WHBN 00-10

Welsh Health Building Note

Part B: Walls and ceilings

GIG CYMRU NHS WALES

Partneriaeth Cydwasanaethau
Gwasanaethau Cyfleusterau

Shared Services Partnership
Facilities Services

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Overview

This Welsh Health Building Note (WHBN) outlines the policy and performance requirements for walls and ceilings used in healthcare facilities. These requirements are a set of essential standards of quality and safety that walls and ceilings must comply with.

WHBN 00-01 Part B supersedes Health Technical Memoranda 56 and 60.

This WHBN outlines the relevant standards that healthcare organisations will need to include in their design briefs.

This WHBN allows choice in the materials and methods of construction – provided they satisfy the performance requirements outlined.

The walls and ceilings used should be appropriate for the type of premises in which they are being fitted, for example, primary care facilities may have different design requirements from acute care facilities.

Note

Mental health facilities have their own specific design requirements. These are addressed in Welsh Health Building Note 03-01 – 'Adult acute mental health units'.

Acknowledgements

Welsh Health Building Note 00-10 Part B – 'Walls and ceilings' is based on Health Building Note 00-10 Part B 'Walls and ceilings' published by the Department of Health in 2013.

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The contents of the original document were reviewed by NHS Wales Shared Services Partnership – Facilities Services.

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Chapter 1 Introduction

Regulatory framework and policy drivers

1.1 One of the Government's key priorities is delivering better health outcomes for patients.

1.2 The quality and fitness-for-purpose of the NHS estate is vital for high quality, safe and efficient healthcare, and this Welsh Health Building Note (WHBN) seeks to set out the quality and standards of certain components used in the construction of the estate.

1.3 Underpinning the guidance set out in this WHBN are the Government's healthcare standards set out in 'Doing Well, Doing Better – Standards for Health Services in Wales, April 2010. Of particular relevance are 'Standard 12 – Environment' and 'Standard 13 – Infection Prevention and Control (IPC) and Decontamination.

Infection prevention and control

1.4 A complex range of issues distinguishes healthcare environments from most other building types. One of the most important of these relates to the prevention and control of infection. Hospital environments in particular are subject to spillage of a range of potentially dangerous substances in areas of general use such as circulation areas and in wards. The choice of finishes is important in determining cleaning regimes.

1.5 Infection prevention and control teams should be consulted in design decisions and a risk analysis conducted on many issues of design (see WHBN 00-09 – 'Infection control in the built environment').

Hygiene and cleaning

1.6 The prevention and control of healthcare-associated infection (HCAI) is a priority issue in terms of not only the safety and well-being of patients and staff, but also the resources consumed by potentially avoidable infections. It is important that the design of the building facilitates good infection prevention and control practices, and has the quality and design of finishes and fittings that enable thorough access, cleaning, disinfection and maintenance to take place.

1.7 All finishes in healthcare facilities should be chosen with cleaning in mind, especially where contamination with blood or body fluid is a possibility, that is, smooth, non-porous and water-resistant. Early and sustained involvement of the infection prevention and control (IPC) team is essential and will lead to the minimisation of infection risks.

1.8 Requirements for frequency of cleaning may impact on the use of rooms, circulation and waiting areas at various times of the day. Cleaning regimes including frequency of cleaning should be addressed in line with current national guidance together with any additional local management requirements.

1.9 Relevant provisions of current guidance are embodied in the following documents:

- 'National Standards for Cleaning in NHS Wales', Revised October 2009.
- WHBN 00-09 – 'Infection control in the built environment'.

Note on antimicrobial-impregnated products

Whilst antimicrobial-impregnated products (such as surface coatings, paints and curtains) and anti-microbial materials are available, there are, at present, no definitive data to support their efficacy in reducing healthcare-associated infection.

Life-cycle and maintenance

1.10 Early consideration of maintenance and replacement of building elements will help to achieve compliance with all the policy drivers

1.11 Materials and finishes are to be selected to minimise maintenance and be compatible with their intended function and lifespan/duration of use.

