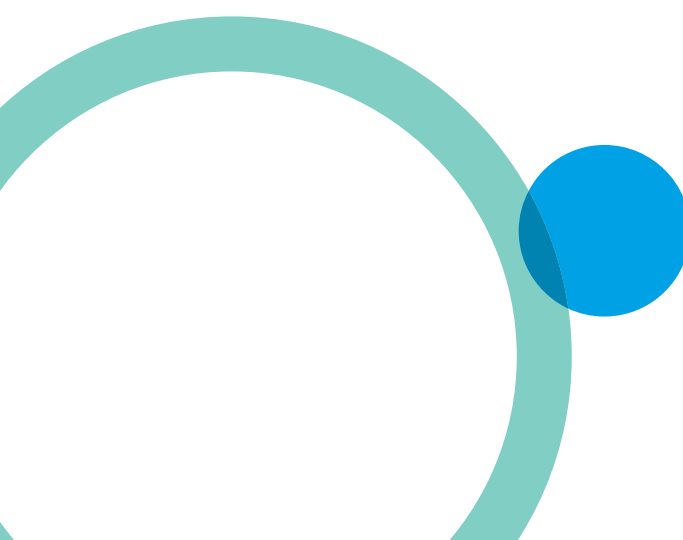


# Scottish Health Planning Note 16-01

Mortuary and Post Mortem Facilities:  
design and briefing guidance



**Disclaimer**

The contents of this document are provided by way of general guidance only at the time of its publication. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application. No warranty is given as to the accuracy, relevance or completeness of the contents of this document and Health Facilities Scotland, a part of NHS National Services Scotland, shall have no responsibility for any errors in or omissions there from, or any use made of, or reliance placed upon, any of the contents of this document.

# Contents

	page
<b>1. Introduction</b> .....	<b>4</b>
About Scottish Health Planning Notes .....	4
Purpose and Scope of SHPN 16-01 (formerly SHPN 20) .....	4
The Context for Facility Provision .....	5
<b>2. General Service Considerations</b> .....	<b>8</b>
Key Functional Elements of a Mortuary or Post Mortem Service .....	8
Scale of Facility Assessment .....	12
Facility Scale Examples, with key functional modules .....	17
<b>3. General Functional and Design Requirements</b> .....	<b>18</b>
Care, Safety and Security .....	18
Location and Site Selection .....	20
Layout.....	21
Internal environment considerations .....	23
<b>4. Specific Risks for Mortuary and Post Mortem Services</b> .....	<b>26</b>
Risks related to Infection .....	26
Risks related to Formalin Use .....	27
Risks related to Waste Disposal .....	28
Risks related to Radioactive Bodies .....	29
Risks with Communication and Information Technology (IT) .....	30
Design to Minimise Risks.....	30
<b>5. Specific Functional and Design Requirements</b> .....	<b>32</b>
Entrances and Signposting .....	32
a. Bereaved Visitors Facilities .....	33
b. Body Receipt, Storage and Removal Facilities .....	36
c. Post Mortem Facilities.....	38
d. Staff and Support Facilities .....	49
e. Teaching and Research.....	53
<b>6. Engineering Services</b> .....	<b>54</b>
Water and Waste systems .....	58
Ventilation and Thermal Comfort .....	60
Electrical Engineering Services .....	63
Communications and Information Technology (IT) .....	66
Safety and Security Systems .....	68
<b>7. Schedules of Accommodation and Costs</b> .....	<b>70</b>
Procurement Guidance .....	70
Schedules of Accommodation .....	71
Accommodation Schedule - Samples for each module.....	73
Accommodation Schedule – Facility Scale/ Hierarchy Examples .....	76
<b>8. Appendices</b> .....	<b>81</b>
<b>9. Glossary</b> .....	<b>91</b>
<b>10. References</b> .....	<b>92</b>

# 1. Introduction

Everyone should receive the care, dignity and respect in death that we would wish in life, whilst recognising the need for public health and safety. Collaboration among the multiple agencies involved will ensure that the people of Scotland are put at the heart of our mortuary and post mortem services.

**Scottish Government Mortuary Review Group 2017**

*“Local authorities and health boards must co-operate with one another in complying with their respective duties under section 87(1) [and], 88(1).”*

clause 89 **Public Health (Scotland) Act 2008**

## About Scottish Health Planning Notes

- 1.1. The Scottish Health Planning Note (SHPN) series provides advice on the planning of health and care related premises in Scotland, plus briefing and design support for the relevant professional bodies.

Particular attention is paid to the relationship between the facility design and its subsequent management. Since this equation will have important implications for capital and running costs, alternative solutions are sometimes proposed. The intention is to give the professional reader informed guidance on which to base investment decisions.

- 1.2. Although current at the time of publication, it is the guidance user's responsibility to confirm its continued currency, at key stages in the project. This will include the many references and links within the document, e.g. [Section 10](#).

## Purpose and Scope of SHPN 16-01 (formerly SHPN 20)

- 1.3. This publication is based on core guidance produced by NHS England and adapted for use in Scotland by Health Facilities Scotland, part of NHS National Services Scotland (NSS). It replaces for use in Scotland, Scottish Hospital Planning Note 20: 'Mortuary & post mortem rooms' (2002), and HBN 20 (2005).
- 1.4. SHPN 16-01 (formerly SHPN 20) provides facility guidance for mortuary and post mortem (PM) services' premises in Scotland, to support public bodies to:

- design new buildings;
- adapt or extend existing buildings;
- assess the standards of existing facilities consistently, see [2.7](#) below.

- 1.5. This publication is aimed at the multiple public bodies involved in the operation, planning or use of mortuary and post mortem facilities in Scotland, for either joint/shared service or individual organisation use. This includes: NHS Scotland Boards, Local Authorities, Police Scotland, Crown Office & Procurator Fiscal Service, plus their partnership organisations e.g. universities.

- 1.6. In recent years there has been a growing need for consistent and high quality mortuary services, whilst ensuring this provision is sustainable. Resource is limited,

with key challenges in the recruitment/ retention of highly experienced and skilled staff, as well as the provision of fit-for-purpose facilities, modern equipment etc.

- 1.7. This SHPN 16-01 document defines the following key functional elements:
  - a. bereaved visitors facilities;
  - b. body receipt, storage and removal facilities;
  - c. post mortem facilities, with or without forensic cases and observation;
  - d. staff and support facilities, with or without post mortem services;
  - e. teaching and research.
- 1.8. This will allow a project-specific solution to be developed to suit local needs. The key functions for a given location, and their scale and quantity, should be planned on an inter-agency basis, at a national, regional and local level, with service quality, resilience and safety for the population as a key consideration.
- 1.9. [Section 7](#)'s modular format for the schedules of accommodation of each of the key functional elements, will enable easy selection on a project specific basis. Key factors that should be considered when calculating scale and quantity for body storage and post mortem tables are also included.
- 1.10. This document does not cover temporary accommodation for a major incident mass fatality, e.g. NEMA. It does however include the need to scale up our current/ future resource for predicted increases in demand in both regular and exceptional events.
- 1.11. Consultation with Regional Resilience Partnerships is required to predict variations, e.g. seasonal death effects, requiring short-term increases to body storage and other resources. Each facility must plan for an appropriate service flexibility and resilience.

## The Context for Facility Provision

- 1.12. Current facilities for mortuary and post mortem services in Scotland have the challenge of providing appropriate services in a large variety of geographical and organisational contexts. These encompass: Victorian to modern architecture; local authority, fiscal and NHS; and from the heart of cities to the islands.
- 1.13. By defining the core facility qualities required for each functional element, this guidance supports the delivery of care, dignity and respect in mortuary and PM public services, across our wide range of facilities. Where existing facilities do not meet the defined quality for a particular function, investment or alternative means of delivering this with care, dignity and respect should be sought. For example, bereaved visitors should not be taken to a facility that does not adequately provide for their needs, i.e. does not have functional element **a.**; see [Section 2 and 5](#) for general and detailed requirements. The 2017 Mortuary Review Group report (see [5.8](#)) is planning to recommend national monitoring and governance arrangements.
- 1.14. A hierarchy of facility provision across Scotland is illustrated in [Fig 2-1](#).
- 1.15. To address the complexity of the current provision and improve the context in which this facility guidance sits, the Scottish Government established in 2017 a multiple agency, short term Mortuary Review Group (MRG). This group is due to report by late 2017 to Scottish Ministers. Its terms of reference include:

- a broad review of Mortuary and Post mortem provision in Scotland;
- ensuring the governance, and potentially minimum service standards, roles and responsibilities, established of the multiple agencies involved in this provision;
- reviewing capacity of resources (e.g. facilities, staff and skills) to meet current and future projected demands;
- input to this revision to SHPN 16-01 (formerly SHPN 20).

### **Key changes since the previous issue of this guidance**

1.16. Since the previous edition of this guidance SHPN 20 (2002), and its English equivalent HBN 20 (2005), there have been significant developments in legislation, policy and guidance. Key changes include but are not exclusive to:

- Public Health (Scotland) Act 2008;
- Equality (Scotland) Act 2010;
- Public Bodies (Joint Working) (Scotland) Act 2014
- Human Tissue (Scotland) Act 2006;
- ICCM – Sensitive Disposal of Foetal Remains 2015;
- Burial and Cremation (Scotland) Act 2016;
- SHFN 30 HAI SCRIBE infection control facilities guidance 2014;
- Construction (Design and Management) Regulations 2015;
- National Guidance for Healthcare Waste Water Discharges 2014;
- Raised awareness of mortuary facilities after incident at Spynie 2016.

1.17. This revision to SHPN 16-01 (formerly SHPN 20) also aims to:

- challenge the multiple agencies to deliver a sustainable, quality-led, public mortuary service, with opportunities for improved and shared resources;
- better define scope and context e.g. storage and resource for predicted regular variations and exceptional events e.g. winter flu, traffic accidents.
- improve layout, add current images, and simplify text;
- capture key lessons from old and new mortuary facilities;
- reflect updates to the Scottish Capital Investment Manual (SCIM);
- add glossary and update references;
- revise SHPN code to suit UK codes agreed 2012, i.e. SHPN 16-01.

## Acknowledgements

The NHSScotland NSS gratefully acknowledges the assistance and comments received from the following organisations and individuals in the preparation of this document, which is an update from SHPN 20 (2002) and HBN 20 (2005) :

Dr Rob Ainsworth, NHS Lothian;

Alison Anderson, NHS Lothian;

Barry Baker, Health & Safety Executive;

Keith Barclay, Graham Construction Ltd;

Tom Brady, Peter Brett Associates LLP;

Aileen Brodie, Aberdeen City Council;

Maureen Doherty, Core Associates Ltd;

Prof Stewart Fleming, University of Dundee;

Ishbel Gall, NHS Grampian;

David Green, Crown Office & Procurator Fiscal Service;

Prof J Grieve, NHS Grampian & University of Aberdeen;

Martin Hunt, LEEC Ltd; Debbie McNally, AFOS Ltd;

Dr P Mishra, Chief Medical Officer Directorate, Scottish Government;

Vin Poran, Health & Safety Executive;

Julie Ramsay, National Records of Scotland;

Sandra Turkington, Resilience Division, Scottish Government;

Dr Marjorie Turner, University of Glasgow;

Margaret Wade, Health & Safety Executive;

Jackie Walker, NHS Greater Glasgow & Clyde

Maryan Whyte, Mortuary Campaigner;

and

members of Scottish Government's 2017 Mortuary Review Group (MRG).

## 2. General Service Considerations

### Introduction

- 2.1. Our users and communities are at the heart of our mortuary and post mortem services. The delivery of care, dignity and respect for the deceased and bereaved visitors, together with everyone’s health and safety, is key to success/ compliance.
- 2.2. This SHPN 16-01 provides guidance on the planning, design and standards to achieve the above, for a range of mortuary and post mortem (PM) services. It covers stand-alone facilities or units in a larger complex; and operations by either one or multiple public agencies, within a contractual agreement.
- 2.3. Close collaboration among the multiple agencies involved in mortuary and post mortem services, will ensure the people of Scotland, are at the heart of service. For example. an appropriate joint process for complaints, their escalation and re-dress must be in place and publicly displayed in the facility reception, and online; with a single named contact for the public to address their complaint to.

### Key Functional Elements of a Mortuary or Post Mortem Service

Types of Centre		Rural/ Specialised	Local Centre	District Centre	Regional Centre
Functional Elements	<b>a</b> Bereaved visitors' facilities	○	●	●	●
	<b>b</b> Receipt, storage and removal of bodies	○	●	●	●
	<b>c</b> Post mortem services:				
	General			●	●
	Paediatric			○	○
	Forensic			○	●
	High Risk Infection			○	○
<b>d</b> Staff and support facilities		○	○	●	●
<b>e</b> Teaching and research					○

Key: ● Essential      ○ Optional

Fig 2-1: Hierarchy or scale of Mortuary & Post Mortem provision

- 2.4. This document defines five key functional elements **a. – e.**; which combine to form a facility hierarchy, or scale of service, sustainable for the population served:
  - a. bereaved visitors facilities;
  - b. body receipt, storage and removal facilities;
  - c. post mortem facilities, with or without forensic cases and observation;
  - d. staff and support facilities, with or without post mortem services;
  - e. teaching and research.



- 2.5. Whether a small local or large regional centre, each facility should comply with the quality and minimum standards of the key functional elements needed for the mortuary or PM service offered. Elements may be sourced from a range of providers / facilities, as long as the deceased, and their bereaved visitors are placed at the heart of the service delivery, within an overall context of public health, safety, security and sustainability. Elements **a.** + **b.** are the minimum essential provision, with few exceptions, e.g. island location, or a child specialist unit adjoining regional centre, where **a.** service only agreed by community. A facility should have sufficient population / projected volume to sustain its agreed functional elements. See *Fig 2-5* for facility scale examples, with their modules of key functional elements.
- 2.6. Scottish Government guidance for temporary emergency accommodation for a national major incident e.g. mass pandemic, air crash; is separate to this SHPN 16-01 document. It is anticipated however that they and other non-NHS agencies will use and implement where practicable the key relevant sections in this publication, e.g. **b.** the receipt, storage and removal of bodies; and **d.** staff support.
- 2.7. Mortuary / PM premises to be reviewed annually ([CEL\(2010\)35](#)), with a view to ensuring sustainable, improving their resilience, processes and sharing resource. This requires collaboration with multiple agencies where involved, e.g. NHS Boards, Local Authorities, Crown Office & Procurator Fiscal Service, Police Scotland, Funeral Directors, crematoria; plus local community. 2017 Mortuary Review Group (MRG) will recommend national governance and independent audits to Scottish Government.

#### **a. Bereaved visitors' facilities**

- 2.8. Upon approach, the visitors' entrance should be clearly identified, with the body entrance distant and concealed from view. Depending on facility scale and / or philosophy, all visitors upon entry should be able to report to a staffed reception; or be seen / escorted immediately to waiting or viewing facilities. The interior design, should be comfortable and welcoming to all, with WC provision at hand.



**Fig 2-2: Viewing/ Bier room, allowing parents to hold their infant, at QEUH Glasgow**

- 2.9. Serene viewing facilities, compliant with the Equality Act, are needed, see [5.8](#); e.g. visitors and deceased may range from infants to elderly. Large regional centres will require appropriate forensic viewing and dedicated infant suites. Appropriate nearby storage e.g. for bassinets, should allow rooms to be used flexibly.

### **b. Body receipt, storage and removal facilities**

- 2.10. [Public Health \(Scotland\) Act 2008](#) states Local Authorities are responsible for provision of mortuaries and PM facilities for all those in their area who require these services. The exception being if a death occurs in hospital, or if the deceased is accepted into hospital by an NHS Board; then the NHS becomes responsible for the mortuary and any PMs it deems are required. This NHS responsibility does not extend to the deceased where the Procurator Fiscal instructs a PM or requires body storage for their specific purposes. Both NHS and Local Authorities have a duty to cooperate and can outsource body storage or PMs, but it remains their responsibility.
- 2.11. For the last 20 years, annual deaths in Scotland are steady ~56,500<sup>1</sup> (Std Dev 2000). Of these, ~40% will need mortuary body storage and ~12% PMs. However facilities report a growth in body storage requirements. A combination of economic, social, demographic and legislative pressures has increased the quantity and the length of stay in many mortuaries, e.g. funeral poverty can delay Funeral Director appointment, therefore body collection. Meanwhile, public and private sectors are under economic pressure on both the capacity and quality of facility provision.
- 2.12. This results in a service with little to no resilience, even for regular variations which affect deaths, e.g. seasonal flu or traffic incidents. Consideration needs to be given to national, regional and local risk registers to ensure that facilities work jointly, and can be scaled up appropriately, to respond to both regular and exceptional events. Multi-agency planning, on a national, regional and local level, is required to ensure our mortuary and PM resources are: in the right location, monitored, and sustainable.
- 2.13. Body storage requires security, temperature control and monitoring. Refrigerated body storage is required for medium stays, ~4 to 30 days. Freezers are for longer term storage >30 days<sup>2</sup>, e.g. for family disputes, or extended forensic investigations, see [5.20](#) & [7.10](#). Some storage units can both refrigerate and freeze, but these are comparatively expensive and are less energy efficient, so will often only benefit a rural or local facility, with space constraints.
- 2.14. The growth in bariatric cases should be carefully assessed and appropriate refrigerated storage and handling provided, see [7.10](#) and [Section 8's Appendix 3](#) for more guidance. In major regional facilities, an appropriate 'cold store room' offers further flexibility / resilience, allowing for a growth in 'bariatric plus' recent cases.
- 2.15. Appropriate storage for infants and still birth facilities should also be considered. [CMO\(2015\)7](#) Disposal of Pregnancy Loss and RCN/ ICCM (2015) Disposal of Foetal Remains all mandate dignified storage for all pregnancy loss.

<sup>1</sup> [www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/deaths](http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/deaths) National Records of Scotland (NRS) website accessed 1 Aug 2017

<sup>2</sup> [www.hta.gov.uk/post-mortem-sector](http://www.hta.gov.uk/post-mortem-sector) Human Tissue Authority (licensing ref PFE2c)

**c. Post mortem facilities, without forensic cases**

- 2.16. Except for child cases where genetic indicators may be being sought, it is increasingly rare for post mortem examinations to be requested by NHS or relatives. For many, death occurs after a known illness in hospital or at home, and their clinical notes will already capture the key cause(s) for certification.
- 2.17. NRS record a decline in PM annual volume from 10,000 to 5,500 over 25 years. NHS Scotland PMs are ~10% of this volume, however the Public Health Act, HIS guidance<sup>3</sup>, geographical logistics and resilience risks, clearly support an ongoing NHS provision. Our 2017 spring survey of NHS facilities records 30 (+8 COPFS Glasgow) PM tables, across 10 NHS sites. There is an increasing risk to PM service sustainability, particularly in terms of staff accreditation, training and recruitment, and any further volume falls will exacerbate this. Service viability is currently dependent on individual agency economic pressures. The future locations, levels and quality of this service are dependent on an increasing ability to jointly plan and operate a PM service network across public agencies.
- 2.18. Volumes in 2.17 above do not include the use of the PM facility for non PM functions, including training and organ harvesting. Trainees / professional observers may be in the PM room, or the Observation area, see 2.21.

**c. Post mortem facilities, with forensic cases and observation**

- 2.19. The Crown Office Procurator Fiscal Service (COPFS) investigate deaths in Scotland which require further explanation. This includes both potential criminal acts (forensic) but also any deaths a medical practitioner reports as an 'unknown' cause of death. In the last 5 years, 9,000 to 11,000<sup>4</sup> per year Death Reports go to COPFS. Annually COPFS instruct 5,500 to 6,500 PM examinations, including view and grant procedure. COPFS currently share NHS facilities in Dumfries, Forth Valley, Glasgow, Inverness, Kilmarnock, Kirkcaldy, and child cases only in Edinburgh. COPFS use Police premises in Dundee, and the Local Authority run city mortuaries in Aberdeen and Edinburgh. Both the latter, are in discussion with NHS on joint facilities. COPFS is currently contracted with NHS, University, Local Authority and Police, the terms of contract vary significantly dependent on local history/ provision in each location.
- 2.20. Where sufficient volume, i.e. regional facilities  $\geq 4$  PM tables, consider the option to provide a segregated PM room, for high risk and / or forensic examination. High risk bodies should be located in an area that can be isolated. In many facilities, high risk cases will be dealt with by timetabling them at the end of a PM session.
- 2.21. Forensic PMs may require multiple agencies to observe, e.g. police, legal / medical profession and trainees. Regional facilities  $\geq 4$  PM tables, must consider a specific observation area, especially if medical training occurs on site. See 5.91 for guidance.
- 2.22. Forensic PMs will also be of Media / Press interest: the facility location, orientation and design is key to protecting the deceased from Press intrusion e.g. concealed or discrete body entrance.

<sup>3</sup> [www.healthcareimprovementscotland.org/our\\_work/person-centred\\_care/resources/post-mortem\\_standards.aspx](http://www.healthcareimprovementscotland.org/our_work/person-centred_care/resources/post-mortem_standards.aspx) criteria 4.6 - PM to be completed  $\leq 3$  working days of authorisation

<sup>4</sup> [www.copfs.gov.uk/images/Documents/Statistics/Statistics COPFS Performance 201617/Statistics on Case Processing Last 5 Years 2012-17.pdf](http://www.copfs.gov.uk/images/Documents/Statistics/Statistics COPFS Performance 201617/Statistics on Case Processing Last 5 Years 2012-17.pdf) COPFS statistics 2012-17

#### **d. Staff and support facilities, with or without PM services**

- 2.23. Small 'body store only' facilities will require as a minimum a staff WC and wash hand basin, with nearby access to changing, lockers, shower and rest provision. A staffed area, e.g. technologists' office, should oversee the body receipt, storage and removal facilities. Mortuary dedicated secure storage, cleaners' and ideally dirty utility rooms are also required for a safe secure service.
- 2.24. Larger facilities, with a higher volume PM / forensic require all of the 2.23 above provision to be dedicated. A dedicated reception and staff entrance will support visitor wayfinding, security and promote a serene environment. They will also require pathologist offices and a second cleaners' room. If forensic PM services are included, optional observation, office / meeting rooms and storage may be needed, along with heightened security and protection from Media / Press intrusion.

#### **e. Teaching and research**

- 2.25. Staff training, accreditation and continual professional development (CPD) are an integral part of all professional bodies including Mortuary and PM services. Major regional centres should have dedicated space for teaching and research, other facilities will require access to a shared resource, ideally nearby.
- 2.26. Teaching rooms for conferences, seminars, training should be both flexible and adaptable. For example: provision of visual and audio communication with PM room allows both clinical training and temporary expansion of observation / office facilities in an exceptional event / major incident; it should also be bookable across agencies.
- 2.27. Research is often multi-agency, e.g. University, NHS, Procurator Fiscal, and may require temporary additional staff and facilities. Potential implications include increased: IT, security, storage, and flexible office space, e.g. hot desks.

#### **Scale of Facility Assessment**

- 2.28. The size and type of facility required will depend upon the projected volume of bodies to be stored and PMs undertaken. Consultation with Regional Resilience Partnerships will ensure flexibility is integral to respond to national, regional and local risk register's regular and exceptional events. If replacing or upgrading an existing facility, careful assessment is required to establish the regional demand across all public agencies involved to ensure service sustainability, particularly in skilled staff.

#### **Body storage provision**

- 2.29. Key factors in identifying current demand and future provision:
- historic and projected volumes analysis, plus regular /exceptional event risks and capacity planning, [www.nrscotland.gov.uk/statistics/deaths](http://www.nrscotland.gov.uk/statistics/deaths);
  - assessing any previous reliance or need for temporary storage facilities or other neighbouring facilities, and consultation with Regional Resilience Partnerships;
  - identifying regional and national population trends in provision, include BMI percentiles for bariatric provision, [www.isdscotland.org](http://www.isdscotland.org);
  - the potential to share resources with other agencies.

## Post mortem room provision

2.30. Factors that need to be considered in deciding the number of PMs tables are:

- existing number of PMs performed, historic and projected figures, local /national risks, regular /exceptional event planning, workload distribution;
- the need for pathologists to be able to perform efficiently, e.g. more than one PM examination at a single attendance in the mortuary;
- an assessment of the length of time required to perform a PM, and the time required for preparation, prior to and after the examination;
- the number of pathologists, the estimated time they can devote to PM work, and the number of mortuary staff available to assist them. Pathologists may need to work simultaneously at adjacent PM tables;
- the need for forensic / criminal investigations, high risk cases and training; usually these are segregated by time slots, or where volumes justify a separate room.



Fig 2-3: 6 PM table room, QEUG Glasgow

## Joint agency, shared mortuary and post mortem facilities

2.31. All relevant bodies for this service provision in Scotland, including NHS Boards, Local Authorities, Police Scotland, Crown Office & Procurator Fiscal Service, and their partnership organisations e.g. universities, must consult and collaborate to ascertain whether joint agency, shared mortuaries and / or PM resources could best meet the needs of the public. Where this is the case, all stakeholders should endeavour to ensure this happens.

2.32. The key advantages of joint agency or shared provision should include:

- enabling deceased and their bereaved visitors to be treated consistently, without segregation/ differentiation, simply due to the place that death occurs;
- mortuary services, accommodated in a sustainable 'centre for excellence,' can better maintain a high quality service and reduce duplication of resource;
- encouraging shared resource; best practice, staff skills, latest equipment, training etc, thus providing resilience and improving service sustainability;
- potential to reduce capital and revenue costs as a result of economies of scale and joint management of staff and facility resources;

Where joint provision is part of a wider service, e.g. regional pathology services, healthcare campus, university research etc, advantages should also include;

- improved access to key support resources and facilities, e.g. pathology laboratory, specialist imaging, training/ conference rooms, research, spiritual sanctuaries, cafes/ restaurants and public transport;
- improved briefing on clinical events related to death and, with the correct protocols in place, direct access to medical records;
- improved accessibility to/ from related services to support skills development, staff awareness and future recruitment.

2.33. When facility planning a mortuary, particularly with PM, and / or forensic PM, the following factors should be considered:

- the need for appropriate approach arrangements to cope with volume of 24hr/ 7 day vehicular traffic, discrete and secure yard/ routes, e.g. sleeping accommodation should not overlook body receipt/ removal entrance;
- location and visibility of the body receipt/ removal entrance from all visitor waiting areas; and other patient/ public day, dining or activity areas if part of a larger campus, including overlooking from above;
- the need for appropriately discrete and secure entrances e.g. Press intrusion, access control for all, e.g. bell /intercom for visitors, ID card swipe access for staff;
- the need for appropriate forensic security arrangements, e.g. lockable body stores or swipe access to facility and
  - secure storage of deceased valuables, clothing and physical evidence;
  - laundry policy;
  - police parking bays;
- the need for an observation gallery and/or room, for ~4-16 people to view forensic PMs. Police etc. also need to work effectively whilst awaiting PMs and provision of seating and desks/ writing surfaces should be considered;
- the need for remote viewing e.g. CCTV for forensic identification;
- the need for segregated high risk and / or forensic PM room(s);
- the need for secure refrigerated and freezer body storage;

- the need to appropriately deal with wider range of deaths e.g. disease, decomposition, dismemberment; and the higher risks these may bring;
- the need for additional IT and communications, including mobile phone/ police radio, and audio/ video communication from the PM room to observation gallery and teaching / conference facilities;
- the need for additional storage, staff training and support areas;
- the need for functional flexibility for regular /exceptional event responses, particularly for forensic functions during a major public incident.

### Temporary additional body store requirements

- 2.34. This document does not cover mass fatality temporary accommodation for major incidents e.g. NEMA, however regular and exceptional events risks are included.
- 2.35. Predicted variations e.g. winter flu, traffic accident, holiday events, will impact locally, requiring temporary additional body storage and other resources. Each facility must plan appropriate service and facility flexibility for national, regional and local risks, likely to be encountered, e.g. Regional Resilience Partnership risk register.



Figure 2-4: Refrigerated temporary body stores, Edinburgh City mortuary

- 2.36. Temporary refrigerated body store, see [Figure 2-](#) example, is a short term ( $\leq 30$  days), quickly deployed ( $\leq 4$  days), mitigation measure, for anticipated risks e.g.:
- seasonal increases in deaths, e.g. winter flu, holiday traffic;
  - localised increases in deaths, e.g. bus or ferry accident;
  - planned decreases in capacity, e.g. due to refurbishment of facilities;
  - unplanned capacity change e.g. due to damage/ closure of existing facilities.

