

**Notes for boards:
Infection Prevention and
Control (IPC) risks in the
design of haemato-
oncology and bone
marrow transplant (BMT)
units**

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Introduction

There is limited technical standards and guidance currently available to aid decision making in respect of optimal design considerations when planning to undertake a new build, adapt, extend, or refurbishment within an inpatient haemato-oncology ward and/or bone marrow transplant (BMT) unit.

This document aims to support NHSScotland boards by providing them with a summarised set of questions and answers which will signpost them to any applicable technical guidance documents and summarise key considerations pertaining to:

- functionality
- layout
- support spaces
- maintenance access arrangements
- water systems (including drainage)
- ventilation systems

In addition to design considerations, HAI-SCRIBE and NDAP/KSAR processes support safe construction practices and commissioning. Haemato-oncology wards and BMT units provide accommodation to profoundly immunosuppressed patients so meticulous care must be taken around protecting its water and ventilation systems during construction works, and both during and beyond installation. There needs to be a robust commissioning plan from the outset. Clear project governance structures and involvement of IPC through each stage of the project are key to ensuring a safe environment for patients is delivered.

Questions and answers

Question 1: What are the optimal functional and design considerations/requirements/guidance specifications for a haemato-oncology ward/BMT unit within the UK?

Answer:

In this document, haemato-oncology wards and bone marrow transplant units refer only to inpatient settings.

Design should consider:

- service activity
- relevant guidance
- footprint available

Assessment of unit activity encompasses:

- case mix
- age range of patients
- treatments and procedures undertaken

Proximity to clinical areas outside the patient ward may be important, for example:

- intensive care
- medical imaging
- radiotherapy
- pharmacy
- operating theatres

Location of the haemato-oncology ward or BMT units should consider risks from adjacent clinical and non-clinical facilities. In particular, risks of water ingress from overhead water or drainage systems and garden areas should be considered. This

requires multidisciplinary input from clinicians, infection prevention and control (IPC), and the project team.

The number of single rooms and any specialised ventilation rooms required will be relative to the forecasted numbers of immunosuppressed patients who would require protective isolation, with the additional provision of source isolation rooms for transmissible infectious diseases.

Planning and design considerations for the adequacy of bed spacing and isolation room sizing and specifications and ancillary facilities are contained in technical guidance documents.

Relevant technical standards and guidance:

1. [Healthcare Building Note: Cancer treatment facilities \(HBN 02-01\) 2013](#)
2. [Scottish Health Planning Note: Inpatient care \(SHPN 04-01\) 2010](#)
3. [Scottish Health Planning Note: Inpatient Accommodation SHPN 04 Supplement 1: Isolation Facilities in Acute Settings 2008](#)
4. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\) 2022](#)

Question 2: What air change rate should be provided to a haemato-oncology ward/BMT unit?

Answer:

For both BMT units and haemato-oncology wards:

- ≥ 10 air changes per hour achieved via supply air to the patient's room - see Table 3, page 79 [SHTM 03-01 part A](#) (1)

Consideration should be given to air mixing.

Each ensuite toilet should achieve:

- > 10 air changes per hour via extraction.

Note: It is a matter of interpretation as to whether haemato-oncology ward/BMT unit refers to only patient rooms or is applicable within the wider unit footprint. The ventilation strategy for all ancillary rooms or spaces should be risk assessed locally based on the activities being undertaken in the ancillary room. Adjacencies, alongside the air flow patterns mitigate any infection risks to patients. In particular, preparation rooms and treatment rooms are areas where implementation of specified ventilation parameters and HEPA/EPA filtration should be considered.

Suitability of the overall ventilation system and its components require consideration. For example, thermal wheels may present a risk as it would recycle some extracted air into supply air, hence plate heat exchangers are preferable within these settings.

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022

Question 3: What pressure differentials should be applied to a haemato-oncology ward/BMT unit?

Answer:

For both BMT units and haemato-oncology wards:

- +15 Pa from patient bedroom to corridor, with air cascading outwards via door undercut, transfer grilles or pressure stabilisers from the patient bedroom through to rooms of lower classification.

This is to be achieved through supply only in the patient room - see Table 3, page 79 [SHTM 03-01 part A](#) (1)

See note in [Question 2](#) related to overall ventilation strategy.