1.12 Some spaces require more maintenance than others due to usage and traffic, and recognition of this is required during the design stage so that, for example, more robust flooring can be specified in

potential problem areas. Maintenance is critically important in the prevention and control of infection, avoiding cracks and tears in finishes where dirt, etc. can build up. Good maintenance can also aid the ease of cleaning, ensuring that cleanliness is maintained. The life-cycle cost of materials is affected by these criteria.

1.13 Organisations responsible for building and engineering maintenance should have access to original copies of all building and engineering commissioning data, including as-fitted drawings and records of any changes implemented since the building was originally built and commissioned. Maintenance personnel should have access to operation and maintenance manuals, including BIM systems, containing building and engineering information such as the suppliers of the materials, fittings and equipment installed during construction, including instructions on cleaning and maintenance.

1.14 A useful whole life-cycle document that will aid designers and NHS organisations in both design and choice of materials when designing new schemes or refurbishments is the British Standards Institute's (BSI) 'PD 156865:2008 - Standardized method of life cycle costing for construction procurement: a supplement to BS ISO 15686-5 Buildings & constructed assets, Service life planning, Life cycle costing'.

Sustainability

1.15 Welsh Health Technical Memorandum (WHTM) 07-07 – 'Sustainable health and social care buildings' provides relevant advice on how to embrace sustainability protocols throughout the design and build process and should be read in conjunction with undertaking the Building Research Establishment Environmental Assessment Method (BREEAM) Healthcare assessment.

1.16 BREEAM Healthcare is the standard tool for assessing the environmental impact of a healthcare facility.

1.17 All new healthcare development projects funded by the Welsh Government and Welsh Government Sponsored Bodies must be built to the BREEAM "excellent" standard, or equivalent. For extensions, alterations and refurbishment, a BREEAM excellent rating is not a requirement, and there are exceptions for small schemes. However, even these small projects must have an energy efficient design solution, and further advice is available from the appropriate Government official dealing with the funding of such projects.

1.18 All new primary care buildings will need to achieve the BREEAM standard of 'Very Good' with the attainment of 'Excellent' in respect of energy.

Relationship to other data

1.19 The main sources of data used in the preparation of this WHBN are listed in References.

1.20 Readers should ensure that they use this WHBN in conjunction with all current building legislation, British and European Standards etc.

1.21 All products should conform to the relevant provisions of an appropriate British or European Standard. Suppliers offering products other than to these standards should provide evidence to show that their products are at least equal to such standards.

1.22 This WHBN's content does not diminish:

- a specifier's responsibility for selection and application of appropriate products to meet project requirements;
- a supply chain's responsibility for fitness for purpose of products;
- a contractor's responsibility for correct product and system installation;
- the need to comply with statutory requirements, including the Building Regulations.

A note on the Equality Act 2010, Approved Document M of the Building Regulations and BS 8300

Where the guidance outlined in this manual proposes requirements that differ from those in Approved Document M or BS 8300:2009, these special requirements should apply as they take into account specific healthcare building issues. The occupier of the healthcare premises should prepare an access statement in support of their argument that the premises comply with the requirements of the Equality Act.

Chapter 2 Walls/partitions

2.1 Partitions enclose spaces and facilitate activities to be carried out whilst protecting adjacent spaces from those activities. This is within defined environmental conditions and for agreed life-cycle replacement periods.

2.2 Finishes are applied to partitions not only for functional reasons but also to enhance the healthcare environment.

2.3 The product/system ranges available to achieve the requirements are extensive and no guidance is offered to appropriate product selection.

Performance requirements

2.4 For the appropriate selection of wall/partition finishes by room space, see Appendix 1, 'Selection process for finishes' and Appendix 2, 'Types of finish by room space'.

2.5 Partitions are to achieve the periods of fire resistance and construction requirements specified in WHTM 05-02 - Guidance in support of functional provisions for healthcare premises.

