

ANC | ACOUSTICS &
NOISE
CONSULTANTS

ACOUSTIC AWARDS 2019



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The ANC awards highlight the unique skills of our UK-based acoustic and noise professionals, and the dynamic and diverse nature of the industry overall, to inspire the next generation of acoustic consultants. These accolades demonstrate excellence

among our members in addressing challenges across the nation and around the world – championing innovation and originality and showcasing the significance of a profession which blends art and science to transformational effect.

EDUCATION ACOUSTICS

sponsored by Ecophon

Adrian James Acoustics

New music school, Kings College School, Wimbledon

WINNER

The project locates a music teaching and performance facility on a very sensitive site, close to houses whose influential owners were concerned about the building's size and potential noise nuisance. Given the planning sensitivity to building height, the consultants had to demonstrate the need for the ideal volume, height and shape of the performance space, using architectural precedents.

Starting with the ideal shape and volume allowed the acousticians to provide optimal concert hall acoustics with no absorption other than seating and audience, maximising the "Loudness" or Gain and hence achieving the maximum possible dynamic range. This approach requires very effective diffusing and scattering finishes on walls and roof to avoid strong room modes and flutter echoes. Working closely with the architect and structural engineers, an innovative modular system of visually striking, flat surface, diffusing finishes was designed which perform an acoustic, architectural and structural function both in the concert hall and in the large rehearsal/recording room.

The Concert Hall features strong triangular geometric elements both externally and internally, with triangular timber panels between exposed glue-lam structural timber beams. The architects wanted a visually flat surface so an entirely novel system of modular diffusers was developed by overlaying layers of board with CNC-machined slots of differing sizes. It is a very elegant and affordable solution to an otherwise intractable acoustic and architectural design challenge.

The judges observed that this project displayed the value of collaboration with other consultants and were impressed that the form and massing on the building had been informed by the acoustic strategy. The use of flat diffusers has enabled the project to be delivered within the architectural requirements. The Head of Music described it as *"A stunning concert hall of exceptional acoustic quality"*.

HIGHLY COMMENDED

Mach Acoustics

Leighton Park School, Reading

The acoustic design at Leighton Park shows that through complex modelling, it is possible to naturally ventilate music practice spaces – not by installing expensive acoustic attenuators that take up valuable floor area, but by adding simple, yet innovative, extrusions on to the façade. In-house Finite Difference

Time Domain (FDTD) modelling software provides confidence in applying untried and untested attenuation measures that upon completion have proven to provide good levels of accuracy and produce a successful design.

FDTD software was used to work closely with the architect to develop a bespoke opening that is complementary to the architect's vision. Post-completion testing has been carried out to corroborate predicted and actual test data.

The judges noted that the consultants developed in-house software tools based around FDTD methods in conjunction with Southampton University (ISVR). They recognised that the client had been persuaded to use something untested and untried which had achieved the desired outcome. This went beyond existing good practice and so could benefit future projects. It was simple to build and provided an appropriate solution.



BUILDING ACOUSTICS

sponsored by H&H Acoustic Technologies

Apex Acoustics

The Houseboat, Lakehouse Drive, Poole

WINNER

The Solidspace concept for modern living is a split-level, open plan design which demands a new approach to acoustic design, as there are neither references nor literature describing desirable acoustic conditions in such a space. The acousticians drew on seminal soundscape principles to prioritise the acoustic issues for the users.

The consultants followed the core soundscape qualitative data collection principles of guided interviews and non-participatory observations, as well as reviewing user feedback from previous Solidspace developments. This approach prioritised users' acoustic concerns and enabled the design to respond to these. Acoustic modelling and auralisation was used to communicate the acoustic possibilities with the developer.

The radical addition of a soundscape approach to the traditional acoustic design process was pivotal in achieving a transformative

design. The acoustic conditions were significantly improved in the three key areas identified by occupiers. Future Solidspace projects will build on the success of the Houseboat. The project demonstrates the power of adopting a soundscape approach to building acoustics design, which has many wide applications.

The judges recognised this project as an innovative solution applying the soundscape principle to address a building acoustics problem. Use of auralisation was key so that the client listened to the outcome and helped determine the standard to be achieved. Including social media feedback in the research was applauded. The client CEO said *"We are immensely grateful to you for helping us to navigate the noise question, and understand exactly what we can do about it"*.



