

WHBN 00-10

Welsh Health Building Note

Part A: Flooring



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Cover image of Neath Port Talbot Primary Care Resource Centre by courtesy of Abertawe Bro Morgannwg. Photograph by Stewart Brooks, NWSSP-FS

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Overview

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

WHBN 00-01 Part A supersedes Health Technical Memorandum 61.

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 flooring 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 A – ‘Flooring’ is based on Health Building Note 00-10 Part A ‘Flooring’ published by the Department of Health in 2013.

NHS Wales Shared Services Partnership – Facilities Services is grateful to the Department of Health for its permission to modify the original guidance for application in Wales.

The contents of the original document was 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 the 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 antimicrobial 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

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

Chapter 2 Floor finishes and skirtings

- 2.1 Floor finishes are required to provide a surface that meets the functional and aesthetic requirements of the space over the defined life-cycle replacement period.
- 2.2 The product or system ranges available to achieve the requirements are extensive; therefore, no guidance is given on product selection.

Performance requirements

- 2.3 For the appropriate selection of floor finishes by room space, see [Appendix 1, 'Selection process for finishes'](#) and [Appendix 2, 'Types of finish by room space'](#).
 - 2.4 Carpets should be avoided in clinical areas (see WHBN 00-09 – 'Infection control in the built environment'). If carpets are to be considered for non-clinical areas, for example, interview rooms, counselling suites, consulting rooms, it is essential that a documented local risk assessment is carried out with IPC involvement and a clearly defined pre-planned preventative maintenance and cleaning programme is put in place.
 - 2.5 Floor finishes should be of a material that is not physically affected or degraded by the detergents and disinfectants likely to be used.
 - 2.6 Floor finishes are to meet the performance classifications and periods of fire resistance given in WHTM 05-03 Part C – 'Textiles and furnishings'.
 - 2.7 Floor finishes should provide a flat surface without pronounced texturing to allow the passage of wheeled traffic and to assist maintenance.
 - 2.8 Before a new or replacement floor covering is specified, the specifier should conduct a risk assessment and the following performance requirements should be considered:
 - environment;
 - contamination;
 - appearance;
 - acoustics;
 - use;
 - footwear;
- slip and trip potential of foot traffic etc. under different conditions.
- 2.9 The risk assessment should be recorded.
 - All flooring, including slip-resistant flooring, should be capable of being cleaned to agreed hygiene standards.
 - Surfaces must be able to prevent pedestrians from slipping both in areas deemed as dry and those that become wet or contaminated in use.
 - In clinical areas and associated corridors, there should be a continuous return between the floor and the wall. For example, coved skirtings with a minimum height of 100 mm allow for easy cleaning.
 - There should be evidence that healthcare providers are monitoring slip resistance levels at regular intervals throughout the service life of a floor in order to identify any changes.
 - Impermeable floor finishes should be designed to prevent water leakage.
 - Where flooring is regularly exposed to water, it should be resistant to the penetration of liquids to comply with BS EN 13553 Annex A, where appropriate.
 - In wet areas, for example, behind pre-plumbed systems, the risk of flood and bacterial colonisation should be addressed in the detailing.
 - Threshold strips are to be avoided.
 - Manhole covers and inspection chambers are not considered acceptable in clinical areas.

Notes

- a. Guidance on slip resistance characteristics is given in the Health & Safety Executive's 'Assessing the slip resistance of flooring: A technical information sheet'.
- b. Reference should also be made to CIRIA's C652 'Safer surfaces to work on: reducing the risks of slipping'.
- c. Despite the work carried out on falls prevention, falling in hospital remains a significant problem. Older people are most at risk of falling, and this patient group is growing. A pilot study (the HIP-

HOP flooring study) is being carried out to describe any changes to fall and injury rates which may be related to the use of the new flooring in elderly care units, as well as exploring maintenance issues, cost implications, and users' opinions.

Hospital streets

- 2.10 Floors in hospital streets and corridors must be capable of withstanding the loads imposed by heavy wheeled traffic and intensive pedestrian traffic. For further guidance, see WHBN 00-04 – 'Circulation and communication spaces'.