Note

Many in-patient hospitals are designed on the principle of horizontal evacuation where bed-bound patients are moved from the fire compartment where the fire is located to the safety of an adjacent compartment on the same level, where they either remain until the fire is dealt with or are evacuated further from the location of the fire. This places greater importance on the integrity of fire-rated partitions in healthcare facilities than in all other building types where the whole building is immediately evacuated when a fire alarm is activated.

2.6 Partitions are to meet the acoustic requirements specified in WHTM 08-01– 'Acoustics'.

2.7 Partitions are to be capable of meeting the requirements of BS 5234 Parts 1 and 2 to the appropriate duty category.

2.8 Partitions are to be designed to withstand loading imposed by equipment, fixtures and fittings, and protection.

2.9 Smooth, hard, seamless and impervious surfaces are required in clinical areas as they are easier to clean.

2.10 Wall surfaces are to be free from fissures, open joints or crevices.

2.11 Walls penetrated by pipes, ducts and conduits are to be sealed tightly to stop entry of pests, to maintain acoustic integrity, to maintain fire resistance and for reasons of hygiene.

2.12 Wall finishes should not comprise materials that promote or sustain the growth of fungi and microorganisms.

2.13 Wall finishes should be able to withstand the expansion and contraction of the wall/partition.

2.14 Wall finishes are to meet the performance classifications given in WHTM 05-02.

2.15 Wall finishes are to be durable and able to withstand minor impacts without the need for additional wall protection.

2.16 Wall finishes are to be impermeable, easily wiped over if necessary and not be physically affected or degraded by detergents and disinfectants.

2.17 Partitions should be suitably reinforced in areas where damage is expected.

2.18 Areas with security requirements, such as pharmacies and laboratories, should be secured to meet the requirements of local security services.

2.19 Consideration should be given to possible future requirements of the healthcare facility.

Radiation areas

2.20 The choice of construction materials for walls/partitions must be agreed with the radiation protection adviser (RPA), who must also be consulted on overall radiation protection standards, including aspects of design and room layout.

Requirements for impact protection

2.21 Impact protection is intended to help reduce the incidence and severity of damage to walls and

partitions in healthcare buildings so that their performance is maintained.

2.22 Protection fittings include:

- handrails;
- crash rails;
- buffer rails;
- chair rails;
- corner guards;
- splayed skirtings;
- protective plates and sheeting;
- bed buffers.

Note

This section does not cover the need for handrails as part of a protection system, as this is covered by the client's project-specific needs and the Equality Act 2010 (see also Welsh Health Building Note 00-04 – 'Circulation and communication spaces'). Nevertheless, this does not preclude the use of handrails as part of a protection system.

2.23 Early consultation between the healthcare provider, designers and facilities management teams should be undertaken to ensure an appropriate strategy on damage avoidance is put in place, based on a full risk assessment of potential damage. This should be reviewed regularly, at no longer than 12-monthly intervals, to ensure prompt action is taken to prevent future damage.

Performance requirements

2.24 The appropriate structure needs to be determined before fixing.

2.25 Protection fittings should not be prone to splinter, and neither should they have any sharp snags or dirt traps.

2.26 Protection fittings must not invalidate the fire-resistance periods of building elements given in WHTM 05-02.

2.27 The type of material used should be suitable for its intended location, for example, stainless steel in kitchens; hygienic surfaces in labs.

2.28 Materials and colours should comply with the requirements of the Equality Act 2010, where appropriate.

2.29 Protective devices on walls should be positioned to give the maximum defence against mobile equipment. The type of mobile equipment to be used in the area and the correct siting of protective devices in terms of location and height is critical in assessing where they should be fitted.

2.30 In some special areas, such as operating theatres, considerations of hygiene may take precedence over the protection recommended for areas where beds and trolleys are present. Rails may be omitted in favour of overall durable, washable finishes.

2.31 Areas such as workshops, storerooms, service corridors and hospital streets may be constructed of materials that are not necessarily given a decorative finish or applied protection. These materials include brickwork, blockwork and concrete. These areas may still require corner protection and handrail/crash rails, splayed skirtings, etc. if used by mechanically propelled tugs and heavy trolleys.