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022

Question 4: What monitoring of ward ventilation pressure cascades should be used in a haemato-oncology ward/BMT unit?

Answer:

“Airborne isolation facilities, both source and protective isolation” are listed as areas where the ventilation systems utilised are considered critical – see page 26 [SHTM 03-01 Part A](#) (1). These facilities include specialised ventilation rooms within BMT units and haemato-oncology wards. Control systems to detect system failures within the ventilation should be installed (1). These should be simple, robust, and reliable.

Room differential pressure gauges should be mounted directly adjacent to the entry door for each room with specialised ventilation 1.5m above floor level so at eye line (7.24; p50 [SHTM 03-01 Part A](#)) (1). These would typically be required where any pressure differential is expected to be maintained so their positioning would be guided by the overall ventilation strategy. This may be a digital monometer or differential manometer, for example Magnehelic gauge, which continually indicates the normal range.

The building management system (BMS) provides monitoring and control of the ventilation system. There should be a ventilation control panel fitted outside critical areas to enable maintenance by the authorised person (see 7.18; p49 [SHTM 03-01 Part A](#)) and there should be a visual indication provided for clinical staff which shows that the air handling unit is operating within expected parameters (see 9.229; p120 [SHTM 03-01 Part A](#)) (1).

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022

Question 5: What level of filtration should be applied to a haemato-oncology ward/BMT unit?

Answer:

For both BMT units and haemato-oncology wards:

- Final filter EPA 12 - see Table 3, page 79 [SHTM 03-01 part A](#) (1). EPA/HEPA filters should be located within a metal terminal housing with airtight seals immediately prior to the grille – see 9.58 and 9.59 p98 [SHTM 03-01 part A](#) (1).

See note in [Question 2](#) related to overall ventilation strategy.

Areas or rooms requiring EPA/HEPA filtration should be fully sealed. Windows should be non-openable style and any trickle vents sealed and non-openable. Consideration should be given to permeability testing for assurance of this being achieved following construction and as part of commissioning – see 12.17-19 page 142 [SHTM 03-01 part A](#) (1).

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022

Question 6: Are HEPA filters required for use in a haemato-oncology ward/BMT unit?

Answer:

EPA 12 filters are sufficient for both - see Table 3, page 79 [SHTM 03-01 part A](#) (1).

These are defined by BS EN 1822 (note testing is now superseded by ISO 29463).

For practical purposes, there is little difference in level of protection provided by different grades of HEPA but higher grades will incur greater energy demand from the air handling unit (2).

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022
2. Inkster T, Peters C, Dancer S. Safe design and maintenance of bone marrow transplant units: a narrative review. Clin Microbiol Infect 2022
<https://doi.org/10.1016/j.cmi.2022.03.032>

Question 7: Should chilled beams be used in a haemato-oncology ward/BMT unit?

Answer:

No. Chilled beams present a hazard of exposure to waterborne pathogens and maintenance requirements may be impractical to implement in these facilities.

Chilled beams can form condensation which can drip into the room and the condensate may be contaminated with waterborne bacteria and fungi (1). This presents substantial infection risks to immune compromised patients.

Chilled beams also require regular cleaning which may be impractical in terms of access requirements – see page 38 [SHTM 03-01 Part A](#) (2). These maintenance activities may generate further hazards to patients, for example dust generation, and have the potential for clinical service disruption.

In addition, rooms with EPA/HEPA supply should be fully sealed, including solid ceilings, usually precluding use of chilled beams.

Relevant technical standards and guidance:

1. [Inkster T, Peters C, Soulsby H. Potential infection control risks associated with chilled beam technology: experience from a UK hospital](#)
2. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022

Question 8: Are interlocking entrance doors recommended for a BMT unit?

Answer:

There are no current recommendations within UK guidance.

[SHTM 03-01 Part A](#) briefly outlines a typical ventilation strategy with supply only into patient rooms, cascading out via door undercut, transfer grille or pressure stabiliser through rooms of lower classification - see Table 3, page 79 [SHTM 03-01 part A](#) (1).

Interlocking entrance doors (for instance an anteroom with at the entrance to the unit) may provide additional protection against fungal spore ingress into the unit from adjoining corridors and spaces.