Sanitary spaces

- 2.11 Floor finishes must be able to prevent moisture penetrating the building fabric. For further guidance on flooring in sanitary spaces, see WHBN 00-02 – 'Sanitary spaces'.

Operating theatres

- 2.12 Floors in operating theatres should be able to withstand:
- the rolling loads of heavy mobile equipment;
 - frequent spillages, regular cleaning and disinfection.
- 2.13 The floor finish material should adhere firmly to a suitable subfloor system that is smooth, crack-free and stable.

Radiation areas

- 2.14 The choice of construction materials for floors 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.

Central kitchens

- 2.15 Selection of an appropriate finish should be made in consultation with environmental health officers (EHOs) and reference should be made to the Health & Safety Executive's 'Stop slips in kitchens' website.

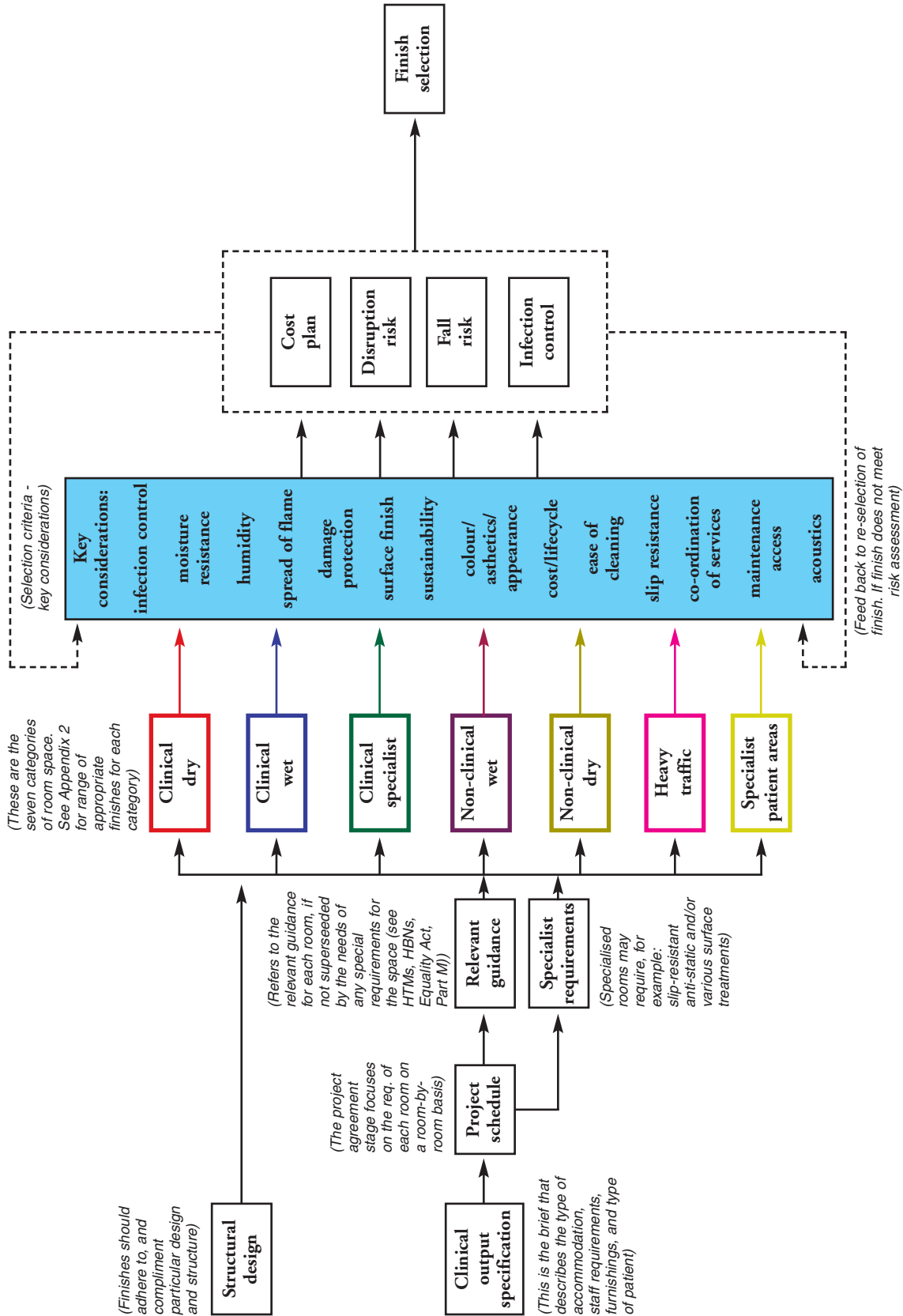
Entrances

- 2.16 Floor surfaces at entrances should be slip/trip-resistant in all weather conditions.
- 2.17 There should be no strips of unprotected floor between threshold and matting.
- 2.18 Entrance matting, suitable for pedestrian and trolley/wheelchair users, should be provided at entrances to reduce dirt being trafficked into the building.
- 2.19 There should be a regular programme that ensures matting is cleaned and maintained appropriately and regularly.
- 2.20 The way in which pedestrians use the entrance should determine how and where the matting should be positioned.

Note

BS 7953:1999 identifies typical matting materials and provides some guidance on their selection, installation and maintenance.

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	<ul style="list-style-type: none"> • 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 • X-ray room	Sheet systems or Seamless finish systems	Thick film paint system (150-300 microns)	Jointless/smooth imperforate finish	Clinical	Medium to no risk
• Post-mortem room	Anti static sheet system Slip-resistant sheet systems or Slip-resistant seamless finish systems	Heavy duty emulsion Thick film paint system (150-300 microns)	Square-edged tile to suit unistrut ceiling Concealed grid/smooth finish (power washable)	Clinical Clinical	Medium to no risk 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: ¹Selection 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 1881 Testing concrete