- 2.37. A variety of capacity mitigation measures should be planned, and will include:
- by negotiation with local network of mortuaries (both public and private);
  - by negotiation with Funeral Directors, crematoria etc to increase throughput;
  - the purchase or rental of “flat-pack” temporary fridges (*Figure 2-*), installed in a suitable internal space, preferably within or adjacent to the mortuary;
  - the provision of a cold room with thermal curtain and storage racks, which may be used as a normal store room when not in use for bodies;
  - the installation of a temporary, freestanding refrigerated store, e.g. portacabin, which is secure, suitably screened, discreet access and adjacent to the mortuary.
- 2.38. Where a temporary refrigerated body store is installed, it must be secure and discreet, both in appearance and in its location. It may be necessary to install structures to restrict visibility by the public, Press etc e.g. hedge/ fencing and canopy adjacent to the entrance. Consider alarms and CCTV systems. Suppliers of temporary facilities must also provide guidance on the use of their equipment. Dignity and respect for deceased, and visitors, is to be considered and upheld at all times. In developing plans for exceptional events, public agencies should identify space that could be made available for temporary refrigerated body stores.
- 2.39. Refrigerated vehicles, double occupancy of trays, trolleys and tables, and the laying of bodies on the floor, is not a safe, dignified nor appropriate temporary solution.
- 2.40. [Appendix 4](#) provides a health and safety checklist for temporary body storage. This provides a list of issues to consider/ adapt for all types of body storage.

### Short term body storage

- 2.41. In Scotland ~40% of all deaths require mortuary storage and ~25% of these need PM services. When cause of death is known, families can engage a Funeral Director and plan bereavement services on receipt of a Death Certificate, this is often within hours of death. Public sector agencies, e.g. NHS also follow this pattern, and have contracts with local Funeral Directors to collect the deceased within hours e.g. 2-6hrs from initial contact. This process may be extended if death occurs overnight, and arrangements are unable start until the next morning. Where required, e.g. PM requested, transportation to a mortuary will follow a similar process and timescale.
- 2.42. In exceptional events, an unforeseen delay may require short term non-refrigerated body storage. This should be minimised, and only be for the least time practical e.g. ≤12hrs<sup>5</sup>. Storage of the deceased must always be safe and with due dignity. If this period is likely to exceed 12hrs, body storage is to be in a secure, cool, and appropriate space, e.g. ward single room or purpose-designed store. The duration and temperature in this storage space to be monitored, with body deterioration risk assessed and mitigated. If temperature is likely to exceed 20°C<sup>6</sup> for a few hours, or if stay likely to exceed 4 days<sup>7</sup>; refrigeration must be provided (optimum 4-6°C); and if stay likely to exceed 30 days, HTA recommend freezer storage (optimum -20°C).<sup>8</sup>

<sup>5</sup> ≤12hrs not a strict fixed period, but to allow overnight stay prior to removal, 2-6hrs preferred.

<sup>6</sup> 20°C not a strict fixed temperature, lower preferred; HSE state ≤20°C inhibits water bacteria growth.

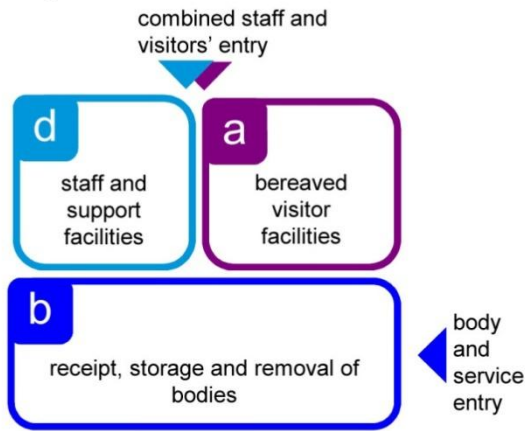
<sup>7</sup> 4 days not a strict fixed period, but refers to 2.36 time to deploy temporary refrigerated facility.

<sup>8</sup> [www.hta.gov.uk/post-mortem-sector](http://www.hta.gov.uk/post-mortem-sector) Human Tissue Authority (licensing ref PFE2c).



## Facility Scale Examples, with key functional modules

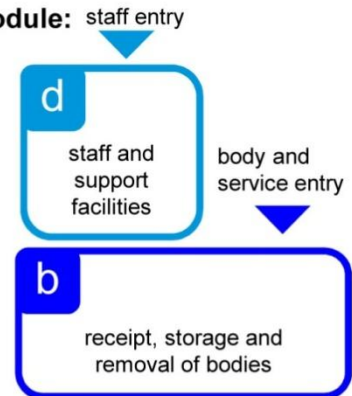
### Functional Module: Example i



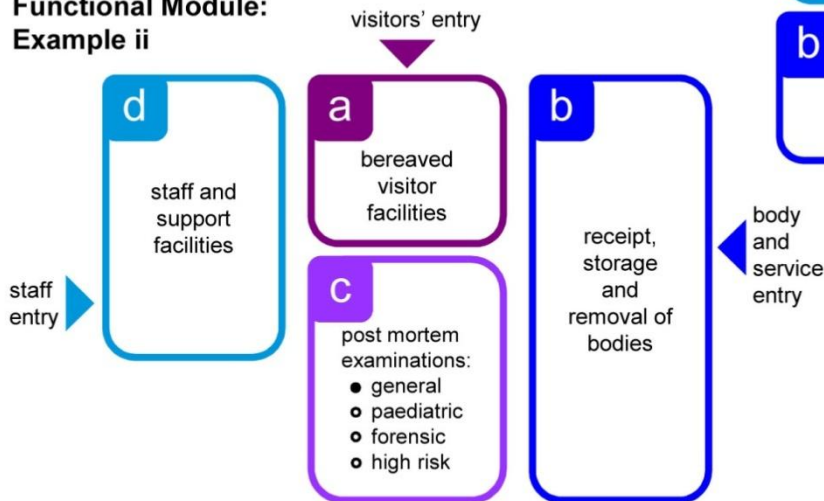
### Functional Module: Example a



### Functional Module: Example b



### Functional Module: Example ii



### Functional Module: Example iii

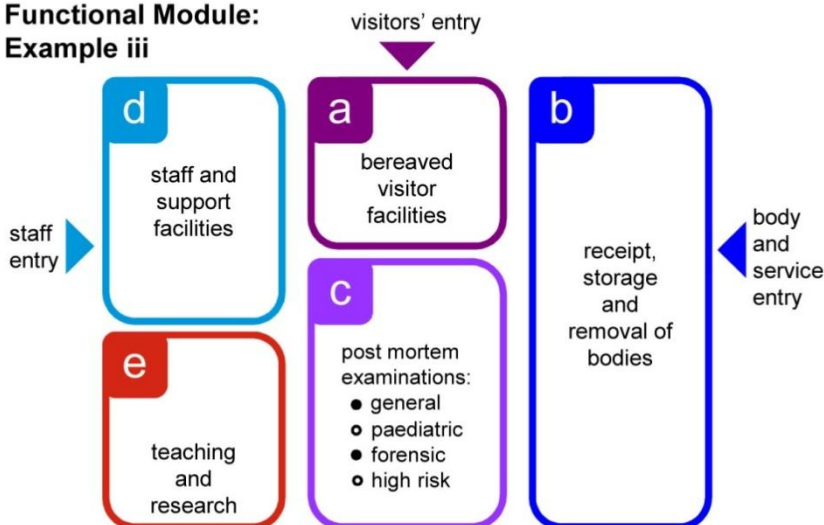


Fig 2-5: Facility scale examples, with key functional modules

## 3. General Functional and Design Requirements

- 3.1. This Section provides guidance on a range of key technical issues to consider when briefing, planning or assessing facilities for Mortuary or Post mortem (PM) services. Details for the quality criteria of specific spaces and functions are available in [Section 5](#) and the NHS Activity DataBase (ADB). Health Improvement Scotland's (HIS) [Management standards for hospital PMs](#) (2016) provide a service framework for consistency and compliance with legislation, e.g. [Human Tissue \(Scotland\) Act 2006](#)

### Care, Safety and Security

- 3.2. Everyone should receive the care, dignity and respect in death that we would wish during life. The page 4 2017 Mortuary Review Group's [quotation](#) on service provision, is a core driver for this SHPN 16-01 facility guidance update. It is the responsibility of all public bodies to collaborate and deliver this to our communities, within an overall context of public health and safety provision.
- 3.3. Appropriate risk assessments are required at both design and in use, to identify and mitigate the key risks to care, safety and security e.g. lone working, out-of-hours collection / deliveries; infestations; infection; refrigeration failure. See also [Section 4](#).
- 3.4. Unauthorised access must be prevented for reasons of both health and security. Unfortunately the nature of the work undertaken by these services can attract unwanted attention. Entry into the mortuary, and to the secure areas within it, must be controlled by staff at all times, e.g. video / audio intercom or bell for Funeral Directors and other visitors entry; swipe card or mechanical lock for staff only / escorted entry. Surveillance of each entrance and body store area is to be provided locally, and to an appropriate 24hr/ 7days staffed area. Passive surveillance supports good behaviour.

### Infection Control

- 3.5. The last decade has seen significant advances in infection control practices. Collaborative multi-disciplinary risk assessments are required periodically and at key stages in the brief, site selection, master plan, design, maintenance and operational use of these facilities. Scottish Government [DL\(2015\)19](#) mandates guidance series [SHFN 30](#) to control construction infection risks in a health or care facility.
- 3.6. Current legislation, HSE, NHS Scotland and industry specific guidance for the handling, storage and examination of bodies, specimens and their facilities, must be used to develop and periodically review Healthcare Acquired Infections (HAI) and other risk assessments. For example, [HSE Safe working and prevention of infection in mortuary and PM room](#) (2003) and [HSE Risks of Infection at Work from Human Remains](#) (2005) are both due to be replaced, potentially into one HSE publication. Mortuary and PM facilities are public but non-patient areas, therefore are **Group 1-risk** in current [SHFN 30](#) HAI-SCRIBE (2014) documentation. [SAN \(SC\) 09/03](#) Safety Action Notice recommends eliminating the use of flexible water supply hoses if possible, and to risk assess WRAS approved EPDM free hoses only, if required.

### Maintenance and cleaning

- 3.7. [SHFN 30](#) HAI-SCRIBE (2014) provides checklists that are a valuable resource in the maintenance and cleaning of all health and care facilities. In addition the current

version of [SHFN 01-02](#) NHS National Cleaning Services Specification (2016) provides details of cleaning systems, their frequency and specifications.

- 3.8. The specification of mortuary and PM facility structures, finishes etc. need to be appropriately robust to withstand their heavy use, i.e. regular trolley impact as well as vigorous cleaning regimes. Materials are to be fit for purpose, minimising redecoration and replacement, e.g. PM floor and wall surfaces to shoulder height (~1450mm above FFL), should be impervious and waterproof. Refer to SHTM Building Component series e.g. [56 partitions](#), [58 doors](#), [61 floors](#).
- 3.9. The junctions and interfaces of each component should also be carefully designed so that as a unit they will withstand wet / heavy use and robust cleaning regimes; gaps or inadequately specified/ constructed joints are most vulnerable and should be designed-out or eliminated wherever possible.
- 3.10. Appropriate soft seating and finishes for bereaved visitor areas e.g. viewing, waiting, interview; should be [SHFN 30](#) risk assessed. These will include art, ceiling/ wall/ floor coverings, and with appropriate detailing and maintenance, this may include carpet.

### Equality Act 2010

- 3.11. This guidance must be read in conjunction with the public sector equality duty in the [Equality Act](#) (2010) and the [Specific Duties \(Scotland\) Regulations](#) (2012), or current equivalents. These state named Scottish public authorities, including NHSScotland, Local Authorities, Police Scotland etc must give 'due regard' to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. This requires an integrated response across services, facilities, training and communications to ensure the characteristics protected by the Act are appropriately served. All proposed public investments need an Equality Impact Assessment (EIA). [Scottish Capital Investment Manual's NHS Scotland Design Assessment Process](#) will also support the implementation of this equality duty at key business case stages of the facility design process.
- 3.12. BS 8300 for design of buildings and their approaches to meet the needs of disabled users, provides the minimum standard for both visitor and staff access needs.
- 3.13. In addition, [HBN 00-02](#) provides details for sanitary spaces, including both public and clinical toilet facilities. [HBN 00-03](#) provides guidance on clinical and clinical support rooms, e.g. cleaners' room. [HBN 00-04](#) provides guidance on corridors, stairs and circulation spaces, including widths for trolley movement. [HBN 08-02](#) provides guidance on elderly and dementia friendly environments, and should be used for all **a.** bereaved visitor areas, and ideally for **d.** staff and **e.** teaching areas.
- 3.14. It is essential that this public facility appropriately promotes equality and respect for everyone. This includes visitors, staff and the deceased, with a wide range of specialist needs, e.g. mobility, communication, religion, gender, orientation and age.

In this facility, this approach is to be fully inclusive in the design, with a particular emphasis on the needs of the elderly, e.g. height of viewing screens, clear and dementia-friendly signage, distinguishable wall / floor junctions and finishes and acoustic design considerations for the hearing impaired. Reception and interview areas will require an induction loop and inductive coupler phones. The design,

equipment etc. in changing, body handling, PM and other staff areas should be as inclusive as reasonably practicable and recorded / justified in the project EIA.

## Location and site selection

3.15. The location and site selection of a mortuary facility is constrained by a number of competing factors, and the inclusion of post mortem (PM) services further adds to the complexity of this. Factors will include:

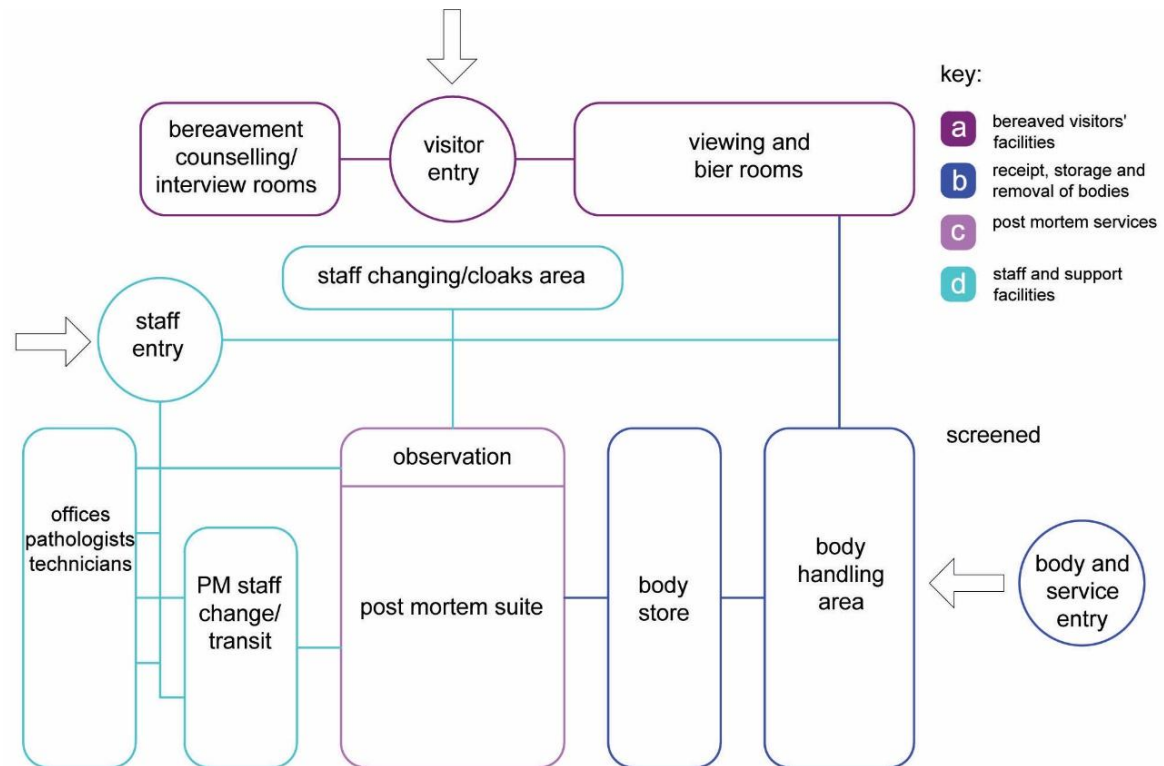
- adequately sized, discreet location, with 24hr / 7day vehicular access;
- segregation of body access from visitors and general public;
- security provision for all entrances, e.g. access controls, secure yard, CCTV;
- multiple agency staff access & facilities e.g. discreet staff entry/ parking, out-of-hours safety, lone working;
- bereaved visitor access & facilities, e.g. gardens and views of greenspace;
- relationships to adjacent services/ avoid overlooking & noise from/ to neighbours;
- external approach & parking for each entrance, parking security/ access controls;
- internal approach if on campus, e.g. from A&E, theatres, ICU, wards, helipad etc;
- exceptional event risks e.g. space for temporary storage.

### where PM services are included, as above plus

- increased volume and complexity of through-puts, extra storage and multiple agency use, e.g. increased space and more complex adjacency layout;
  - increased security and discretion, particularly from the Press/ Media, e.g. entirely secure and enclosed garage space for vehicular body loading;
  - increased access/ relationship to services, e.g. histopathology laboratories, imaging, clinical research, police, local authority, NHS, child services, training etc;
  - increased resilience risks, including likelihood and impact of exceptional event, or PM services for major incidents, e.g. resource capacity, access prioritisation.
- 3.16. The location and layout should support easy wayfinding to the visitors' entrance, with sensible segregation of other user's approach routes. Key to this is the sensitive location of the body loading area to avoid overlooking, particularly from the bereaved.
- 3.17. The number of entrances should be kept to a minimum, yet balanced with the need for discretion. Staff entry can be combined or separate from visitors' entry, but larger facilities will benefit from this, creating a more serene ambience in bereaved visitor areas. Numerous public and / or staff entrances in close proximity are to be avoided.
- 3.18. Site constraints may determine whether the mortuary / PM service is a stand-alone facility, or integrated into a larger campus / facility e.g. hospital. Cognisance must be taken to ensure that the general public can go about their daily business without overlooking the mortuary body entry. The requirement for discrete body entry is inevitably more difficult if the mortuary is e.g. at campus centre, overlooked by busy routes, public spaces, bedrooms, housing etc., so as not to be overlooked by public spaces, bedrooms etc.

## Layout

- 3.19. All the demands listed in this publication will affect the layout of the facility, particularly the provision of separate access and circulation routes for visitors and staff to obviate the risk of visitors straying into work areas, e.g. PM suite, body store. The relationships of key functional elements to each other are shown in [Figure 3.1](#). This layout is based on a hierarchy / scale **ii-** district mortuary with PM service.



**Figure 3-1: Relationships of key functional elements in a district facility with PM**

- 3.20. Layout on one ground floor is often ideal, but dependant on scale, vertical links may actually improve otherwise excessive circulation. Splitting over two levels also offers advantages in better acoustic separation between public and working areas and security at non-ground levels. However dependence on lifts, e.g. for visitor access, body movement, will require the resilience of  $\geq 2$  lifts.
- 3.21. For infection control, the layout comprises: clean activity areas, transit areas, and dirty activity areas, as defined in [Figure 3.2](#). The facility should be planned to reduce, and eliminate wherever possible in the workflow, the movement of people and materials from dirty activity areas into clean activity areas.
- 3.22. To support the above segregation of 'clean' and 'dirty' activity areas, a separate cleaners' room for each is preferred. A dedicated PM suite cleaning bay / room, adjoining the main PM room is required, this will also support a efficient timetabling.
- 3.23. The **c**. PM suite should be directly connected to the body store, the dirty utility / instrument store and PM transit area, through which access is gained to the staff changing area and from there the circulation routes. Authorised entry only.
- 3.24. The **b**. body receipt, storage and removal suite is where bodies are transferred and handled. It adjoins the vehicular service yard and will be secure, with staff controlled entry. Both will be overseen 24/7 by a staffed area e.g. technologists' office, and / or CCTV. It will have direct access to stores, disposal, bier rooms and the PM suite.

“Clean” activity areas include:	“Transit” activity areas include:
<ul style="list-style-type: none"> <li>● the reception area;</li> <li>● waiting area(s);</li> <li>● visitor / interview room(s)</li> <li>● viewing room(s);</li> <li>● bier room(s);</li> </ul>	<ul style="list-style-type: none"> <li>● the body receiving and handling area;</li> <li>● the disposal room (where this leads off the PM room);</li> <li>● the PM transit area.</li> </ul>
<ul style="list-style-type: none"> <li>● offices, meeting &amp; training rooms;</li> <li>● general and linen store;</li> <li>● the observation area;</li> <li>● the staff changing areas;</li> <li>● the specimen store;</li> <li>● visitors’ toilets;</li> <li>● staff support facilities.</li> </ul>	<p data-bbox="818 591 1185 624"><b>“Dirty” activity areas include:</b></p> <ul style="list-style-type: none"> <li>● the PM room</li> <li>● the dirty utility /instrument store;</li> <li>● the body store;</li> <li>● the disposal room;</li> <li>● PM room bays e.g. cleaning, x-ray, hoists etc equipment.</li> </ul>

**Figure 3-2: Example Clean, Dirty and Transit areas in a mortuary and PM facility**

- 3.25. The **a.** bereaved visitors’ suite should be serene and therefore segregated visually and acoustically from the secure ‘dirty’ activity areas e.g. body store, PM room.
- 3.26. The **d.** staff and support facilities, plus **e.** teaching and research suite if included, should ideally be secure and close together to minimise circulation, but needs to link and serve each of the three other key functional elements: **a. b. c.** as *Figure 3.1*.
- 3.27. Operational practice should ensure that all work with bodies, organs and unfixed specimens is strictly limited to the ‘dirty’ activity areas, see *Section 4*.

### Storage

- 3.28. The storage safety and security in a mortuary and PM facility go beyond the routine need to safeguard supplies against misuse or theft. Specific considerations include:
- **staff changing:** lockers for personal clothing and valuables, plus shelving for personal protective equipment (PPE) e.g. tyvek suits, boots, breathing apparatus;
  - **deceased belongings:** secure storage for deceased’s personal items/ valuables
    - Items removed from infectious or contaminated bodies must be as infection control policy, e.g. safe segregated storage or disposal.
    - Items removed from forensic case bodies must be as fiscal / police policy, e.g. forensic physical evidence secure storage
  - **specimen storage:** secure refrigerated and freezer storage is required for tissues and genetic samples taken from deceased. Segregation is required of clinical

research samples and forensic case samples. Case load volumes must determine whether this is simply a separate shelf, a separate refrigerator, or two rooms.

### Staff Changing

- 3.29. Staff Changing has two requirement levels. The core provision includes staff lockers, WC and showers for all personnel within the facility who wear a uniform, particularly those handling bodies. This is to ensure adequate contaminant protection to staff, e.g. Anatomical Pathology Technologists (APT), porters. It should be within the mortuary, or if part of a larger campus, in very close proximity to it.
- 3.30. A further provision level is required for PM services. All PM staff and non-mortuary personnel entering these facilities must change and be provided with lockers, WC, shower, PPE and decontamination facilities. A transit area is needed prior on entry / exit to the PM room(s). Workflow should avoid cross contamination & bottle necks. Controlled access is required to either the PM suite, or to a whole 'staff only' area.

### Communications and Information Technology

- 3.31. The comprehensive communications (comms), information technology (IT) system(s) selected will be critical to success of mortuary and particularly PM services. These should offer a wide range of compatibility and amenity for the potential multiple agencies and partners involved in the facility, e.g. NHS Board, Local Authorities, Crown Office & Procurator Fiscal Service, Police Scotland, and universities. It must cover the whole facility and satisfy each of the agencies' security protocols and policy requirements. Communication and IT resilience and potentially volume will greatly increase during an exceptional event or major incident. IT risks require early identification; see [Section 4](#) and [Section 6](#) for more details.
- 3.32. Examples of IT data handling needs to be met by the installation include:

#### within mortuary and PM facility:

- admin / records for deceased;
- general communications;
- managing materials and stores;
- managing statistical information;
- direct dial phones & fax (VOIP).

#### from and to other areas/ agencies:

- results from labs and imaging;
- patient records;
- Procurator Fiscal notifications etc;
- Police records etc;
- University communications etc.

### Internal environment considerations

- 3.33. Good interior design can contribute to visitor and staff morale and the aim should be to create a serene, comfortable and safe environment throughout the facility within the constraints of mortuary practice. Interior design should be particularly sensitive to the needs of bereaved visitors.
- 3.34. Interior design, e.g. colours, textures, space, fittings, furniture, finishes and lighting should work holistically to facilitate the function of the accommodation and provide an efficient, robust and safe working environment appropriate for the activities in each area. Art, wayfinding and greenspace views should also contribute to a serene, calming and reassuring experience for visitors.

### Natural and artificial lighting

- 3.35. Daylight should be incorporated wherever possible with windows that maximise light but maintain privacy. Glare should be minimised and may be controlled by curtains or blinds. Solar gain can be mitigated by external screens or by the shape of windows and depth of reveals. (See [SHTM 55](#) - Windows and the current CIBSE Lighting Guides e.g. LG2).
- 3.36. The position and design of windows and roof lights should ensure that the internal mortuary and post mortem key sensitive spaces cannot be seen into by the public. However the benefits of natural light, ventilation and visual links to the outside, especially to greenspace are well evidenced e.g. memorial garden, nature walks. Appropriate windows are to be encouraged wherever staff and visitor spend time.
- 3.37. All areas where staff spend extensive periods e.g. >30min, should be prioritised to benefit from natural lighting. Where possible this should also offer a view, and an opening window. Access to 'green' space e.g. off staff rest room, should be provided.
- 3.38. Outwith bier / viewing rooms, all other areas where bereaved visitors spend time e.g. >10min, should be prioritised to benefit from natural lighting, a view, and an opening window. Access to 'green' space e.g. memorial garden, should be provided either as part of the facility or close by.
- 3.39. Artificial lighting design can significantly contribute to the aesthetic appeal of the interior, and should complement natural lighting where possible. The reception and bier / viewing rooms should have feature and dimmable lighting. A PM suite requires high performance, robust task lighting and low-contrast glare-free background lights. An observation room requires dimmable lights, and task lights for individual working.

### Acoustics and noise

- 3.40. The acoustic environment for both staff and bereaved visitors requires careful briefing and early design consideration. The layout design must mitigate the noise transmission from the PM suite, body handling and storage, to bereaved visitor areas. This is particularly vulnerable via the bier room into body viewing areas.
- 3.41. The specification of acoustic ceilings, soft finishes, furnishings and equipment to mitigate intrusive noise is required, e.g. acoustic 'art' wall panels, carpet, heavy curtains, soft-closing bin lids. Consider infection control in design and maintenance.

### Fittings and equipment

- 3.42. Fittings and equipment to be made of robust, impervious, non-rusting, non-decaying, non-staining materials, which will withstand intense use, e.g. heavy duty stainless steel, ceramic. To be designed for ease of cleaning (on all sides, wherever possible) and to be free from sharp corners or projections to mitigate accidents.
- 3.43. Body store and PM suites fittings and junctions, particularly around dissection bench or observation room glazed screens, are continuously exposed to water, spray, heavy traffic and are subject to vigorous daily cleaning. They must be of durable design, robust, impervious specification, and subjected to rigorous assessment.
- 3.44. Ledges and gaps in fittings, floors, walls, doors and junctions must be eliminated where possible with sealed joints, impervious, robust and durable to heavy traffic.