Decision to include or not depends on assessment of whether other control measures are sufficient to provide a safe BMT unit and assessment of operational risks of interlocking doors. Control measures to consider include:

- presence or absence of anterooms
- ventilation strategy adopted
- pressure of unit relative to the outside corridor

This may require multidisciplinary risk assessment.

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022

Question 9: What is the recommended water and drainage system design for a haemato-oncology ward/BMT unit?

Answer:

Design considerations should encompass:

- hot and cold water system components from supply to ward
- layout of services on the ward and access requirements for maintenance to components of the water system. Services include hot and cold water distribution, as well as wastewater drainage system
- selection of the water outlets, associated sanitary assemblies and equipment using water, and drain outlet locations

Haemato-oncology wards and BMT units are considered high-risk areas for waterborne infection with *Pseudomonas aeruginosa* and other waterborne pathogens (1). This is due to the immunosuppressed patient population which confers greater likelihood of adverse events from exposure to waterborne pathogens, rather than the setting per se. CEL 03 (2012) (1) initially detailed requirements of the Health Board to identify high-risk units (stated to include haemato-oncology) and establish a water safety group. CEL 03 (2012) has now been replaced by CEL 08 (2013) (2), introducing further guidance and requirements.

[SHPN 04-01](#) (3) states every single-bed room should have one clinical handwash basin (CHWB) and multi-bed rooms should have two CHWBs. SHPN 04-01 also advises an ensuite bathroom for each single-room with a toilet, shower and wash-hand basin (3). Further to this SHPN 4 Supplement 1 (4) on provision of isolation facilities advises a further CHWB in lobby rooms. SHPN 04 was last updated in 2010 (3), and since then Scottish Government have issued two letters of advice on water sources and potential infection risk to patients in high-risk units, stating substantial further evidence has been gained on potential risks to patients (1, 2). CEL 08 (2013) (2) introduced new HPS guidance for minimising risk of *Pseudomonas aeruginosa* in neonatal and intensive care units, updated in 2018 (5). This HPS guidance advises for neonatal and intensive care settings that risk assessment should determine

number of handwash basins rather than a particular ratio (5). At present, there is no similar guidance for haemato-oncology wards or BMT units.

Documents applicable to other settings may be considered in risk assessment of water outlets acknowledging their limitations. In addition to risks posed, consideration should be given to requirements of CHWBs for handwashing in line with NIPCM recommendations of where soap and water should be used vs hand rub (6).

SHTM 64 includes guidance on acceptable designs of CHWB and ancillary parts such as taps (7). Consideration should be given to splash risk and to design features which may reduce this risk. Sinks should be planned so that patients and care equipment are outside the splash zone. IPCT should be involved in tap selection and selection of ancillary equipment, for example bins for waste disposal.

Multidisciplinary expertise should be drawn on with the aim of designing out infection risks and planning management of residual risk. It is crucial this is undertaken early in the project to inform the design brief. All parts of SHTM 04-01 should be considered, including parts B-G focussed on operational use (8). Maintenance requirements should be considered for all outlets planned. Risks specific to patient population should also be considered, for example impact of hair shedding into drains due to cytotoxic chemotherapy.

Relevant technical standards and guidance:

1. [CEL 03 \(2012\): Water sources and potential infection risk to patients in high risk units](#)
2. [CEL 08 \(2013\): Water sources and potential infection risk to patients in high risk units – revised guidance](#)
3. [Scottish Health Planning Note: Adult In-patient Facilities \(SHPN 04-01\) 2010](#)
4. [Scottish Health Planning Note: Inpatient Accommodation SHPN 04 Supplement 1: Isolation Facilities in Acute Settings 2008](#)
5. [Guidance for neonatal units \(NNUs\) \(levels 1, 2, &3\), adult and paediatric intensive care units \(ICUs\) in Scotland to minimise the risk of Pseudomonas aeruginosa infection from water. Health Protection Scotland 2018](#)