Chapter 3 Ceilings

3.1 Ceilings enclose space and facilitate activities to be carried out whilst separating adjacent spaces from those activities. This is within defined environmental conditions and for agreed life-cycle replacement periods.

3.2 Strategic ceiling design is determined by acoustic and fire strategies for the building.

3.3 Detailed ceiling design is determined by humidity level, services access, infection prevention and control, ease of cleaning, aesthetics and patient well-being, and light reflectance values.

3.4 The product/system range available to achieve the requirement is extensive and no further guidance is offered relating to appropriate selection.

Performance requirements

3.5 For the appropriate selection of ceiling finishes by room space, see Appendix 1, 'Selection process for finishes' and Appendix 2, 'Types of finish by room space'.

3.6 Ceilings should be selected using the data in Appendix 2.

3.7 Smooth surfaces on concealed suspension systems should be impervious and able to withstand hard cleaning regimes.

3.8 A ceiling system should be able to support dead loading from a range of surface-mounted or recessed ceiling fixtures.

3.9 Ceilings must be able to achieve the periods of fire resistance specified in WHTM 05-02 when subjected to tests in accordance with BS 476 Parts 20–23.

3.10 Demountable ceiling systems must not be required to provide or contribute to the fire resistance of the elements of structure or to the fire containment principles such as the enclosure of hazard rooms, because access requirements to services in the ceiling void may render them incompatible with achieving the fire-resisting performance. Fire-rated ceilings should be capable of achieving at least 30 minutes' fire resistance, or the designated period of resistance as required by the fire strategy, when subjected to tests in accordance with BS 476 Parts 20–23.

3.11 Ceiling finishes are to meet the performance classifications given in WHTM 05-02.

3.12 Components and cavity barriers should limit the surface spread of flame and contribute to achieving a compliant fire strategy.

3.13 Proprietary ceiling finishes and site-applied ceiling finishes will need to meet the surface spread of flame requirements outlined in WHTM 05-02, that is:

a. small rooms (maximum 4 m^2) are to meet Class1 (C-s3, d2);

b. circulation spaces and all other rooms are to meet Class 0 (B-s3, d2).

Note

The definitions of national Class 0 and Class 1, and the equivalent European classes, are given in the Building Regulations.

3.14 Ceiling finishes in clinical areas should be easily cleaned and not physically affected or degraded by detergents and disinfectants.

3.15 Completed assemblies are to contribute to achieving a compliant acoustic strategy (see WHTM 08-01 – 'Acoustics').

3.16 The specification should reflect low, normal and high humidity spaces and be able to withstand intermittent contact with water and water vapour.

3.17 Ceilings should be designed and constructed to provide patients with a safe environment especially in unsupervised areas, with consideration to anti-ligature points (see WAG HN No (2004) 008 'Suicide risk from points of ligature related to suspended ceilings').

3.18 Ceiling voids should be designed to allow primary and secondary services distribution, access and support of ceiling-mounted services.

Coordination of services

3.19 All lighting services should comply with CIBSE's Lighting Guide 2: 'Hospitals and healthcare buildings'.

3.20 Areas acceptable for enhanced ceiling design, for example, public areas or circulation routes, should, wherever possible, enhance the patient experience.

3.21 Access points should be designed to allow panels and tiles to be removed without damage or disfiguration and should be clearly identified. They should not change the overall design/appearance of the ceiling.

3.22 Access through jointless membranes should be avoided where possible.

3.23 Service access points should not be located over patient bed positions.

3.24 In operating theatres/areas, aseptic suites and laboratories, access through the ceiling should be avoided. A local risk assessment should be undertaken as this list is not exclusive.

