ANC ACOUSTICS & NOISE CONSULTANTS

# AWARDS 2018

# **ACOUSTIC AWARDS** 2018

ANC members provide consultancy advice in all areas of acoustics, noise and vibration to support the built environment, and transportation and entertainment sectors and diverse nature of the industry overall, to inspire the with innovation and best practice. Their expertise creates usable environments from the most challenging sites. Members also aid the well-being and comfort of buildingusers across the whole spectrum of use, in public, private and commercial places.

The ANC awards highlight the unique skills of our UKbased acoustic and noise professionals, and the dynamic 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.

Building Acoustics	Education Acoustics	Environmental Noise
sponsored by H & H Acoustic Technologies	sponsored by Ecophon	sponsored by ANV Measurement Systems
Vibration	Smaller Projects	

The Awards look for examples of work that demonstrates value and guality for the client, collaboration with project stakeholders to deliver a successful outcome, have potential to benefit future projects and goes beyond current good practice. They might enable an otherwise challenging project to be delivered and should provide justification for any problems and explanation of how they were overcome. Creativity and innovation however small will be appreciated

within any entry and the size and prestige of the overall project are not significant as these awards recognise the acoustics consultancy within the project.

The judging panels were made up of representatives from other professions, academics, and consultants as well as the sponsor for each category. Any conflicts of interest were declared.

Chair of judging panels	Sue Bird, ANC Honorary Member.	
Building Acoustics	Joe Cilia, Finishes & Interiors Sector. Stephen Dance, London South Bank University. Matthew Hyden, Cundall.	
Education Buildings	lan Pratt, Scott Brownrigg. Andy Moorhouse, Salford University. Jo Webb, IOA President.	
Environmental Noise	Simon Clothier, Leeds Council. Lisa Lavia, Noise Abatement Society. Martin Raisborough, MZA Acoustics.	
Smaller Projects	Dani Fiumicelli, Temple Group. Jo Webb, IOA President. Somayya Yaqub, LB Hammersmith & Fulham.	
Vibration	Tom Brodowski, Noise & Vibration Engineering. Daniel Lurcock, ISVR. David Waddington, Salford University.	
	And sponsor representatives.	

The Judges have 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.









## **BUILDING ACOUSTICS**

sponsored by H&H Acoustic Technologies

#### **Clarke Saunders Associates**

Quadrant 4, Piccadilly, London

#### WINNER

The project was a challenging, constrained refurbishment of

The centralised atrium space. an existing steel frame building with an existing, retained and throwing up countless interfacing reconfigured commercial gym at basement, ground and first scenarios and a mixture of existing floors, and the creation of 49 new luxury apartments. It required and new steel frame elements needed to the implementation of an isolated box-in-box solution, and be used to support the box whilst maintaining whilst that concept had been seen before, the pioneering the isolation of the fabric elements to achieve the required design approach involved working within the constraints of separation. Close collaboration with architect and structural the existing building to deliver the client's expectations in engineers, led to the development of a hanging corbel detail terms of sound insulation and acoustic comfort. with isolated fixings to maintain the independence of the box. The judges liked the use of auralisation to establish the extent Early instruction allowed thorough investigation and of the mitigation and identify areas of the building requiring identification of the potential acoustic risks associated with the attention. They were impressed by the decision to remove gym's proposals at the outset. Alterations to the future layout and rebuild the slab and noted that the Architect said: of the gym were not feasible nor would there be any workable "Clarke Saunders's support has been fundamental to the restriction on the noise levels generated in the commercial realisation of a number of extremely challenging architectural space beyond that already in place. The team eventually agreed ideas - in particular in relation to the 'box-in-box' concept to remove the existing second/third floor slab and replace with which was the key feature of this project." a two-storey isolated box comprising a 150mm cast-in situ slab.

## HIGHLY COMMENDED

#### **Adrian James Acoustics** Nur Alem Pavilion, Kazakhstan

The Nur Alem Pavilion is a unique building – believed to be the world's largest spherical structure – which presented very unusual acoustic design challenges. Standing 100 metres high, with a diameter of 80 metres, the key acoustic design challenge was in the provision of suitable acoustic conditions for the vast array of AV displays spread over the eight floors of the building. Acoustically absorbent treatments were incorporated inconspicuously into exhibits and decorative aspects of the building fabric and advice was provided to the AV consultants on loudspeaker placement in acoustically critical areas to minimise noise spill between nearby exhibits.