- 3.45. Door location, configuration, width, closers, and door materials / finishes, must all be designed to reduce damage by heavy traffic, trolleys, water and other contaminants. Ideally locate doors away from splash zone, or protect by a smooth impervious finish. Visual and acoustic privacy must be considered, particularly if 'auto' opening door. 'Swing-free' closers is preferred solution for fire doors easing public or trolley access

### Floors and drainage

- 3.46. Floor covering must contribute to each environment, i.e. serenity in visitor spaces, but reduce risk for slips, trips and infections and endure heavy traffic, see [3.33](#) - [3.44](#). The floor must reflect the functions and risks of each space. Rigorous assessment is key to ensuring appropriate decision making, and effective maintenance regimes e.g. [SHTM 61](#) Flooring, [SHFN 30](#) HAI scribe. For example: PM suite: terrazzo, or anti-slip heavy-duty vinyl, >100mm self-coved skirting; hose-wash/ scrub daily and replace >5yrs; Visitor areas: timber-effect acoustic vinyl, or carpet tiles, sit-on skirting; wash / Hoover >2/ week and replace ~1yr. Use colour / pattern / tone to define spaces e.g. clean / dirty, traffic flows and room edges. Consider locations where biological or chemical spill stain resistance are likely, then ensure design mitigations are in place.
- 3.47. Body store and PM suites floors need to fall to drainage gullies, plus coordinate with fittings and equipment where a level surface is needed, e.g. PM table, body storage and handling systems. The falls to, location and type of gullies need careful design and robust specification for easy and regular maintenance, e.g. easily lifted short section channel gratings, allowing disinfection by submersion in sink or container. Water pooling is not acceptable; this must be tested and eliminated before handover.
- 3.48. PM boot wash is key to infection control, but must be balanced with safe access and an Equality Impact Assessment. A boot trough floor recess within the PM doorway of the transit area(s) is one option, but will require careful design to enable easy filling, cleaning and drainage, whilst reducing risks e.g. slips, trips. An alternative option is a 'step-over' barrier, with a CJD (see [4.8](#)) boot wash station within the transit area.

### Activity Database

- 3.49. The NHS Activity DataBase (ADB) software and reference library assists project teams with the briefing and design of the health and care environment.

ADB provides an activity-based approach to facility design with room data sheets (RDS) providing each room's personnel, planning relationships, environment, surface finishes, and space requirements. Schedules of equipment, assemblies and components are included for each room. Schedules of equipment can also be displayed at department and project level, and by equipment group, e.g. who is responsible for supply/ fitting etc.

- 3.50. ADB provides room layout sheet (RLS) drawings, will include critical dimensions, key equipment and their layout. Once produced, project RDS and RLS may be adapted and modified to suit project specific needs. See [7.20](#) for accommodation schedules with room ADB codes, where available.

[Appendix 3](#) includes layouts for new room types which are not currently available within the ADB library, e.g. combined infant viewing/ bier room and bariatric design considerations within PM and body store areas.

Contact [Health Facilities Scotland](#) for further information.

## 4. Specific Risks for Mortuary and Post Mortem Services

### Introduction

- 4.1. A mortuary and post mortem (PM) facility poses a number of specific health and safety risks, which require collaborative assessment and mitigations, including:
- **physical risks:** accidents and injuries may be associated with the use of equipment and heavy loads. The risks of lifting and moving bodies should be assessed. Increased bariatric volumes. Slipping and falling due to the presence of fluids on the floor, and accidental cuts, from sharps, instruments, bone fragments, or corners of a fitting, are significant risks in the PM and body store suite;
  - **infection risks:** exposure to infectious agents, already present in bodies received for storage and/or PM or other materials received. Infection can be dispersed in the form of aerosols, fluids or material handling. Infection may occur as a result of inhalation, ingestion, inoculation or splashing e.g. eyes. Note that infection risks may not only arise from the work of pathologists, Anatomical Pathology Technologists (APT) or mortuary assistants but potentially from visitors and contractors working in the facilities, e.g. agency cleaners;
  - **electrical risks:** can arise from incorrect or poorly maintained fittings or connections. Potential exposure to water and electrocution hazards must be considered when specifying electrical appliances, lighting, switches etc. This is particularly relevant in the PM room. Implant risks e.g. Cardioverter Defibrillator (ICD);
  - **chemical risks:** associated with noxious or flammable chemicals, e.g. fixatives, solvents, disinfectants; which are used regularly in the mortuary and PM room;
  - **radiation risks:** radioactive materials following their use for diagnosis or treatment, still present in the body; or from imaging equipment used for PM.

### Risks related to Infection

- 4.2. See Health Protection Scotland ([HPS](#)) & Health & Safety Executive ([HSE](#)) websites for current guidance, e.g. [Infection Prevention and Control during Care of the Deceased](#) (2014) details Standard Infection Control Precautions (SICPs), required to reduce the risk of infections for Mortuary, PM and other related workers e.g. Funeral Directors. HPS's [SHFN 30](#) and HSE's two key publications are referenced in [3.6](#), but are planned to be combined and replaced by 2018.
- 4.3. Further information is available in [Appendix 1](#) including guidance for high risk Hazard Group 4 pathogens e.g. Viral Haemorrhagic Fevers (VHF). See [Viral Haemorrhagic Fever \(VHF\) referral and follow-up process algorithm and Scottish National VHF Test Service \(SNVTS\)](#) 2015; plus current guidance on [HSE](#) and Department of Health ([DoH](#)) websites [www.gov.uk](#), e.g. [Viral haemorrhagic fever \(VHF\): ACDP algorithm and guidance on management of patients \(including infection control\)](#) 2014; and HSE [BBV](#) guidance, e.g. [Biological agents: design and operation of Containment Level 4 facilities](#) 2006.

The Advisory Committee on Dangerous Pathogens' ([ACDP](#)) advises on risks and handling of Hazard Group 4 VHF of concern in the UK, i.e. Lassa Fever, Crimean / Congo Haemorrhagic Fever, Ebola and Marburg viruses. In 1996 ACDP advised that a PM examination on a person known to have died of VHF exposes staff to unwarranted risk and should not be performed. In exceptional circumstances, limited sampling may be necessary to establish or eliminate diagnosis of VHF or provide an alternative diagnosis. This should only be carried out after consultation with the appropriate specialists and by an experienced doctor adopting stringent protective measures. If the body is in an isolator, it is preferable to take the specimens before moving the body.

- 4.4. The UK Chief Medical Officers issued guidance in 2000 on two further Hazard Group 4 pathogens, '[Hendra Virus and Nipah Virus - Management and Control](#)'. It advises that a PM examination on a person known to have died from Hendra or Nipah virus exposes staff to unwarranted risk and should not be performed. Contact a High Security Infectious Disease Unit if the diagnosis is in doubt for advice.
- 4.5. [Risk Assessment for Forensic Investigation of Drug-related Anthrax](#) 2013, HPS stress the need for risk assessment and personal protective equipment (PPE) when handling known or suspected drug addicts, particularly heroin, or their effects.
- 4.6. Rabies is classified as a Hazard Group 3, in [Appendix 1](#). The DoH '[Memorandum on Rabies – Prevention and Control](#)' 2000, advises that a PM should only be performed if absolutely necessary. Recent HSE guidance advises not to perform a PM as this is an unwarranted risk to staff. [HPS](#) advises suspected or known cases are bagged, with handling minimised and no hygienic preparation.
- 4.7. A mortuary and PM room built to the standards of this SHPN 16-01 (or 2002 SHPN 20), is adequate to deal with bodies infected with Hazard Group 3 organisms: M tuberculosis; Hepatitis B; Hepatitis C; and Human Immunodeficiency Virus. HSE emphasises appropriate staff training, procedures and PPE for mitigating risks.
- 4.8. [Minimise transmission risk of CJD and vCJD in healthcare settings](#) 2012-17 ACDP guidance on risk and controls for known or suspected CJD / TSE cases: PMs can be done in any mortuary subject to risk assessment, but a "high-risk" suite is preferred. Stringent precautions, trained staff and strict decontamination protocols are required, e.g. 20,000 ppm Sodium hypochlorite. This may affect boot wash, with move away from floor recess option, to a boot wash decontamination station in the transit area.
- 4.9. The specification of down draught PM tables is preferred, along with appropriate ventilation design and protocols, to reduce risk of infection and odours for staff.

### **Risks related to Formalin Use**

- 4.10. Formalin, a solution of formaldehyde gas in water, is commonly used as a fixative to preserve tissues for microscopic examination. The vapour that arises from solutions exposed to the air is pungent and an extreme irritant to the eyes and respiratory tract even at very low concentrations. Skin exposure may lead to sensitisation. ECHA ([EU 605/2014](#)) recently re-classed Formalin as a Cat 1b carcinogen.
- 4.11. The [Control of Substances Hazardous to Health \(COSHH\) Regulations 2002](#) require that exposure to formaldehyde be controlled as low as possible below the maximum exposure limit of 2 ppm (2.5 mg m<sup>3</sup>) in the air for both the eight-hour and 15-minute

reference periods. Refer to HSE guidance, [Approved Code of Practice](#), [Workplace Exposure Limits](#), and [EH40 2011](#), or their current versions.

- 4.12. The facility users should be consulted to determine precisely what activities involving formalin are being planned. Employers have a duty to limit exposure of their employees and others to formaldehyde under the terms of Sections 2, 3 and 4 of the [Health and Safety at Work etc Act 1974](#), and its related current regulations, codes of practice, [HSE guidance](#) etc.
- 4.13. As well as strict controls over the use, storage and transport of formalin, continuous mechanical ventilation is necessary in areas where formalin is handled in order to minimise the formaldehyde concentration in the air to be as far below the prescribed limit as possible. COSHH requires examination and testing on the local exhaust ventilation of  $\leq 14$  months intervals. Personal exposure to formaldehyde to be monitored  $\leq 12$  months, or when any change occurs which may affect exposure.
- 4.14. Formaldehyde should be provided on tap. The mixing and storage of formalin should preferably take place in the specimen store where continuous mechanical ventilation is provided. If formalin is made up in the dirty utility room, continuous ventilation will be required. Alternatively, formalin may be provided on tap to the point of use, e.g. the dissection benches see [5.39](#) - [5.50](#).
- 4.15. Operational practice should ensure that all work with bodies, organs and unfixed specimens is strictly limited to the 'dirty' activity areas. Specimens should be brought out of the PM room in suitable containers, and only after surface cleansing and decontamination. The specimens store should adjoin the PM room, ideally with a separate access for collecting the specimens. The holding and transfer of specimens within the facility and subsequent transport onwards e.g. to pathology laboratory, require local policies and risk assessment.

### Risks related to Waste Disposal

- 4.16. Waste products in the mortuary and PM room fall into five categories:
  - i. human tissues and body fluids;
  - ii. disposable, generally single-use items such as paper shrouds, swabs, dressings, disposable protective clothing and gloves;
  - iii. discarded syringes, and other sharps; may include some implants;
  - iv. discarded chemicals such as used fixative solutions;
  - v. clean waste arising from office or general activity, may include some implants.
- 4.17. Category *i.* above should be treated with respect and dignity at all times. Waste categories *i.* to *iv.* are a potential risk to health and unpleasant for those who are required to process it prior to final disposal. For safe waste disposal, arrangements for clear segregation and appropriate containment of the different types of waste, from source to final disposal point, are essential. See Scottish Government policy document: [SHTN 03-00 Waste Management Action Plan](#) 2017 and HFS [SHTN 3](#) series part A - D. Also the [National Guidance for Healthcare Waste Water Discharges](#) 2014 guidance from [www.water.org.uk](http://www.water.org.uk).
- 4.18. Most items *i.* to *iv.* will come under the term "clinical waste" disposal, but some may be recyclable. For operational detail and categorisation in colour-coded containers,

see SHTN 3 series e.g. [SHTN 3 Waste Segregation Chart](#) 2015. Also see [HSE Safe working and infection prevention in mortuary & PM room](#) due to be revised in 2018.

- 4.19. Waste organic solvents awaiting disposal will need to be stored in well ventilated areas. See [HSE](#) waste industry guidance, and [4.11](#) above references.
- 4.20. In a mortuary and PM facility, two basic provisions are necessary to enable the safe management of waste. These are:
  - a sluice or sluices for material suitable for direct discharge to drains, subject to the consent of the appropriate water authority; see [National Guidance for Healthcare Waste Water Discharges](#) 2014;
  - adequate secure storage and ventilation for material in bags, packages or drums awaiting removal for appropriate treatment and disposal.
- 4.21. All PM room sinks, floor drains and sluices etc. will be prone to the build-up of tiny elements of clinical waste and therefore should be designed to allow capture wherever possible, facilitating easy removal and daily cleaning, see [5.58](#).
- 4.22. An appropriate rigid container should be used for transporting clinical waste.

### **Risks related to Radioactive Bodies**

- 4.23. Where radioactive compounds have been used for treatment or diagnosis during the life of the subject under examination, this may present a radiation hazard. This hazard extends to clothing and bed linen.
- 4.24. The majority of diagnostic investigations are undertaken with a radioactive isotope known as Technetium-99m. This isotope has a short life of only six hours, and thus PM examinations and embalming, burial etc can usually take place 48 hours after administration of the substance. The external radiation hazard associated with most diagnostic investigations will be small, and special requirements are usually not necessary.
- 4.25. A number of therapeutic procedures are undertaken in cancer centres that involve large doses of unsealed radioactive substances being administered. Most notably amongst these is the use of Iodine-131 to treat thyroid cancer and Strontium-89 for bone metastases. Virtually all the substances used have relatively long half-lives.
- 4.26. The design of the facility should adhere to guidelines set out in the Ionising Radiations Regulations and statutory requirements of the Radioactive Substances Act 1993/ 2000. Further guidance on dealing with radiation risks is in [Appendix 2](#).
- 4.27. Where mortuaries are separate from hospitals and are handling a radiation hazard for the first time, there is a requirement for them to notify the HSE.
- 4.28. The special problems of infection and radiation risks associated with a mortuary and PM facility should be discussed at a local level, and the advice of the hospital health and safety advisor, Infection Control Team member and Radiation Protection Adviser sought in the early stages of planning.

## Risks with Communication and Information Technology (IT)

- 4.29. The safety and security in a mortuary and PM facility go beyond the routine need to safeguard data privacy or misuse. Specific considerations include compatibility with potentially multiple agencies and systems involved in service delivery, but also Press / Media intrusion and communications resilience during an exceptional event or major incident. Such risks require early identification and assessment; see [3.31](#) & [6.126](#).
- 4.30. For communications and IT resilience, the project team must:
- consider multi- agency needs holistically at an early stage;
  - review relevant agencies current policies and IT equipment compatibility;
  - ensure sufficient account is taken at the infrastructure design stage in terms of architecture, engineering and needs of communications and IT, e.g.
    - data storage and data backup needs;
    - consider flexibility of design particularly for exceptional event/ major incident;
  - ensure reliable internet and telephone access in all areas which can be challenging. Particularly where PM facilities are located at basement level, they have dense or solid wall construction, or their body storage refrigerator units obstruct signals.

## Design to Minimise Risks

- 4.31. The risks associated with a mortuary and PM can be minimised not only by careful work practice, but also by good design. It is essential that the design team and others involved with procuring a new or refurbishing an existing mortuary and PM facility appropriately consult with all those operating and using the services. Scottish Government [SCIM](#) and [NDAP](#) provide guidance on this. Project team membership, under the leadership of a project director, should include:
- NHS Board and/ or Local Authority director level representative;
  - a histopathology/ mortuary manager;
  - representatives of public bodies involved in operation or use;
  - representatives of staff and key users of the mortuary service e.g. mortuary Anatomical Pathology Technologists (APT)s, pathologists, hospital ward and hospital mortuary administrators, technical support or bereavement care officer;
  - representatives from infection control, health & safety, radiation protection, IT and estate teams e.g. NHS national water group, electrical group, facilities group;
  - community representatives, e.g. local access groups ([SDEF.org.uk](#)).
- 4.32. This team should draw on both past experiences and future plans for the mortuary / PM service. It is important to canvass the views of the wide range of stakeholders including other organisations affected by the proposed changes. This will include: commissioners, local mortuary service providers and users (e.g. Procurator Fiscal, Police, Funeral Directors, universities, laboratories, external pathologists, member of public / community groups etc), plus current and future mortuary equipment, materials maintenance contractors and suppliers should be widely consulted. Reference should also be made to good practice in other similar operations, both

locally and nationally. Equipment manufacturers should also be consulted at a very early stage in the design process, as the type of PM tables, benches, refrigerators, hoists and trolleys selected can have a significant impact on working and handling procedures, and impact on the area requirements within which they need to operate.

- 4.33. Well considered design subjected to rigorous assessment, is paramount to success. The early establishment of workflows which lessen the contamination risk from the outset can be key. It is well established that to effectively control and minimise the risk of infection, a mortuary and PM facility must comprise of distinct dirty and clean areas, see [Figure 3.2](#). This needs to be considered early in the planning stage, and will determine working practices and flows within these areas. The use of stringent hygiene practices and appropriate disinfection and cleansing agents on working surfaces, together with the immunisation of staff and provision of suitable PPE e.g. protective clothing, is also essential.
- 4.34. All entrances must be controlled and facilitate authorised access only, with bereaved visitors being greeted and directed upon arrival to a waiting room or interview room with WC facilities nearby. If a shared entrance, open waiting area is not appropriate and staff traffic through the public areas should be kept to a minimum. Appropriate access controls are required, with practical consideration given to how limited staff can control varying entrances, especially during out-of-hours or at busy times.
- 4.35. Security should be tailored to local requirements, functions and scale. For example, a dedicated local alarm panel or a more complex security system which forms part of a larger campus. Security features to consider may include motion detectors, door contacts, window contacts / seismic window sensors and sounders with remote monitoring to a manned station (24hr/ 7day). CCTV security systems are now commonly required for entrances, the site perimeter, and body stores. This may also be an option for the service yard, reception and visitors' area.
- 4.36. Both general and sector specific guidance on mortuary and PM risks, controls and design are available from [HSE](#), e.g. [moving & handling](#), [slips & trips](#), [sharps](#). By 2018 a new combined HSE publication is due to replace both: [Safe working and prevention of infection in mortuary and PM room](#) 2003 and [Risks of Infection at Work from Human Remains](#) 2005. Notable other references include: Health Facilities Scotland ([HFS](#)) guidance e.g. [SHFN 30 HAI SCRIBE](#) 2014 or Safety Action Notices e.g. [SAN\(SC\)02/33 2002](#); and Health Protection Scotland ([HPS](#)) guidance e.g. [National Infection Prevention and Control Manual](#); [Infection Prevention and Control during Care of the Deceased](#) 2014; [Risk Assessment for Forensic Investigation of Drug-related Anthrax](#) 2013.

## 5. Specific Functional and Design Requirements

### Introduction

- 5.1. This Section provides guidance on the functional requirements and design implications for each of the key functional spaces within the mortuary and post mortem (PM) facility.
- 5.2. Activities, equipment, detailed environmental conditions and finishes of walls, floors and ceilings are given in the ADB Room Data Sheets (3.49). Reference should also be made to the relevant NHSScotland facilities guidance publications, e.g. HBNs core elements and SHTMs building components, at [www.hfs.scot.nhs.uk](http://www.hfs.scot.nhs.uk).

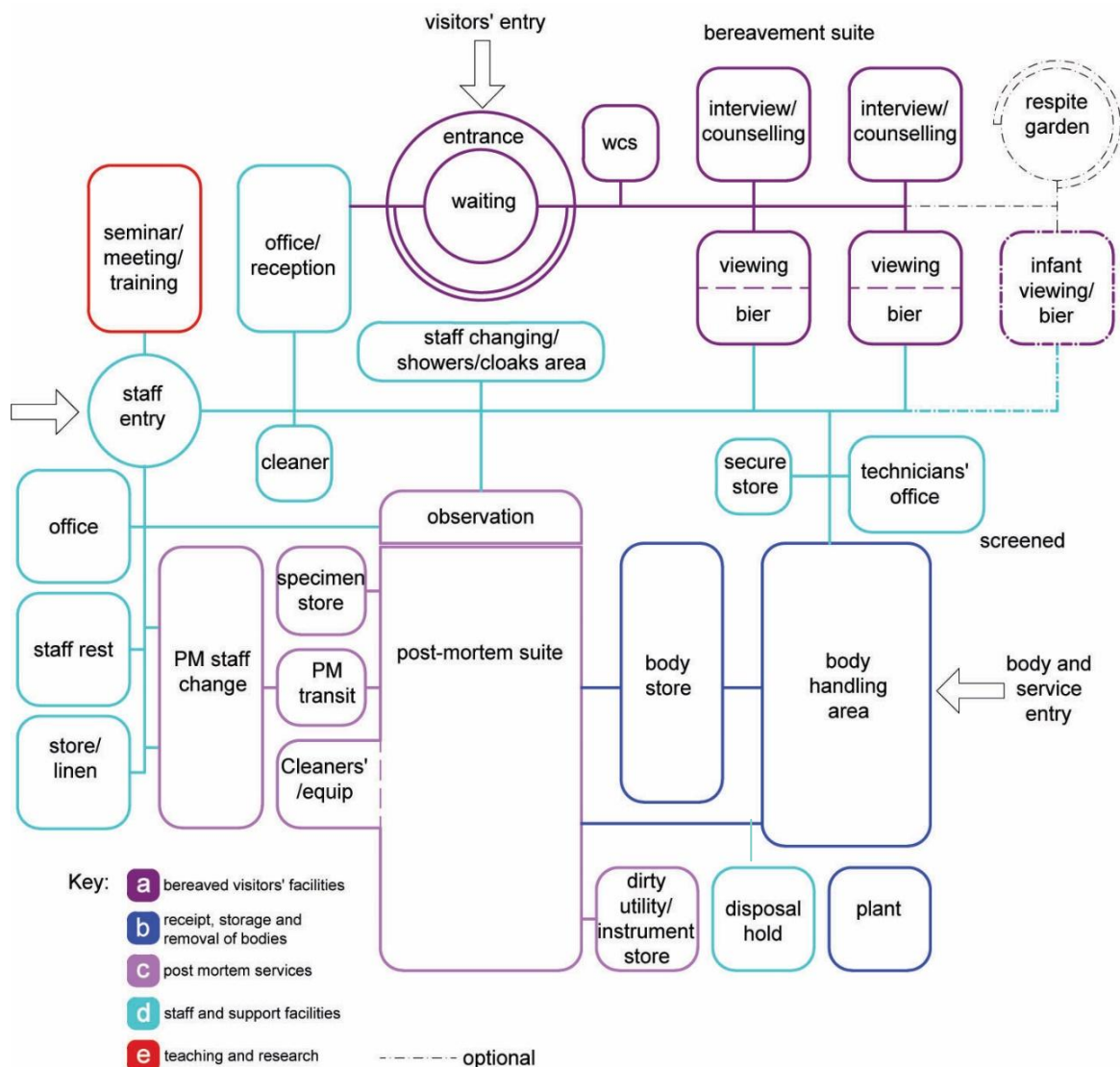


Figure 5.1: Relationships of key functional elements in a regional facility

### Entrances and Signposting

- 5.3. As outlined in Section 2, the number of entrances and approach to the mortuary and PM suite will be determined by the scale of the facility, its location and how it may relate to adjacent services. Generally entrances should be obvious to their function



and be kept to a minimum for security. The facility will often require three entrances, one for bereaved visitors, one for body delivery / collection and a third for staff, though in smaller facilities this can be shared with visitors. Where part of a larger building, e.g. hospital, a direct external entrance for body delivery / collection is still required, however a shared approach with several entrances off a communal 'street' is common. In this case, careful consideration should be given to the discrete flow / arrival, particularly of bodies e.g. automatic body entrance doors are not to open and reveal all to the passing public. All external entrances are normally locked to facilitate authorised access only.

- 5.4. Depending on local requirements, functions and scale, separation of entrances may benefit visitors and staff, i.e. reducing staff traffic through serene visitor areas, particularly in larger, multiple agency units with a busy 24hr access. Most visitors will be by appointment and / or escorted upon arrival. Multiple visitors' entrances should be avoided as they are not supportive of equality, security or wayfinding ([SHTM 65](#)). Nearby parking is required for visitors and possibly police (for forensic IDs).
- 5.5. Preferably, the visitors' external entrance will be lobbied. Access should be overlooked by a staffed area, and have a bell, or audio / visual intercom. Where 24hrs access or forensic use, consider both CCTV monitor and visual intercom. Entry leads to visitors' waiting area(s), with interview/counselling room(s) and WC facilities off. Clear and appropriate signage and visual / audible notice to be provided so visitors know when mortuary staff are available, or are being summoned.
- 5.6. The body and service entrance must not be overlooked from bereaved visitor areas, bedroom windows or public gathering spaces, e.g. cafe. The external entrance for body receipt / removal should be screened from general public view. The layout should naturally inhibit public looking into the body handling areas by the provision of a chicane, lobby, window height, or screening e.g. planting. The body entrance will be overlooked by a staffed area, e.g. technologists' office, unless audio-visual intercoms and CCTV are in operation. Security controls, alarms, dedicated parking bays and sufficient space for large vehicles to safely manoeuvre and load / unload discreetly are required. A discreet approach / exit route is desirable, but not essential as most vehicles for body transportation are inherently designed to be discreet.
- 5.7. Regional facilities, which include large forensic PM suites, should have an entirely secure service yard that cannot be overlooked by the general public. The facility body entrance must be covered or entirely enclosed, e.g. drive-in garage, to secure against Press intrusion during body transfer to vehicles.

### **a. Bereaved Visitors Facilities**

- 5.8. The bereaved visitors' suite should be a serene and reassuring environment: choice of colours, textures, art and lighting are important. Acoustic design should be carefully specified to minimise noise transference from other parts of the mortuary. Natural lighting and ventilation will preferably provide user control and choice, and offer pleasant external views where possible. Artificial lighting should further enhance the internal environment: soft lighting using table lamps, subtle wall washing and dimmable controls within the viewing and bier rooms. Ventilation should be carefully designed to prevent odour transfer from other parts of the mortuary.
- 5.9. As a minimum this should comprise a visitor's viewing room and a bier room for one body. Curtains, blinds or similar are required across a window / glass partition with a

door, or across glass doors; to separate these rooms. This will allow visitors both time to prepare and choice in how they interact with the deceased. Access should be close to the visitors' entrance, waiting room(s), interview / counselling room(s), and sanitary facilities. Equality of access for all is essential, including young, elderly, those with hearing or visual impairments and wheelchair users, etc., e.g. glazing height between the viewing and bier room will allow both sitting and standing viewing. The environment should promote calm reflection without affinity to any particular religion. A mobile phone signal is needed, and access to a cordless phone required in emergency. Provision of drinking water facilities should also be considered.

### Waiting room

- 5.10. The visitors' waiting area, is preferably one or more rooms, which can double as an interview / counselling room, and will be the first area visitors are escorted or directed to upon arrival. It should be visible from the visitors' entrance, and the admin / reception area, if possible. It should be serene and non-institutional, see [5.8](#) & [5.11](#) below for environmental requirements. An adjacent wheelchair accessible WC is required. It should also be close to the body viewing room, and be readily accessible to mortuary staff. An open waiting area may be distressing and uncomfortable for visitors to be in public view, and appropriate only if a separate staff entry and short term wait e.g. <10min.

### Interview/ Counselling room

- 5.11. There should be a sufficient quantity of interview / counselling rooms to allow appropriate visitor gathering and segregation if required, both pre and post viewing. The environment should be non-institutional, with soft furnishings, art, comfortable chairs, a small table, heating and lighting should be, controlled in room, with natural light and ventilation if possible. These rooms are shared across agencies, so may be used by mortuary staff, police or others, to comfort the bereaved, explain procedures following a death or PM, or discuss tissue donations, findings from PMs etc. An adjacent wheelchair accessible WC is required. The room should be near the visitor entrance and body viewing, but also easily accessible by staff.
- 5.12. Consider the wider range of bereavement care requirements for visitors. A bereavement centre may be provided within the mortuary, or located within the community. It may deal with many aspects of counselling following a death, including issuing the death certificate, retrieval of the deceased's belongings, tissue donations and advice/ information on dealing with bereavement. Different elements are often provided by multiple agencies, e.g. social care, charities and voluntary sector.

### Viewing and Bier room(s)

- 5.13. The viewing room will directly connect with the bier room. The environment should be serene with soft acoustics and privacy from the rest of the mortuary. Furnishings are to be homely with range of soft chairs and space for wheelchairs and children's prams/ strollers. When visitors are ready the escort will open the curtain / blinds, or connecting door for those who may wish closer access to the body. The length of stay may vary and the staff escort may leave to allow privacy, but be 'close at hand'. Controls, e.g. curtain / blinds, doors, heating, dimmable lighting are to be accessible by the escort from the viewing room. Ideally curtain / blinds to both sides, e.g. integral blind operated by bier staff, and heavy curtain to cover the full viewing wall. A handrail at the window, or furniture nearby, will provide support to viewer, [Fig:5.14](#).