- 6.** [National Infection Prevention and Control Manual: Home](#)
- 7.** [Scottish Healthcare Technical Memorandum 64: Sanitary Assemblies – Building Component Series 2009](#)
- 8.** [Scottish Healthcare Technical Memorandum 04-01 \(SHTM 04-01\)](#)
 - [Water safety for healthcare - Design installation and testing \(SHTM 04-01 Part A\)](#)
 - [Water safety for healthcare - Operational management \(SHTM 04-01 Part B\)](#)
 - [Water safety for healthcare- TVC Testing Protocol \(SHTM 04-01 Part C\)](#)
 - [Water safety for healthcare- Disinfection of domestic water systems \(SHTM 04-01 Part D\)](#)
 - [Water safety for healthcare- Alternative materials and filtration \(SHTM 04-01 Part E\)](#)
 - [Water safety for healthcare- Chloramination of water supplies \(SHTM 04-01 Part F\)](#)
 - [Water safety for healthcare- Operational procedures and exemplar \(SHTM 04-01 Part G\)](#)

Question 10: What water system designs and components can exacerbate or contribute to an increased infection risk and what design considerations should be taken to reduce those risks within a haemato-oncology/BMT setting?

Answer:

[SHTM 64](#) contains details on sanitaryware design (1).

Procurement of sanitaryware should follow options appraisal and multidisciplinary risk assessment by IPCT, estates management and clinicians.

In patient areas taps with thermostatic mixing valves (TMVs) are likely to be required due to scalding risk and there needs to be a plan for ongoing cleaning and maintenance of these. TMVs should ideally be located within the tap. If sensor taps are considered, the sensor should be placed in a visible area above or to the side of the outlet, so the user does not risk contaminating the outlet.

Consideration should be given to volume of water retained and the presence of any solenoid valves with synthetic rubber diaphragms which present a risk for biofilm growth. These risks may be weighed against possibility for automated flushing. Lever taps installed should be elbow operated.

Flow straighteners, rosettes, and aerators should not be fitted on outlets as these have been linked to outbreaks of *Pseudomonas aeruginosa*. Swan neck taps should not be installed. Consideration should be given to autoclavable taps.

Splash risk from basins presents a risk to patients so patients and patient care equipment should be outside the splash zone.

CHWBs should be rear-draining and consideration given to splash reducing designs.

Activity area of all outlets should be sufficient to fit a point of use filter (POUF) if required.

Flexible hoses should be kept to a minimum and risk assessed where required.

Showers hoses should be short enough for the showerhead to avoid the drain/floor. Similarly, it should not be possible to submerge a showerhead in a bath.

Bathrooms should be adequately sealed, have water-resistant cladding and sufficient extract ventilation for moisture control to decrease risk of mould proliferation.

Sufficient storage should be supplied so that patient hygiene products and cosmetics are not stored on sink tops.

Relevant technical standards and guidance:

1. [Scottish Healthcare Technical Memorandum 64: Sanitary Assemblies – Building Component Series 2009](#)
2. Scottish Health Facilities Note Part A: [HAI-SCRIBE Manual information for project teams \(SHFN 30 Part A\)](#)
3. Scottish Healthcare Technical Memorandum 04-01: [Scottish Healthcare Technical Memorandum 04-01 \(SHTM 04-01\) Part A](#) 2014
4. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022
5. Safety Action Notice SAN SAN(SC)09/03 Flexible water supply hoses: risk of harmful micro-organisms.

Question 11: What are the recommendations for installing POU or inline filters as a control measure within a haemato-oncology ward/BMT unit?

Answer:

POUFs or inline filters may be considered as a control measure to protect against waterborne pathogens from supply water alongside other remedial actions (1).

POUFs provide immediate protection where the source of pathogens is the outlet, which is desirable given the vulnerability of this patient population.

Where POUFs are used, splash risk should be assessed and a plan made for their ongoing management. This should include cleaning regimens to avoid contaminating the filters, need for replacement at expiry/if removed/contaminated, and criteria for discontinuation.

Long-term use of POUFs may be required in some circumstances and the board Water Safety Group should participate in decision-making and the maintenance plan if this is the case.

In new and refurbished facilities, taps should be provided which can accommodate POUFs should the need arise – see 5.19 page 28 [SHTM 04-01 Part A](#) (2).

Consideration should be given to sanitary ware during procurement that safe operation of an outlet would be possible with a POUF fitted.

Relevant technical standards and guidance:

1. [Prevention and management of healthcare water-associated infection incidents/outbreaks. Health Protection Scotland 2019](#)
2. Scottish Healthcare Technical Memorandum 04-01 (SHTM 04-01) [Water safety for healthcare- Design installation and testing \(SHTM 04-01 Part A\)](#)

Question 12: What maintenance considerations are essential to prevent infection risk in water and drainage systems in a haemato-oncology ward/BMT unit?

