



## ACOUSTICS IN HEALTHCARE FACILITIES

The national focus on the quality of health care and facilities has never been greater. The Department of Health has continually released and updated Health Technical Memoranda (HTM) with the aim of improving standards of new build and refurbished hospitals and clinics.

The current HTM for acoustics is **HTM 08-01: Acoustics, 2013**.

Let's take a look at the vital statistics...

<b>NOISE :</b>	BUILDING ENVELOPE TO INSULATE AGAINST ENVIRONMENTAL NOISE INTRUSION. NOISE RATING ( NR ) LIMITS SET FOR MECHANICAL VENTILATION SYSTEMS.
<b>VIBRATION :</b>	CONTINUOUS/INTERMITTENT LIMITS SET FOR SENSITIVE ROOMS.
<b>SOUND INSULATION :</b>	ON-SITE DESIGN TARGETS SET REQUIRING CAREFUL ACOUSTIC DESIGN ( SOUND FLANKING CONTROL ).
<b>REVERBERATION :</b>	MIN. CLASS C SOUND-ABSORBENT MATERIAL ( USUALLY CEILING TILES ) REQUIRED IN MOST ROOMS.

### Our services include...

- > [Noise & Vibration Surveys](#)
- > [Planning & BREEAM Assistance](#)
- > [Architectural Acoustic Design](#)
- > [Building Services Noise & Vibration](#)
- > [Demolition/Construction Monitoring](#)
- > [Sound Testing](#) ...and [more](#).

*Unnecessary noise is the most cruel absence of care which can be inflicted either on the sick or well.*

Florence Nightingale

Consideration for Acoustics in healthcare facilities is nothing new. However, recent research at Johns Hopkins University in America has shown that noise levels in hospitals internationally have grown steadily over the past five decades; disturbing patients and staff members, lowering moral and raising the risk of medical errors.

As discussed in the new HTM Acoustics document, noise, which can be defined as "unwanted sound", can increase heart rate, blood pressure, respiration rate and even blood cholesterol levels. Good acoustic conditions essentially help to provide a comfortable environment for staff and patients, resulting in raised staff moral, improved patient privacy and promoting essential sleeping patterns—elements which are key to healing.

## Q *What does HTM 08-01 : Acoustics cover?*

This HTM covers the acoustic design criteria that are important for healthcare premises, and addresses issues such as the provision of temporary healthcare facilities, refurbishments and the control of noise & vibration during construction.

The document also covers site inspections and pre-completion acoustic commissioning, which are essential for quality assurance.

## Q *What are the Acoustic design criteria?*

The HTM 08-01 criteria are minimum recommended targets, although it is accepted that some developments have special features for which these criteria may not be appropriate.

Criteria are set for the following:

### **Noise Levels in Rooms**

There are two separate criteria; external noise intrusion and mechanical services noise. The criteria for the former are internal equivalent continuous sound pressure level,  $L_{Aeq}$ , targets over typical 1-hour daytime periods (and also night-time for wards). Targets for maximum noise levels,  $L_{Amax}$ , are also set for wards and operating theatres.

Noise from sirens and helicopters can be common around hospitals, although designing the building fabric to combat this would be impractical. Site planning is therefore important.

Targets for controlling rain noise are set, which has implications for the design of lightweight roof systems.

Noise Rating (NR) levels are recommended for mechanical services, although these exclude noise from specialist medical equipment.

### **Sound Insulation**

Noisy activities should not interfere with the requirements of adjacent rooms, and private conversations should not be overheard outside the room.

To achieve this, airborne and impact sound insulation criteria are set which are to be achieved on-site. It is therefore wise to appoint an acoustic consultant to identify suitable partition types and advise upon appropriate flanking details.

For long term patient accommodation, Building Regulations Part E should apply.

### **Room Acoustics**

Guidance is provided on quantity of acoustically absorbent material, as opposed to set targets for reverberation time.

In most spaces, it is advised that a Class C absorber (at least) is applied to an equivalent of 80% of the floor area.

### **Vibration**

Criteria are set in accordance with BS 6841 for plant, medical equipment, intrusion from external sources and general activities.

### **Other Criteria**

HTM 08-01 also contains guidance for audiology facilities, audio/public announcement systems and sound masking.

Generally, it is anticipated that a dispensation of HTM 08-01 guidance and criteria would be likely for temporary or refurbished facilities.

## Q *What are the key changes from past HTMs?*

It was widely agreed that the old HTM 2045 contained some unnecessarily stringent acoustic criteria, such as:-

1. unorthodox noise level targets in rooms - replaced in HTM 08-01 with target values consistent with other modern acoustic guidance documents.

2. an overly complicated sound insulation rating method - replaced in HTM 08-01 with more pragmatic sound insulation targets.

3. extremely low reverberation time targets - replaced in HTM 08-01 with simple guidance on absorption quantity.

With regard to the old HTM 56 'Partitions', the laboratory performance targets are replaced in HTM 08-01 with more applicable on-site target values.

HTM 08-01 supersedes the acoustic advice in both HTM 2045 and HTM 56.

**Hann Tucker Associates**, the leading independent UK acoustic consultancy, can provide all the necessary professional advice and assistance on the Acoustic design of healthcare facilities.

By using [expertise](#) and [experience](#) gained in over 40 years of successful acoustic consultancy, suitable cost effective solutions can be provided to ensure satisfactory design solutions are achieved.



MRI Scanner

## **Hann Tucker Associates**

Consultants in Acoustics Noise & Vibration

Head Office:  
Duke House, 1-2 Duke Street  
Woking, Surrey, GU21 5BA  
Tel: 01483 770595  
Fax: 01483 729565

Northern Office:  
First Floor, 346 Deansgate  
Manchester, M3 4LY  
Tel: 0161 832 7041  
Fax: 0161 832 8075

Email: [enquiries@hanntucker.co.uk](mailto:enquiries@hanntucker.co.uk)

Web: [www.hanntucker.co.uk](http://www.hanntucker.co.uk)