The judges noted specific challenges within the spherical building envelope such as the balcony areas outside the main exhibition floors, which were open over nearly the full height of the building. The consultants used image source mapping to demonstrate the potential for long-delayed echoes in these areas and assessed the effect of introducing

suspended sculptures to diffuse troublesome reflections. They also conducted extensive research, practical testing and auralisations to demonstrate the noise generated from a free-fall waterfall which led the client to change to a substantially guieter arrangement with water trickling down a curtain of clear acrylic 'strings'.

#### COMMENDED Hoare Lea Outer Space Project, Space Studios,

Manchester

A new, large scale production studio forming part of Space Studios, the project presented an acoustic challenge from concept, with very high client expectations and requirements, plus a lengthy planning process due to it lying just 25m from adjacent residential areas. To ensure client and planning requirements were achieved, there was heavy reliance on the acoustics team to develop an optimised design.

The judges recognised there were a lot of conflicting factors that needed to be solved and applauded the collaborative approach with other consultants and close co-ordination with the contractor's team

Centre cover photo by Tim Soar

The location between industrial sites as well as proximity to residential is an excellent example of where involvement of the acoustic consultants can deliver the client's high expectations.

#### COMMENDED Arup Royal Academy of Music

The project aimed to thread new teaching and performance space into and around the existing heritage building. A key challenge was increasing the capacity of the theatre from 200 to 309 seats without dramatically increasing its volume whilst achieving excellent acoustics.

Due to the scale of the performance spaces, each room's surface required close attention in order to obtain the right support and blend across all registers. One example is the unusual sloping roof of the Recital Hall which was incorporated to maximise the room's volume whilst eliminating the visual impact of the new-build from surrounding streets.

The judges noted that this was a unique environment with lots of isolated rooms requiring a high quality of acoustics.

## **EDUCATION ACOUSTICS**

sponsored by Ecophon

#### Hoare Lea

Royal Birmingham Conservatoire

#### WINNER

The new Royal Birmingham Conservatoire delivers state of the art, world class instrumental music teaching, rehearsal, performance and recording facilities. Designed to elevate Birmingham City University's musical educational offering, the aim was for a facility to truly inspire the next generation of the world's finest Classical and Jazz musicians. Client expectations were high, so this unique and innovative building demanded a 'tour de force' in acoustic design, including very high levels of airborne and structure borne sound insulation, varied and exacting room acoustic conditions and ultra-low building services noise. Located on a small parcel of land, adjacent to a dual carriageway, with future proposals for a new tram line, challenges were evident from the outset.

During the tendering process the consultants proposed that, in the interests of the controlling project budget and mitigating design risk, and also in view of the short construction programme for this complex building, they should be retained

as overall 'project acoustician' representing both client and contractor interests. This helped expedite both the decision making process and the resolution of issues on site, and allowed ultimate control of the acoustic quality of the completed building. This pragmatic agreement between client and contractor was key to the successful completion of the building.

The judges recognised that high profile projects inevitably stand out but this is offset by the high expectations of this project, the existence of multiple venues within the building and a contractual arrangement allowing the acoustician to act for the project as a whole, which all make this unusual. They were pleased to see testimonials from users and that the facilities had been booked for both TV and Radio broadcasts.

#### **HIGHLY COMMENDED**

#### **Apex Acoustics**

The National Centre for the Written Word, South Shields

The Word is a library for the 21st century, a new paradigm for a community library. The acoustic challenge was to enable the many distinct, varying activities to co-exist and even support each other within an open plan environment. There was no precedent for this type of space. The success of the entire project would rely on a suitable acoustic environment. This bold new architecture demanded an equally inspiring new approach to acoustic design

Making comparisons to similar types of spaces was inadequate - the success of the project would rest on the operationa conditions, not the empty conditions to which design criteria generally refer. The user experience would determine success. To understand the factors affecting users' generation of noise, sensitivity to noise, and sensitivity to distraction, the consultants returned to the scientific literature, particularly around

speech intelligibility, and acoustics in schools They used an approach based on emerging data from open plan office acoustics to estimate the potential spatial decay of sound between the noisier atrium and calmer, guieter areas at the perimeter.

The judges liked the clever use of a video to support this entry which demonstrated in the walk through that the claims for variation in noise levels and acoustic response of the spaces had been achieved.

#### COMMENDED WSP

#### New River College Pupil Referral Unit (PRU) and The Bridge Integrated Learning Space, London

An educational building, providing an optimal acoustic environment for students with severe learning disabilities, the building provides two schools which operate as separate entities; The Bridge ILS special school, and New River College Pupil Referral Unit. The key design challenges were to provide for

the individual needs of each school within the same building, and to provide a good level of sound insulation between the two schools.

The acoustic design challenges included two schools within one building with very different student requirements; incorporating a desire for natural ventilation, exposed concrete soffits to assist with overheating; and responding to the 2015 update of Building Bulletin 93 during the design process.