- 5.14. In large facilities, a minimum of two viewing / bier rooms are required, particularly where providing NHS and forensic services. At least one should be provided with a wall mounted CCTV monitor, again controlled by staff escort. This CCTV links to a camera in the body handling area, and allows for body viewing remotely in monochrome for those visitors who wish it, as well as forensic identification.
- 5.15. The bier room requires access from both the **a.** viewing room and **b.** body handling. The body may be prepared for viewing in the body handling area and laid out on a draped bier trolley which is then wheeled into this room. Careful design of the connecting doors is required to allow easy, noiseless passage of the trolley, plus provide visual and acoustic isolation while viewing is in progress. For infection control, the bier room flooring should be impervious and walls washable, but as non-institutional as practicable for bereaved visitors to view the body.

Both the viewing room and the bier room should be capable of minor adaptation to suit the needs of all religious beliefs, and for viewing bodies of infants appropriately. Ritual washing is often left to Funeral Directors, however if EIA requires this facility, (see 3.11) it should be sited in a wet room accessible to visitors and to bier room. Religious beliefs may have an effect on the orientation of this body wash station.



Figure 5-3: Viewing rooms in QEUH Glasgow and in RIE Edinburgh

**Project option: separate infant viewing suite**

- 5.16. Larger centres which include specialist paediatric and maternity facilities, where infant, still birth and pre-natal loss volumes justify the addition of a dedicated viewing room, are likely to benefit from a combined viewing / bier room. This more comfortable environment, without a screen barrier, enables parents to sit and hold their infant. See Fig:2-2 and Fig:5.9 for QEUH child bereavement centre.
- 5.17. Access to nature, e.g. a garden. outdoor seating; is considered greatly beneficial.

**Project option: Quiet room/ spiritual space, garden room and ritual wash**

- 5.18. Access to or provision of, a quiet room / spiritual space or garden room for visitors to spend contemplative or remembrance time is to be considered. It may be part of, or

slightly separate, from mortuary, e.g. part of larger campus / gardens. This option could benefit from endowment or charitable funding, e.g. SANDS. Following EAI (see 3.11) service may benefit from access to ritual wash space.

### **Project option: Charitable funding**

- 5.19. Facilities may greatly benefit from charitable funding, e.g. SANDS. This extra community engagement is welcome; however it must be subject to standard governance etc., e.g. [SHFN 30](#) risks for multi-disciplinary agreed functions and design solutions, to ensure the investment performs operationally. Note that the actual costs and risks in-use can be far in excess of any initial capital contribution provided.

## **b. Body Receipt, Storage and Removal Facilities**

- 5.20. A refrigerated body store is required:
- to limit decomposition while burial or cremation arrangements are made;
  - to hold bodies (and specimens) for longer periods in conditions of security;
  - to maintain bodies (and specimens) in a condition for optimal scientific findings from a PM and any subsequent analytical investigations;
  - to hold all pre-natal loss remains occurring on NHS premises.
- 5.21. Bodies normally remain in the mortuary for 1 - 4 days. However the period can extend to weeks or occasionally months, if delays occur, e.g. next-of-kin are difficult to trace, disputes arise, or particularly complex investigations are required. Optimally: if  $\leq 30$  days refrigeration at 4-6°C; if  $> 30$  days<sup>9</sup> body to be frozen at -20°C.
- 5.22. The body handling area should adjoin PM room, with nearby access to the bier room. These areas should be designed to be isolated both visually and acoustically from the viewing areas and visitor suite. Space is required for parking and manoeuvring trolleys, and body weighing if required; either on a separate weighing machine or on a trolley which incorporates a weighing mechanism. A bay within this area may also be required for live, secure CCTV link ID to a viewing room.
- 5.23. Space is also required in this suite for the:
- receipt of bodies on trolleys;
  - labelling or identification of bodies and logging details in a PC (or book);
  - removal, recording and storage of personal effects;
  - preparation, cleaning and placing of shrouds/ bags on bodies;
  - transfer by trolley/ hoist of bodies to the refrigerated body store;
  - removal and transfer of bodies from the body store to PM/ bier rooms;
  - removal, identity confirmation and hand over to Funeral Director or police.
- 5.24. Careful consideration should be given to the dimensions, manoeuvrability and storage of body trolleys and mobile or fixed ceiling hoists, (see [Section 8](#)). This equipment can have a vast impact on space, fittings and finishes, e.g. some hoists

<sup>9</sup> [www.hta.gov.uk/post-mortem-sector](http://www.hta.gov.uk/post-mortem-sector) Human Tissue Authority (licensing ref PFE2c)

are incompatible with some refrigerated body compartments. Confirm hoists, body stores, PM tables etc. are fully coordinated as each is procured and that ceiling heights, fixtures / services and floor surfaces allow their smooth operation. Hoists must be able to go high, low and deep enough to efficiently engage the retraction / insertion mechanism and retrieve bottom and top trays within the body store. Turning circles of the largest equipment should be agreed, see [Appendix 3](#).

- 5.25. If bodies are to be prepared, undressed or cleaned in the body handling area, there should be at least one screened bay to ensure some privacy.
- 5.26. Space to operate a computer with appropriate services / data connection, and a writing surface are required within the handling area or an adjoining office, e.g. technologists', to record the receipt and discharge bodies and personal effects. Note that all body storage spaces will need frequent decontamination and cleaning, requiring electrical and other equipment removal.
- 5.27. The body store consists of a number of labelled compartment bays (optimally: refrigerated at 4-6°C; or frozen at -20°C). Each bay contains between three and five tiers for holding the body trays upon which bodies are stored. Individual compartment bays may either be physically separated from one another or may be open between one another in a continuous run. The former is useful to isolate high / unknown risk bodies or alternatively body bags can be used. Body bags are to be used for all cases of known high infection risk; however the risk status is often unknown.
- 5.28. Body store bays may have single access within the body transfer area or dual access from both the PM room(s) and the body transfer area. Dual-sided, pass-through fridges; are more expensive and require space on both sides to allow for the extraction of bodies, but preferable for both hygiene and efficiency. They also provide a physical barrier and clear demarcation between clean and dirty.
- 5.29. Depending on the facility scale, a proportion of the body cold storage bays should be freezers, and extra wide to allow for bariatric bodies; see [Section 7](#) for indicative quantities. Consideration is also required for storage of pre-natal and infant remains, where this is more likely to occur, e.g. maternity or paediatric services nearby.
- 5.30. Body storage safety is a prime concern. A robust security policy and design response is required, particularly but not only for, forensic cases. This should be integral to the layout design; access controls etc., and / or locks on each body store bay. If used locks are used, they must be operable from inside the body store bay for safety. All doors to the refrigerated compartment bays must open out to give access to the body trays and also be constructed in such a manner that they will not fall closed while in use. High quality, robust hinges and ironmongery are required.
- 5.31. All compartment bays should be robustly designed for easy and regular maintenance, e.g. easily cleaned. Internal rollers and racking holding body trays should be removable to permit clear entry to the compartment bay for cleaning.
- 5.32. The refrigeration plant is to be resilient and fully accessible for maintenance.
- 5.33. Clinical wash basins ([SHTM 64](#)) and wash-down points must be provided in the body handling area. The floor should be self-draining towards a drainage outlet.

- 5.34. Personal effects may often be left on deceased unless instructed by next-of-kin or police, prior to body uplift or PM. These should be fully documented and signed for. Personal effects secure storage is to be provided e.g. locked store or lockers.
- 5.35. The frequent movement of heavily-laden, mortuary trolleys, and mobile hoists, have potentially severe safety and maintenance implications. Corners, doors and exposed areas of walls must be protected against damage. Doors and frames must be robust and wide enough to reduce the chances of collision and consequent damage to property and injury to staff.
- 5.36. The parking of trolleys and the hoists when not in use, requires a large bay or alcove, readily accessible, but also out of the way to avoid collisions.

### Finishes

- 5.37. The floor of the body handling area must be robust, non-slip, and impervious to withstand daily hose cleaning and disinfectant. The floor should self-drain, i.e. fall without water ponding, to frequent drainage gullies or short section channels. The whole floor system is to be easily maintained, jointless, durable and self-covered at wall junctions. Wall and ceiling finishes should be robust and withstand daily washing.

### Ventilation

- 5.38. Mechanical ventilation should be provided to the body handling area so that air flows from this area into the PM room. Extraction ideally should be as low as practicable. A lobby is required if there is access from outside, e.g. vehicle bay, public corridor, directly into the body handling area; to aid security, privacy and thermal comfort.

## c. Post Mortem Facilities



**Figure 5-4: PM 6-table suite with observation room at rear, QEUH Glasgow**

- 5.39. The PM room, which is also known as an autopsy room, serves to carry out several functions. These include the opening of bodies, the weighing and dissection of organs, and demonstration of PMs to clinical staff. The police or other authorities

may be present during forensic examination procedures but are most likely to be in the observation area. Bodies are brought from the body store on a hoist or trolley and transferred onto a PM table. In the case of full-body handling systems, the body remains on the store body tray during the PM, secured to a PM station. This option must ensure the deceased is cleaned and dried fully underneath prior to being returned to body store. The dissection of organs should take place on a nearby dissecting bench, often running along a length of wall. The observation area should overlook a dissecting bench and PM beyond. CCTV above the PM table will allow a closer view of procedures in the observation area, with the facility to record if required.

- 5.40. A dual-sided refrigerated body store is preferred to allow access to the compartment directly from the PM room. Appropriate space is needed in the PM room for safely manoeuvring trolleys / hoists in front of body stores, loading or transferring bodies onto the PM table, and for storing and using a second hoist (if required), without risk of collision. Equipment selection has serious consequences for space and layouts; see [Appendix 3](#) for critical dimensions.



**Fig 5-6: PM 4-table suite with observation area at rear, Royal Victoria Hospital(RVH) Belfast**

- 5.41. PM rooms are to be sized for anticipated volume of cases, plus resilience. Three or four PM tables will permit the pathologist(s) to carry out efficient exams in one attendance in larger facilities. A two table provision is a typical configuration for lower volumes. Working efficiency is generally improved if they are located within the same room. Currently no facilities in Scotland have only one PM table / room. See [Section 7](#) for typical schedules of accommodation.
- 5.42. Tissues, organs and / or fluids obtained during PM examination are infused in fixative in various-sized containers. This work is carried out at the dissection bench. These samples may be held for a short time within the PM suite or specimen store prior to dispatch, e.g. to the pathology laboratory. An option for a dual access specimen store (to PM and clean / staff corridor) could benefit flow, but only if appropriate security and ventilation solutions are in place.

- 5.43. PM tables / trolleys are to be easy clean, free from traps for potentially infected material and allow provision for water flow. Down-draught ventilated PM tables See [Fig 5-7](#) are often preferred, despite their challenges to install, clean and maintain, as they offer microbiological and odour benefits over conventional PM tables. These need regular system verification and easy cleaning access to the underside of the perforated top e.g. removable short sections. Some PM rooms, e.g. [Fig 5-6](#) use a full-body handling system where the body tray is moved by ceiling hoist and “plug” into the table on brackets (RVH); or [Fig 5-15](#) has plug-in tilting trolleys (Dundee). These both simplify manual handling and floor services, but RVH has complex ceiling coordination; and Dundee utilises a large open-plan cold store.



**Figure 5-7: PM 3-table suite, with observation room on left, at Edinburgh City mortuary**

- 5.44. Adjustable-height tables should be provided to comply with Health & Safety at Work and Manual Handling Regulations for working heights. Consider also dissection bench height(s). A 180° rotating table adds flexibility and demonstrates the ‘other-side’ to viewers in the observation area, though CCTV may negate the need for this.
- 5.45. Each PM table should have a hot and cold water supply (see [6.51- 6.56](#)) and a waste outlet ~75mm diameter, fitted with a suitable, easily accessible trap and drain pipe. The table should be fixed to the floor, in proximity to a floor drain.
- 5.46. During PM examination, there may be a need to dictate findings, take X-rays, examine X-rays taken earlier, and use portable electrical equipment. Safety precautions are required when using fixed and portable electrical equipment in the PM room. Services outlets should be provided both overhead and on the table plinth for ease of access, see [Section 6](#) for details.
- 5.47. The dissecting bench should have raised edges and slope to a sink(s), which should be deep enough for the washing of organs. There should be provision for running water over the bench itself. The drainage flow of water should be checked and confirmed. The positioning of sinks along the dissecting bench should suit the pattern of working agreed upon by the staff.



- 5.48. A dissecting bench with integrated sluice is required for the opening of intestines and disposal of their contents. A low-pressure water pipe should be provided, preferably in the wall of the sink(s). A standing waste is required and a filter trap is necessary. The observation area should oversee a dissecting bench. Access to power outlets where required, should be either water resistant 'IP65' rated with robust hinged covers, or if possible should be located away from a direct exposure to water and splashes. See [Section 10](#) references, e.g. National Guidance Healthcare Waste Water Discharges 2014 [www.water.org.uk](http://www.water.org.uk)
- 5.49. Risk assessment should be undertaken on PM staff safety e.g. an emergency eye wash station or appropriate tap / shower in or near the PM suite.



**Figure 5-8: Dissecting benches, at Glasgow & Edinburgh PM suites**

- 5.50. The dissecting bench and immediate surrounding splash area must be robust and easily cleaned daily, regularly maintained, and have no traps or gaps for infected material to be lodged. Ideally it should be wall-mounted with integral splashback, and have a specific dissecting station for each PM table, with access to a sink, raised stands and weighing machine. Each station should also have a linear exhaust ventilation grille to reduce infection risk and odours.

### **Finishes and fittings**

- 5.51. The specification of mortuary and PM facility fittings, finishes etc. need to be appropriately robust to withstand their heavy use, i.e. regular trolley impact as well as vigorous cleaning regimes. Materials should be selected to be fit for purpose, minimising redecoration and replacement. Floor and wall surfaces to at least shoulder height (~1450mm above floor), or ideally to ceiling, should be impervious to water and disinfectant and durable to daily hose / wash-down cleaning. Refer to SHTM Building Component series e.g. [56 partitions](#), [58 doors](#), [60 ceilings](#), [61 floors](#).

- 5.52. PM room walls and partitions to be appropriately robust, sealed and jointless, with access panels, ledges or gaps carefully designed to be minimised or eliminated wherever possible. They should withstand high levels of humidity and daily wash-downs. The finish and substructure should be durable; impervious to water and disinfectant, to at least shoulder height (~1450mm), or to ceiling where surfaces are subject to heavy wet use, i.e. spray from daily hose cleaning, e.g. near floor, dissection bench or cleaning station.
- 5.53. PM room doors are to be appropriately robust, sealed and jointless. If vision panels are required, they should be specified with no ledges or gaps. They should withstand high levels of humidity and occasional wash-downs. The finish and substructure should be durable; impervious to water and disinfectant, to at least shoulder height (~1450mm), or to ceiling where surfaces are subject to heavy wet use, i.e. spray from daily hose cleaning, e.g. near floor, dissection bench or cleaning station.
- 5.54. PM room floors must be very hard-wearing, jointless, non-slip, coved and sealed at wall junctions. The floor should fall sufficiently and evenly, to be self-draining towards gullies, or channels. It is imperative that outlets are at the lowest floor level with falls to drains to ensure no water pooling, and to minimise slipping and infection hazards. Drains are to be designed for easy and regular cleaning, e.g. channel gratings in easily lifted short sections, allowing disinfection by submersion in a sink or container.
- 5.55. An appropriate physical barrier must be risk assessed to reinforce infection control good practice whilst providing equality of access (EIA) and mitigating risks, e.g. trips at the key exit/entrance(s) to the PM room. A boot trough floor recess within the PM doorway of the transit area(s) is one option, but will require careful design to enable easy filling, cleaning and drainage, whilst reducing slip risks. An alternate option is a 'step-over' barrier, with a CJD (see 4.8) boot wash station within the transit area.
- 5.56. PM room ceilings should be sealed and jointless, with access panels minimised. It should withstand high levels of humidity and occasional wash-downs. Acoustic design must also be considered, as the ceiling is the easiest surface to provide the sound absorption essential to ensure appropriate staff audibility and wellbeing.
- 5.57. PM room fittings are to be appropriately robust, sealed and jointless. All fittings should be ergonomically designed, with minimal ledges, gaps or dishing. Porcelain and stainless steel are suitable materials for sinks and benches; although porcelain has a high-quality finish, it is expensive and liable to damage. Plastic, laminate, wood and wooden fittings are not suitable as benches / work surfaces.
- 5.58. PM room sinks and drains must include a sump pot to reduce the accidental risk of human tissue washing away. Drains should be of sufficient large diameter to limit blockages, e.g. sink waste pipes. All taps should be elbow-operated or hands-free. Refer to [SHTM 64](#) Sanitary fittings. [SAN \(SC\) 09/03](#) 'Safety Action Notice' recommends eliminating the use of flexible water supply hoses if possible, and to risk assess WRAS approved EPDM free hoses only, if required.
- 5.59. Special design consideration should be given to joints at entrances, corners, walls, fittings etc. that will be subject to heavy and / or wet use. Careful detailing and specification to prolong the life cycle of materials in vulnerable areas is required.

- 5.60. The type of PM table, body storage and handling system proposals must be co-ordinated with surface finishes, e.g. dual sided body storage needs ~2m level floor zone for safe hoist operation.
- 5.61. Users should be consulted at an early stage to risk assess activities and the design of PM facility fittings, finishes etc. Identified key risk areas will require rigorous assessment, e.g. a full-scale mock-up for user testing and agreement, constructed at the earliest opportunity, and certainly prior to handover acceptance.



Figure 5-9: Waiting, with soft light and furniture, QEUH Glasgow and RIE Edinburgh

### Lighting and acoustics

- 5.62. The PM room is an area where staff can be working for extensive and intensive periods of time. Where practicable, daylight and views to the outside world should be considered to promote wellbeing, e.g. windows, skylights, see also [3.33](#) - [3.41](#).
- 5.63. The distribution and location of windows should take into account the need for ample daylight, yet maintain security and privacy, and prevent glare or excess solar gain. Windows are generally preferable to rooflights but consideration must be given to minimise ledge design, and ensure easy cleaning and maintenance. Black out may be required for forensic work / photography, e.g. blinds. PM window units must be fixed and non-opening to avoid loss of control of air movement by the ventilation system, which is crucial in this area. Glazing should preferably face north, or be diffused to minimise shadows; and should not affect colour tones; (see [SHTM 55](#)).
- 5.64. As stated in [6.7](#)- [6.10](#), artificial lighting in the PM room should supplement natural lighting, providing low-contrast glare-free background illumination and high performance, robust task lighting. Ceiling lighting should provide good, even, general illumination ( $\geq 300\text{lux}$  at workbench height). Local task lights ( $\geq 1000\text{lux}$ ), on articulated arms must cover the whole length of each PM table and the dissecting benches. Approved colour-rendering light source and high efficiency luminaires, sealed or designed to ensure no dust ledges; (see CIBSE Lighting Guides LG02).

- 5.65. Acoustic control / sound absorption is needed in the PM room to provide a suitable working environment, particularly where intercom or dictating is required. The option to play music should be considered, e.g. ceiling mounted speakers. There must also be control of noise breakout to any bereaved visitors' areas.

### Ventilation

- 5.66. Special attention must be given to the need for adequate ventilation in the PM room, and the provision of local extract systems (LEV):
- to minimise the spread of offensive odours;
  - to minimise the possibility of infection of staff and visitors by contaminated airborne droplets;
  - to maintain a comfortable working environment;
  - for public safety and security, e.g. COSHH, LEV safe discharge locations.
- 5.67. The air supply to the PM room in conjunction with the extract should promote good air distribution without generating undue turbulence at the working stations. The specification of down draught PM tables is preferred, along with appropriate ventilation design to reduce risk of infection and odours for staff. Ventilation at the rear of the dissecting bench is essential, and the exhaust volume resulting from a properly designed bench and table, will comprise a significant proportion of the total extract from the PM room. Supplementary exhaust grilles should be sited at low level. The control of air movement in the PM room may be achieved partly by using air supplied to the body handling area, the observation area (when provided), and by air drawn into the PM room from other areas of the accommodation.
- 5.68. The design philosophy for air movement control and the recommended supply and extract rates are detailed in [Section 6](#).
- 5.69. When not in use, the ventilation system for the PM room should be energy efficient and able to be shut down, provided it is allowed to run on for a limited period (a minimum of 30 minutes) after final cleaning of the room; to purge residual odours and to assist in the drying of washed surfaces.
- 5.70. No naturally ventilated space should link directly with the PM room, without an intervening lobby or corridor to reduce the dirty air outflow risk from the PM room.

### Project Option: PM table in a separate room

- 5.71. Early in the briefing process, when the functional scale and primary activities proposed to be carried out in the post mortem suite have been established, and if case volume / resilience justifies, consideration to be given to the benefits of providing a PM table in a separate room, with / without own support rooms for:
- **forensic PMs** – allowing lengthy examinations, privacy, visitor attendance e.g. police, photographic crew/ equipment, without disrupting routine work;
  - **paediatric, teaching or research PMs** – as above, without disrupting routine work; the first of which may also benefit from a paediatric store;

- **high risk PMs** – for deceased with high levels of body deterioration, or known/ suspected infection, without disruption of routine work and reducing the area where there is risk of contamination and extent of cleaning.
- 5.72. Most PM service facilities may occasionally undertake the some or all of the above functions, and will simply segregate using time, i.e. carry out specialist PMs at end of a normal PM session or on a separate day.



Figure 5-10: Single, segregated PM table in 'high risk' room, QEUH, Glasgow

### PM Room with Forensic Facilities

- 5.73. If a PM room is designated, or used most frequently for forensic examinations, the following additional considerations and equipment should be provided:
- Observation room, with 2-way audio/visual communication, see [5.91](#);
  - Audio/visual recording and 2-way communication to a large meeting / exceptional event/ major incident room and /or to an 'off site' facility, see [5.116](#) ;
  - Additional office accommodation/ hot desks for other agencies;
  - Additional area around the PM table for photography crew and equipment;
  - Ceiling mounted white screens for photography;
  - UV Light and blackout screens for DNA work;
  - Additional and secure storage e.g. evidence, equipment.

### PM dirty utility/ instrument store

- 5.74. This room should open directly off the PM room. It serves as a dirty utility room and for the storage of instruments. It is preferable for the door to swing into the dirty utility. Access from the dirty utility to the disposal hold is a project option. Options for instrument storage, transportation and decontamination should be risk assessed, e.g. local or central autoclave, ultrasound cleaner, washer-disinfector; all as current guidance, e.g. BS EN ISO15883, HSE, SHTM 2030, SHFN 30, GUID series. Chemical solutions may also be prepared or dispensed in this room, according to local policy, e.g. formalin, see [4.10](#).
- 5.75. Sinks will be required for washing and disinfecting bowls and instruments. Waterproof aprons, if used, will also be washed in this room, and facilities are needed for them to be hung to dry.
- 5.76. The reserve stock of instruments, unused specimen jars and chemical solutions may be held in this room.
- 5.77. A wash-basin with hands-free tap controls is needed. A flushing sluice may be sited in this room or immediately outside it within the PM room.

### PM cleaners' room/ equipment bay

- 5.78. This room / bay should open directly off the main PM room. It should house the cleaning equipment required to ensure the PM rooms are kept clean, safe and hygienic at the end of every PM session, e.g. floor scrubber. It may be used for adjacent 'dirty' areas e.g. separate PM rooms, body store, but this cleaning equipment should be segregated from all 'clean' activity zones; see [Figure 3-2](#).
- 5.79. This space may also be used for cleaning contaminated equipment e.g. trolleys.
- 5.80. If there are multiple PM rooms, consider a 'cleaning station' within each, for spot cleaning between sessions.



Figure 5-11: PM room cleaning station; PM transit/ boot room, both at QEUH, Glasgow

### PM transit/ boot lobby

- 5.81. Controlled access to and from the PM room is preferably via the PM transit lobby, adjoining the PM staff changing area. It separates 'clean' from 'dirty' activity areas.
- 5.82. All persons entering the PM room must change into protective clothing, boots etc, (PPE). Suitable shelving, racks and hooks are to be provided within the PM transit lobby for the storage of PPE and their decontamination/ disposal.
- 5.83. All persons should discard used protective clothing within the PM transit lobby or PM room. Separate bins should be provided for the disposal of single-use items, and collection of re-usable items pending decontamination / cleaning. A decontamination station and space to dry / store items, e.g. boots should also be provided. The space and layout must reinforce clean and dirty flows to avoid cross contamination.
- 5.84. Clinical hand wash facilities with hands-free tap controls should be provided for washing hands and faces, following the removal of protective clothing, see [SHTM 64](#). A mirror will allow staff to check for contamination and cleanliness.
- 5.85. Prior to entry or on exit of the PM room, all persons must pass through a 'transit' area, incorporating a physical barrier and decontamination facilities to suit both risk and equality impact assessments (EIA). Clean PPE and boots must be worn by all participants or observers of PM procedures. PPE are mostly discarded, with re-usable items e.g. boots, cleaned, hung up to dry and stored in the PM transit area, see [5.55](#) options.

### Staff Changing suite

- 5.86. Staff Changing has two functional requirement levels:
- **core:** for all staff - storage of coats and personal belongings; standard toilet and shower provision with changing facilities. These should be within, or in very close proximity to this facility/ department.
  - **PM suite:** for all authorised personnel, staff and visitors, prior to entering or exiting the PM room(s) – storage for all outer garments (overcoats, jackets and hospital white coats, worn outside the mortuary). Toilets, showers and changing facilities are also required. These link from a controlled corridor into the PM transit/ boot lobby, which leads to the PM room.
- 5.87. Changing facilities must suit local policy and follow the Equality Act range of 'protected' characteristics, e.g. disability, transgender etc., as identified in a project EIA. There are two main layout options, with a wide range of sub options:
- **'open plan'** single, flexible, changing room, zoned by equipment e.g. lockers; with WC and shower room(s)/ cubicle(s) off; at least 1no each function to be accessible to each agreed 'protected' EIA characteristic;
  - **'traditional'** multiple (≥3no) gender segregated, small changing rooms, each with lockers, ≥1no WC and shower, so all functions are accessible to each agreed 'protected' EIA characteristic.
- 5.88. The functions and scale of the mortuary / PM services will affect the quantity of the staff changing suite provision. However generally, the 'open plan' option above is

more flexible and may also be more economic in space / operation; therefore [Section 7](#) schedule of accommodation assumes this option.

- 5.89. PM suite WC / wash areas should allow face and hand washing in a clinical or general, wash basin. A mirror at each allows users to check for cleanliness. An option to provide a WC within the 'dirty' zone accessible from the transit area allows use during long PM sessions, without compromising 'clean' zones.
- 5.90. The requirements for staff changing should be established early in the briefing process, when the overall scale, key activities and projected numbers are known.

### Observation Area

- 5.91. Depending on the scope of the facility, a PM room may require an observation area for police, students etc. to view PM procedures. There are two options: 'open plan', e.g. [Fig 5-13](#) Royal Victoria Hospital (RVH), Belfast; or a physically separate room, e.g. [Fig 5-12](#) QEUH Glasgow and Edinburgh City mortuary. The only entrance to the observation area should be from outside the PM room. Dundee Police Mortuary combines observation, study and hot-desks into multi-purpose L-shape, [Fig 5-15](#).
- 5.92. A dissecting bench should be provided along the wall of the PM room adjoining the observation area for the demonstration of pathological findings in organs. An angled, partial or full-height glazed divider will protect viewers from splashes during the demonstration of findings and should be designed to provide a good view of the dissection bench and at least 2no PM tables.
- 5.93. Video / audio intercom facilities should be provided enabling two-way speech. The observation area can accommodate 1–16 people. Two options are given in [7.20](#) schedules. The larger room assumes teaching, and project EIA will determine access requirements of this as a 'public' area, e.g. if tiered floor / fixed seating used to optimise sight lines, a flat area (or CCTV) for wheelchair observation is required.

