Scottish Health Planning Note 04

In-patient accommodation: Options for choice

NHS in Scotland, P&EFEx, May 2000

Contents

About this series

The Scottish Health Planning Note series is intended to give advice on the briefing and design of healthcare premises in Scotland.

These Notes are prepared in consultation with representatives of the National Health Service in Scotland and appropriate professional bodies.

Health Planning Notes are aimed at multidisciplinary teams engaged in:

- designing new buildings;
- adapting or extending existing buildings.

Throughout the series, particular attention is paid to the relationship between the design of a given department 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 reader informed guidance on which to base design decisions.

Acknowledgements

The NHS in Scotland gratefully acknowledges the assistance received from the following individuals:

Dr S. D. Slater	Royal College of Physicians and Surgeons of Glasgow
Council Members	Royal College of Surgeons of Edinburgh
Dr J. St J. Thomas	Royal College of Physicians
Ms June Andrews	Royal College of Nursing
Miss M. Henderson	Southern General Hospital NHS Trust
Miss Gill Donnelly	Southern General Hospital NHS Trust
Mr A. Gorrie	WS Atkins Healthcare

SHPN 04 has been adapted from the core text provided by NHS Estates, England. The NHS in Scotland Property and Environment Forum Executive thanks Mr Norman Raitt of Norman Raitt Architects for editing and adapting the text for the NHS in Scotland.

1. Scope of SHPN 04

1.1 This Scottish Health Planning Note (SHPN) provides guidance on the planning and design of hospital accommodation for people with acute illness or who require an acute intervention. It replaces SHPN 4 Adult acute wards (1992). The guidance in this Note can be used either to inform the decisions made during the planning of a project or for evaluating a design solution.

1.2 Services for people with acute illness may be delivered in a variety of locations. These include care at home managed by primary healthcare, community health service or hospital outreach teams; day facilities at local health centres, community hospitals or acute hospitals or in-patient accommodation in community, acute general or specialist hospitals. This Note offers guidance for adult in-patient accommodation in acute general hospitals. Guidance on facilities for other modes and types of care is provided in other documents in the Scottish Health Planning Note series.

The rationale for review

1.3 There have been profound changes in the organisation, delivery and practice of bedside care since 1992 when the NHS in Scotland issued the last guidance on the adult acute ward. In clinical practice new technologies have resulted in an in-patient population which has a rapid turnover with a high number of interventions and a high dependence on services (medical gases, electrical/electronic) and on staff.

1.4 The emphasis on the efficient use of resources has led to high bed utilisation not simply to maximise the use of the bed itself, but to gain the greatest value from the more costly elements of the hospital complex, the diagnostic and therapeutic facilities, imaging and operating departments.

1.5 The organisation and use of the most valuable resource – the knowledge, skills and expertise of staff – is being scrutinised, reviewed and subjected to new standards. This includes the working hours of doctors, the removal of the untrained worker, etc. Different organisational practices are being implemented: multi-disciplinary teams, care groups, multi-skilled generic workers, and professional accountability with flat management structures to name but some.

1.6 The use of computerised systems to hold, process and transfer patient information both digitally and by video at every point of clinical activity is rapidly becoming a reality – reducing the need for personal staff-to-staff interaction, proximity to specialised inputs and a multiplicity of paper-held records.

1.7 Adjacency of some areas with others becomes less significant when information is accessible throughout a system. The use of technology to manage and manipulate information relating to patients also supports organisational change in professional practice. Whilst hands-on skills and expertise cannot yet be substituted, the body of up-to-date professional knowledge is no longer limited to committed professionals but is widely available to anyone – including the lay public – through computer-held databases.

1.8 Telemedicine in its widest definition is "the investigation, monitoring and management of patients and the education of patients and staff, using systems which allow ready access to expert advice and relevant patient information, no matter where the patient is located". This will have a significant impact on the configuration of healthcare services, within the hospital as well as between one location and another.

1.9 The most notable change in today's society is the public's own increased expectations about the quality of the delivery of services – whether in the public or private sector. These expectations are reflected in the NHS in Scotland Patient's Charter – Charter for Health, which set out people's rights in the NHS and the minimum standards to be expected from all health services.