HIGHLY COMMENDED

RBA Acoustics

Archlight Cinemas,
Battersea Power Station

The acousticians were consulted at the design stage on the viability of a three screen commercial cinema installed within railway arches beneath the main lines serving Victoria Station. Extensive noise and vibration surveys were conducted within the arches to determine the scale of the problem. To achieve suitable internal

noise levels within the completed screens a series of sound insulation measures were proposed working within the constraints of the site. The arches themselves could not be compromised as they are a Network Rail asset and strict guidance was enforced for any fixings into the structure. A metal framework was proposed which was lined with dense boarding and isolated from the floor slab forming a fully isolated shell. A fully isolated lightweight floor was installed in order to limit the amount of tactile vibration into the cinema seats.

A significant reduction in intrusive noise was realised, exceeding predictions, and vibration within the completed Auditoria is barely perceptible to the majority of users.

The judges noted that a practical and creative approach had been adopted which had enabled the project to go ahead in what was otherwise an improbable site for a cinema. There was collaboration with the client throughout and expectations were managed in recognising that some unobtrusive noise would still be audible.

COMMENDED

Hoare Lea

Student Accommodation,
Balliol College, Oxford

The world's oldest college wanted to create exceptional student accommodation as part of a masterplan. Based on research, analytical analyses

and on-site trial tests, the acousticians challenged the status quo of sound insulation design with Cross Laminated Timber (CLT) structures. There was creativity and collaboration which led to a solution that could be applied to future projects by other acoustic consultants. With a move towards offsite and modular construction, the judges consider there

is great potential for this approach to be adopted elsewhere. It has significantly added to the data available on CLT structures which will assist other projects and shows how early engagement of acoustic consultants adds value to projects and helps reduce the environmental impact of construction.

ENVIRONMENTAL: INFRASTRUCTURE

sponsored by ANV Measurement Systems

Temple Group

Acoustic Deterrents as a Bat Mitigation Strategy

JOINT WINNER

Eighteen species of bats are present in the UK. Their sensitive and highly evolved acoustic apparatus, coupled with complex habitat requirements and wide-ranging use of the landscape, means they are vulnerable to disturbance, habitat fragmentation and killing or injury caused by a wide range of development projects. There are emerging approaches to using acoustic output as a mitigation methodology to dissuade bats from sites such as windfarms that pose a risk of killing and injuring them, but little attention has been paid to the use of sound to enhance the effectiveness of mitigation. Instead of simply excluding bats from an area, the consultants determined that acoustic deterrents can be used to deter bats while ensuring normal levels of bat behaviour in the vicinity remain the same. They assessed the sound emitted and adapted the design by changing the configuration of acoustic deterrents to maximise

their effectiveness in eliciting localised and predictable changes in bat flight behaviour. This involved recording changes in bat flight behaviour in response to acoustic stimuli.

This research was carried out to evaluate acoustic deterrents as part of mitigation measures designed for protection of woodland bats present along part of the High Speed 2 (HS2) Phase 1 railway. This could be a new and widely applicable approach.

This was a very different entry than most. It was a practical solution to a problem affecting a major infrastructure project and good to see acoustic consultants helping to satisfy Natural England whose consent was required to enable the project to go ahead. The mixture of ecology with acoustics makes this stand out and it also receives an award for innovation.



Arup

Soundbooths for Heathrow's public consultation on Airspace and Future Operations

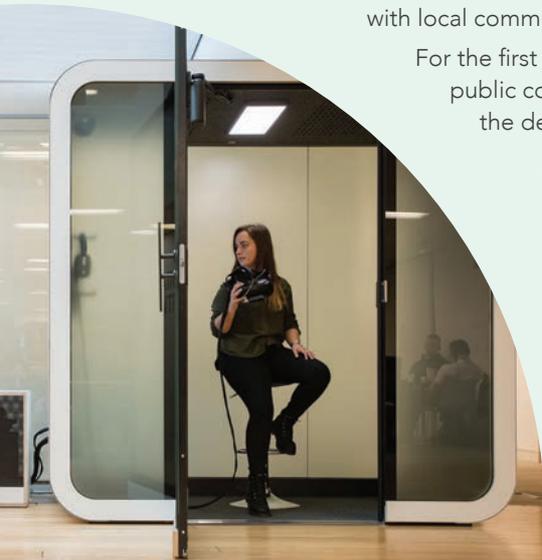
JOINT WINNER

Information relating to changes in aircraft noise can be challenging for communities to understand. Reading noise contours and decibel levels can have little meaning to those who are directly affected. To communicate the potential noise impact that stakeholders and communities could be facing, Arup developed three fully mobile Soundbooths equipped with a set of virtual reality sound demonstrations for Heathrow Airport's 2019 consultation. The interactive demonstrations allowed people to experience aircraft noise at calibrated levels, enabling the airport to communicate more transparently, meaningfully and effectively with local communities.