BS 4790 Method for determination of the effects of a small source of ignition on textile floor coverings (hot metal nut method)

BS 5287 Specification for assessment and labelling of textile floor coverings tested to BS 4790

BS 5325 Installation of textile floor coverings. Code of practice

BS 5385-3 Wall and floor tiling. Design and installation of internal and external ceramic and mosaic floor tiling in normal conditions. Code of practice

BS 5385-5 Wall and floor tiling. Design and installation of terrazzo, natural stone and agglomerated stone tile and slab flooring. Code of practice

BS 5395-1 Stairs. Code of practice for the design of stairs with straight flights and winders

BS 5606 Guide to accuracy in building

BS 6263-2 Care and maintenance of floor surfaces. Code of practice for resilient sheet and tile flooring

BS 6925 Specification for mastic asphalt for building and civil engineering (limestone aggregate)

BS 7953 Entrance flooring systems. Selection, installation and maintenance

BS 8203 Code of practice for installation of resilient floor coverings

BS 8204-1 Screeds, bases and in-situ floorings. Concrete bases and cement sand levelling screeds to receive floorings. Code of practice

BS 8204-2 Screeds, bases and in-situ floorings. Concrete wearing surfaces. Code of practice

BS 8204-3 Screeds, bases and in-situ floorings. Polymer modified cementitious levelling screeds and wearing screeds. Code of practice

BS 8204-4 Screeds, bases and in-situ floorings. Cementitious terrazzo wearing surfaces. Code of practice

BS 8204-5 Screeds, bases and in-situ floorings. Mastic asphalt underlays and wearing surfaces. Code of practice

BS 8204-6 Screeds, bases and in-situ floorings. Synthetic resin floorings. Code of practice

BS 8204-7 Screeds, bases and in-situ floorings. Pumpable self-smoothing screeds. Code of practice

BS EN 650 Resilient floor coverings. Polyvinyl chloride floor coverings on jute backing or on polyester felt backing or on a polyester felt with a polyvinyl chloride backing. Specification

BS EN 651 Resilient floor coverings. Polyvinyl chloride floor coverings with foam layer. Specification

BS EN 652 Resilient floor covering. Polyvinyl chloride floor coverings with cork-based backing. Specification

BS EN 653 Resilient floor coverings. Expanded (cushioned) polyvinyl chloride floor coverings. Specification

