

Case Study: BBC Broadcasting House £270m Phase 2 redevelopment project



***One of the largest broadcast projects of its kind;
the most technologically advanced production
centre in the world.***

Completed in September 2010, the BBC's Broadcasting House redevelopment project Phase 2 (BH Phase 2) involved the development of 48,000m² of flexible accommodation for studios, offices, production and support services needed to meet long-term radio and news broadcasting requirements for the 21st century, creating one of the largest live news centres in the world and the headquarters and a production hub for all the BBC's news and World Service programming.



Broadcasting House in the centre of London

AAD provided acoustic consulting support to the substantial Phase 2 design and build contract; their broadcasting acoustic design experience meant they brought essential skills and knowledge to the project. BH Phase 2 started in 2006, with Phil Mansfield of AAD the principal consultant, heading up his team of acoustic design experts.



The Newsroom, with the glass fronted BBC News Channel studio in the background (the sheer quantity of glass was another aspect of the project that required the expertise of the acoustic design team at AAD)

Challenges

A major challenge was that the building is sandwiched between two London underground lines, Victoria and Bakerloo, both of which run extremely closely alongside the building's basement. The sub-basement is three levels down (and equivalent in volume to 40 Olympic size swimming pools!), and within it are four TV studios. They all float on steel springs, for noise and vibration isolation, on deep concrete slabs. Additionally, there was a request from the client to keep the build as lightweight as possible.

"Because of the relatively high levels of noise and vibration from the tube lines, one would normally go for heavyweight construction," explains Phil Mansfield, "so, our solution was to use a multi-layered combination of board material, similar to plasterboard but heavier, but still essentially

‘lightweight’ and a dry construction, which met the challenge and provided the necessary performance.”

Another challenge presented itself in the form of height restrictions. Because of the nature of studios, noise criteria are stringent. Phil adds, “Because there is access from the upper levels of BH Phase 2 into the original old Broadcasting House (OBH) building, there was a need to match floor-to-ceiling heights. There are numerous radio studios, and the challenge was to build what are colloquially known as ‘radio boxes’, within the restricted floor-to-ceiling height. Because, again, there are floating floors to maintain sound insulation, high specification radio studios had to be shoehorned into these upper floors.” Since space is at a premium, the Corporation wanted to make the most of the office or ‘production’ areas, but at the same time ensure that the studios had the right footprint, maximising space and minimising the plant rooms that serve the studios.

Particularly in the radio studios, noise criteria for the air conditioning systems are stringent, and with the brief to keep the plant rooms as small as possible, squeezing the necessary air-conditioning (a/c) plant into the plant room, serving the studio, and getting enough attenuation to quieten the a/c was another challenge.

Furthermore, within all studios, the necessary close control of reverberation resulted in tight specifications for tuned sound absorbers. With the need to secure close control of low frequency reverberation, deep finishes on the walls were required, which also needed to look right aesthetically, whilst being mindful that the more you put in, the smaller the footprint of the room.



BH Phase 2: one of the two atria

Traditionally stringent noise criteria from Westminster Council’s Town Planners required tight control of external plant and machinery noise emissions, presenting further acoustic design challenges. “There is significant electrical and cooling load on this project – large chillers on the roof, and a substantial generator in the basement, the exhaust outlet from which is at roof level; large fans and air handling units are also at roof level,” Phil comments, “the location of this landmark site has a number of residential buildings nearby, all of which presented further challenges to be overcome.”

By working exceptionally closely with all the design and build, and client team members, AAD’s service delivery was on budget and on time whilst meeting and resolving numerous and significant challenges head-on, passing an extensive and audited acoustic performance commissioning process with flying colours.

Team

Employer: BBC
 Developer: Land Securities
 Main Contractor: Bovis Lendlease
 Architect: Sheppard Robson
 Services Engineer: AECOM
 Structural Engineer: Ramboll

Typical Acoustic Criteria

Radio Studio a/c noise: approx NR18
 Radio Studio reverberation time: 0.18-0.28 sec
 Radio Studio horizontal impact sound insulation L’nTw 15dB