NVA CASE STUDY:

BRISTOL UNIVERSITY GRADUATE CENTRE

Application:

Cross Ventilation

Reqiurement:

BB93

BB101

Key Products/Services:

Consultancy

NAT Vent Attenuator

Partners:

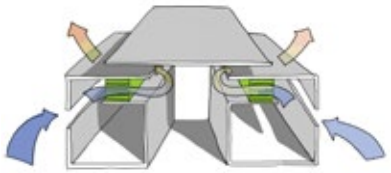
Capita Architects

Cowlins

MACH PRODUCTS

MACH Acoustics, in collaboration with Capita Architects have been involved in the design of Bristol University's Graduate School refurbishment. The need for sustainable and low-energy buildings has led to a natural ventilation scheme being carefully implemented into the design. The scheme involves air being brought into the classrooms through open-able windows and discharged into the main corridor via cross-talk attenuators, as shown within the section below.

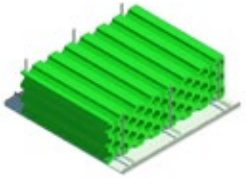
The Stack Effect.



The stack effect, caused by the height difference between the air in-let windows and the air out-let, naturally drives the hot air out of the building. Cowlin Construction, the main contractor, had handed over the project to the University and has therefore asked MACH Acoustics to support the final design and installation of crosstalk attenuators, integrating with existing ducting.

The crosstalk attenuators limit the transfer of noise between the classrooms and corridors, therefore maintaining privacy but allowing air flow.

NVA Bulkhead.



A simple, clean bulkhead containing the Nat Vent Attenuator is the most common way to install and achieve BB93 performance requirements.

Its lightweight design allows the MF system to be the supporting structure but it can also be enclosed in purpose built ducting within the bulkhead, as specified in this project.

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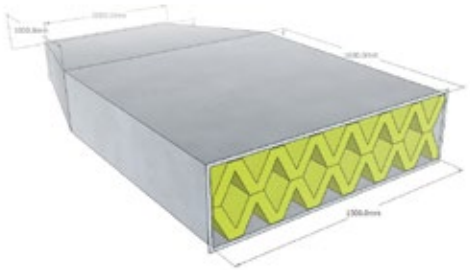
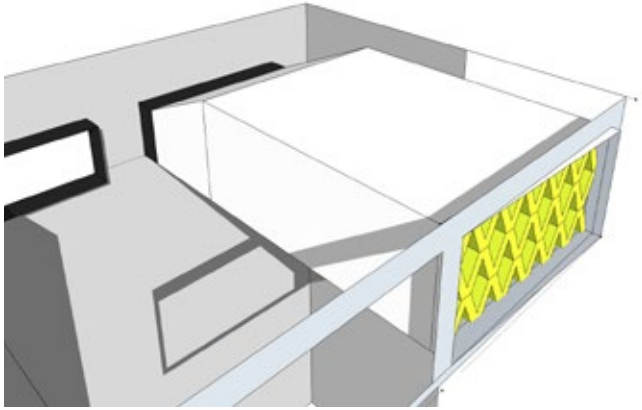
Design.



BB93 requires the weighted element-normalized level difference (Dn,e,W) of 39dB. To achieve this target in the new Graduate School, MACH Acoustics designed 1100mm long NVAs which were installed into bulkheads between the teaching rooms and the main corridor.

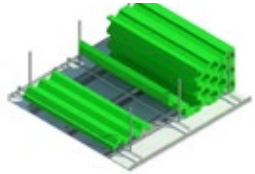
As a refurbishment, the NVA had to integrate with the pre-existing smoke dampers without reducing the flow area. Using a 50% free-area NVA, a tapered duct design which expands from 0.3m^3 to 0.6m^3 was designed to accommodate this.



Install.

For the Attenuators to be efficient, they have to be acoustically enclosed so the noise cannot bypass the attenuators. Our solution here was to install the attenuators into a pre-constructed duct; forming an NVA Box.

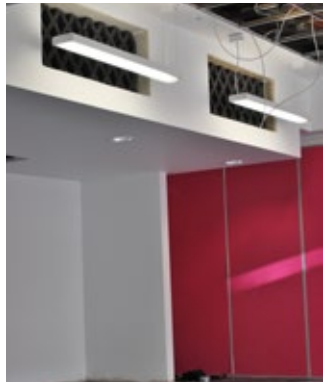
The ducts can be made of any material as long as it provides sufficient sound reduction. In this case the ducts have been constructed using plasterboard for cost, time and convenience reasons. The photos below show the different stages of the construction to install the bulkhead and ducts.



Result.

Cowlins Construction completed the installation of the NAT Vent attenuator by means of adding grill to the above units (not pictured). As smoke vents, louvres were fitted at the tapered end of the ducts.

MACH Acoustics specified the partition to perform to a (Dn,e,W) of 39dB. On-site testing following installation resulted in the partition achieving this and conforming to BB93 requirement. Considering the NVA as a separate element, it was shown to perform over it's quoted attenuation.



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