BS EN 655 Resilient floor coverings. Tiles of agglomerated composition cork with polyvinyl chloride wear layer. Specification

BS EN 686 Resilient floor coverings. Specification for plain and decorative linoleum on a foam backing

BS EN 687 Resilient floor coverings. Specification for plain and decorative linoleum on a corkment backing

BS EN 688 Resilient floor coverings. Specification for corklinoleum

BS EN 1816 Resilient floor coverings. Specification for homogeneous and heterogeneous smooth rubber floor coverings with foam backing

BS EN 1817 Resilient floor coverings. Specification for homogeneous and heterogeneous smooth rubber floor coverings

BS EN 1997-1 Eurocode 7. Geotechnical design
General rules

BS EN 1307 Textile floor coverings. Classification of pile carpets

BS EN ISO 10595 Resilient floor coverings. Semi-flexible/vinyl composition (VCT) poly(vinyl chloride) floor tiles. Specification

BS EN 12104 Resilient floor coverings. Cork floor tiles. Specification.

BS EN 12199 Resilient floor coverings. Specifications for homogeneous and heterogeneous relief rubber floor coverings

BS EN 12620 Aggregates for concrete

BS EN 13553:2002 Resilient floor coverings. Polyvinyl chloride floor coverings for use in special wet areas. Specification

BS EN 13748-1 Terrazzo tiles. Terrazzo tiles for internal use

BS EN 14411 Ceramic tiles. Definitions, classification, characteristics, evaluation of conformity and marking

BS EN 14499 Textile floor coverings. Minimum requirements for carpet underlays

BS EN ISO 140 Acoustics. Measurement of sound insulation in buildings and of building elements. This BS has many parts some of which are current and some of which have been replaced by various parts of **BS EN ISO 10140**

BS ISO 2424 Textile floor coverings. Vocabulary

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

BS EN ISO 9000 Quality management systems. Fundamentals and vocabulary

BS EN ISO 9239-1 Reaction to fire tests for floorings. Determination of the burning behaviour using a radiant heat source

BS EN ISO 10581:2013 Resilient floor coverings. Homogeneous poly(vinyl chloride) floor covering. Specifications

BS EN ISO 24011:2012 Resilient floor coverings. Specification for plain and decorative linoleum

CP 102:1973 Code of practice for protection of buildings against water from the ground
Note: Partially replaced by **BS 8102:2009** Code of practice for protection of below ground structures against water from the ground and **BS 8215:1991** Code of practice for design and installation of damp-proof courses in masonry construction

PD 156865:2008 Standardized method of life cycle costing for construction procurement. A supplement to BS ISO 15686-5. Buildings and constructed assets. Service life planning. Life cycle costing

BREEAM Healthcare

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

Health and Safety Executive

<http://www.hse.gov.uk/index.htm>

Assessing the slip resistance of flooring

<http://www.hse.gov.uk/pubns/geis2.htm>

Stop slips in kitchens

<http://www.hse.gov.uk/SLIPS/kitchens/index.htm>

CIRIA

www.ciria.org/

Safer surfaces to work on: reducing the risks of slipping C652

<http://www.ciria.org/SERVICE/Search1/core/orders/product.aspx?catid=3&prodid=138>

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/wh

Internet: www.wales.nhs.uk/wh

Welsh Health Building Note 00-02 – Sanitary spaces

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 04-01 – The control of Legionella, hygiene, “safe” hot water, cold water and drinking water systems

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

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

National Standards for Cleaning in NHS Wales, Revised October 2009

<http://howis.wales.nhs.uk/sites3/Documents/254/Cleaning%20Standards2009ed.pdf>

University of Portsmouth

<http://www.port.ac.uk/>

The HIP-HOP flooring study

<http://www.port.ac.uk/research/hiphop/>

Welsh Government

[www://wales.gov.uk/](http://www.wales.gov.uk/)

Building Regulations Approved document M - Access to and use of buildings

<http://wales.gov.uk/topics/planning/buildingregs/publications/?lang=en>

Doing Well, Doing Better – Standards for Health Services in Wales

<http://wales.gov.uk/docs/dhss/publications/100419standardsforhealthservicesen.pdf>