Answer:

All water services installed should be incorporated into the board Water Safety Plan and the board Water Safety Group should have oversight of this (1).

As with the rest of the hospital, temperature control should be regularly monitored and a risk assessment in place for Legionella control – guidance can be found in [SHTM 04-01 part B](#) (1). The board Water Safety Plan should include wider risk assessment of waterborne pathogens presenting a risk to vulnerable patients, including *Pseudomonas aeruginosa* and non-tuberculous mycobacteria (2, 3).

There should be a maintenance programme, including flushing, with defined responsibilities for each aspect.

Total viable count (TVC) testing should be undertaken quarterly and sampling locations determined by board Water Safety Group with guidance from [SHTM 04-01](#)

[part C](#) (4). Additionally, water testing for *Pseudomonas aeruginosa* is advised at least every six months but dependent on previous results (5).

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 04-01: [Water safety for healthcare- Operational management \(SHTM 04-01 Part B\)](#) 2014
2. British Standards BS 8680:2020: Water quality — Water safety plans —Code of practice
3. British Standards BS 8580:2019: Water quality – Risk assessments for Legionella control – Code of practice
4. Scottish Healthcare Technical Memorandum 04-01: [Water safety for healthcare- TVC Testing Protocol \(SHTM 04-01 Part C\)](#) 2014
5. [Pseudomonas aeruginosa routine water sampling in augmented care areas for NHSScotland. Health Protection Scotland 2018](#)

Question 13: What maintenance considerations are essential to prevent infection risk in ventilation systems in a haemato-oncology ward/BMT unit?

Answer:

Ventilation systems for source isolation are “critical systems”.

Planning resilience into the ventilation system and contingency plans to ensure patient safety in the event of ventilation failure are crucial – see 4.14-4.16 page 26 [SHTM 03-01 Part A](#) (1).

Inspection and annual verification requirements are advised in chapters 4 and 5 of [SHTM 03-01 Part B](#) (2). Ventilation systems should be maintained in compliance with [SHTM 03-01 Part B](#) under oversight of the Board Ventilation Safety Group (2).

All air handling units have an expected life span. It is important that trends are monitored to detect sudden changes in performance requiring urgent remediation and to inform planning for replacement.

Relevant technical standards and guidance:

1. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022.
2. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Operational and verification \(SHTM 03-01 Part B\)](#)

Question 14: How should drinking water/ice be provided for BMT patients?

Answer:

Automated ice machines have been linked to outbreaks of waterborne pathogens and should not be used in this setting (1, 2). For immune compromised patients, ice may be prepared using sterile water in single use ice-making bags in a conventional freezer (2). Cooled boiled tap water is a reasonable alternate to sterile water for making ice.

There is variation in practice within the UK around drinking water provision for haemato-oncology patients, sometimes dependent on degree of immune suppression. Local risk assessment with key stakeholders should guide approach and may include wider considerations of bottled water, dietary provision and food preparation.

Relevant technical standards and guidance:

1. Safety Action Notice - Automatic Ice Making Machines: Risk of Infection (SAN(SC)06/46). Health Facilities Scotland 2006
2. Scottish Health Facilities Note Part A: [HAI-SCRIBE Manual information for project teams \(SHFN 30 Part A\)](#)

Question 15: What are the commissioning and validation requirements for a BMT unit?

Answer:

The commissioning process enables the installed environment to be brought into operational use; the processes for healthcare facilities in Scotland are described in the Scottish Capital Investment Manual (1). Commissioning is undertaken by an independent company, however local IPCT should be involved in tendering of the company and the commissioning strategy – see KSAR Notes for Boards section on Commissioning KSAR (2).

Engagement from IPCT on commissioning working groups is required throughout the project to ensure a safe handover for both technical and operational aspects (1, 2). Systems of key technical importance for IPCT are ventilation and water. An outline of the technical commissioning process for each can be found in [SHTM 03-01 Part A](#) chapter 11 (3) and [SHTM 04-01 Part A](#) Chapter 16 (4) respectively.