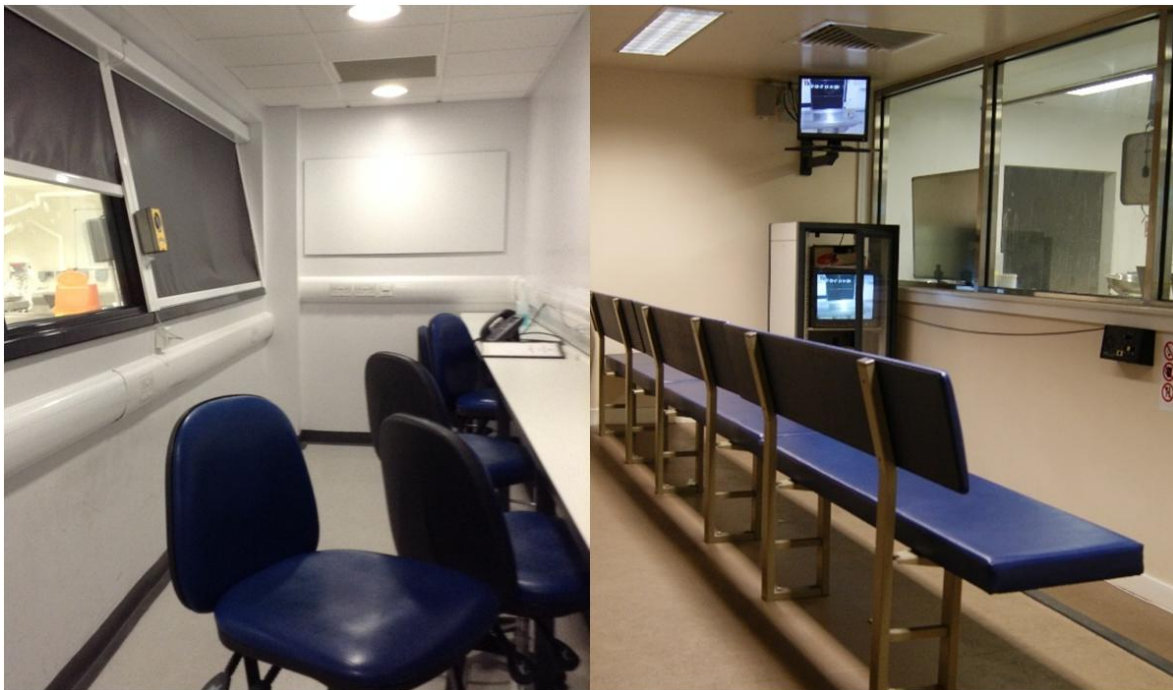


Figure 5-12: Observation Room, in Glasgow and Edinburgh city mortuaries



- 5.94. Mechanical ventilation to the observation area should contribute to the control of air / infections / smells within the PM suite as a whole. (See 5.66 - 5.70 above). The ducting from the rear of the dissecting bench linear exhaust ventilation may be built into the glass divider separating the observation area from the PM room.
- 5.95. The availability of an observation area will obviate the need for those others attending a PM to change into protective clothing. The observation area size will vary according to local arrangements and facilities required, e.g. a workbench and phone for police. If there are overwhelming reasons for clinical staff or others to be admitted into the PM room, they will be required to enter via the PM transit area, change into the protective clothing provided and observe the agreed local protocol.
- 5.96. Local policy may seek to limit direct observation during PM examination and arrange for a demonstration of case findings to take place remotely, e.g. local meeting / training room or off-site facility. Recording may also be required.



Figure 5-13: Open plan observation area, in 'high risk' PM room, Royal Victoria, Belfast

#### **d. Staff and Support Facilities**

- 5.97. The functions and scale of the overall facility will affect the quantity and types of activities in the staff and support provision, e.g. storage, offices, meeting rooms. Although it is beneficial to keep these functions as contiguous, to provide staff support, often the location of these facilities is and must be driven by a need to support the other key functions, e.g. technician office oversees the body entrance, admin office oversees visitors' entrance.

##### **Storage**

- 5.98. Providing secure storage in a mortuary and PM facility goes beyond the conventional need to safeguard supplies of linen, instruments etc. Both physical measures and protocols must mutually reinforce and deliver on local policy, as well as a shared efficiency and flexibility, across public agencies.

### Specimen Store

- 5.99. Tissue samples for microscopic examination in the pathology department, together with retained organs in fixative, may be kept in the specimen store for certain periods. Shelves made from impervious material will be required for holding jars or containers of various sizes. Plinths, or spaces below high benching, may be required for formalin containers. The room must be ventilated continuously because of the hazard arising from formalin used in the specimen containers. See [4.10](#) for further information on the use of formalin. This store should be linked to the PM room e.g. hatch, to allow specimens to be taken from the PM room without walking from a dirty area into a clean one.

### Pathologists' office

- 5.100. The function of the pathologists' office(s) is to provide space for consultations and writing reports. It should benefit from natural ventilation and light, and accessed from the circulation route leading to the staff changing facilities and the body handling area.

### Technologists' office

- 5.101. This room(s) should be situated adjacent to the body handling area and body entrance / service yard for passive security. This will allow bodies to be registered and labelled on receipt / removal from the body store. It should benefit from natural ventilation and light, and be accessible from the main circulation route leading to all parts of the mortuary. A close proximity to both body viewing and bereaved visitor' facilities enables quick response times. The staff call / bells/ audio or visual intercoms for Funeral Directors and visitors entrances are likely to be located here. Consider how practical proposed call systems will work, e.g. out-of-hours, staff breaks.
- 5.102. The staff rest or pantry room and staff lockers are preferably separate from, but nearby, this office. In smaller scale or more remote facilities, a single room may be justified, or risk assessed to support lone working. Clerical and rest / pantry functional zones should be designated and retained as food preparation and social functions are likely to disturb work functions and vice versa; unless small staff numbers are extremely small, e.g.  $\leq 3$ .

### Staff rest or pantry

- 5.103. In all but the very smallest facilities, a dedicated or shared staff rest room should be nearby but be distinct from work areas. Staff should be able to take breaks and relax without disruption. Room size is dependent on numbers likely to take breaks at one time, but should include food preparation, dining and soft seating. The area should benefit from natural daylight and ventilation, with views and / or access to green space where possible.

### Disposal room

- 5.104. The safe disposal of used items will depend on local policy and must be in accordance with current legislation, e.g. COSHH, and NHS guidance e.g. [SHTN 03-00](#) Waste Management Action Plan. A secure disposal room is required, with adequate space for the temporary storage of securely packed, segregated, recycled refuse and dirty linen bags (appropriately colour-coded); with easy access from both the dirty utility room and externally for their collection.

- 5.105. The PM room access to the disposal room is also a key consideration to prevent access via clean areas. If the disposal room is located directly off the PM room, consider:
- waste and dirty linen generated in the PM suite must be bagged up within the PM suite before being deposited in the disposal;
  - control of air movement in the whole PM suite, see 5.66 - 5.70 above;
  - control of entry to the PM suite and mortuary, and the means by which unauthorised movement is prevented.
- 5.106. Disposal areas should be organised so that clinical waste, linen and domestic waste are not mixed together, including waste recycling segregation, prior to collection. See NHSScotland guidance, e.g. HBN 00-03, and SHTN 03 series.

### **Cleaners' room**

- 5.107. A separate cleaners' room must be provided to service this facility. The number and location of cleaners' rooms should be reviewed with the 'clean' and 'dirty' zoning strategy. In PM facilities it will be necessary to provide more than one cleaners' room to avoid cross-contamination.
- 5.108. The equipment and functions of the cleaners' room(s) / bays, should be determined by local policy, and with the solution, including size and layout see SHTM 00-03. This should be reviewed using SHFN 30 HAI Scribe, but generally 'clean' zone areas e.g. offices, waiting; will require less maintenance equipment and this should be reflected in size, layout and location of design provided. See also SHFN 01 series, incl. SHFN 01-02 National Cleaning Services Specification.
- 5.109. A lockable cupboard space for COSHH and secure storage of stock, with shelving for in-use materials. There should be adequate space for manoeuvring machines, emptying and filling buckets and bowls, and routine servicing and cleaning of equipment. Clean and dirty zones should be segregated, with easy access to a sink and a wash basin. All finishes should be easy clean and impervious to water.

### **General purpose and linen store**

- 5.110. A general-purpose store is required for a wide variety of stock items and linen that do not require special conditions, e.g. security, contamination. As stock dimensions vary considerably, adjustable shelving would be recommended. Adequate space should be allowed for the storage of bulky goods. Good natural or mechanical ventilation is required.
- 5.111. Arrangements for supplies and storage facilities will be in accordance with local policies. This may require alignment and agreement of protocols across multiple agencies to ensure a sustainable and efficient service. Storage is required for clean supplies of general utility, toilet items and linen, e.g. drapes, shrouds, white coats, protective clothing, disposable items, and for the reserve stock of cleaning materials.
- 5.112. The store must be accessible to staff servicing all areas of facility, e.g. body handling, visitor viewing areas, and the PM suite.

## Communications and Information Technology (IT)

5.113. The provision of an effective communications and IT system(s) are necessary for the efficient management of a mortuary and PM room facility, see 6.128 - 6.140. These requirements can be identified in five main categories:

- **telephones:** to be provided as per local policy for communication internally and / or externally. Ideally VOIP, all with direct line etc, but minimum direct lines for one phone and one fax. (Despite its decline in use and NHS policy, 'fax' communication is occasionally required for Funeral Directors, forensic services or in an emergency). Robust cordless phone handsets, with excellent sound quality and range, ≥8 hr battery life, are required for visitor and staff use. Hands-free / loudspeaker and wall-mounted options are required e.g. PM, body store, and observation area. Options for hearing and sight impairment will also be needed.
- **staff call:** there is a need for visitors and Funeral Directors to alert staff to their arrival at the mortuary. A simple bell or an audio / visual-intercom should be provided at all appropriate entrances. Staff call / bells/ audio or visual intercoms should be able to be answered from the technicians' office;
- **intercom:** the majority of communication needs within the mortuary and PM facility, and between it and the pathology laboratory, should normally be satisfied by the specified telephone system. Consideration might also be given to audio visual communication between the body handling area and **a.** viewing room; **c.** PM room; and **e.** teaching rooms, e.g. CCTV & monitors;
- **dictation:** a custom-built dictation system, suitable for the conditions within the PM room, may be provided. The field of voice recognition, voice command and audio / visual technology is continually improving and the latest advances should be considered in any new or refurbishment projects;
- **computer:** intranet; internet access; email and server access is required.



Figure 5-14: Visitor reception and Viewing room, Dundee Police Mortuary



**Figure 5-15: Cold room and Observation room, Dundee Police Mortuary**

### e. Teaching and Research

- 5.114. Generally in-house training of pathologists and technicians will be possible in a mortuary and PM room facility that meets this guidance's design standards. Training is required for all staff, but this should be in shared, not dedicated, space.
- 5.115. If the teaching of PM services for undergraduate medical students is to take place, and their numbers justify, this section relates to the additional space needed to facilitate this. This is most likely to be located in our major regional centres, and should relate to joint agencies and PM skills resilience for NHS, COPFS and their university partners. This investment is further justified, if these spaces are required under regional exceptional events / national major incident plans.
- 5.116. In facilities where a seminar room is a project option, provide a:
- teaching, seminar and presentation equipment, e.g. IT, projector, screen, whiteboard, smartboard, conference call / video conferencing;
  - the opportunity to transmit a post mortem via a live visual and audio link to trainees, e.g. cameras above PM table and dissection benches will provide a clear view of all procedures with the option of recording for further analysis;
  - provide an area for exceptional events / major incident coordination with police and other agencies, which is also useful for major criminal cases, or;
  - a small kitchen / beverage bay should serve this room, and be part of/ shared with other mortuary staff welfare facilities.
- 5.117. In facilities where a hot-desk office is a project option, provide a:
- Flexible space for administration, study, research, tutorials and storage for visiting staff, post-grad students etc, who need a work base.

## 6. Engineering Services

### Introduction

- 6.1. This section should be read in conjunction with all relevant NHSScotland facility guidance, e.g. Scottish Health Technical Memorandum (SHTM); for current versions see [www.hfs.scot.nhs.uk](http://www.hfs.scot.nhs.uk), and relevant current legislation; European & British Standards and professional guidance, e.g. [HSE](#), [CIBSE](#), [BSRIA](#).

### Value for money

- 6.2. Engineering services account for a significant proportion of both the initial capital and also operational revenue costs. The project team must demonstrate optimisation of their overall design for whole life cycle value, efficiency and sustainability, whilst achieving the functional and clinical standards set out in this guidance publication for mortuary and post mortem (PM) services.

### Energy reduction and sustainability

- 6.3. Energy usage has a major impact on the environment. Heating, ventilation, cooling and lighting should be automatically controlled when not in use (e.g. at night or weekends). Equipment life cycle e.g. body stores, is also a key element that must be an integral part of ensuring this service's overall sustainability.
- 6.4. Facilities should be designed to meet the requirements of the Non Domestic Technical Handbook's Section 6. Their NCM model is for compliance only.
- 6.5. The NCM is an inherently unrealistic model, i.e. it does not reflect actual operations, energy or thermal comfort in-use. Therefore during design, a 'realistic' Dynamic Simulation Model (DSM) is required at key stages, evidencing a holistic approach to delivering safe, sustainable long term investment. New build projects will target BREEAM 'Excellent' or equivalent. Early pre-assessments and NDAP reviews will allow the Client to set a pragmatic, bespoke percentages and BREEAM score. Minimum criteria may include:
- **Ene01**: 5credits; **Ene02**: sub-meter; **Wat01**: 1credit;
  - **Wat02 + Mat03**: criteria1; **Hea04**: 3credits;
  - **Man03**: considerate construction;
  - **Man04**: building user guide;
  - **Man05**: +3yrs seasonal commissioning;
  - Set a total operational energy target e.g.  $\leq 300\text{kWhr/ m}^2$ ; evidenced by 'realistic' DSM including future and local weather data e.g. DSY 2020 high, 2050 medium; DSM to confirm thermal safety & comfort : TM59 or TM52: all 3 criteria;
  - Soft Landing: annual Display Energy Performance i.e. total operational energy report / certificate (similar to DEC), for full FM contract period or a min. 3yrs; to focus & drive sustainability and continuous improvement.
- 6.6. Both the 'realistic' DSM and NCM models must to be made available to Board / Client or independent review to enable informed decision making at all key design stages.

## Lighting

- 6.7. As stated in earlier chapters, natural lighting is preferred wherever practical. Passive Solar Design (PSD) potential should be explored to minimise operational heating / cooling costs but also from a visitor and staff welfare perspective. The visitor / staff areas people spend time, e.g. >10 or >30 minutes, should be located where they can benefit from daylight, and preferably natural ventilation with views of greenspace.
- 6.8. Distribution and location of windows should take into account the need to maintain security and privacy, whilst preventing glare and excess solar gain. Where clinically required, e.g. PM room and any directly linked rooms must have fixed i.e. non-openable, windows.
- 6.9. Solar protection should be provided to minimise solar gain and control glare. This may include the use of brise-soleil, solar reduction glazing, external / interstitial blinds and greenspace design. The layout must be considered carefully in areas where glare may be a problem, e.g. rooms where computers are routinely used.
- 6.10. Glazing solutions should achieve good daylight in all occupied spaces, without glare or overheating. This should be evidenced at key design stages by a 'realistic' DSM (6.5) including Climate Based Daylight Modelling (CBDM), e.g. on seasonal solar gains. If solar performance glass is used, ensure good colour rendering to PM suite.

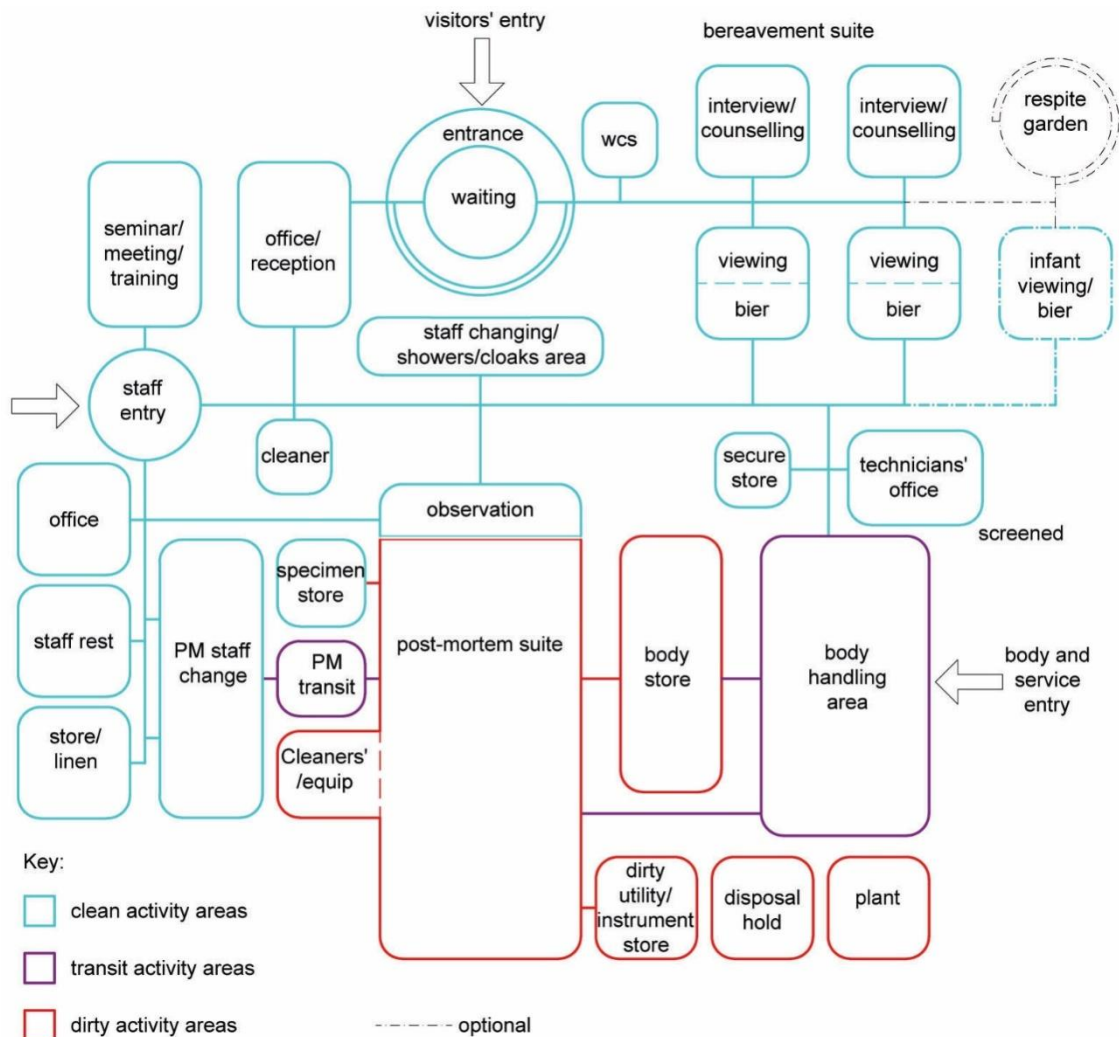


Figure 6-1: Relationships of functions, with 'clean' and 'dirty' zones

## Ventilation

- 6.11. Ventilation design must support safety, i.e. control odours and infection risks, see [Fig 6-1](#) and [Fig 3.24](#) 'dirty' and 'clean' areas, plus [Section 4](#). As stated in [5.66](#) - [5.70](#), apart from PM suite, natural ventilation should be used wherever possible.
- 6.12. The overall design should incorporate passive measures for minimising solar and incidental or uncontrolled heat gain, thus minimising the need for mechanical cooling. A 'realistic' DSM ([6.5](#)) to evidence key plant and service void gains, to ensure safety.

## Mechanical ventilation

- 6.13. The shape of the building and / or spatial relationships should be optimised for sustainability and whole lifecycle costs. Internal rooms to be minimised, but where they exist, they should be reserved for:
- room functions that require mechanical ventilation irrespective of whether their location is internal or peripheral, e.g. cold store, utility room;
  - spaces that only have brief / transient occupation, i.e. will benefit less from daylight & views, and may need less mechanical ventilation, e.g. toilets, stores.
- 6.14. SHTM 03 series provides guidance on appropriate energy recovery devices etc, plus the system's design and commissioning, e.g. use 100% fresh air
- 6.15. Consideration should be given to the following potential hazards;
- leakage / recirculation between intake and exhaust air streams;
  - biohazards to maintenance staff;
  - chemical reaction on plant.

## Space required for plant and distribution systems

- 6.16. Plant areas should provide convenient and safe access, arranged to prevent unauthorised entry. Plant and equipment should be spaced to permit access for routine inspection and maintenance. Removal and replacement of plant and components should be possible without disruption to other services.
- 6.17. To be most economical, plant should be located as close as possible to the areas served, but with regard to factors such as noise, vibration, flooding and fire. The risks from these factors can be minimised by the introduction of measures such as active fire suppression systems and additional acoustic treatment. A risk analysis is required to explore the most appropriate solution.

## Maintenance of plant and services distribution

- 6.18. All plant (except heat rejection and certain ventilation extract plant) should be located within plantrooms. Main services distribution (cabling and pipework) should be routed above corridors and other circulation spaces. This will allow inspection, maintenance, modifications, additions and renewals to be undertaken without disruption to the Mortuary or PM facility.
- 6.19. In clean areas it is important to ensure that plant and equipment are arranged so that access to the space is only required for terminal outlets.



- 6.20. Engineering services within the mortuary facility should be arranged so that they are secure but accessible for maintenance purposes. With the exception of drainage, only services that serve the facility should be located above ceilings.
- 6.21. In clean areas and other areas requiring non-accessible ceiling voids, access for terminal filters etc. should be from below. Access for items such as ceiling void smoke detectors should be via lighting fittings. This will avoid the need for sealed access panels. Where suspended drainage above clean areas cannot be avoided, the system should have extended cleaning eyes that are accessible remotely from the user space.

### **Flexibility of design**

- 6.22. Engineering installations should provide an organised and systematic arrangement that can be modified to facilitate changes in service requirements. This should be achieved by distributed systems with vertical or horizontal services ducts and bench spines. These should be readily accessible so they can be remodelled and maintained with minimal disruption to the facility.
- 6.23. Designers should provide wherever possible, solutions that enable alternative items of equipment to be used in the future, without causing extensive cost and disruption to the associated engineering service infrastructure.

### **Design for safety**

- 6.24. Devices for the control and isolation of primary engineering services should be located in areas where they can be protected against unauthorised interference. This includes plantrooms, engineering service spaces and circulation areas. They should not be located in working areas.
- 6.25. Engineering design has an important role in infection control, particularly the design of water and ventilation services. See SHTM04-01: Water systems and SHTM03: Heating and Ventilation systems series.
- 6.26. The Health and Safety at Work Act 1974 imposes a statutory duty on all persons who design, manufacture, import, supply, install or erect “articles for use at work”.

### **Drainage effluent**

- 6.27. Whilst most discharges from Mortuary processes are acceptable for discharge to the foul sewer, care should be taken to ensure the levels of disinfectants and preservatives are not excessive. Special attention must be given to the need to comply with the requirements of the National Guidance for Healthcare Waste Water Discharges (2014) document, by [www.water.org.uk](http://www.water.org.uk).
- 6.28. Where discharge effluent contains pH neutral enzymatic detergents, hydrogen peroxide, biocides, corrosion inhibitors, scale inhibitors, antifoams, bio-dispersants, formaldehyde, phenol, methanol or glycerine the owner shall be responsible for contacting the Sewerage provider to discuss if discharge consent is required.
- 6.29. The discharge is acceptable provided levels of formaldehyde do not exceed 100mg/l or 10mg/l phenol at the discharge point to the public foul drain system.

### Acoustics and noise

- 6.30. Acoustic controls and sound absorption measures are required, as noise is a common problem that can adversely affect the operational efficiency of the facility and causes anger / discomfort. Some limits and means of control are described in [SHTM 08-01](#) . It is recommended that advice is also sought from an Acoustic Engineer, particularly in larger facilities with PM suites; to ensure holistic solutions are incorporated e.g. layout, specification of building components and equipment.
- 6.31. Serenity and privacy are required in the bereaved visitors suite. This should have auditory isolation from the rest of the facility, e.g. body receipt/ storage, PM suite. Minimum acoustic requirements are given in the ADB Room Data Sheets ([3.49](#)).
- 6.32. Bells, alarms, visual / audio intercoms and PM dictation may be required. Their location for serenity, privacy and audibility must be considered. Also a project option for music, e.g. PM suite, visitors suite; but this is likely to be portable equipment .

### Fire safety and precautions

- 6.33. The principles of regular fire safety risk assessments apply equally to new projects, alterations and upgrading of existing buildings.
- 6.34. Consideration should be given to the fire safety strategy during the design stage. The architect and engineer should verify the proposals with the relevant fire authority. The project team and all other planning staff should be fully acquainted with the fire safety strategy. This will include operational aspects e.g. staff responsibilities, evacuation protocols, equipment provision, building and engineering layouts.
- 6.35. Fire safety policy is set out in HFS's current 'Firecode' series e.g. [SHTM 81 part 1](#).

### Decontamination of systems

- 6.36. Engineering services should be designed to allow incidents, e.g. a spillage of hazardous material, to be dealt with effectively and with minimal risk to staff.
- 6.37. The design should permit the shortest possible exit route from the hazard area and ready access, if required, to a drencher. Rooms should be able to safely contain any contamination until it can be removed and fumes have been extracted to a safe concentration level.

### Water and Waste systems

#### Drainage and waste systems

- 6.38. The internal drainage system should use the minimum of pipework and remain water / airtight at all joints and connections. The system should be sufficiently ventilated to retain the integrity of water seals.
- 6.39. Mortuary waste systems should be made of heat-sealed polypropylene. High silicone iron alloy (14.5%) should be used below ground.
- 6.40. Mortuary facilities should be provided with an acid resistant waste and vent system connected, after dilution, to the foul sewer outside the building perimeter. Space should be available for a neutralisation tank since this is likely to be required in the future.

- 6.41. Sink traps and piping to floor drops should be made of acid-resistant materials. Below ground, acid resistant pipes will not be damaged by minor quantities of acids and solvents. Vents should be routed through the roof and not connected to sanitary vent piping.
- 6.42. Drainage systems from pathology laboratories may contain pathogens. To prevent any risk of cross infection, the system should be routed to avoid other hospital accommodation such as critical care areas, operating theatres and catering departments.
- 6.43. Drainage may also contain chemicals and should be designed for maximum dilution. Frequently-used large-volume appliances should be located upstream.
- 6.44. The internal drainage system should be connected to the main drainage system as far downstream as possible to ensure maximum dilution. Designer to liaise with the statutory authority on volumes and agreed method of connection to main services.
- 6.45. The drainage system should allow easy access for inspection and maintenance. Access should be above the appliance flood / rim level so that spillage of contaminated effluent can be minimised. Access for cleaning should cause minimal disturbance to facility staff.
- 6.46. The briefing documents should identify the types of discharge produced by specialist equipment and the effect that the mixing of various chemical discharges may have upon the drainage system.
- 6.47. If radioactive effluent is to be discharged into the drainage system, the requirements for catch-pot recovery, dilution and maintenance should be discussed and agreed with the Radiological Protection Advisor.
- 6.48. Autoclaves (except those used for decontamination of infected material), glassware washing machines and refrigerators should not be connected directly to the drainage system. They should have an air gap to prevent the ingress of bacteria.
- 6.49. The steriliser for discarded material should be connected to the drain via a vented break tank and trap. The break tank should be vented outside the building. The vent termination should be above roof level and clear of any ventilation inlet or window. The trap should be positioned between the break tank and the connection to the drainage system
- 6.50. Stainless steel floor gullies shall be located between tables to ensure that wastewater / spillages can be easily / safely removed. The floor between the PM tables should be graded and drain into suitable gullies (see [3.47](#), [5.54](#), [5.61](#)).

### **Hot and Cold Water Systems**

- 6.51. Hot and cold water systems to mortuary & PM facilities should be designed safely, e.g. independent of hospital cold water storage tanks and hot water generators. Signage should state where the water is non-drinkable.
- 6.52. The hot water may be point-of-use, or  $60^{\circ}\text{C} \pm 2.5^{\circ}\text{C}$  at the storage vessel outflow. If calorifier, return temperature  $\geq 50^{\circ}\text{C}$ .