For the first time at an airspace public consultation level, the demonstrations

have been made available in an interactive virtual reality environment, offering an immersive experience for consultees. This experience combined a virtual user interface, 360 video footage and 3D planes with detailed spatial audio recordings of aircraft and different background ambient sound recordings. Other demonstrations included the simulation of different sound insulation schemes, a comparison of aircraft and the effects of alternation (runway and airspace) that could be implemented in the future.

This is an excellent example of collaboration and public engagement, which could be the start of a new approach to presenting information at public consultations. It builds on a similar initiative for HS2 and is an innovative approach which helps with understanding what the impact will be of proposed changes.



ENVIRONMENTAL: NON-INFRASTRUCTURE

sponsored by *Bruel & Kjaer*

MLM

Pentagon Motors, Chatham

WINNER

The site was formerly a car repairs facility (Pentagon Motors) and is bounded by a viaduct and a night club. The application involved the change of use of the site for construction of a 7-storey building comprising a total of 35 apartments. The EHO was very concerned with potential health detriments from noise to future occupants. The night club owners were firmly opposed to the scheme as it could compromise their future operations.

The scheme was re-designed several times to ensure that good acoustic conditions would be achieved while providing an optimum balance with other design constraints and ensuring an architectural design appealing for the regeneration of the area. Key acoustic aspects of the re-design included: re-orientation of the internal layout, with no bedrooms facing the night-club; central corridor relocated to form an external corridor facing the night-club; high acoustic performance winter gardens to habitable rooms facing the night-club and the viaduct. In the

words of the Environmental Protection Officer: *"This is a very good example of the local authority officers, developers and their acoustic consultants working towards solutions that will provide satisfactory levels of amenity in a very challenging environment."*

This was a complex project with high quality visual, amenity and acoustic features. The judges were impressed by how the acousticians kept pushing to redesign the site despite initial rebufs. Although the acoustic elements are familiar, this project is an excellent example of the acoustician influencing design of the site. The holistic and collaborative approach during the design stage to overcome the extreme acoustic challenges of the site means this project also receives recognition as 'good acoustic design'.

HIGHLY COMMENDED

Bureau Veritas

*Proposed Care Home,
St. Asaph Business Park, St. Asaph*

This project is a noise assessment for a new care residential development next to the A55 dual carriageway in Wales. Given the inefficiencies of traditional road noise barriers at this location, the innovative idea was to improve the acoustic environment of the less noisy internal courtyard to offset the noise impact of the traffic and create a restorative environment for the residents.

The consultant advised why and how to use the natural sounds within the internal courtyard and provided natural sound assessment with sound propagation modelling. Sound was designed and assessed as a positive element at the early design stage, rather than noise only. The project is a pilot under Planning Policy Wales 10, showing an example of low-cost soundscape assessment in a planning application for a common residential development.

The judges saw this as an effective solution which focussed not on noise control and

abatement but on soundscapes and the consultancy's own research. There was a risk in adopting this approach given there is currently no guidance for soundscape assessment in planning applications and this project provides a simple solution to the requirement for restorative environments. It also receives recognition as 'good acoustic design'.

COMMENDED

SRL Technical Services

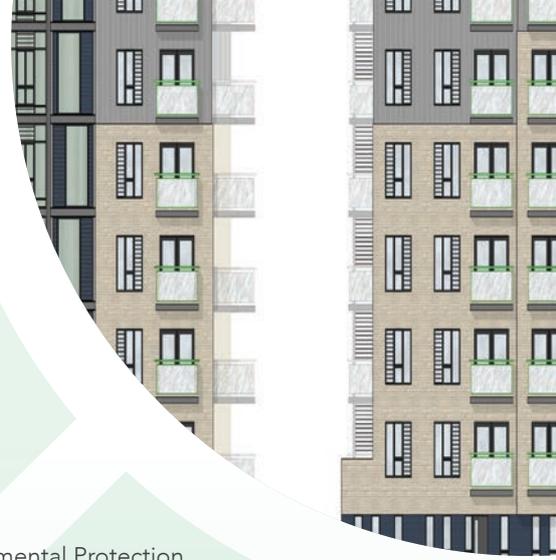
St Andrews Church, Much Hadham

A Grade I Listed Church dating back to Saxon times, has recently had its historic bells refurbished. However, a significant reduction of the noise break-out from the bell tower at the boundary of the church yard was required and improvement to the dilapidated sound insulation to the louvres in the church tower. Uniquely, the tower has glass louvres which allow more

daylight into the belfry and also enable internal lighting to emanate and enhance the church's flood lighting scheme at night. The Church Council's hope was to use "secondary windows" rather than the more traditional acoustic mitigation which could be kept shut during bell ringing practice and opened when the congregation was called.