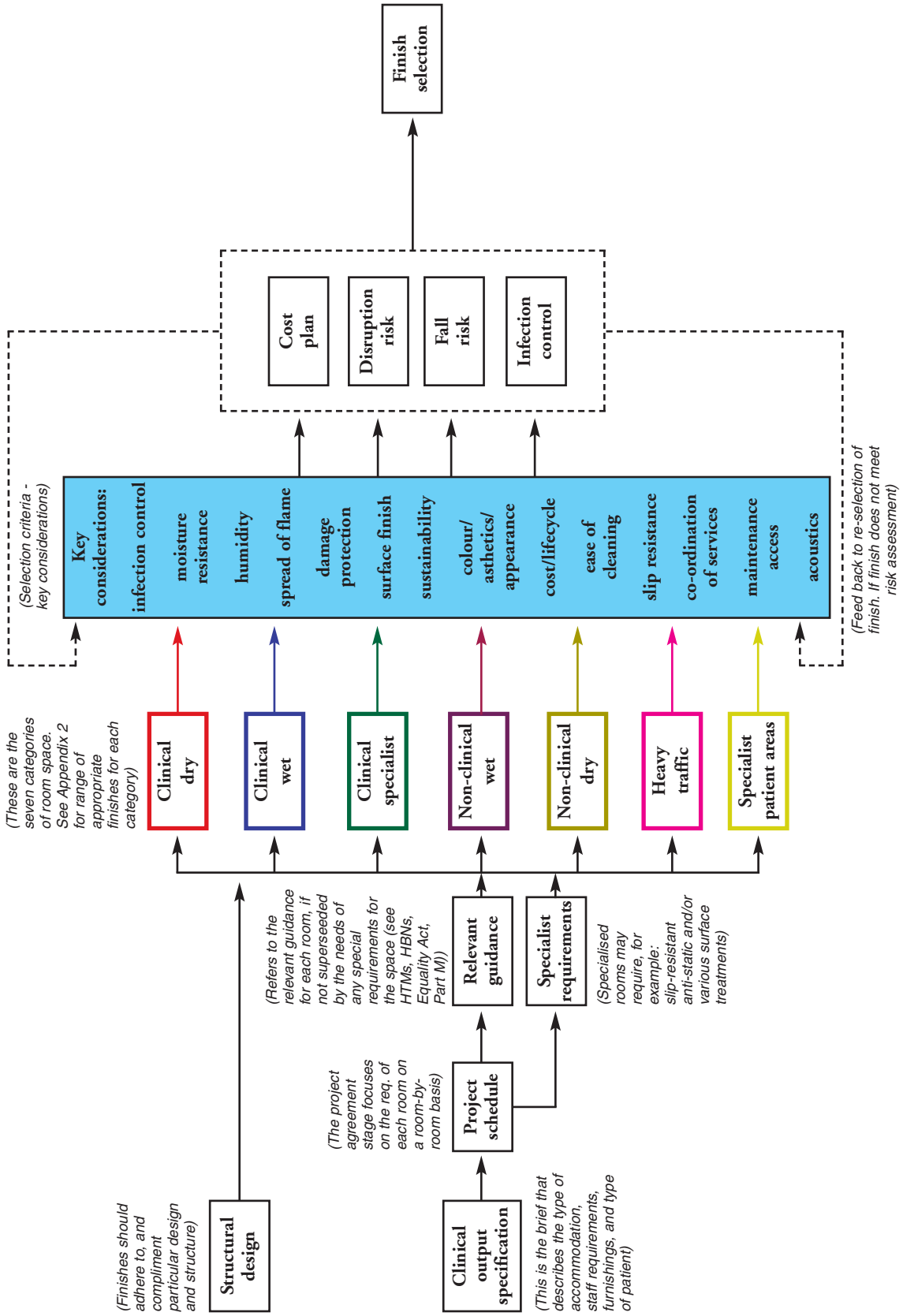
Ceiling heights

3.25 Guidance on appropriate ceiling heights to functional rooms is given in the range of specific Welsh Health Building Notes.

Radiation areas

3.26 The choice of construction materials for ceilings must be agreed with the radiation protection adviser (RPA), who must also be consulted on overall radiation protection standards, including aspects of design and room layout.