1.10 People attending a healthcare facility for assessment, diagnosis, treatment or care expect:

- to be able to find their way around the facility easily from clear signposting;
- to have greater consultation and discussion (in confidence) with those responsible for their health care;
- that interventions or bodily functions will be performed in private and that they will not be visible to or within earshot of others;
- that there will be sufficient flexibility to enable the patient's religious and cultural beliefs to be upheld;
- that the environment will be not only safe, clean and hazard-free, but will have a pleasant ambience.

It should be possible for people to be able to alter the environment to suit themselves. All these expectations have an impact on in-patient accommodation.

2. Service objectives

Introduction

2.1 The essential message is the ever-increasing rapidity of change in the function and utilisation of hospitals. Flexibility in use on both a day-to-day basis and over time is the key to economic, efficient provision. The capacity to accommodate patients with different needs simultaneously and over a period must be the first criterion.

2.2 In the light of today's concerns a greater emphasis on the human needs of patients is required without jeopardising health outcome or a loss to the efficiency of the hospital.

2.3 There is a close similarity between the different sets of criteria used by authorities in assessing and evaluating hospital design overall. The criteria are readily applicable to in-patient areas alone, to ensure the appropriate balance between the efficiency of the hospital, the effectiveness of health care and that the human needs of individuals are met.

The desirable environment

2.4 The following table summarises the key criteria of a desirable environment:

Space for	
	clinical activity at the bedside. clinical activity elsewhere. storage/display of patients' possessions. storage of bulky equipment. staff support and training. social support of patient
Suitability of	
	services and supplies at the bedside for clinical activity. access to and within area for physically and sensorially impaired people. services to enable personal communication by patient. services to enable direct admin/clinical communication from the bedside. a reassuring, stress reducing, environment. a safe and hazard free facility.

Privacy	
	during clerking and clinical discussions between patient and staff. during clinical treatment. for bodily functions and personal care. for personal discussions and telephone calls. for staff communications. for staff rest and beverage breaks.
Choice, control, comfort	
	to be alone or in company, including visitors. of temperature, ventilation, lighting and sound. of diversion, outlook, entertainment. with access to beverages for patients and relatives. with local storage of personal belongings of staff. with access to the outside world.

2.5 A particular focus of concern has been the “mixed-sex” ward in which the needs of patients for privacy and dignity have taken a lower priority than the interests of efficiency and clinical effectiveness. Although no fixed definition has been given, it is assumed to be one where men and women may be in adjacent beds or use common washing and sanitary facilities. This form of use of accommodation has become more common, as the drive for the efficiency represented by high levels of occupancy and the demand for high throughput generated by the waiting times initiatives have taken effect. Ad hoc comment, surveys and pressure groups all emphasise the public distaste for the “mixed-sex” ward concept, particularly non-segregated sanitary facilities. This is of such concern that the guidance in this Note has been developed to ensure that all future in-patient areas, including sanitary facilities, should be for single sex occupation only.

2.6 However a range of surveys and studies demonstrate that concerns embrace many more issues than the lack of privacy and dignity associated specifically with ‘mixed-sex’ wards. The levels of sensory stimulation - noise in particular -disturbing rest and sleep, inadequate numbers of bathrooms and lavatories, inability to alter lighting and temperature are among those issues repeatedly occurring. Capturing local views and wishes at the outset, throughout the design stage and when evaluating the finished design is important: people value the opportunity to comment at all stages of development.

Flexibility, efficiency and economy in the use of beds

2.7 When putting together the brief for in-patient ward accommodation in an acute general hospital, local priorities and preferences in regard to clinical emphasis and organisation of care delivery play an important role in determining the nature and design of the facility.

2.8 Whilst this document does not discuss the relevant merits of different organisational models, it is nevertheless necessary to recognise that different models of organising patient care are being developed and that the physical environment should enable and not inhibit the adoption of new organisational models**.** The principles of flexibility, efficiency and economy in the use of beds should, however, not be abandoned and ward accommodation must be arranged to also satisfy these basic planning parameters.