The acousticians used data collected on site to predict the effect of both one layer and two layers of glazing

and determined that only one set of windows was necessary to effectively render the bells as quiet at the boundary with the windows closed as it was half a mile away with them open. The judges consider this demonstrated a good solution to the "problem" of church bells in some communities and that it offers an approach that could be adopted elsewhere.



VIBRATION PREDICTION AND CONTROL

sponsored by CMS Danskin

WSP

Paddington Square, London

WINNER

The project used innovative and complex numerical modelling to assess potential changes in vibration levels due to the redevelopment of Royal Mail Group buildings next to Paddington Station. The project is the demolition of buildings, and the construction of a 17-storey commercial building resting on a podium which is to be connected, via tunnels, to the Underground station.

The complex nature of the underground rail network, which includes numerous curved tunnels and trains travelling at different speeds, meant that the project presented unprecedented challenges. Cutting-edge vibration modelling techniques were used to investigate how changes to the ground conditions would affect vibration propagation, and advanced the understanding and application of those modelling techniques in the process, in order to apply them to the specific constraints and challenges posed by the project. The approach has been accepted by

Westminster City Council (WCC) and can be applied to future projects to identify issues and inform mitigation measures prior to construction, allowing developers and design teams to be proactive with respect to potential vibration impacts.

The judges recognised the work required to create two numerical 3D models of existing and future conditions, including co-operation with the software developers to enable it to be used for curved tunnels taking into account the change in travelling speed associated with trains departing or arriving at a station. Collaboration with other members of the project team, contributed to success in discharging the planning condition in relation to vibration. It was good to see a solution that avoided the need for vibration mitigation. The judges consider that it goes beyond existing good practice and could be applied internationally for future projects.

HIGHLY COMMENDED

Hoare Lea

Great Sankey Neighbourhood Hub, Warrington

The project is a dementia-friendly community hub which provides a range of cultural, health and wellbeing services. To facilitate the arrangement of a ground floor library and first floor public gymnasium, it was essential to ensure that the structure had sufficient provision to mitigate noise and vibration generated by the activities within the gym. The scale of mitigation required was a challenge

in balancing acoustic performance and structural dynamics solely using prediction methodologies. A unique method for the prediction of structure-borne noise and vibration from heavy-impact generating gym equipment was developed. A detailed prediction model allowed a virtual acoustic prototype of mitigation floating floors to be developed which can be extended to other fields of application for impact control.

The judges noted that this pioneering approach and constant stake-holder, contractor and architectural engagement

ensured that the final design was not only fit for purpose but optimised within the constraints of the scheme. The judges also noted that the predicted values were validated by testing, allowing some last-minute changes to the floor finishes from the gym to further improve performance, making this project a technical success. This has great potential for future use and provides a new way to produce predictions of noise and vibration levels within structures that are also subject to complex force inputs.

COMMENDED

Bickerdike Allen Partners

Royal Opera House Open Up, London

The Royal Opera House (ROH) Open Up development project required an innovative system using structure-borne vibration measurements to monitor noise that could affect its operations. The project has seen a significant amount of structural interventions carried out within

the existing building. The auditorium within ROH remained open for regular scheduled performances during the entire demolition and construction process. The associated noise had to be sufficiently controlled to allow continuing use of the auditorium and also a large number of rehearsal performance spaces where quiet conditions are paramount and essential to daily activities.

The judges recognised that this project explored new ways of monitoring noise in sensitive spaces where traditional measurement methodologies could not be used. There was good collaboration with the design team, construction team and the client which met the challenge of allowing performances to keep going. It was a highly complex project delivered to the satisfaction of the client.



WORKPLACE ACOUSTICS

sponsored by Armourcoat Acoustic

Hoare Lea

Project One 1 New Street Square, London

WINNER

This is Deloitte's new flagship London HQ, housing 5,500 employees. Deloitte's philosophy was that design could affect cultural change. The sound environment would be key to successfully operating the building; directly linking to the health, wellbeing, and productivity-potential for Deloitte people.