Areas with specialised ventilation should be considered for permeability testing and this may also be required during construction -see 12.17-12.19 page 142 [SHTM 03-01 Part A](#) (3). [SHTM 03-01 Part A](#) provides no recommendation on microbiological air sampling in these facilities, however consideration should be given to air sampling for filamentous fungi during commissioning. This may provide additional assurance of a safe ventilation system and provides a baseline in case further sampling is required in the future.

Microbiological testing in water should be undertaken during commissioning (5) including for TVCs, coliforms, E coli, Legionella, and Pseudomonas aeruginosa. The water sampling plan should provide assurance of a safe water system and a baseline for future testing results, with sufficient time before handover to react to any out-of-specification results. Operational aspects may include consideration of patient pathways and cleaning after handover.

Relevant technical standards and guidance:

1. [Scottish Capital Investment Manual: NHSScotland Commissioning Process. Scottish Government](#) 2017.
2. [Key Stage Assurance Review \(KSAR\): Notes for Board Infection Prevention and Control Teams. National Services Scotland](#) 2023.
3. Scottish Healthcare Technical Memorandum 03-01: [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#) 2022
4. Scottish Healthcare Technical Memorandum 04-01: [Water safety for healthcare- Design installation and testing \(SHTM 04-01 Part A\)](#) 2014
5. Scottish Healthcare Technical Memorandum 03-01: [SHTM 04-01 Part G v1.0 Jul 2015 \(nhs.scot\)](#) 2015

Appendix 1: Summary of relevant guidance

Health Building Note 02-01: Neonatal settings

- [Healthcare Building Note: Cancer treatment facilities \(HBN 02-01\) 2013](#)

Scottish Health Planning Note 04-01: Adult In-patient facilities

- [Scottish Health Planning Note: Inpatient care \(SHPN 04-01\) 2010](#)

Scottish Health Planning Note 04-01: Supplement 1: Isolation Facilities in Acute Settings

- [Scottish Health Planning Note: Inpatient Accommodation SHPN 04 Supplement 1: Isolation Facilities in Acute Settings 2008](#)

Health Building Note 00-02: Sanitary spaces

- [HBN 00-02 Mar 2017](#)

Scottish Health Planning Note 4 supplement 1: Isolation facilities in acute settings

- [In-patient accommodation - supplement 1 - Isolation facilities in acute settings \(SHPN 4 sup 1\)](#)

Scottish Health Technical Memorandum 02: Parts A and B: Medical gas pipeline systems

- [Medical Gas Pipeline Systems: Design installation validation and verification \(SHTM 02-01 Part A\)](#)
- [Medical Gas Pipeline Systems: Operational management \(SHTM 02-01 Part B\)](#)

Scottish Health Technical Memorandum 03: Parts A and B: Ventilation for healthcare

- [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#)
- [Ventilation for Healthcare - Operational and verification \(SHTM 03-01 Part B\)](#)

Scottish Health Technical Memorandum 04: Water safety Parts A-G

- [Water safety for healthcare - Design installation and testing \(SHTM 04-01 Part A\)](#)
- [Water safety for healthcare - Operational management \(SHTM 04-01 Part B\)](#)
- [Water safety for healthcare- TVC Testing Protocol \(SHTM 04-01 Part C\)](#)
- [Water safety for healthcare- Disinfection of domestic water systems \(SHTM 04-01 Part D\)](#)
- [Water safety for healthcare- Alternative materials and filtration \(SHTM 04-01 Part E\)](#)
- [Water safety for healthcare- Chloramination of water supplies \(SHTM 04-01 Part F\)](#)
- [Water safety for healthcare- Operational procedures and exemplar \(SHTM 04-01 Part G\)](#)

Scottish Health Technical Memorandum 06: Electrical services. Parts A and B:

- [Electrical services supply and distribution: Design considerations \(SHTM 06-01 Part A\)](#)
- [Electrical services supply and distribution: Operational considerations \(SHTM 06-01 Part B\)](#)

Electrical safety guidance for high voltage systems

- [Electrical safety guidance for High Voltage systems \(SHTM 06-03\)](#)

Scottish Health Technical Memorandum 08-03: Bedhead services

- [Specialist Services - Bedhead Services \(SHTM 08-03\)](#)

Scottish Health Technical Memorandum 08-03: Building Management Systems – Parts A-D:

- [Building Management Systems: Overview and Management \(SHTM 08-05 Part A\)](#)
- [Building Management Systems: Design Considerations \(SHTM 08-05 Part B\)](#)
- [Building Management Systems: Validation and Verification \(SHTM 08-05 Part C\)](#)

- [Building Management Systems: Operational Management \(SHTM 08-05 Part D\)](#)

Scottish Health Technical Memorandum 54 – 69: Building component series

- [Building component series -User manual \(SHTM 54\)](#)
- [Building component series -Windows \(SHTM 55\)](#)
- [Building component series - Partitions \(SHTM 56\)](#)
- [Building component series - Internal glazing \(SHTM 57\)](#)
- [Building component series - Internal doorsets \(SHTM 58\)](#)
- [Building component series - Ironmongery \(SHTM 59\)](#)
- [Building Component Series - Ceilings \(SHTM 60\)](#)
- [Building component series - Flooring - matrix example xls \(SHTM 61 app 1a\)](#)
- [Building component series - Demountable storage systems \(SHTM 62\)](#)
- [Building component series - Fitted storage systems \(SHTM 63\)](#)
- [Building Component Series – Sanitary assemblies \(SHTM 64\)](#)
- [Building component series - Cubicle curtain track \(SHTM 66\)](#)
- [Building component series - Laboratory storage systems \(SHTM 67\)](#)
- [Building component series - Protection \(SHTM 69\)](#)

Scottish Health Technical Memorandum 81- 87:

- [Fire safety - Precautions in new healthcare premises \(SHTM 81 part 1\)](#)
- [Fire safety - Fire engineering of healthcare premises \(SHTM 81 part 2\)](#)
- [Fire safety - Atria in healthcare premises \(SHTM 81 part 3\)](#)
- [Fire safety - alarm and detection systems \(SHTM 82\)](#)
- [Fire safety - General fire precautions in healthcare premises \(SHTM 83\)](#)
- [Fire safety - Precautions in existing healthcare premises \(SHTM 85\)](#)
- [Fire safety - Risk assessment \(SHTM 86\)](#)
- [Fire safety - Textiles and furniture \(SHTM 87\)](#)

NHSScotland Waste Management Guidance

- [NHSScotland Waste Management Guidance \(SHTN 03-01\)](#)

Scottish Capital Investment Manual

- [Scottish Capital Investment Manual: NHSScotland Commissioning Process. Scottish Government 2017](#)

Key Stage assurance Review

- [Key Stage Assurance Review \(KSAR\): Notes for Board Infection Prevention and Control Teams. National Services Scotland 2023](#)

Health Technical Memorandum 01-04

- [Health Technical Memoranda: Decontamination of Linen for Health and Social Care \(HTM 01-04\) Management and Provision 2016](#)

National Guidance for the Safe Management of Linen

- [National Guidance for Safe Management of Linen in NHSScotland Health and Care Environments For laundry services/distribution. Health Protection Scotland 2018](#)

Scottish Government Chief Executive Letters to health boards on water safety

- [CEL 03 \(2012\): Water sources and potential infection risk to patients in high risk units](#)
- [CEL 08 \(2013\): Water sources and potential infection risk to patients in high risk units – revised guidance](#)

Guidance to minimise risk of *Pseudomonas aeruginosa* in neonatal and intensive care

- [Guidance for neonatal units \(NNUs\) \(levels 1, 2, &3\), adult and paediatric intensive care units \(ICUs\) in Scotland to minimise the risk of *Pseudomonas aeruginosa* infection from water. Health Protection Scotland 2018](#)

Pseudomonas aeruginosa routine water sampling in augmented care areas

- [*Pseudomonas aeruginosa* routine water sampling in augmented care areas for NHSScotland. Health Protection Scotland 2018](#)

Prevention and management of healthcare water-associated infection/incidents/outbreaks

- [Prevention and management of healthcare water-associated infection incidents/outbreaks. Health Protection Scotland 2019](#)

National Infection Prevention and Control Manual

- [National Infection Prevention and Control Manual: Home \(scot.nhs.uk\)](#)

Scottish Health Facilities Note Part A - C

- [HAI-SCRIBE Manual information for project teams \(SHFN 30 Part A\)](#)
- [HAI-SCRIBE Implementation strategy and assessment process \(SHFN 30 Part B\)](#)
- [HAI-SCRIBE question sets and checklists \(SHFN 30 Part C\)](#)