- 6.53. Safe outlet temperatures and fittings for washbasins, sinks and showers to prevent scalds are detailed in the ADB Room Data Sheets (3.49) for mortuary & PM facilities.
- 6.54. All water supply pipework, valves, flanges etc, to be insulated and vapour-sealed.
- 6.55. Hot and cold water systems must be designed in accordance with regulations and guidance to limit the risk of legionellae, e.g. HSE L8, SHTM 04-01 series.
- 6.56. The cold water system to be designed and maintained at a safe temperature, to inhibit microbiological growth, i.e.  $\leq 20^{\circ}\text{C}$ . Water storage, pipe location, size, flow etc, must evidence limit to thermal gains, e.g. 'realistic' DSM model (6.5)

## Ventilation and Thermal Comfort

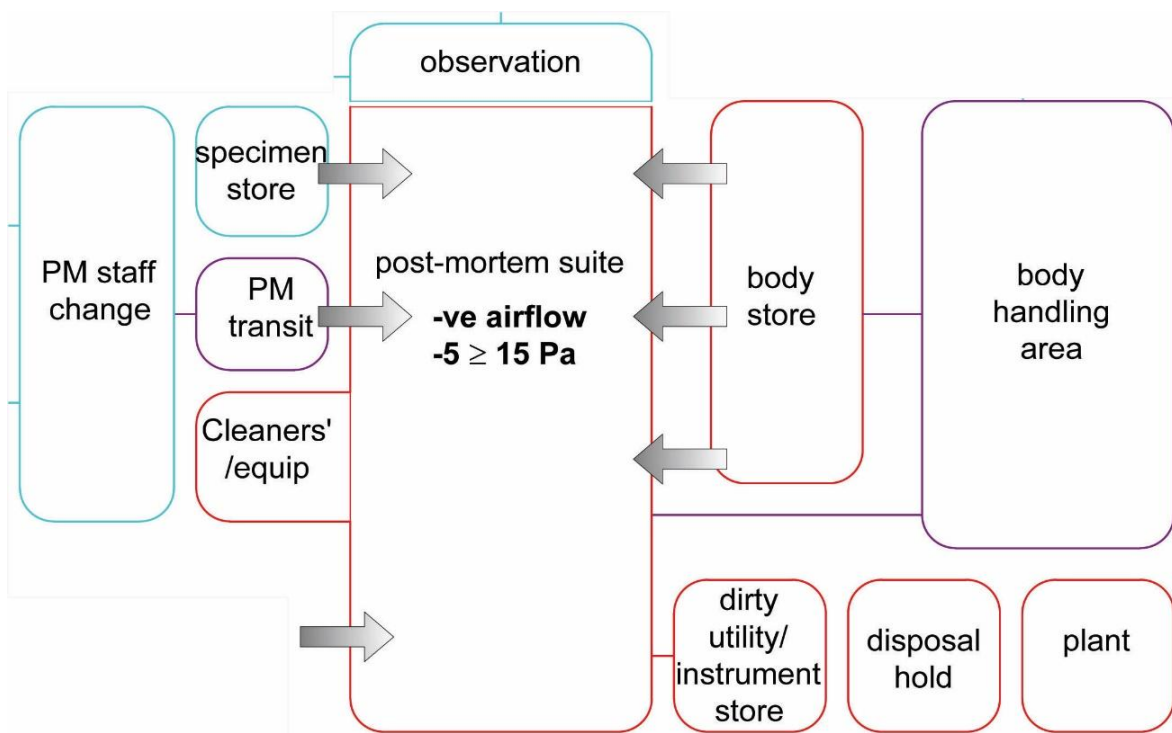
### Cooling systems

- 6.57. Cooling is to be minimised, but where required, sustainable passive systems to be considered. As a last resort, chilled water cooling systems should be used rather than the direct expansion type. If the location permits, the mortuary facility could be connected to the main hospital or campus chilled water plant.
- 6.58. Evaporative-type heat rejection plant should not be used. If cooling cannot be provided from a central chilling plant, a separate air-cooled chiller plant using environmentally friendly refrigerant should be used.
- 6.59. There may be a need to maintain temperatures within specified limits to prevent equipment failure. Temperature limits should be obtained from equipment manufacturers.
- 6.60. Consideration should also be given to the selection of a chilling plant that offers low ambient free cooling to applications requiring year-round cooling (e.g. chilled water circuits serving fan coil units in equipment rooms).

### Heating systems and ventilation systems

- 6.61. Spaces heated by low-pressure hot water systems should use low surface temperature radiators or overhead radiant ceiling panels. The surface temperature of wall-mounted radiators should not exceed  $43^{\circ}\text{C}$ . Ceiling radiant panels can exceed this surface temperature and allow space savings.
- 6.62. Radiators should be located under windows or against exposed walls. There should be space between the top of the radiator and the windowsill to prevent curtains reducing the output. There should be adequate space underneath (at least several inches) to allow cleaning machinery to be used. Where a radiator is located on an external wall, back insulation should be provided to reduce the rate of heat transmission through the building fabric.
- 6.63. All radiators should be fitted with thermostatic control valves. These should be of robust construction and selected to match the temperature and pressure characteristics of the system. The thermostatic head should incorporate a tamper-proof facility for pre-setting the maximum room temperature. It should be controlled via a sensor located integrally or remotely. To provide frost protection, the valve should not remain closed below a fixed temperature.

- 6.64. Radiators should be used to offset only building fabric heat loss in mechanically ventilated rooms. All rooms should have local heating controls; the facility should be controlled throughout by the building management system (BMS). Natural ventilation is preferred wherever practical.
- 6.65. Mechanical extract ventilation should be provided to all 'dirty' activity areas e.g. PM room, body store, plantrooms, toilets and disposal areas. See [Fig 6.1](#) and [3.24](#).
- 6.66. Mechanical ventilation to internal rooms other than to the PM Suite should provide minimum air change. In some cases, cooling will be necessary to maintain thermal comfort / safety. A low-velocity mechanical ventilation system should be used.
- 6.67. Diffusers and grilles should be located to encourage uniform air movement without causing discomfort to staff. The design should allow for airflow from naturally ventilated spaces or spaces with a mechanical supply, into spaces that have only mechanical extract ventilation, via transfer grilles in doors or walls.
- 6.68. The design should avoid the introduction of un-tempered air and should not prejudice other performance needs, e.g. fire safety, privacy, security, comfort.
- 6.69. The supply air distribution system should not distort the unidirectional and stable airflow pattern required for the mortuary tables. Supply air ceiling diffusers or grilles should not discharge directly towards mortuary tables, unless the terminal velocity is such that the airflow pattern is unaffected.



**Figure 6-2: PM suite ventilation requirements**

- 6.70. The design should ensure that high air change rates and / or opening and closing doors or windows in the facility, do not have an adverse effect on the performance of the mortuary tables. A door closing / damping mechanism may assist.
- 6.71. The airflow rate for the mortuary spaces will be determined by the following:
- infection and odour control e.g. min. ACH / hr (when occupied);

- internal heat gains e.g. equipment, plant, services/ service voids;
  - solar heat gain;
  - use of fan coil or split local air-conditioning units to offset heat gains.
- 6.72. The PM Room should be designed with supply and extract systems balanced to maintain negative pressure. Negative pressure will range from  $-5$  Pa to  $-15$  Pa. They should normally use 100% fresh air. Temperature control should be achieved by means of reheat coils in supply air systems.
- 6.73. Design of ventilation systems for summer conditions should be in accordance with current guidance, e.g. CIBSE Guide A, SHTM 03-01, TM52 and TM59.
- 6.74. Extract fans should be located close to the point of discharge to ensure that the extract system is maintained at negative pressure.
- 6.75. External discharge arrangements for extract systems should be protected from back pressure from adverse wind effects and located to avoid contamination, including exhausted air re-entering the building via air intakes and windows.

### Dissecting benches

- 6.76. Dissecting areas should have bench extract systems that ensure air flows away from operators' faces. Low level extract should be provided adjacent to equipment for use when solvents are employed, or when specimens in formaldehyde are opened. All are subject to risk assessment, e.g. COSHH, HAI.
- 6.77. Air should flow towards dissecting benches from adjoining spaces. Local ventilation should limit the concentration of formaldehyde vapour within the breathing zone of the operator. The threshold limit should be 2 ppm (parts per million).
- 6.78. The following parameters are aimed at maintaining a concentration below 1 ppm.
- a continuous run of benching (with a continuous up-stand at the rear) should be provided for dissecting activities. Benches should be a maximum of 650 mm deep, from front to rear;
  - each dissecting position should have a linear extract grille mounted with its face flush with the upstand;
  - the bottom of the grille should be as close as practicable to the level of the working surface. For cleaning purposes, the minimum height of the bottom of the grille opening above the working surface should be 75 mm;
  - each dissecting position to be  $\geq 1.2$  m long. The extract grille to be same length and  $\sim 150$  mm high. It should be mounted on a purpose designed plenum box to ensure a minimum uniform face velocity of 1 m/s along the total length, and across the full height of the grille opening;
  - the grille should be easily de-mountable to permit periodic internal cleaning of the plenum box and any guide vanes;
  - filtration of the extract system is not necessary.

## Electrical Engineering Services

6.79. Electrical services include the following:

- main intake switchgear and distribution board;
- small power distribution systems;
- sub distribution
- emergency electrical supplies;
- IT data & phone systems;
- staff call system;
- mechanical services and BMS supplies
- metering and sub-metering
- earthing installation
- lighting systems;
- security systems;
- lightning protection.

6.80. Electrical installations should comply with BS 7671 and SHTM 06 Electrical services series.

6.81. Care should be taken to avoid mains-borne interference and electrical radio frequency interference affecting diagnostic and monitoring equipment, computers or other sensitive electronic equipment.

6.82. The facility's main electrical intake houses the main isolators and distribution board. It should be:

- sited within the facility / department away from public areas;
- accessible directly from a circulation area providing clear, adequate and safe access for maintenance staff; (access space may be part of the circulation area; but care should be taken to ensure that safety is not compromised during maintenance by passing traffic or the opening of adjacent doors);
- sited away from water services, and lockable.

6.83. Equipment should be mounted at a height that gives safe and easy access from a standing position. All switchgear should be lockable in the "off" position.

### Emergency electrical supplies

6.84. Emergency electrical provision should comply, as a minimum, with the requirements of SHTM 06-01: Electrical services supply and distribution.

6.85. The emergency generator providing electricity in the event of a main supply failure should be capable of providing appropriate mortuary backup, e.g. 100% or an agreed % min. Backup is not required on refrigeration plant for comfort cooling.

6.86. If an existing generator is to be used, the extent of emergency coverage will be dependent on the spare capacity available, subject to a minimum provision. If this minimum requirement cannot be met, it will be necessary to either replace the existing generator, or provide an additional generator dedicated to the facility.

- 6.87. Equipment and systems that are unable to sustain a break in service, inherent in bringing a generator supply on line, e.g. computers, should be protected against outages by the provision of solid-state non-interruptible power supplies.
- 6.88. In the event of a main supply or local final circuit failure, escape routes should be illuminated by self-contained, battery-powered luminaires charged continuously from the main supply and capable of providing illumination for a period of three hours.

### **Small power distribution systems**

- 6.89. Depending upon the available capacity of the emergency generator installation it may be necessary to provide separate essential and non-essential small power distribution systems; to comply with SHTM 06-01 and BS 7671.
- 6.90. 13-amp switched and shuttered socket-outlets in accordance with the room data sheets requirements should be provided and connected to ring or spur circuits.
- 6.91. Where there is separation between essential and non-essential small power distribution, socket-outlets served by the essential distribution should be clearly marked with an engraved red capital letter “E”.
- 6.92. In the first instance it is preferable to locate power outlets outwith cleaning 'hose down' zones, or areas where they will come into frequent contact with water / fluids. Only where this is unavoidable, water resistant IP65 (min) rated, IEC 60309 “commando” style outlets, with appropriately robust covers, to be specified.
- 6.93. Where equipment is permanently installed, or where there is a possibility of equipment theft, switched double-pole 13-amp spur-outlets should be used in preference to socket-outlets. The spur-outlet should incorporate a red neon lamp indicating when the supply to the equipment is live.
- 6.94. Equipment requiring a 3-phase supply should be permanently connected to a separate sub-circuit. The sub-circuits, incorporating a circuit breaker, should be fed from the distribution board and terminate in a local isolator.
- 6.95. Adequate provision should be made in circulation areas, e.g. corridors and lobbies, to permit the use of domestic cleaning equipment having flexible cords up to 9m long.
- 6.96. Lockable isolation switches to be provided immediately next to all engineering plant and equipment, and clearly labelled to identify the equipment they serve.
- 6.97. Refrigeration, heating appliances and automatic equipment should be provided with red neon lamps indicating when they are live. The neon lamps should be incorporated in the control panel of the equipment, in the control switch, or in the socket-outlet or spur-outlet from which the equipment derives its supply.
- 6.98. Storage of the deceased should always be safe and with due dignity. Body storage is to be in a secure, cool, and appropriate space, where the duration and temperature can be monitored. Refrigeration provided at an optimum 4-6°C; and freezer storage at an optimum -20°C for >30 day stays.<sup>10</sup> The resilience of any building services related to body storage is therefore an essential requirement.

---

<sup>10</sup> [www.hta.gov.uk/post-mortem-sector](http://www.hta.gov.uk/post-mortem-sector) Human Tissue Authority (licensing ref PFE2c)



## Lighting systems

- 6.99. To achieve energy efficiency, lighting systems should be designed to:
- maximise natural daylight;
  - avoid unnecessarily high levels of illumination;
  - incorporate efficient luminaires, control gear and lamps;
  - incorporate effective controls;
  - see CIBSE guides F and LG2 for further information.
- 6.100. For detail regarding illumination levels and luminaires, consult BS EN 12464, BS EN 60598-2-25, IEC 60598-2-25 and CIBSE Guide LG2.
- 6.101. Lighting must be closely coordinated with architecture / interior design. In particular, ensure decorative finishes are compatible with the colour-rendering properties of lamps and the spectral distribution of the light source is not adversely affected. Lighting to be well distributed and located, with space for maintenance access. See NHS funded research: '[Lighting and colour for hospital design](#)' (2004).
- 6.102. Lighting switches to be provided in easily accessible positions within each area, and at appropriate locations in corridors and general circulation areas. In areas with multiple luminaires, switching should permit the selection of luminaires appropriate only to that area requiring illumination. In areas of more complex lighting layout design, it is recommended signage detailing lighting controls is located near the corresponding light switches.
- 6.103. Where local circumstances permit, timed switches with absence / occupancy detection, using acoustic or ultrasonic detectors should be considered.
- 6.104. Generally, luminaires should be fitted with high efficiency LED sources with ultra low-loss drivers or highly efficient fluorescent lamps equipped with low-loss or high frequency control gear. Where luminaires are infrequently used, or where the interior design ambience dictates, compact fluorescent, LV or tungsten lamps may be used.
- 6.105. Colour-corrected lighting to CIBSE LG2 should be provided in all work rooms.
- 6.106. Where necessary, general lighting should be supplemented with dedicated task lighting. In the bier room and other areas used by relatives, lighting should be provided and selected to create a domestic rather than an institutional ambience.
- 6.107. Lighting installations within viewing and bier rooms shall have the facility for the lighting levels to be reduced by means of local dimmer switches.
- 6.108. In areas where VDUs are in use, lighting should be designed to avoid any bright reflections from the screen.
- 6.109. Safety escape lighting should be provided on primary escape routes in accordance with the provisions of SHTM 06-01, BS EN 12464, BS EN 60598-2-25, IEC 60598-2-25 and BS 5266.

## Communications and Information Technology (IT)

### Control systems

- 6.110. All supply and extract systems should have local control systems. These should be integrated with the overall Building Management System (BMS)
- 6.111. Engineering plant and equipment should be monitored and regulated by the BMS, in accordance with [SHTM 08-05](#): automatic controls series.
- 6.112. Plant and system operational data should be recorded and reported. The BMS should also monitor, measure and record energy consumption and incoming water temperatures etc. for the facility.
- 6.113. If the main site has a BMS, the mortuary facility should be set up as an outstation so that systems serving the facility can be monitored and controlled at a central station. The engineering systems within the facility should be capable of management from both the central station and the outstation itself.
- 6.114. Controls should include temperature, pressure and time-switching functions. Their selection should take account of the extent to which they can be linked to the BMS serving the whole hospital.
- 6.115. Supply and extract fans should be interlocked. This will ensure that the supply fan will not operate unless airflow is established with the extract system.
- 6.116. All heater battery coils and filters should be provided with frost protection control.
- 6.117. Control systems should incorporate energy-efficient equipment including:
  - high-efficiency motors;
  - suitable air-to-air heat recovery systems.
- 6.118. Mortuary air conditioning systems to be controlled to ensure comfort, operational safety and regulatory compliance, plus satisfy process constraints. A well controlled system should provide flexibility, sustainability and minimise WLC costs.
- 6.119. A control system should provide the following minimal safety responses:
  - detection of equipment failure by the BMS and automatic initiation of standby equipment;
  - maintenance of relative negative pressures in the PM Rooms.
- 6.120. The control of supply air volumes using a variable air volume (VAV) type system is recommended for large PM Rooms. Supply and extract air volumes should be balanced to achieve desired pressurisation levels. The VAV supply system is to provide temperature control and maintain the minimum room ventilation rate.
- 6.121. Mortuary spaces should be comfort cooled without local humidity control. Large mortuary spaces should be zoned, with each zone / room equipped with a thermostat for individual control.

- 6.122. It may be necessary to have one microbiological safety cabinet within or adjacent to the PM room. Therefore, local controls for operating any associated ventilation plant will be necessary.
- 6.123. Where “make up” air is provided by mechanical ventilation, a supply air failure warning system should be provided. If any safety enclosure or room extract system fails, the associated supply system should be capable of being shut down automatically or reduced to prevent pressurisation of the room and possible contamination of adjacent areas.
- 6.124. The ventilation control system for safety cabinets should incorporate a five minute delay timer. This will ensure that the system will continue to run after work has finished and purge any remaining contaminants

### **Pneumatic tube systems**

- 6.125. Following risk assessment, e.g. chain of evidence and formalin fixed specimens, a pneumatic tube system is project option for the transfer of specimens to and from other departments. The system is to be designed to [SHTM 08-04A](#) & [B: Pneumatic tube systems](#).

### **IT and phone systems**

- 6.126. The approach to provision of IT and telephone infrastructure within the facility may be conditioned by existing systems within shared or adjacent facilities. However, where possible a structured wiring system as described in the HGN ‘Structured cabling for IT systems’ should be provided. This will permit a unified approach to the provision of cabling for:

- voice systems;
- data systems;
- imaging systems;
- alarm systems.

Whilst this “universal” cabling system is initially more expensive than separate voice and data systems, the long-term whole life cycle cost is less.

- 6.127. In determining the nature of the IT system to be provided, it is necessary to identify:
- areas to be served;
  - whether structured cabling will be used;
  - density of fixed outlets is to be provided (not less than two per workstation);
  - whether wiring will be on a “flood” or “as required” basis;

### **Telephone equipment**

- 6.128. The extent and complexity of telephone equipment and associated infrastructure will be dependent on the size of the facility and/ or campus.
- 6.129. As stated in the above section IT & phone systems (6.126 - 6.127), it is likely to be beneficial to integrate voice cabling (VOIP) with the structured wiring system for IT.
- 6.130. Incoming calls to the facility should in general be routed through the reception. However, in larger premises, a number of direct dial inwards (DDI) lines will be

needed. These should be high quality cordless phones, with excellent sound quality and range, +8 hr battery life to allow use in visitor, staff and PM areas.

- 6.131. A properly planned telephone system will provide prompt intercommunication facilities between all extensions. Abbreviated dialling can be used for a range of frequently called extension numbers. Consequently, reasons for providing a separate intercommunication system should be clearly shown.
- 6.132. Visitors will generally use their own mobile phone, however a cordless handset should be available to borrow within visitor facilities, e.g. from reception.

## Safety and Security Systems

### Fire detection

- 6.133. Fire detection sensors are specified based on room use. Installation of multi head sensor units will aid setting to the appropriate detection i.e. heat, smoke, CO detection. If the facility is stand-alone, a separate panel should be installed with remote alarm to a 24hr/ 7day manned centre. If not, it must integrate as part of a joint fire strategy.

### Security systems

- 6.134. Any parts of the facility that are only used during the day should be protected “out of hours” by an intruder alarm system, to either BS 4737 or BS 5979 as appropriate.



Figure 6-3: Visitor reception within admin office, Royal Infirmary, Edinburgh

- 6.135. Points of ingress and egress from the facility, including body storage and receiving areas, even if temporary, should all be monitored by high-definition CCTVs. These should be equipped with a pan and tilt facility and capable of producing high quality images in low levels of light. Positioning of cameras should be determined with care,

selecting optimum positioning for maximum field of coverage. Monitors should be sited at a location that is permanently manned whilst the facility is in use.

- 6.136. Entrances, work areas and other sensitive spaces should be protected wherever possible by passive security, plus one of the variety of electronic access control systems available.
- 6.137. Visitors and Funeral Directors will only gain access to the mortuary after operating a bell or audio / video intercom at the appropriate entrance, see [2.33](#), [3.17](#), [5.113](#), [6.32](#) CCTV surveillance at entrances, perimeter and body store should be provided, and linked to permanently manned monitoring location, e.g. off-site for out-of-hours.
- 6.138. Consideration to be given to personnel attack alarms being available to staff. This is preferably a type capable of identifying the location of a member of staff in difficulty.

### **Call systems**

- 6.139. Staff call points should be provided in all spaces accessible to the public, see [5.113](#).
- 6.140. Each call unit should include a push-button or pull cord, reassurance lamp and reset unit. A visual and audible indication of operation of each call point should be provided to reassure the visitor, and report an unambiguous location of the source to a reception area or staff base. A repeater unit should be provided within the staff restroom or technologist office, or any area staff able to attend, regularly occupy.

### **Lightning protection**

- 6.141. Protection of the building against lightning should be provided in accordance with SHTM 06-01, BS 7671 and BS 6651.

## 7. Schedules of Accommodation and Costs

### Introduction

- 7.1. For all types of public investment, it is important that the overall costs, including building, maintenance and operating costs, are best value for money and consistent with appropriate functions and quality standards. It is estimated that in over 30 years of operations, for every £1 spent on building design / construction, ~£4 is spent on facility maintenance and £40-75 on operation running, mostly staff related, costs.

In using this document to produce a detailed design for mortuary and post mortem (PM) services, value and economy are integral to its development. The functions and quantity of activities should be carefully considered so that, where appropriate, spaces are shared and activities are programmed to enhance utilisation. The best value solution should be justifiable, sustainable, and deliver the appropriate functions, with care, dignity, and respect for all.

### Procurement Guidance

- 7.2. The Scottish Government mandates use of their Scottish Capital Investment Manual (SCIM) suite of guidance documents for any public procurement related to health and care service investment: <http://www.pcpd.scot.nhs.uk/Capital/scimpilot.htm>

Key elements of SCIM include the demonstration of strategic need, early stakeholder and public engagement and long-term best value. Due to the nature of mortuary and PM investment, this will require a careful consideration by all public sector bodies involved in the regional provision of these services.

- 7.3. SCIM provides detailed guidance on developing an appropriate business case at each stage of the development. This includes the commercial, economic, management and quality aspects to demonstrate the preferred solution will deliver the necessary service change(s), is value for money and affordable.

### Project affordability, costs and risks

- 7.4. The base building costs include all the mortuary and PM accommodation and internal engineering requirements, assuming a simple, stand-alone 'green-field' type site. This is exclusive of VAT, Building Warrant and Planning Fees and all other Local Authority charges and site abnormalities.

On-costs are then added to cover the external works, external engineering services e.g. link corridors, lifts, stairs, boiler plant, sub-station; these are the 'abnormals'. The abnormalities cost is largely determined by the site characteristics, such as an inner-city location, poor ground conditions, or the condition and type of the existing building if a refurbishment option.

- 7.5. It is important that project teams should assess at the earliest opportunity all the likely key risks and on-cost implications of individual sites and options. Service resilience should be a key consideration.

## Schedules of Accommodation

- 7.6. Sample Schedules of Accommodation (SoA) for each key functional mortuary element or module, and full departmental examples of SoA's are listed at the end of this Section. The examples provide a hierarchy of five different types and scales of mortuary and PM services. The examples do not have to be taken as ideal provision for any particular project. The schedules are purposely modular; to allow key functional elements to be combined, and scaled up or down; to suit the local service needs and activity in an overall regional strategy.
- 7.7. This hierarchy lists all space types and major options covered by the document giving a range of provision, together with nominal areas. This modular approach will ensure consistency in service quality, allowing ease of transfer between premises, aiding value for money and service resilience.

### Modules of key functional elements

- 7.8. The modules of key functional elements are functional associations and not necessarily a single suite or physical grouping. These modules may be provided either separately or as grouped accommodation with shared supporting spaces. Together the modules can either create a stand-alone unit, or be combined as part of a larger facility or campus.
- 7.9. The sample schedule [7.20](#), lists each of the five **a. – e.** key functional element modules, each with their minimum or 'core' spaces, plus a variety of space sizes and some additional non-core, project 'option' spaces to select from. This information includes a minimum square metre area, and where possible the ADB Room Data Sheet ([3.49](#)) reference code.
- 7.10. The five example schedules [7.21](#), have each been built up from the sample modules in schedule [7.20](#), to create different scales or a hierarchy of service provision, e.g. 'mortuary only' and 'mortuary and PM service' facilities. These include:
- **a. Rural/ Specialist Visitors' Viewing only**, comprising:
    - Bereaved visitor facilities only;  
Strong preference for combined mortuary with body storage facilities, unless care, dignity and respect justifies, e.g. parent / child viewing within children's hospital, but with e.g. iii) Mortuary on campus / close by.
  - **b. Rural / Specialist Buffer for Body Storage only**, comprising:
    - Body storage suite only, refrigeration strongly preferred;  
Strong preference for combined mortuary with visitor facilities, unless care, dignity and respect justifies, e.g. bereaved viewing in ward single room, then short-term transfer to appropriate buffer storage to minimise disruption to patients. Provide clear signage: e.g. "Strictly No Public Access."
  - **i. Local Centre: Mortuary only**, comprising: (preferred minimum)
    - Bereaved visitor facilities;
    - Body storage suite containing: min. 6 bodies, incl. 2no or 50% bariatric;

- **ii. District Centre: Mortuary and PM**, comprising:
  - Bereaved visitor facilities;
  - Body storage suite containing: min. 50 bodies, incl. 8no or 20% bariatric; min. 4no – 10% freezer; also consider ‘bariatric plus’ e.g. cold room;
  - Post mortem suite two - four PM tables.
- **iii. Major Regional Centre: joint agency, Mortuary and PM**, comprising:
  - Bereaved visitor facilities: min. two bier viewing suites; (if dedicated infant viewing required = above +1);
  - Body storage suite containing: min.150 bodies, incl. 10no or 20% bariatric; min. 10no or 10% freezer; min. 2no or 4% ‘bariatric plus’ cold room;
  - Post mortem suite with observation: min. four PM tables, min.1no in a high risk PM room;
  - Consider **e.** Teaching and Research suite;
  - Consider resilience in exceptional event or a major incident .

7.11. A **Temporary Body Store** facility, is a separate modular provision for 25 bodies. This could be added to any of the above hierarchy of premises, to provide short-term additional storage capacity in regional exceptional events. Note that any national major incident planning will assume maximising current facilities / service capacity, before the investment and deployment of temporary emergency accommodation.

### Critical dimensions and areas

- 7.12. In determining spatial requirements, a key factor is not only the total room area provided but the critical dimensions essential to the efficient functioning of the activities which are to be carried out. To assist project teams in preparing detailed design solutions for the rooms and spaces, studies have been carried out to establish requirements in the form of critical dimensions. The results of these studies appear as ergonomic diagrams in [Appendix 3](#).
- 7.13. For development planning and at the early design stages, it may assist designers to have data available which will enable them to make an approximate assessment of the areas required. Schedules of Accommodation for the purpose of establishing the cost allowances are found at the end of this Section.
- 7.14. Note with caution that these published areas do not represent recommended sizes, nor are they to be regarded in any way as specific individual entitlements. All areas are subject to review against local requirements, e.g. variation in user numbers, equipment quantities and specification.
- 7.15. Efficient planning, for instance, in the refurbishment or conversion of older properties may also necessitate a more flexible approach in establishing area requirements as:
- rooms tend to be larger than the recommended area;
  - some rooms may be too small or in the wrong location for efficient use;
  - circulation may form a larger than normal proportion of the total area.