Judges felt this was a good example of acoustics consultancy in practice within educational buildings - with the unusual aspect of addressing differing needs of two schools.

## **ENVIRONMENTAL NOISE**

sponsored by ANV Measurement Systems

#### Southdowns Environmental Consultants

Crossrail C510 Whitechapel and Liverpool Street Station Platform Tunnels

#### WINNER

The construction of 200m long platform tunnels for two new underground stations – this was the first Crossrail contract to use Sprayed Concrete Lining (SCL) techniques in close proximity to sensitive receptors. The requirement to design mitigation measures to control significant contributions of airborne noise, structure-borne noise, groundborne noise and vibration is considered unprecedented and was closely scrutinised by the Regulatory authorities due to the level of perceived risk at this site.

Challenges included continuing major 24/7 tunnelling and support activities in close proximity to high density residential to address noise issues and this was demonstrated through properties 5m from the site boundary. The main tunnel access collaboration with other stakeholders. and other smaller shaft structures required careful scheduling As the Project Director, noted: "This included the research, of any invasive works in and around the shafts. To enable the development and successful implementation of prediction tunnel spoil removal activities to continue 24/7 it was necessary tools never before used in such a way, ultimately to the to design, specify and test massive acoustic enclosures with benefit of the local building occupants. This was a multi-faceted closable acoustic doors and associated silenced tunnel acoustical design project in its own right and unusual in the ventilation systems to fit around the mucking area and spoil range of noise and vibration issues that required attention transfer area, and ensure the neighbouring concrete batching at pre-planning stages." plant was also highly sound insulated. Together with monitoring equipment suppliers, the consultants deployed web-based

#### **HIGHLY COMMENDED** Temple Group

### Northern Line Extension

The extension comprises two new 3.2km running tunnels joining the existing network at Kennington and terminating at Battersea Power Station. This has required major construction sites close to residential and commercial properties, often with works taking place during the evening, night and at weekends. The control of noise, vibration and air quality during construction has been a major challenge faced while delivering the programme.

The Kennington Green and Kennington Park ventilation shaft sites were a major concern amongst key stakeholders including local residents. Both sites required 24 hour working with residents overlooking each work site. Auralisation Animations were devised to show the benefits of Acoustic Sheds as a form of noise control

#### Engagement with the public was considered exemplary by the judges who welcomed the Auralisation Animations as a way to demonstrate what residents should expect as an outcome.

#### COMMENDED Arup

#### Forth Replacement Crossing

Substantive innovation with respect to noise (and vibration) assessment and management assisted in securing development consent and project delivery quickly – safeguarding a vital connection in the transportation network. There were various sound, noise and vibration sources to consider including ground investigations, blasting, demolition, hydro-demolition, piling, earthworks, concreting, vibratory rolling and road planing in relatively close proximity to sensitive receptors (human and ecological) on land and the marine environment.

noise monitors on this project with innovative, real-time capabilities and audio capture used to distinguish construction noise from other sources and from other neighbouring contractors.

HH

The judges were impressed by the level of mitigation from existing and novel solutions. They recognised the efforts made through the development of empirical correction factors rather than relying on generic figures to predict vibration activities. From the outset, there had been acceptance of the need

Community engagement was a major factor, including the forming of a Noise Liaison Group (NLG) comprising Employer (and Employer's Delivery Team members), three Local Authorities, Marine Scotland and Scottish Natural Heritage who were involved in the appraisal of proposed works, decision making and approvals for all construction works.

Judges were pleased to see that Transport Scotland is taking the lessons learned to shape new best practice on its other projects.

#### **VIBRATION** sponsored by Pliteq

#### Atkins

Sensitive Artefacts Strategy: Museum Collection Centre (MCC)

#### WINNER

The high sensitivity to vibration provided a number of technical challenges and constraints, requiring collaboration with stakeholders and creative problem-solving to successfully fulfil the project's aims. This required test methods that would not expose the artefacts to an unacceptable risk of damage, limitations caused by space constraints within the facility, and a variety of shelving structures each with a different ability to amplify ground-borne vibration.

Real world construction conditions were simulated outside the MCC to determine the ability of the site to cope with piling and compaction works. This innovative, non-standard approach was used to provide a high degree of certainty of the vibration levels under tightly controlled conditions so that tests did not exceed levels that would risk damage to the artefacts. The vibration mitigation strategy included storage system recommendations and the avoidance of rubber resilient materials on the shelving units as these would risk causing chemical reaction harmful

to the sensitive artefacts. The consultants justified the use of vibrationinducing equipment and undertook extensive testing including measurements of the baseline vibration conditions and external to internal vibration transmission.