The ambitious aspiration to create this new type of inspirational workplace presented multiple challenges; demanding a willingness to embrace fresh approaches, original thinking, and the need to scrutinise acoustic quality beyond conventional guidance. From this new kind of collaborative design and delivery process, innovation ensued and knowledge was gained; information that can positively feed into the creation of modern, acoustically-optimised, workplaces.

Collectively questioning standards led to altering Deloitte's 'Workplace design guide', and a change to the WELL standard. Stakeholders needed to understand the end-product:

How would these new spaces sound? Would there be spill of disruptive noise? Would the spaces work? A range of demonstration techniques, auralisations in particular, enabled informed decisions.

The judges noted the range of challenges extended beyond those associated with open plan spaces and included an auditorium connected directly onto workspace via a feature stair and an executive director's offices adjacent to one of the key client event spaces. This project is an example of good collaboration with an engaged client and a very joined up approach. It shows how acoustic consultancy is not just about using physics and numerical modelling but involves demonstrating what the client should expect as a result.



HIGHLY COMMENDED

Adrian James Acoustics
Fletton Quays, Peterborough

The project comprised the conversion of a very large Grade II listed Victorian railway shed to open-plan Council offices. The client was particularly sensitive to acoustic conditions because many of the staff would be re-locating from cellular offices, so that there was a built-in resistance to the concept of open-plan offices. The consultants developed a scheme using

soffit-suspended rafts and acoustic wall panels. This is in itself not innovative, but the use of acoustically absorbent high-backed furniture items was. These combined with the more conventional screens to reduce direct noise transmission between work positions and different zones in the open spaces. This reduced the reliance on conventional inter-desk screens and so avoids the "rabbit hutch" or "maze" effect which so often arises in acoustically efficient open-plan offices. The use of informal "chat spaces" away

from the workstations has greatly reduced one of the main causes of irritation in open plan offices while encouraging healthy mobility around the offices.

The judges liked this example of the issues involved in moving to open plan particularly within the constraints of a heritage building. There was a high level of collaboration with the interior designer and a determination to use both the visual impact and the acoustic quality of the space to overcome the occupants' initial hostility to change.

HIGHLY COMMENDED

Apex Acoustics
New acoustic design method for open plan offices

This new method of assessing the acoustic requirements between specific workstations in an open plan office is particularly suitable to assess areas for different types of use, for example a breakout or meeting area impacting on workstations intended for non-collaborative work. It can be used for assessing requirements within agile

(activity-based) working environments, or for the partial refurbishment of more traditional open plan layout concepts with assigned desks. The approach focuses on workers' acoustic needs in open plan offices and offers a design method to address those needs. It is inspired by the emerging soundscape concept that the individual's perception of the acoustic environment is key to acoustic satisfaction. The results are easy to communicate amongst the wider design team.

With no end product it was not possible to judge its significance until the principles have been applied to a project. However, the judges liked the approach which was easily understood and should provide a useful assessment tool. The project also receives an award for innovation both in relation to its adoption of the soundscape principles and use of a novel descriptor – liveliness - for the acoustic environment in open plan offices.

This year the Awards categories are:

Building Acoustics



Education Acoustics



Environmental: Infrastructure



Environmental: Non Infrastructure



Vibration Prediction and Control



Workplace Acoustics



Chair of judging panels

Sue Bird MBE, ANC Honorary Member

Building Acoustics

Ian Strangward, Architectural Wallzs, John Pritchard, Derby University, Phil Dunbavin, PDA

Education Acoustics

Ian Pratt, Scott Brownrigg, Andy Parkin, Cundall

Environmental: Infrastructure

Stephen Turner, ST Acoustics, Peter Hepworth, Hepworth Acoustics

Environmental: Non Infrastructure

Lisa Lavia, Noise Abatement Society, Somayya Yaqub, LB Ealing, Jo Miller, Miller Goodall

Vibration Prediction and Control

Tom Brodowski, Noise & Vibration Engineering, Daniel Lurcock, ISVR

Workplace Acoustics

Stephen Dance, London South Bank University, David Garritt, S & D Garritt

Good Acoustic Design

Stephen Turner, ST Acoustics, Somayya Yaqub, LB Ealing, Ed Clarke, Clarke Saunders Associates

Innovation

Phil Dunbavin, PDA, Graham Parry, ACCON UK

And sponsor representatives

- The judges have not visited any of the projects or heard the results
- In a number of cases the projects are not built, and so it is not possible to validate the results
- Any conflicts of interest were declared