## Space allowances and communications

- 7.16. Space for departmental internal planning, engineering and circulation e.g.. partitions, columns, small vertical ducts and corridors, etc, are included as standard cumulative percentage allowances in the example schedules. These areas are included in the departmental total target area and 7.4's base building costs, before 'abnormals'.
- 7.17. Where 'option' space is added, these percentage space allowances should be applied to the increased net area, e.g. to i. 'core only' add J0221 Enquiry desk and S0028 Interview (large) =  $159 + [(4 + 16) \times 5\% \times 3\% \times 20\%] = 185$  sqm.
- 7.18. Communications, include staircases, lifts and plantrooms, with the exception of the 12sqm refrigeration plantroom (which will usually house the electrical switchgear), are not included in the building base costs. Communications can vary significantly, and must be estimated on a project-by-project basis as 'abnormal' or on-cost.

## Specialist engineering and equipment

- 7.19. This guidance together with the ADB Room Data Sheets (3.49), provide detailed requirements for the specialist engineering and equipment provided in mortuary and PM services. These will require to be appropriately integrated into the project brief, design, construction and maintenance to ensure both whole life cycle (WLC) value, resilience and sustainability. Specific examples include refrigeration body bays and plant, PM tables, exam lights, set-back ventilation, ceiling hoists etc.

## Accommodation Schedule - Samples for each module

7.20.

ADB reference	Space Type	Area (sqm)	Notes
<b>a- Bereaved Visitors Facilities</b>			
	Visitor Entrance provision	-	circulation
J1255	Waiting area: 5 place (inc 1 wheelchair)	9.0	
J1255*	Waiting area:10 place (inc 1 wheelchair)	16.0	
M0724*	Interview/ Counselling room: 5 place (inc 1 wheelchair)	9.0	core
P0711	Mini kitchen	5.0	
S0028*	Interview/ Counselling room: 8 place (inc 1 wheelchair); with beverage bay	16.0	
V0923	Visitors' wheelchair WC: independent/ semi-ambulant	5.5	core
V1010	Visitors' WC : ambulant	2.0	option
L1610	Viewing Room	8.0	core
L1609	Bier Room	10.0	core
New*	Viewing/ Bier combined room, e.g. for infants: 5 place (inc 1 wheelchair)	12.0	option; Appendix 3

ADB reference	Space Type	Area (sqm)	Notes
<b>b. Body Receipt, Storage and Removal</b>			
	Body Entrance, inc screened area provision	-	circulation
	Body store compartment: dual access	3.0	
	Body store compartment: bariatric, dual access	3.5	
	Body store compartment: single access	2.5	
	Body store compartment: bariatric, single access	3.0	
New*	Body store: bariatric plus, 2 place, single access cold store	10.5	option Appendix 3
	Body handling area – per compartment bay	3.5	core
	Body handling admin area	5.0	option
L1613	Body store and handling area: 2 compartment bays, single access; up to 10 bodies	18.0	
L1625	Body store and handling area: 5 compartment bays, dual access; up to 25 bodies	37.0	
L1627	Body store and handling area: 7 compartment bays, dual access; up to 35 bodies	50.0	
L1628	Body store and handling area: 15 compartment bays, dual access; up to 75 bodies	100.0	
L1629	Body store and handling area: 20 compartment bays, dual access; up to 100 bodies	125.0	
	Refrigeration plant: inc switchgear	12.0	(or 8.0sqm)
	Bay: trolley/ large equipment parking – 1 space	2.0	core
G0171*	Bay: trolley/ large equipment parking – 2 space	4.0	
	Bay: trolley/ large equipment parking – 3 space	6.0	
	Store: secure, patient valuables & clothing	8.0	core
L1651	Temporary body store: 5 bay portable building; up to 25 bodies	29.0	
<b>c. Post mortem Suite, with or without forensic cases</b>			
L1641	PM room: 1 table (e.g. high risk procedures)	27.00	option
L1642	PM room: 2 tables (5 bay body store access)	70.0	core
L1643	PM room: 2 tables (7 bay body store access)	75.0	
L1645	PM room: 3 tables (15 bay body store access)	102.0	
L1647	PM room: 4 tables (20 bay body store access)	135.0	
	Additional table allowance	20.0	option
	Store: PM specimens	8.0	(or 5.5sqm)
	Store: secure, forensic evidence	8.0	(or 5.5sqm)
Y1510	Cleaners' room (or bay)	8.0	(or 5.5sqm)
L1607	Dirty Utility and instrument store	12.0	core
G0505*	PM transit area: inc WC, changing & wash	12.0	core
L1602	PM observation area: up to 8 places (inc 1 wheelchair)	8.0	
	PM observation area: up to 16 places (inc 1 wheelchair)	16.0	for teaching

ADB reference	Space Type	Area (sqm)	Notes
<b>d. Staff and Support Facilities, with or without PM services</b>			
	Staff Entrance provision	-	circulation
M0251	Office: 1 person	8.0	
M0252	Office: 2 person	12.0	
	Office: 3 person, or 2 inc staff rest	16.0	core
	Office: 4 person	20.0	
D0205*	Rest room: inc pantry bay, up to 6 staff	12.0	
	Rest room: inc pantry bay, up to 12 staff	20.0	
V0554-01	Changing room: 5 lockers	8.5	
V0554-02	Changing room: 10 lockers	11.0	
V0725*	Changing room: semi-ambulant	2.5	core
V1106	WC: semi-ambulant	2.5	
V1606	Shower: semi-ambulant	3.5	core
V0923	Wheelchair WC (independent/ semi-ambulant)	5.5	core
	Store: linen (or bay)	8.0	(or 5.5sqm)
W1585	Store: general & linen	12.0	
Y0642-01	Hold: disposal, 1700 litres dual access	8.0	core
Y0642-02	Hold: disposal, 3000 litres: dual access	12.0	
Y1510	Cleaners' room	8.0	core
<b>e. Teaching and Research</b>			
	Meeting room: inc CCTV monitor, ≤14 staff	20.0	option
	Office: hot desks and storage, ≤3 students	12.0	option

\* denotes new or amended layout, e.g. due to wheelchair or bariatric / bariatric plus trolley movement requirements, see HBN 00-04 & [Appendix 3](#) for critical dimensions.

## Accommodation Schedule – Facility Scale/ Hierarchy Examples

7.21.

ADB reference	Space Type	Qty	Area (sqm)	Total Area	Notes
<b>i - Local Centre: Mortuary Only (storage ≤ 15 bodies)</b>					
<i>from a. Bereaved Visitors' module:</i>					
	Visitor / staff entrance area	1	-	-	circulation
J0221	Enquiry /info desk: 1 staff	-	4.0	4.0	option
J1255	Waiting area: 5 place (inc 1 wheelchair)	-	9.0	9.0	option
M0724*	Interview/ counselling : 5 pl (inc 1 wheelchair)	1	9.0	9.0	core
S0028	Interview/ Counselling : 8pl (inc 1 wh'r); & beverage bay	-	16.0	16.0	option
V0923	Visitors' wheelchair WC: independent / semi-ambulant	1	5.5	5.5	core
V1010	Visitors' WC : ambulant	-	2.0	2.0	option
L1610	Viewing Room	1	8.0	8.0	core
L1609	Bier Room	1	10.0	10.0	core
<i>from b. Body Receipt, Storage &amp; Removal module</i>					
	Body & services entrance area, screened	1	-	-	circulation
L1613*	Body Store and handling: 3 bay; ≤15 bodies (inc ≥3 obese; ≥3 bariatric)	1	21.5	21.5	core; single access
	Body handling admin area (if desk deleted from L1613)	-	5.0	5.0	option
	Plant	1	8.0	8.0	core
	Bay: trolley/ large equipment parking – 1 space	-	2.0	2.0	option
G0171*	Bay: trolley/ large equipment parking – 2 space	1	4.0	4.0	core
	Store: secure, valuables (if locker deleted from L1613)	-	8.0	8.0	option
<i>from d. Staff &amp; Support module</i>					
M0252	Office: 2 person	-	12.0	12.0	option
	Office: 3 person, or 2 inc staff rest	1	16.0	16.0	core
D0205*	Rest room: inc pantry, ≤6 staff	-	12.0	12.0	option
V0554-01	Changing room: 5 lockers	1	8.5	8.5	core
V0725*	Changing room: semi-ambulant	1	2.5	2.5	core
V1106	WC & hand wash: semi ambulant	1	2.5	2.5	core
V1606	Shower & wash: semi ambulant	1	3.5	3.5	core

ADB reference	Space Type	Qty	Area (sqm)	Total Area	Notes
V0923	Wheelchair WC independent/ semi-ambulant	-	5.5	5.5	option
	Store: general & linen	1	5.5	5.5	core
Y0642-01	Hold: disposal, 1700 litres dual access	1	8.0	8.0	core
Y1510	Cleaners' room	1	8.0	8.0	core
	Switchgear	1	2.0	2.0	core
<i>net allowance:</i>				<b>122.5</b>	core only
planning allowance		5%	6	128.5	
engineering allowance		3%	4	132.5	
circulation allowance		20%	26.5		
<b>i - Local Centre: Mortuary Only Total allowance:</b>				<b>159.0</b>	<i>core only</i>

<b>ii - District Centre: Mortuary &amp; PM (storage for ≤75 bodies; 3 PM tables)</b>					
<i>from a. Bereaved Visitors' module:</i>					
	Visitor entrance area	1	-	-	circulation
J0221	Enquiry /info desk: 1 staff	1	4.0	4.0	core
J1255	Waiting area: 5 place (inc 1 wheelchair)	-	9.0	9.0	option
M0724*	Interview/ counselling : 5 pl (inc 1 wheelchair)	1	9.0	9.0	core
S0028	Interview/ Counselling : 8pl (inc 1 wh'r); & beverage bay	1	16.0	16.0	core
V0923	Visitors' wheelchair WC: independent / semi-ambulant	1	5.5	5.5	core
V1010	Visitors' WC : ambulant	-	2.0	2.0	option
L1610	Viewing Room	1	8.0	8.0	core
L1609	Bier Room	1	10.0	10.0	core
New*	Viewing/ Bier combined room, for infants	-	12.0	12.0	option
<i>from b. Body Receipt, Storage &amp; Removal module</i>					
	Body & services entrance area, screened	1	-	-	circulation
L1628*	Body Store and handling: 15 bay; ≤75 bodies (inc ≥10 obese; ≥3 bariatric; with ≥5 freezer)	1	105	105	core; dual access
New*	Cold Room: ≥2 "bariatric plus" size body store	1	10.5	10.5	option; single access
	Body handling admin area	-	5.0	5.0	core
	Plant	1	12.0	12.0	core
	Bay: trolley/ large equipment parking – 1 space	1	2.0	2.0	option
G0171*	Bay: trolley/ large equipment parking – 2 space	2	4.0	8.0	core
	Store: secure, valuables	1	8.0	8.0	core

ADB reference	Space Type	Qty	Area (sqm)	Total Area	Notes
L1651	Space for: temporary body store: 5 bay portable building; ≤25 bodies	-	29.0	29.0	option
<i>from c. Post mortem Suite, without forensic cases module</i>					
L1645	PM room: 3 tables; access to 5-15 body store bays	1	102.0	102.0	core
	Store: specimen	1	5.5	5.5	core
	PM cleaners' room (or bay)	1	5.5	5.5	core
L1607	Dirty utility & instrument store	1	12.0	12.0	core
G0505*	PM room transit: inc WC, wash, gown and boot	1	12.0	12.0	core
V0554-02	PM Changing: 10 lockers	1	11.0	11.0	core
V1106	WC & hand wash: semi ambulant	1	2.5	2.5	core
V1606	Shower & wash: semi ambulant	2	3.5	7.0	core
V1010	WC & hand wash: ambulant	-	2.0	2.0	option
L1602	PM observation: ≤8 places	-	8.0	8.0	option
<i>from d. Staff &amp; Support module</i>					
	Staff entrance area	1	-	-	circulation
M0252	Office: 2 person	3	12.0	36.0	core
	Office: 3 person, or 2 inc staff rest	-	16.0	16.0	option
D0205	Rest room: inc pantry, ≤6 staff	1	12.0	12.0	core
V0554-02	Changing room: 10 lockers	1	11.0	11.0	core
V0725	Changing room: semi-ambulant	1	2.5	2.5	core
V1106	WC & hand wash: semi ambulant	2	2.5	5.0	core
V1606	Shower & wash: semi ambulant	1	3.5	3.5	core
V0923	Staff wheelchair WC independent/ semi-ambulant	-	5.5	5.5	option
W1585	Store: general & linen	1	12.0	12.0	core
Y0642-02	Hold: disposal, 3000 litres dual access	1	12.0	12.0	core
Y1510	Cleaners' room	1	8.0	8.0	core
	Switchgear	1	2.0	2.0	core
	IT Node Room	1	5.5	5.5	option
<i>net allowance (core only):</i>				<b>452.0</b>	core only
planning allowance		5%	22.5	474.5	
engineering allowance		3%	14.0	488.5	
circulation allowance		20%	98.0		
<b>ii - District Centre: Mortuary &amp; PM Total allowance:</b>				<b>586.5</b>	<i>core only</i>

ADB reference	Space Type	Qty	Area (sqm)	Total Area	Notes
<b>iii - Major Regional Centre: Mortuary &amp; PM ( ≥150 bodies; ≥4 PM tables)</b>					
<i>from a. Bereaved Visitors module:</i>					
	Visitor entrance area	1	-	-	circulation
J0143*	Office: 2 staff inc reception	1	12.0	12.0	core
J1255	Waiting area: 5 place (inc 1 wheelchair)	1	9.0	9.0	core
M0724*	Interview/ counselling : 5 pl (inc 1 wheelchair)	2	9.0	9.0	core
S0028	Interview/ Counselling : 8pl (inc 1 wh'r); & beverage bay	1	16.0	16.0	core
V0923	Visitors' wheelchair WC: independent / semi-ambulant	1	5.5	5.5	core
V1010	Visitors' WC : ambulant	1	2.0	2.0	core
L1610	Viewing Room	2	8.0	16.0	core
L1609	Bier Room	2	10.0	20.0	core
New*	Viewing/ Bier combined room, for infants	-	12.0	12.0	option
<i>from b. Body Receipt, Storage &amp; Removal module</i>					
	Body & services entrance area, screened	1	-	-	circulation
New*	Body Store and handling: 30 bay; ≤150 bodies (inc ≥20 obese; ≥9 bariatric; with ≥15 freezer)	1	145	145	core; dual access
New*	Cold Room: ≥4 "bariatric plus" size body store,	1	21	21	core; or 2x 2store
	Body handling admin area	1	5.0	5.0	core
	Plant	1	12.0	12.0	core
	Bay: trolley/ large equipment parking – 1 space	-	2.0	2.0	option
G0171	Bay: trolley/ large equipment parking – 2 space	2	4.0	8.0	core
	Store: secure, valuables	1	12.0	12.0	core
L1651	Space for: temporary body store: 5 bay portable building; ~25 bodies	-	29.0	29.0	option
<i>from c. Post mortem Suite, with forensic cases module</i>					
L1647*	PM room: 4 tables; access to 9-20 body store bays	1	145.0	145.0	core
	Store: specimen	1	8.0	8.0	core
	Store: secure, evidence	1	8.0	8.0	core
	PM cleaners' / equip bay	1	8.0	8.0	core
L1607	Dirty utility & instrument store	1	12.0	12.0	core
G0505*	PM room transit: inc WC, wash, gown and boot	1	12.0	12.0	core
V0554-02	PM changing: 10 lockers	1	11.0	11.0	core

ADB reference	Space Type	Qty	Area (sqm)	Total Area	Notes
V1106*	WC & hand wash: semi ambulant	1	2.5	2.5	core
V1606	Shower & wash: semi ambulant	2	3.5	7.0	core
L1602	PM observation: ≤8 places	1	8.0	8.0	core
L1641	PM room: 1 table for high risk procedures; access ≥3 bays	-	27.0	27.0	option
G0505	PM room transit: inc WC, wash, gown and boot	-	12.0	12.0	option
V0554-01	PM changing: 5 lockers	-	8.5	8.5	option
V1106	WC & hand wash: semi ambulant	-	2.5	2.5	option
V1606	Shower & wash: semi ambulant	-	3.5	3.5	option
V1010	WC & hand wash: ambulant	-	2.0	2.0	option
	Dedicated Imaging room	-	27.0	27.0	option
	PM observation: ≤16 places	-	16.0	16.0	option
<i>from d. Staff &amp; Support module</i>					
	Staff entrance area	1	-	-	circulation
M0252	Office: 2 person	2	12.0	36.0	core
	Office: 4 person; or meetings	1	20.0	20.0	core
D0205*	Rest room: inc pantry ≤12	1	20.0	20.0	core
V0554-02	Changing room: 10 lockers	2	11.0	22.0	core
V0725	Changing room: semi-ambulant	1	2.5	2.5	core
V1106	WC & hand wash: semi ambulant	1	2.5	2.5	core
V1606	Shower & wash: semi ambulant	2	3.5	7.0	core
V0923	Staff wheelchair WC independent/ semi-ambulant	1	5.5	5.5	core
W1585	Store: general & linen	2	12.0	24.0	core
Y0642-02	Hold: disposal, 3000 litres dual access	1	12.0	12.0	core
Y1510	Cleaners' room	1	8.0	8.0	core
	Switchgear	1	2.0	2.0	core
	IT Node Room	-	12	12	option
<i>from e. Teaching &amp; Research module</i>					
	Meetings: inc CCTV ≤14 staff	-	20.0	20.0	option
	Office: hot desk 2-3 students	-	12.0	12.0	option
<i>net allowance:</i>				<b>675.5</b>	core only
planning allowance		5%	34.0	709.5	
engineering allowance		3%	21.5	731.0	
circulation allowance		20%	146.0		
<b>iii - Major Regional Centre: Total allowance:</b>				<b>877.0</b>	<i>core only</i>



## 8. Appendices

**Appendix 1:           Categorisation of biological agents**

**Appendix 2:           Requirements for handling bodies that received radioactive  
substance cancer treatments**

**Appendix 3:           Critical dimensions**

**Appendix 4:           Temporary body store health and safety checks**

## Appendix 1: Categorisation of biological agents

Employers whose work involves exposure of employees to biological agents must refer to current guidance to be able to comply with their statutory duties.

Relevant legislation, HSE, NHSScotland and industry specific guidance for the handling, storage and examination of bodies, specimens and their facilities, must be used to develop and periodically review biological risk assessments. For example:

- [Human Tissue \(Scotland\) Act 2006](#);
- [HIS Management standards for hospital PMs](#) (2016);
- [HSE Safe working and prevention of infection in mortuary and PM room](#) (2003);
- [HSE Risks of Infection at Work from Human Remains](#) (2005);

Both HSE documents above are due to be replaced, potentially in one HSE publication. Specific guidance for with blood-borne viruses, transmissible spongiform encephalopathies and viral haemorrhagic fevers etc. must be followed e.g.

- [www.hse.gov.uk/biosafety](http://www.hse.gov.uk/biosafety);
- [ACDP Approved List of biological agents 2013](#);
- [Viral haemorrhagic fever \(VHF\): ACDP algorithm and guidance on management of patients \(including infection control\) 2014](#);
- [Rabies: risk assessment, post-exposure treatment, management 2014](#);
- [Control of Substances Hazardous to Health \(COSHH\) Regulations 2002](#).

### Definitions Of Hazard Groups

- **Hazard Group 1** - A biological agent unlikely to cause human disease.
- **Hazard Group 2** - A biological agent that can cause human disease and may be a hazard to employees; it is unlikely to spread to the community and there is usually effective prophylaxis or effective treatment available.
- **Hazard Group 3** - A biological agent that can cause severe human disease and presents a serious hazard to employees; it may present a risk of spreading to the community, but there is usually effective prophylaxis or treatment available.
- **Hazard Group 4** - A biological agent that causes severe human disease and is a serious hazard to employees; it is likely to spread to the community, and often has no treatment.

### Hazard Group 4 Pathogens

Cases of Hazard Group 4 infection are rare in this country, e.g. Ebola. However, when cases occur, patients and clinical samples must be handled in appropriate facilities. Employers who intend to work with the agents listed in Schedule 3 of COSHH must give HSE advance notification. This applies to those who may offer a diagnostic or PM services, even if virus cultivation is not involved.

## Appendix 2: Requirements for handling bodies that received radioactive substance cancer treatments

### Body Storage

The compartment bays should be constructed so that there is no leakage of fluid from one compartment to another. Shielding of compartment bays to handle these cases will not normally be necessary due to their inherent design, although consultation with the RPA is advised.

Appropriate signage should be appended to the front of the compartment bay to indicate the presence of a radiation hazard.

### Personnel Contamination Hazards

Iodine-131 is used to treat thyroid cancer. Iodine is excreted through the sweat pores, urine, saliva and faecal routes. Therefore, the surface of a body that has been treated with Iodine-131 will probably be radioactively contaminated before it is transferred to the mortuary. Staff handling radioactive bodies – both during transfer and throughout the PM procedure – should wear protective clothing, consisting of plastic gloves, waterproof overalls, face shields and plastic overshoes.

Separate shielded facilities should be provided for the storage of these items before they are disposed of. These articles should be treated as solid radioactive waste. Facilities managers should be aware that adjustments to the radioactive waste disposal certificate may be required to account for these contaminated articles.

Staff undertaking PM examinations on radioactive bodies should check hands, arms, feet etc. for radioactive contamination following the procedure. This should take place in the staff changing area. Storage of radioactive monitoring equipment and decontamination spill kits should be located in this area.

### Facility Considerations for the Post mortem room

The use of stainless steel PM tables and dissection benches is not advised when performing PM examinations on patients who have recently been administered radioactive iodine. The iodine compounds have an affinity with stainless steel, which makes stainless steel surfaces contaminated with radioactive iodine difficult to decontaminate.

Care should be taken to minimise fissures in surfaces within the PM facility, as radioactive substances can accumulate in cracks etc. and give rise to contamination hazards. Walls and finishes should be designed to meet the requirements in [5.39 – 5.65](#), with the additional consideration that they should be impervious to and easily cleaned of radioactive iodine compounds. Facilities managers should be aware that the use of bleach or similar chemicals on iodine is not advised as this can cause hazards from oxidation and the release of a potentially hazardous gas.

An additional sink may be needed for the disposal of aqueous radioactive substances, which may be collected during the PM examination. The sink will need to be designated for this purpose and labelled appropriately. Special considerations apply to the drainage of materials from these sinks (see Appendix in [HBN 6 Vol 1 'Facilities for diagnostic imaging and interventional radiology'](#), under 'Radionuclide imaging'). These considerations also apply to drainage from the floor.

The same sink may be used to wash and disinfect instruments which will have become contaminated with radioactive substances during the PM procedure. Stainless steel devices which have, or are likely to, come into contact with iodine-131 should be treated as single-use instruments and arrangements made for their disposal and possible interim storage. The use of fixed tiles in and around the sink may make it easy to clean up spills and splashes, although the need to minimise fissures must be observed.

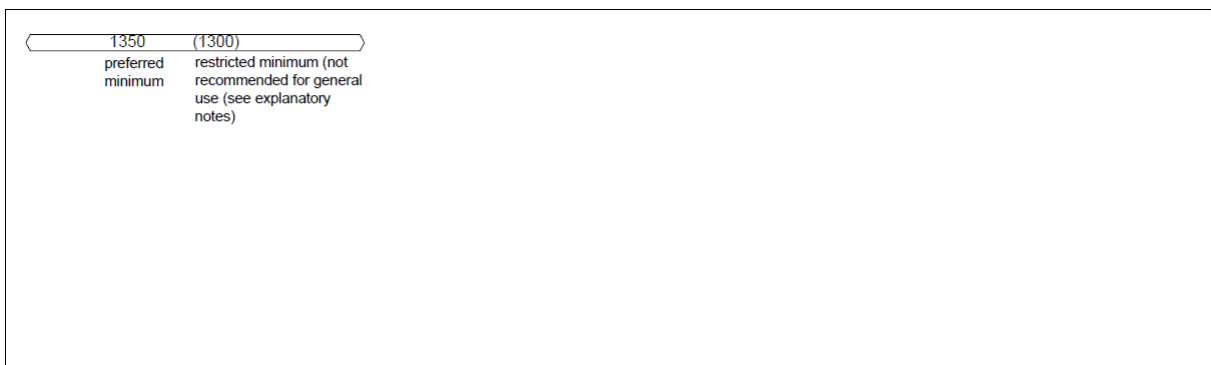
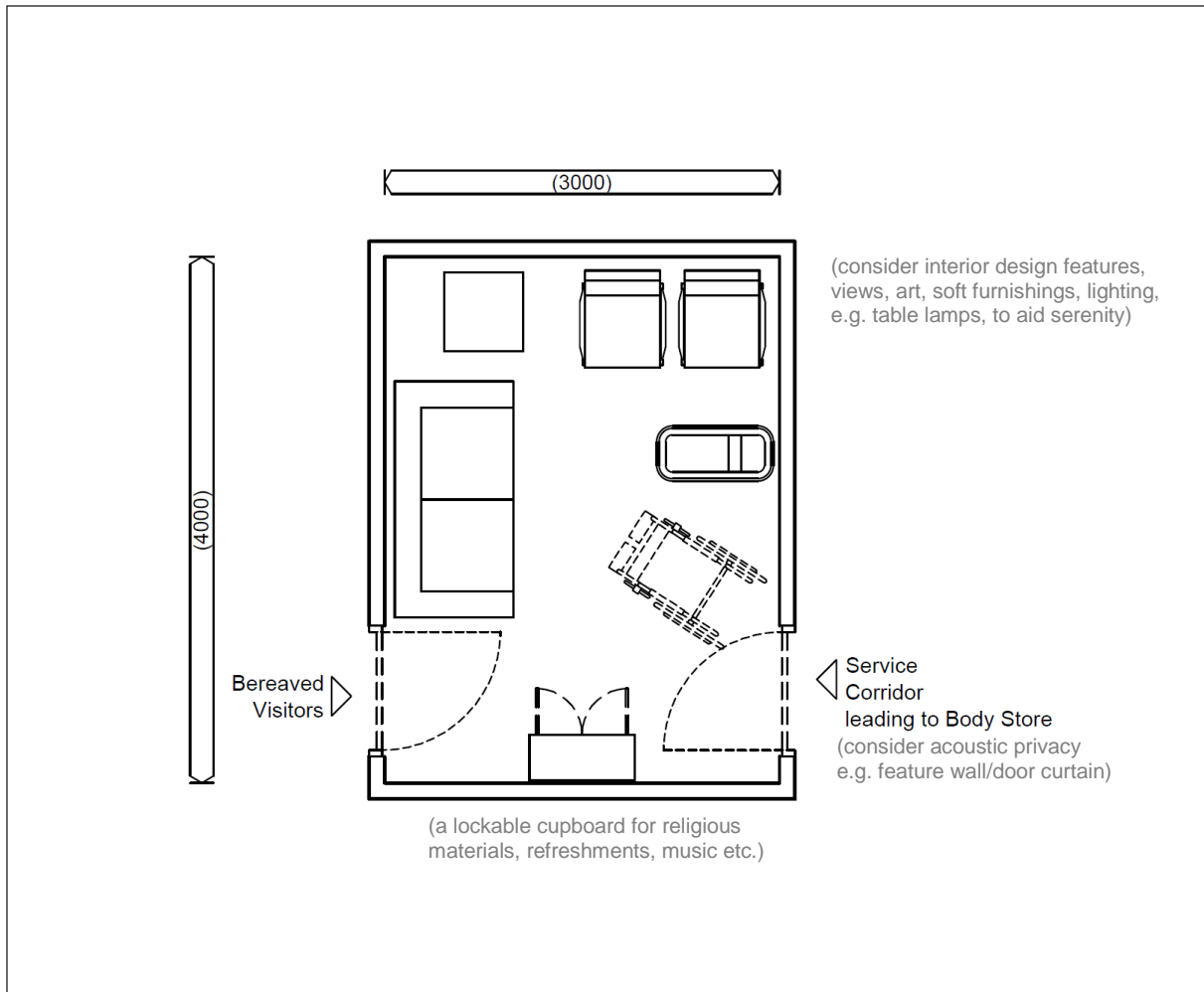
### **Cleaning the facility**

Following a PM on a body containing radioactive material, standard cleaning and sterilisation procedures should be sufficient, although these may need to be repeated many times in order to decontaminate the facility. Staff must check the room for radioactive contamination before and after cleaning. The actual procedures should be devised in conjunction with the RPA.