Appendix 1: Selection process for finishes



Appendix 2: Types of finish by room space

Category of room space (see 'Selection process for finishes' section)	Floor finish	Wall/partition finish	Ceiling finish[1]	Sanitaryware	Protection (potential risk of damage)
Clinical - dry For example: • Single-bed room • Multi-bed room • Consulting room • Clean utility	Sheet systems or Seamless finish systems	Emulsion or heavy duty emulsion	• **High clinical:** Jointless/smooth imperforate finish • **Moderate clinical:** Jointless or concealed grid/smooth imperforate finish or Jointed or concealed grid/smooth imperforate finish • **Light clinical:** Jointed/exposed grid/textured perforated finish	Clinical	Low risk Medium risk
Clinical wet For example: • Dirty utility • Assisted bathroom • Consulting room	Sheet systems or Seamless finish systems Slip-resistant sheet systems	Heavy duty emulsion/ PVC sheet	Moderate clinical: Jointless or concealed grid/smooth imperforate finish or Jointed/concealed grid/smooth imperforate finish Both resistant to high humidity levels	Clinical	Medium to low risk
Clinical specialist For example: • Theatre suite	Sheet systems or Seamless finish systems	Thick film paint system (150-300 microns)	Jointless/smooth imperforate finish	Clinical	Medium to no risk
• X-ray room	Anti static sheet system	Heavy duty emulsion	Square-edged tile to suit unistrut ceiling	Clinical	Medium to no risk
• Post-mortem room	Slip-resistant sheet systems or Slip-resistant seamless finish systems	Thick film paint system (150-300 microns)	Concealed grid/smooth finish (power washable)	Clinical	Medium to no risk
• Aseptic suite	Sheet systems	Sheet vinyl	Sheet vinyl on jointless/smooth imperforate finish	N/A	Medium to no risk
Non-clinical wet For example: • WC/shower room (en-suite) • Cleaner's room	Slip-resistant sheet systems or Slip-resistant seamless finish systems	Humidity-resistant paint/ PVC sheet	Jointless concealed grid/smooth finish/ resistant to humidity or Jointed/exposed grid/smooth finish Both resistant to high humidity levels	Non-clinical	Low to no risk
Non-clinical dry For example: • Offices • Stores	Sheet systems or Seamless finish systems or Textile flooring	Paint	Jointed/exposed grid/textured finish	Non-clinical	Low to no risk
Heavy traffic For example: • Corridors • Entrances • Lift lobbies • Stairs • Plantrooms	Sheet systems or Seamless finish systems	Heavy duty emulsion or specialist floor paint	Jointed/exposed grid/textured finish Jointed/exposed grid/textured perforated finish		Medium to high risk
Specialist patient areas (Areas where patients are at risk of self-harm)	Sheet systems or Seamless finish systems	Selection is dependent on an assessment of level of clinical requirement	Jointless/smooth imperforate finish without potential ligature points Concealed grid/smooth imperforate finish	Selection is dependent on an assessment of level of clinical requirement	High risk
If a room from one category falls within a different category of room space, the higher criterion should be adopted					

Note: [1] Selection is dependent on an assessment of level of clinical requirement, i.e. in-patient accommodation is considered 'light clinical'; a treatment room would be considered 'moderate clinical'; and a theatre suite considered 'high clinical'.

References

Acts and regulations

The acts and regulations shown below can be accessed from the www.legislation.gov.uk/ website

Equality Act 2010

British Standards Institution

http://shop.bsigroup.com/en/

BS 476 Fire tests on building materials and structure

BS 4322 Recommendations for buffering on hospital vehicles such as trolleys

BS 5234-1 Partitions (including matching linings). Code of practice for design and installation

BS 5234-2 Partitions (including matching linings). Specification for performance requirements for strength and robustness including methods of test

BS 5250 Code of practice for control of condensation in buildings

BS 6100-9 Building and civil engineering. Vocabulary. Work with concrete and plaster