The judges applauded the collaboration with stakeholders to proactively reduce vibration-generation and amplification to a minimum. The consultants went beyond best practice by providing a high degree of certainty of the likely vibration levels during the construction phase. As well as satisfying stakeholders, the project has provided updated risk profiles of storage systems which will assist other heritage organisations to improve their processes for storing artefacts. The establishment of a procedure to allow the determination of vibration limits for sensitive sites that can enable monitoring at internal and external locations is of particular benefit.

#### **HIGHLY COMMENDED**

#### AECOM

Edit Suites

The project involved the acoustic design for 24 edit suites including an audio editing suite with voice over booth. It was particularly challenging acoustically due to: noise and vibration from television studios above, surrounding plant rooms and underground trains; constraints due to Listed Building status and severely restricted floor/ceiling heights; and full design and commissioning being undertaken within an 11-month period.

Standard isolation methods, such as utilising a floating sprung concrete slab, were not possible due to the mass and depth of concrete required which exceeded loading constraints of the existing structure. An innovative design based around a lightweight aerated concrete slab with just enough depth to incorporate the vibration isolation springs, yet low enough mass for the existing structure to handle was

developed. A series of well-received, confidence-inspiring auralisations demonstrated to end users that the noise and vibration transfer from studios above (via a structural borne path) would not be audible.

The judges noted the attention to detail throughout the project alongside the use of a bespoke and unconventional design. The end result is a positive wellconstructed solution delivered within a number of challenging constraints.

#### COMMENDED **Apex Acoustics**

Empirical method for vibration flanking transmission in steel-concrete composite floors

Undertaking in-situ measurement of the velocity level difference Dv,ij in continuous steel-concrete composite floors has enabled a new assessment of flanking sound insulation capability, that significantly exceeds previous expectations. This enables the designer to reduce the mass of continuous floors or omit floating floors entirely for this building typology.

The judges liked the software predictions and measured data being combined with a sanity check of actual measurements. They saw potential for this work to provide significant benefit to acoustics and the building industry. At this stage it is a research project and not yet proven so may be reconsidered in the future when there is evidence of its delivery and performance on a project.

## **SMALLER PROJECTS**

#### **Bureau Veritas**

Sidac Sports and Social Club, St Helens

#### WINNER

Planning permission was sought for a residential development The acoustic consultant liaised between the Client, the on a site adjacent to a sports and social club venue with a long history of noise complaints from existing neighbours Local Authority, club, contractor relating mainly to entertainment noise. Refusal was initially and existing neighbours. A holistic recommended as the EHO had insisted that appropriate internal approach included: benchmark sound noise levels within new dwellings must be achieved with open insulation testing; enhancing the building windows, which would not have been possible. The Client envelope; addressing all significant transmission paths for noise out of the building including the provision of agreed to undertake remedial works on the venue (under a Section 106 agreement) to achieve an appropriate indoor noise acoustic lobbies and enveloping the poorest performing level within new dwellings with open windows and thus secure sections in masonry. A bespoke 'tamper-proof' sound system planning permission. to control levels was also included.

The Local Authority made it clear that a satisfactory acoustic outcome was going to be a key driver in its decision regarding planning permission for the proposed development. The insistence of achieving appropriate indoor noise levels without relying on an alternative means of ventilation to open windows was challenged by the acoustic consultant but the LA would not concede on this issue. The only way to progress was to look at treating the venue rather than the dwellings.

#### **HIGHLY COMMENDED RBA Acoustics**

#### Lyall Mews Site Enclosure, London

As part of the refurbishment of a mews property in central London, the consultants were tasked with controlling noise from major demolition/ construction activities in order to minimise disturbance to neighbouring properties. The site is surrounded by residential buildings in a quiet mews overlooked on all sides. Noise limits were agreed with local residents at the nearest noise sensitive window which was approximately 1m from the site boundary. The acoustic enclosure was expected to give at least Dw 21dB reduction in noise levels at the nearest noisesensitive residential windows. In reality, the temporary enclosure provided a greater noise reduction performance than predicted and surpassed expectations.

The noise mitigation measures installed for this project are over and above the measures typically employed by construction sites. This has since shaped the consultants approach to noise mitigation for construction sites giving them the confidence to suggest innovative solutions and lead design to minimise noise nuisance.

The judges considered this a useful example of the contribution of acousticians to the delivery of other projects. Basement works, particularly in London, are an increasing area of work and the involvement of acousticians can assist all parties.

The acoustic consultants have enabled the existing social club to continue whilst the need for new housing has been met. A good range of acoustic disciplines have been applied along with management of expectations. It is a good illustration of the type of work which ANC member consultancies undertake regularly and shows the range of skills required on a smaller project.