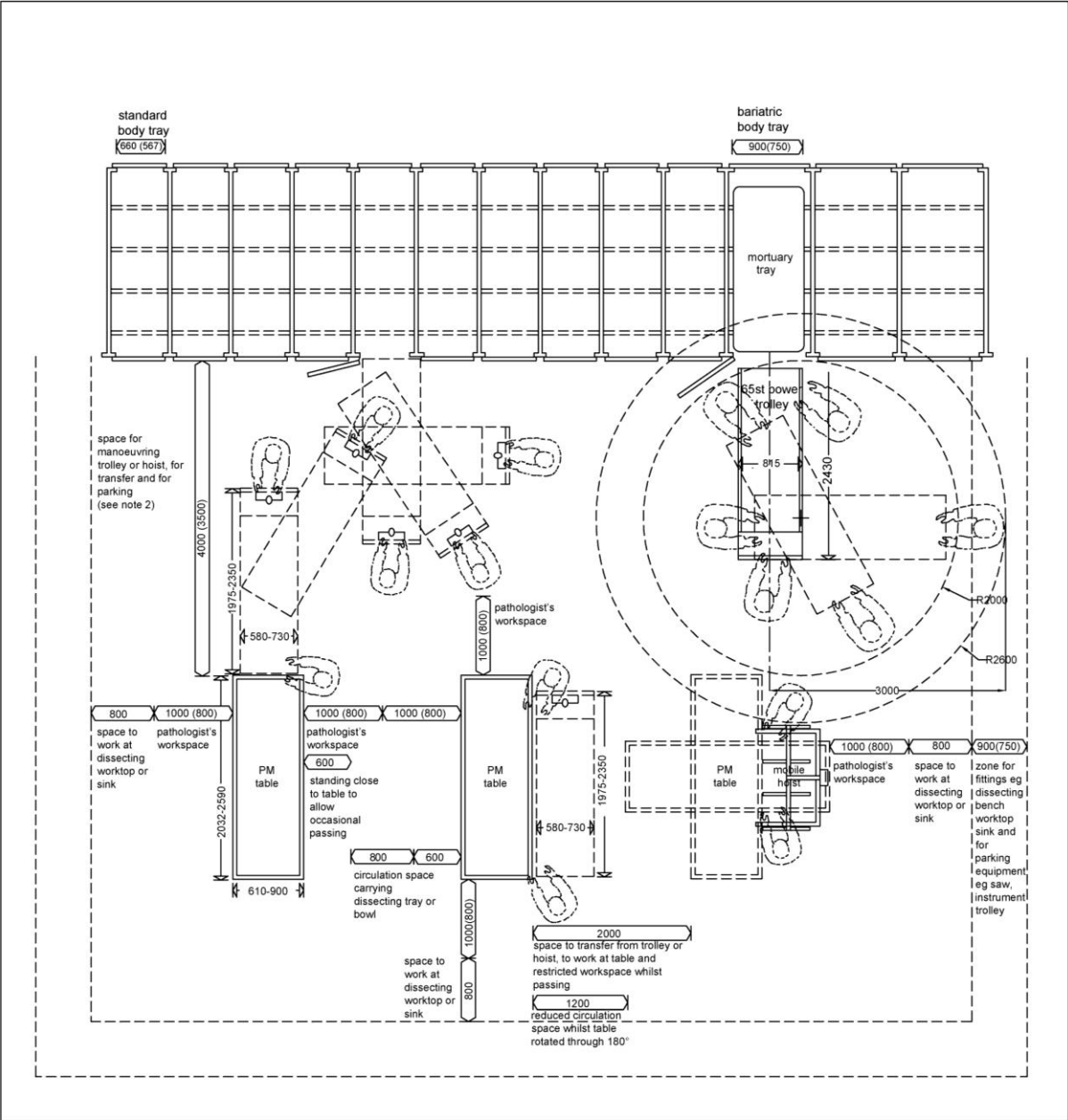
All waste generated from the cleaning process should be treated as low-level radioactive waste and disposed of accordingly. Waste disposal units may have to be located in the PM room to act as low-level radioactive temporary storage receptacles and must be labelled appropriately.

## Appendix 3: Critical dimensions

<p><b>Activities</b> To provide an alternative area for the viewing of infants by family.</p> <p>NHS Ergonomic data sheet not to scale</p>	<p><b>Sheet 3A:</b> <b>Viewing / Bier room combined, for infants</b></p> <p>Users: Bereaved visitors, Anatomical Pathology Technologists (APT's)</p>
--	--

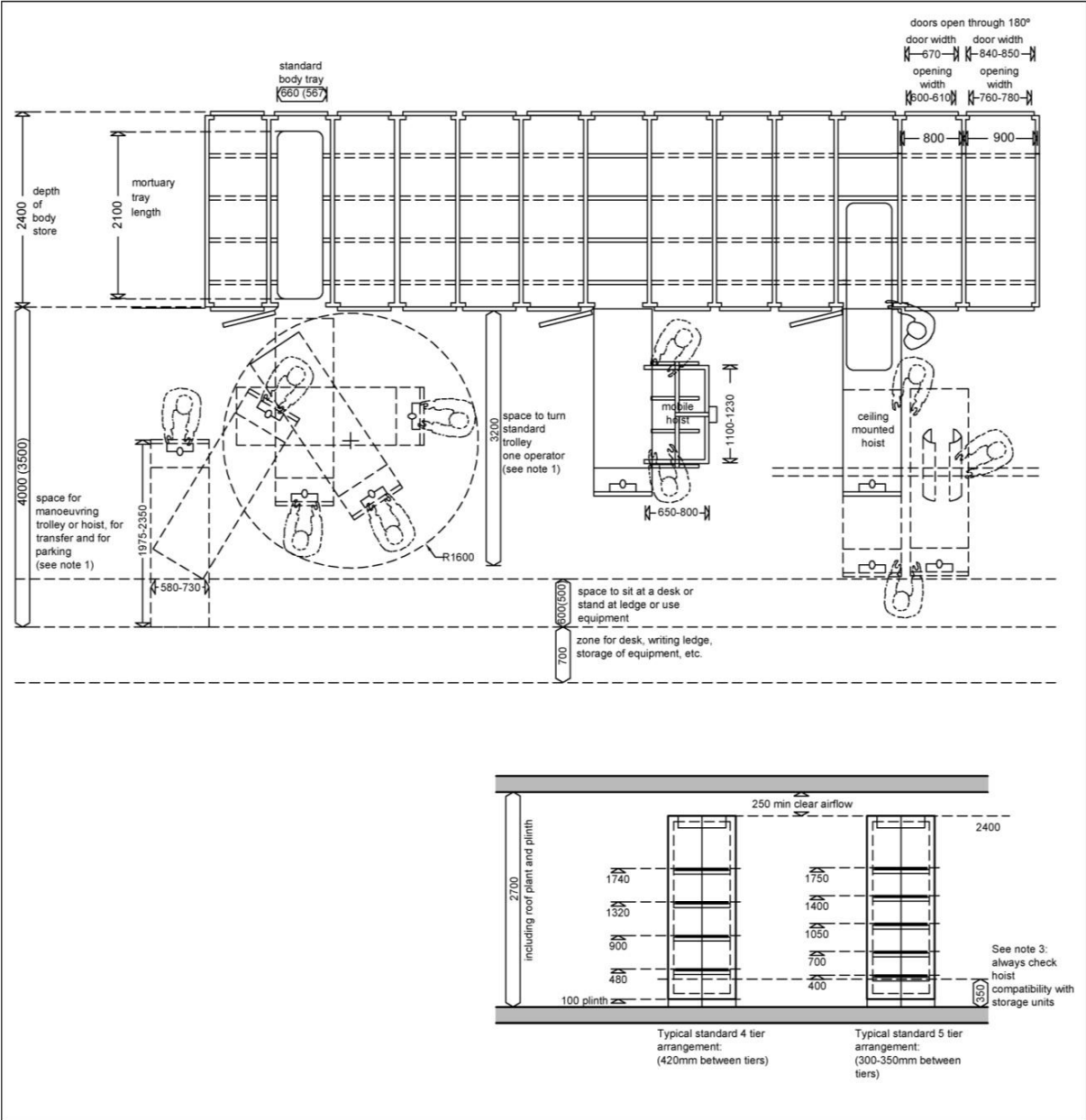


<p><b>Activities:</b>                  Concurrent activities/examinations on adjacent mortuary tables, and transfer of bodies.                  Possible use of hoist systems.</p> <p><b>NHS  </b>                  Ergonomic data sheet not to scale</p>	<p><b>Sheet 3B:</b>  <b>Post mortem room</b></p> <p><b>Users:</b>                  Pathologists, Anatomical Pathology Technologists (APT's) and mortuary assistants.</p>
---	--



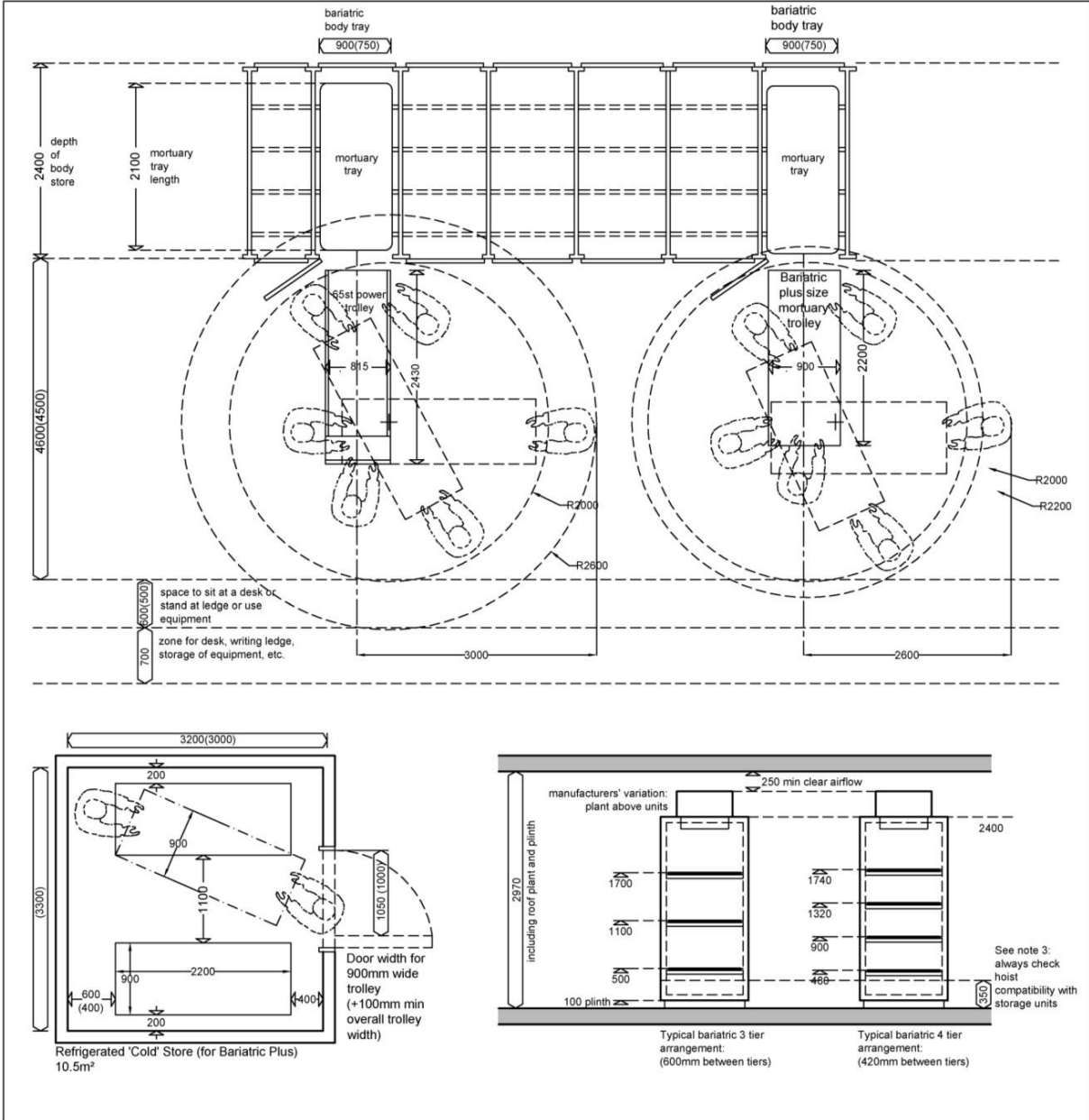
<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">1350</td> <td style="text-align: center;">(1300)</td> </tr> <tr> <td style="text-align: center;">preferred minimum</td> <td style="text-align: center;">restricted minimum (not recommended for general use (see explanatory notes))</td> </tr> </table>	1350	(1300)	preferred minimum	restricted minimum (not recommended for general use (see explanatory notes))	<p><b>Notes.</b></p> <ol style="list-style-type: none"> <li>1. A minimum of two tables is recommended for all Post Mortem services.</li> <li>2. The dimension is based on the longest standard size mortuary trolley. Note bariatric trolleys will impact on minimum dimensions. If a smaller trolley is used and/ or trolley or hoist is parked alongside post mortem table for transfer, dimensions can be reduced.</li> <li>3. Some tables incorporate sinks or adjoin dissection benches therefore these will not need to be provided separately, unless there is a requirement to dispose of aqueous radioactive substances.</li> </ol>	<p>If smaller tables are installed, room dimensions can be reduced, but adequate space to transfer, to work at the table and to pass is still to be allowed.</p> <ol style="list-style-type: none"> <li>4. Tables may be installed offset or rotated in relation to each other. 2000mm is still to be allowed between the long sides of two tables.</li> <li>5. Consider location of bariatric body store bays in relation to post mortem tables. There may be more flexibility at the perimeter of the room where zones for other activities can be shared.</li> </ol>
1350	(1300)					
preferred minimum	restricted minimum (not recommended for general use (see explanatory notes))					

<p><b>Activities:</b> Transfer of bodies to/from trolleys, to/from body store and to/from undertaker's vehicle, by two or more people. Possible use of hoist systems.</p> <p><b>NHS I</b> Ergonomic data sheet not to scale</p>	<p>Facilities for storage of bodies under refrigerated conditions.</p>	<p><b>Sheet 3C:</b> <b>Body transfer area and body store - general use</b></p> <p><b>Users:</b> Anatomical Pathology Technologists (APT's), mortuary assistants, porters, undertakers</p>
---	--	---



<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">1350</td> <td style="width: 50%; text-align: center;">(1300)</td> </tr> <tr> <td style="text-align: center;">preferred minimum</td> <td style="text-align: center;">restricted minimum (not recommended for general use (see explanatory notes))</td> </tr> </table> <p><b>Notes.</b></p> <p>1. These dimensions are based on the longest mortuary trolley for general use. Also refer to 'Body transfer area and Body Store layout for Bariatric/ Bariatric Plus use'. A minimum space of double the length of the chosen trolley must be allowed for manoeuvring the trolley.</p>	1350	(1300)	preferred minimum	restricted minimum (not recommended for general use (see explanatory notes))	<p>2. Different methods of transferring the body may be practised, but must comply with local manual handling policy.</p> <p>(a) the mortuary tray may be transferred to the mortuary trolley by one person</p> <p>(b) the body may be transferred from one trolley to another, side by side, a min. of two up to eight people</p> <p>(c) a mobile hoist may be used which has slings, straps or "scoops" requiring one or two people</p> <p>(d) a ceiling mounted hoist may be used requiring one or two people.</p>	<p>3. Standard size body stores may typically have four or five tiers of trays within one bay. For flexibility, manufacturers recommend adjustable/ removable full length rollers as opposed to stubb rollers. The minimum height of a roller for safely crouching and pulling out/pushing in a loaded tray is 350mm and most hoists will not operate below this height. The maximum height for safely reaching in to the store, past the raised mortuary trolley and pulling out/pushing in a loaded tray is 1750mm for general use (confirm with local Manual Handling policy).</p>
1350	(1300)					
preferred minimum	restricted minimum (not recommended for general use (see explanatory notes))					

<p><b>Activities:</b> Transfer of bodies to/from trolleys, to/from body store and to/from undertaker's vehicle, by two or more people. Possible use of hoist systems.</p> <p><b>NHS</b> Ergonomic data sheet not to scale</p>	<p>Facilities for larger than average storage of bodies under refrigerated conditions.</p>	<p><b>Sheet 3D:</b> <b>Body transfer area and body store - bariatric/ bariatric plus</b></p> <p><b>Users:</b> Anatomical Pathology Technologists (APT's), mortuary assistants, porters, undertakers</p>
---	--	---



<p>1350 (1300) preferred minimum      restricted minimum (not recommended for general use (see explanatory notes))</p> <p><b>Notes.</b></p> <ol style="list-style-type: none"> <li>These dimensions are based on the longest mortuary trolley for general use. A minimum space of double the length of the chosen trolley must be allowed for manoeuvring the trolley.</li> <li>Different methods of transferring the body may be practised but must comply with local manual handling policy</li> </ol>	<ol style="list-style-type: none"> <li>the mortuary tray may be transferred to the mortuary trolley by one person</li> <li>the body may be transferred from one trolley to another, side by side, a min. of two up to eight people</li> <li>a mobile hoist may be used which has slings, straps or "scoops" requiring one or two people</li> <li>a ceiling mounted hoist may be used requiring one or two people.</li> </ol>	<ol style="list-style-type: none"> <li>Bariatric body stores may typically have three to four tiers of trays within one bay. For flexibility, manufacturers recommend adjustable/ removable full length rollers as opposed to stubb rollers. The minimum height of a roller for safely crouching and pulling out/pushing in a loaded tray is 350mm and most hoists will not operate below this height. The maximum height for safely reaching in to the store, past the raised mortuary trolley and pulling out/pushing in a loaded tray is 1750mm for general use. Refer to local Manual Handling Policy for bariatric transfers.</li> </ol>
--	--	---



## Appendix 4: Temporary body store health & safety

A check list of the common issues to be considered when assessing the health and safety risks that may arise from the deployment of a refrigerated temporary storage building, to house increased body storage capacity for several months. This should not be intended as a long-term or permanent storage solution.

### Emergency procedures checklist:

Issue	Risks
<b>Emergency release:</b> - design & condition of door release mechanism	Lone working; Hypothermia;
<b>Body fluid spillage:</b> - procedures	Infection;
<b>Capacity of temporary body store exceeded:</b>	Manual handling; Infection;
<b>Temporary body store out of service:</b>	Manual handling; Infection;

### Outside the body store:

Issue	Risks
<b>Lighting:</b> - level of illumination	Slips, trips & falls; Violence;
<b>Access:</b> - condition of route - weather protection - oversight and privacy	Slips, trips & falls; Security;
<b>Electrical Supply:</b> - integrity & condition	Electrocution;
<b>Door:</b> - design of condition of opening mechanism - height of opening mechanism - design & condition of door seals and hinges	Security; Lacerations; Manual Handling; Entrapment;

**Inside the body store:**

Issue	Risks
<b>Ventilation:</b> - air changes per hour	Infection; Asphyxiation;
<b>Temperature:</b> - level - integrity of cooling system	Infection; Hypothermia; Exposure to refrigerant gases;
<b>Lighting:</b> - level of illumination	Slips, trips and falls, Ability to assess control of infection risks;
<b>Floor &amp; other surfaces:</b> - design of condition - ease of cleaning	Slips, trips and falls; Infection;
<b>Access Ramp:</b> - safe working load - width - gradient of slope - nature of surface - features designed to prevent loss of hoist - weight of ramp	Slips, trips and falls, Manual handling;
<b>Aisle Corridors and Passageways:</b> - width (should be wide enough to accommodate hoist and person)	Manual handling; Slips, trips and falls;
<b>Compartments:</b> - method of loading bodies (side-v-end) - height of compartments & racking - compartment dimensions (width x height x depth) - containment of body fluid spillages - devices (e.g. rollers) to facilitate lateral movements of body tray / body - ease of cleaning	Manual handling; Infection;
<b>Hoist:</b> - Suitability e.g. mobile, ceiling-mounted, safe working load, height range, compatibility to equipment e.g. body store and PM tables.	Manual handling; Access; Equality;

See [Section 10](#) References below for list of legislation current at time of publishing.

## 9. Glossary

<b>Bariatric</b>	term used for a person/ body of large weight, shape or size, which may cause difficulty in mobility or manual handling. Defined in this document as: $\geq 159\text{kg}$ (25stone); or $\geq 0.65\text{m}$ width; and up to $\leq 249\text{kg}$ (39stone), or $\leq 0.9\text{m}$ width.
<b>Bariatric plus</b>	as above, this document defines larger 'plus' size as: $\geq 249\text{kg}$ (39stone), or $\geq 0.9\text{m}$ width; and up to $\leq 415\text{kg}$ (65stone), or $\leq 1.0\text{m}$ width.
<b>Body Store</b>	refrigerated facility for the storage of deceased humans.
<b>Body Storage -short term</b>	non-refrigerated body storage as a short-term measure i.e. $\leq 4$ days, as a buffer only, until refrigeration, or removal for burial/ cremation. Body, temperature & time must be monitored, in a secure, dignified space, e.g. ward room, spiritual room, purpose-designed store.
<b>Body Store -temporary</b>	refrigerated temporary facility, to provide increased body storage capacity for a few months, i.e. not permanent.
<b>Exceptional Event</b>	an incident that requires the implementation of pre-identified measures, e.g. Regional Resilience Partnerships local, regional or national risk mitigations for winter flu, traffic accident, holiday events.
<b>EPDM free</b>	synthetic rubber not to be used in clinical water supply, e.g. WRAS approved flexible hose, (also see SHFN 30).
<b>Forensic Service</b>	all work undertaken for or by Police Scotland or Crown Office Procurator Fiscal Service (COPFS). This often relates to a cause of death investigation, which is suspect or may involve criminality.
<b>Funeral Director</b>	person or private company, who supervises or directs the preparation of the deceased for burial/ cremation, e.g. uplift, viewing and memorial, as instructed usually by next-of-kin.
<b>Major Incident</b>	national emergency / disaster that requires an implementation of special measures, e.g. NEMA, often across multiple agencies. Includes transport of overwhelming casualties, storage and victim examination / ID, e.g. extensive mass pandemic, intensive airplane crash.
<b>NEMA</b>	National Emergency Mortuary Arrangements. Current Scottish/ UK wide processes and guidance for mass fatalities (e.g. $\geq 150$ ) preparedness and facilities.
<b>Post mortem</b>	an examination of the deceased, or autopsy; often to confirm cause of death, but may be for public health or training.
<b>Mortuary</b>	room or building in which the deceased are kept, for hygienic storage, until burial or cremation.
<b>Pathologist</b>	doctor who performs autopsy; and is regulated by recognised professional body e.g. Royal College of Pathologists (RCP)
<b>Public Bodies</b>	agencies that deliver our public services across UK, ranging from health and social care, to the arts and security, e.g. NHSScotland NHS Boards, Local Authorities, Police Scotland, Crown Office & Procurator Fiscal Service, Universities. <a href="http://www.gov.scot/Topics/Government/public-bodies/about">www.gov.scot/Topics/Government/public-bodies/about</a>
<b>Technologist</b>	professional mortuary staff who support the pathologists in conducting post mortem examinations, and who ensure safety, dignity and respect for the deceased and their visitors. Conduct should be regulated by the professional body, e.g. Anatomical Pathology Technologists (APT)

## 10. References

### **NHSScotland standards and guidance**

Health Improvement Scotland provide standards for hospital post mortems [http://www.healthcareimprovementscotland.org/our\\_work/person-centred\\_care/resources/post-mortem\\_standards.aspx](http://www.healthcareimprovementscotland.org/our_work/person-centred_care/resources/post-mortem_standards.aspx) .

Current document [list](#) and versions of SHTMs, SHPNs, SHFNs SHTNs GUIDs etc are available free on our HFS website: [www.hfs.scot.nhs.uk/publications/](http://www.hfs.scot.nhs.uk/publications/) Also see HPS website for guidance on health risks: [www.hps.scot.nhs.uk](http://www.hps.scot.nhs.uk)

### **Scottish Government, Health & Social Care policy**

Current Health and Care policy [list](#) and documents DLs, CELs, HDLs etc. are available free on [www.sehd.scot.nhs.uk](http://www.sehd.scot.nhs.uk)

SGHSCD website [www.pcpd.scot.nhs.uk](http://www.pcpd.scot.nhs.uk) contains policy and guidance for facilities and procurement including [Scottish Capital Investment Manual](#)

### **Legislation and policy**

Current legislation for UK and Scotland is available: [www.legislation.gov.uk/](http://www.legislation.gov.uk/)  
Examples of relevant legislation for this document include, but are not limited to:

- [Health and Social Care \(Safety and Quality\) Act 2015](#)
- [Health and Safety at Work etc Act 1974](#)
- [Health and Safety \(Amendments etc\) Regulations 2017](#)
- [Human Tissue \(Scotland\) Act 2006](#)
- [Management of Health and Safety at Work \(Amend't\) Regulations 2006](#)
- [Manual Handling Operations Regulations 1992](#)
- [Construction \(Design and Management\) Regulations 2015](#)
- [Consumer Protection Act 1987](#)
- [Equality Act 2010](#), plus [Specific Duties \(Scotland\) Regulations 2016](#)
- [Radioactive Substances Act 1993](#)
- [Control of Substances Hazardous to Health \(Amendment\) Regulations 2004](#)
- [Control of Substances Hazardous to Health \(COSHH\) Regulations 2002](#)
- [Electromagnetic Compatibility Regulations 2016](#)
- [Control of Electromagnetic Fields at Work Regulations 2016](#)
- [Gas Safety \(Installation and Use\) Regulations 1998](#)
- [Ionising Radiation \(Medical Exposure\) \(Amendment\) Regulations 2011](#)
- [Control of Noise at Work Regulations 2005](#)

Current guidance on health and safety is available: [www.hse.gov.uk/guidance/](http://www.hse.gov.uk/guidance/)  
Examples of relevant legislation for this document include, but are not limited to:

- [ACDP Approved List of biological agents 2013](#)
- [A brief guide to controlling risks in the workplace 2014](#)
- [HSG274 Part 2 Control of Legionella in hot and cold water systems](#)
- [Safe working and the prevention of infection in the mortuary and post mortem room 2003](#) (HSE update due end of 2017)

Also see current version of [www.water.org.uk](http://www.water.org.uk) or equivalent professional body; [National Guidance for Healthcare Waste Water Discharges](#) 2014.

### Department of Health guidance

Current guidance is on [www.gov.uk](http://www.gov.uk), examples include, but are not limited to:

- [Viral haemorrhagic fever \(VHF\): ACDP algorithm and guidance on management of patients \(including infection control\) 2014](#)
- [Rabies: risk assessment, post-exposure treatment, management 2014](#)

### British Standards

Current British Standards are available at: [www.bsigroup.com/Standards/](http://www.bsigroup.com/Standards/) Examples of relevant standards for this document include, but are not limited to:

- **BS EN 285:2015** Sterilization. Steam sterilizers. Large sterilizers
- **BS EN 60601-1-11:2015** Medical electrical equipment.
- **BS 5266-1:2016**. Code of practice for the emergency escape lighting
- **BS 4737-3.30:2015** Intruder alarm systems 2015
- **BS EN 50131-1:2006+A1:2009** Alarm systems. Intrusion & hold-up systems
- **BS 8300:2009+A1:2010** Design of buildings and their approaches to meet the needs of disabled people. Code of practice 2010.
- **BS EN 12056-1:2000** Gravity drainage systems inside buildings 2000
- **BS EN 12464-2:2014**. Light and lighting. Lighting of work places 2014
- **BS 8468-7:2012**. Respiratory protective devices for use against chemical, biological, radiological and nuclear (CBRN) agents. Closed-circuit breathing

**Other Publications**, include, but are not limited to **e.g.** [CIBSE](#), [BSRIA](#), [Design Council](#):

- **CIBSE Guide F**: Energy Efficiency in Buildings 2016
- **CIBSE Guide G**: Public Health Engineering 2014
- **CIBSE Lighting Guide 02**: Hospitals & Health Care Buildings - LG2 2008
- **BSRIA** Life Safety and Firefighting Power Supplies - BG70 2017

**National Records Scotland**: [www.nrscotland.gov.uk/statistics/vital-events/deaths](http://www.nrscotland.gov.uk/statistics/vital-events/deaths)

Current and historical annual death certification data for Scotland, includes causes by Local Authority and NHS Board.