

# Acoustic Design for Advanced Audio Research and Testing Environments



## VISION

Convert three industrial units into a unified, high-performance acoustic research facility capable of supporting five distinct space types, each with independent acoustic performance criteria, while meeting UK planning requirements and protecting neighbouring amenity.

## PARTNERSHIP

Hold a single-team mandate covering both planning noise assessment and technical fit-out design, coordinating with the architect and contractor across architecture, structure, and MEP to translate the client's global acoustic standards into a RIBA Stage 4 specification and continue to monitor the project throughout construction and handover.

## VALUE-ADD

Achieve sound insulation values above 70 dB Rw within an existing industrial shell by combining high-isolation partition systems, detailed junction and penetration design, MEP noise criteria, and a formal commissioning methodology to validate performance at handover.

ARCHITECT  
*tp bennett*

CONSTRUCTION FIRM  
*OD Group*

ACOUSTICS  
*AWN, a Trinity Consultants Team*

## INTRODUCTION

This project for a confidential technology client transformed three existing industrial units into a single 12,000-square-foot specialist facility housing offices, acoustic laboratories, control rooms and anechoic testing spaces. AWN Consulting, a Trinity Consultants team, delivered both the planning-stage noise impact assessment and the detailed acoustic design for the internal fit-out, helping the project meet demanding research performance targets, satisfy UK planning requirements and maintain a tightly controlled environment for advanced audio development.

## VISION

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The project required a purpose-built research environment capable of replicating real-world acoustic conditions with laboratory precision, across five distinct space types within one industrial envelope, each with independent performance targets. That ambition had to be realised within an existing shell, with adjacent residential properties and a future housing parcel adding a UK planning dimension alongside the technical design challenge.

- Anechoic chambers → near free-field conditions; structure-decoupled floating floors and wall constructions
- Semi-anechoic / configurable labs → flexible low-noise environment; >70 dB Rw isolation from adjacent spaces
- Control rooms → high isolation combined with controlled reverberation time; optimised critical listening conditions
- Office areas → standard occupancy NR/NC targets; speech privacy maintained at partition interfaces
- Support / circulation → acoustic buffer zoning; flanking paths to critical spaces managed by design

## PARTNERSHIP

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AWN worked alongside tp bennett and OD Group from early design through construction, holding a single-team mandate across both planning and technical design. This eliminated the interface risk typically introduced when planning assessment and fit-out specification are managed separately and kept acoustic criteria consistent from concept through commissioning.

- Planning: predictive noise modelling of plant and laboratory breakout at sensitive receivers, with individual and cumulative scenarios assessed against UK planning policy
- Internal design: Stage 4 acoustic specification covering all five space types, including wall and ceiling constructions, reverberation targets, background noise limits, vibration isolation, and penetration detailing
- MEP coordination: duct velocity criteria, attenuator schedules, flexible connector requirements, and plant vibration isolation specifications issued across mechanical packages
- Junction and penetration detailing: interface conditions at wall-slab junctions and service penetrations developed to preserve acoustic integrity across all critical boundaries

## VALUE-ADD

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A defining challenge was achieving sound insulation values above 70 dB Rw within an existing industrial shell, without the benefit of purpose-built structure. AWN developed robust double-leaf and decoupled partition and ceiling systems, detailed junction treatments and a full set of performance criteria across all acoustic parameters:

- Sound isolation → >70 dB Rw in critical spaces via double-leaf and decoupled constructions; box-in-box approach for anechoic volumes; flanking limited at structural junctions
- Reverberation control → space-specific RT targets defined and specified for labs, control rooms, and offices
- Background noise → NR/NC criteria enforced through duct velocity schedules, attenuator sizing, and plant selection guidance across a heavily serviced fit-out
- Vibration isolation → spring and inertia-base specifications for HVAC and mechanical equipment; flexible connections at duct and pipe interfaces

AWN also established a formal commissioning and validation framework to confirm performance before occupation, with in-situ sound insulation testing per ISO 16283, reverberation time measurements against space-specific RT targets and background noise surveys under occupied plant conditions. The result is a high-performance research facility with validated acoustic metrics at handover, engineered to support advanced audio innovation within a tightly controlled environment.