BS 6150 Code of practice for painting of buildings

BS 6262 Code of Practice for glazing for buildings

BS 6750 Specification for modular coordination in building

BS 7719 Specification for water-borne emulsion paints for interior use

BS 8212 Code of practice for dry lining and partitioning using gypsum plasterboard

BS 8300 Design of buildings and their approaches to meet the needs of disabled people. Code of practice

BS 8481 Design, preparation and application of internal gypsum, cement, cement/lime plastering systems specification

BS EN 520 Gypsum plasterboards. Definitions, requirements and test methods

BS EN 1154 Building hardware. Controlled door closing devices. Requirements and test methods

BS EN 13279-1 Gypsum binders and gypsum plasters Definitions and requirements

BS EN 13279-2 Gypsum binders and gypsum plasters. Test methods

BS EN 1365-2 Fire resistance of loadbearing elements. Floors and roofs

BS EN 13964 Suspended ceilings. Requirements and test methods

BS EN 1935 Building hardware. Single-axis hinges. Requirements and test methods

BS EN 1996 Eurocode 6

BS EN 10143 Continuously hot-dip metal coated steel sheet and strip. Tolerances on dimensions and shape

BS EN 13501-1 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests

BS EN 13501-2 Fire classification of construction products and building elements. Classification using data from fire resistance tests, excluding ventilation services

BS EN 13823 Reaction to fire tests for building products. Building products excluding flooring exposed to the thermal attack by a single burning item

BS EN ISO 140 Acoustics. Measurement of sound insulation in buildings and of building elements

BS EN ISO 354 Acoustics. Measurement of sound absorption in a reverberation room

BS EN ISO 717-2 Acoustics. Rating of sound insulation in buildings and of building elements. Impact sound insulation

BS EN ISO 1182 Reaction to fire tests for building products. Non-combustibility test

BS EN ISO 1716 Reaction to fire tests for building products. Determination of the gross calorific content

BS EN ISO 10140 Acoustics. Laboratory measurement of sound insulation of building elements

BS EN ISO 11925-2 Reaction to fire tests for building products – ignitability when subjected to direct impingement of flame. Single-flame source test

BS EN ISO 10848 Acoustics. Laboratory measurement of the flanking transmission of airborne and impact sound between adjoining rooms

PD 6697 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

PD 156865 Standardized method of life cycle costing for construction procurement: a supplement to BS ISO 15686-5 Buildings & constructed assets. Service life planning, Life cycle costing'.

BREEAM Healthcare

http://www.breeam.org/page.jsp?id=105

CIBSE

https://www.cibseknowledgeportal.co.uk/

Lighting Guide 02: Hospitals and healthcare buildings

NHS Wales Shared Services Partnership – Facilities Services

The publications below are available from the NHS Wales Shared Services Partnership - Facilities Services websites:
Intranet: howis.wales.nhs.uk/whe
Internet: www.wales.nhs.uk/whe

National Standards for Cleaning in NHS Wales, Revised October 2009

Welsh Health Building Note 00-04 – Circulation and communication spaces

Welsh Health Building Note 00-09 – Infection control in the built environment

Welsh Health Technical Memorandum 05-02 – Guidance in support of functional provisions for healthcare premises

Health Technical Memorandum 05-03: Part C – Textiles and furnishings

Welsh Health Technical Memorandum 07-07 – Sustainable health and social care buildings

Welsh Health Technical Memorandum 08-01 – Acoustics

Welsh Government

www://wales.gov.uk/

Building Regulations
http://wales.gov.uk/topics/planning/buildingregs/publications/?lang=en

Approved Document B2 – Buildings other than dwelling houses

Approved document M - Access to and use of buildings

Doing Well, Doing Better – Standards for Health Services in Wales
http://wales.gov.uk/docs/dhss/publications/100419standardsforhealthservicesen.pdf

WAG HN No (2004) 008 Suicide risk from points of ligature related to suspended ceilings
http://howis.wales.nhs.uk/sites3/documents/321/WHE%20HN%202004-08.pdf