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ACOUSTIC SPECIFICATION

for

FIXED PLANT & VENTILATION

at

THE SYMPHONY GROUP,
ASHES PHASE 3,
PARK SPRING ROAD,
BARNSLEY,
S72 7EZ

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Members of the Association of Noise Consultants (ANC) & Institute of Acoustics (IOA)
Originally established in 1981. Company number 4688174.

The new Phase 3 building at The Symphony Group is subject to a BREEAM 2018 assessment. Three credits are available under BREEAM 2018 Industrial Hea 05 'Acoustic Performance,' two of which are being targeted at this development. Full details are given in our preconstruction acoustic report dated 27th May 2020.

This document gives an overview of the acoustic design targets relating to fixed plant and ventilation equipment, sound levels from which contribute to compliance with the requirements of Hea 05.

Ventilation Sound in Rooms

Internal ambient sound level requirements include contributions from all sources, including ventilation sound. The suggested limits on ventilation sound in rooms at 1m from any termination are given in the table below to assist with system design. It is recommended that sound levels from ventilation equipment do not exceed:

Room	Ventilation Noise Limit (dBA SPL @1m)
Reception	40
Meeting Rooms	30
Cellular Offices	30
Transport Office	30
Open Plan Offices	35
Kitchen	40
Canteen	40
Changing Rooms	40
Toilets	40

Crosstalk Attenuators

The sound insulation between rooms depends on all transmission paths, including sound through ventilation systems.

The recommended minimum level of crosstalk attenuation between adjacent rooms through the ventilation system is given in the table overleaf to assist with the system design.

Crosstalk attenuation between rooms separated by a floor should be at least 55 dB where one or both rooms are an office or meeting room. In other areas, crosstalk attenuation across the floor should be ideally at least 50 dB, and 45 dB as an absolute minimum.

Room 1	Room 2	Minimum Crosstalk Attenuation
		$D_{w,crosstalk}$ dB minimum
Ground Floor		
Meeting Room	Reception	55
Reception	Meeting Room	50
Meeting Room	Post Room	55
Post Room	Meeting Room	50
Canteen	Female Changing	45
Female Changing	Canteen	45
Male Changing	Female Changing	45
Male WC	Female WC	45
First & Second Floors		
Office	Kitchen	55
Kitchen	Office	50
Meeting Room	Transport	55
Transport	Meeting Room	50
Meeting Room	Office	55
Office	Meeting Room	55
Office	Office	55
Meeting Room	Male WC	55
Male WC	Meeting Room	55
Male WC	Female WC	45

Plant Deck, Fixed Plant, AHUs & External Terminations.

The recommended design targets for plant sound received in rooms immediately underneath the plant deck are:

Room	Sound Level Limit dB LA_{eq}
Meeting Rooms	27
Cellular Offices	27
Open Plan Offices including Amenity Pods	30
Kitchen	40
Toilets	35

There is no sound insulation test data available for the overall plant deck construction, but from fundamental principles of acoustics it appears that an on site D_w of at least 40 dB is reasonable, notwithstanding flanking transmission.

It is likely that the sound insulation of the floor will require upgrading as part of meeting the requirements of BREEAM 2018, either by additional construction above or below the concrete base. These improvements have not been confirmed, but the sound levels in office accomodation caused by fixed plant should still be considered carefully. The possibility of flanking transmission (i.e. fixed plant sound travelling down the external wall) should be considered.

The sound insulation of the floor will vary according to frequency. This can be illustrated by the values of the standard reference curve corresponding to an overall sound insulation value of D_w = 40 dB:

Freq (Hz)	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**
Attenuation	17	23	32	40	43	44	44

Fixed plant including ductwork should be installed on suitable antivibration mounts and using flexible connectors as needed to ensure that structure borne sound does not cause sound levels in excess of the requirements and that adverse comment is unlikely about perceptible vibration. BS 6472 quantifies perceptible vibration in buildings, though it is common for sufficient technical data to be unavailable in order to perform quantitative predictive calculations. Perceptible vibration falls outside the quantitative tests of BREEAM, but adequate control remains important for fitness for purpose.

The design target for outdoor fixed plant sound is slightly flexible for reasons outlined in the pre constructoin report, though it is suggested an initial suitable design target would be **55 dBA @1m from any outdoor termination of any item of fixed plant, AHU or duct**. A more onerous design target of 50 dBA @1m would be desirable if practicable.

The sound level within the main warehouse and production areas caused by any fixed plant or ventilation equipment is not subject to BREEAM criteria directly, but excessive levels should be avoided for fitness for purpose and transmission through the walls into the office accommodation. The suggested design target is that sound levels from fixed plant, ventilation and heating equipment should not exceed 60 dBA taken as a roving sweep or fixed positions at work areas on the warehouse / production facility floor.
