any works being transferred to the tunnels themselves. The high value nature of the proposed properties also meant that it was essential to maximise floor area as far as possible. In the words of the main contractor: “The Queen Street scheme was an extremely challenging project and our original acoustic consultant left us fearing the worst. However, RBA Acoustics took a very positive approach to the various problems and delivered a solution which exceeded our expectations.”

The judges were impressed by the innovative and practical solution which was intriguing in its approach. The consultants had worked closely with the other members of the project team and in particular the structural engineer and had the nerve to remove what they could, leaving only the exterior wall in contact with the ground. It scored highly on originality and a clear design concept that was followed through and for these reasons it is the 2016 winner.

HIGHLY COMMENDED

Bickerdike Allen Partners

British Museum – World Conservation and Exhibition Centre

The World Conservation and Exhibition Centre (WCEC) is a recently constructed research and exhibition centre extension at the British Museum. The consultanst assisted on the design of the new building and protection of existing objects from adverse effects of construction vibration. Significant acoustic challenges were present at all stages of the project. The new, state-of-the-art laboratory facilities required extremely low background vibration levels. The control of vibration from daily activities such as footfalls, vehicular activity and mechanical plant was of paramount importance. Comprehensive FEA analysis was undertaken to ensure this objective was achieved.

One of the most unique and difficult challenges was the close proximity of heavy demolition and construction work to irreplaceable objects and artefacts. The consultants developed vibration criteria to ensure object protection while minimising construction disruption. A pioneering set of object protection vibration criteria were developed that have since been used successfully on numerous similar construction projects. The numerous challenges required innovative, out-of-the box thinking and problem solving throughout. Not a single object was damaged during the project and the laboratories function without vibration issues.

The judges agreed this was an impressive piece of work which had to take into account a large number of factors. It was an unusual brief, a complex project and an “operational” site. It was carried out with thoroughness over a long period and achieved the desired outcome. There was an original approach to establishing appropriate vibration limits and effective use of measurement, monitoring and prediction, plus it demonstrated that such works are possible without damaging collections and disrupting museum operation. It was very highly commended.

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