2.9 This Note engages these parameters by offering "mix and match" options for generating in-patient accommodation that should meet most local priorities including the reuse of existing accommodation. The ultimate aim is to provide a selection of spaces that may be combined in different ways to create an environment appropriate for today's needs and which may be readily suitable for tomorrow's.

2.10 The "mix and match" modular approach is particularly useful as new service patterns develop. It enables the easy aggregation of spaces to provide a variety of accommodation for in-patients either as part of a specialist patient focused department, day surgery and small in-patient areas, an admission/short stay facility in association with an accident and emergency department or a large in-patient floor.

2.11 The levels at which management communication and information systems operate, and the extent to which these alter throughout a 24-hour period influence the location of the clinical and administrative areas. Allied to this are decisions on the extent and location of staff facilities.

Person-centred, service-focused bed space

2.12 The starting point for the consideration of spaces to generate the modules is the person-centred, service-focused bed space. From decisions taken on the nature and size of the bed space flow consequences for spaces for clinical treatment and storage, staff workstations, patient social spaces and meeting/discussion/interview spaces.

2.13 In an acute hospital today, the volume of activity that centres on the patient in or at the bedside is increasing. The period that a patient spends in hospital is shortening, and becoming limited to that part of a package of healthcare that requires active interventions for diagnosis, treatment and immediate recovery. The level of dependence and disability of patients once interventions begin until discharge is relatively high; movement by staff around the patient may be considerable and there is likely to be a high use of equipment and aids at the bedside. The activities and the patient's response to interventions are recorded, increasingly on computer held databases.

2.14 There are three distinct categories of direct activity that take place:

1. clinical treatment and care:

- admission, with the intimate discussion of personal matters;
- specific medical and nursing interventions and observation;
- rehabilitation;
- teaching and training the patient and relatives;
- informing, discussing, listening and advising.

2. personal care and maintenance:

- eating, drinking, washing and toileting;
- entertainment/diversion, reading, watching the television;
- socialising;
- receiving visitors.

3. support activities:

- preparation of clinical procedures;
- maintaining records;
- holding stores;
- communicating;
- developing staff skills.

2.15 Single-bed room accommodation remains relatively rare in the UK National Health Service, although it is common practice in the private sector. In the USA and some of the European countries there are more single-bed rooms than multi-bedded areas in acute care hospitals.

2.16 Single-bed rooms provide complete flexibility of use for patients of gender, any age, and most clinical conditions including source isolation. This increases the opportunity for shortening turnover intervals and thus raises annual average occupancy. Single rooms offer privacy for treatment and personal activities, confidentiality of discussion, quiet for sleep and rest. Patients can control the environment, have visitors without disturbing others and can venture the short distance from bed to bathroom in relative safety without having to negotiate past other patients and staff and the general paraphernalia of a busy acute area. When the room is used to hold the necessary supplies for a patient's daily care needs, staff travelling distance and time is reduced.

2.17 Arguments presented against the single-bed room are the increase in the overall floor area (and consequential increase in capital cost), difficulty in observing patients and that patients feel lonely**,** increase in staffing (and consequential increase in revenue costs). There is some degree of validity to these arguments. However, the balance of the evidence indicates that the advantages outweigh the disadvantages.

Clinical responsibility

2.18 The ward generally reflects the span of clinical responsibility covered by a Sister/Charge Nurse. From time to time, the span of clinical responsibility of an individual Sister/Charge Nurse may be bigger or smaller than the size of the actual ward: it may change from as few as 12-18 beds to as many as 30-36 beds. It is therefore essential that wards are planned to permit the flexible use of accommodation by effective nurse charges based on patient requirements. In practice a number of wards may be combined to form a unit, which can range in size from 96-120 beds with supporting rooms; this usually reflecting the span of management and clinical responsibility of a clinical nurse manager. The design of the ward must permit the flexible use of the accommodation and this is determined by clinical need, resources available and nurse management patterns adopted.

Grouping of patients

2.19 Patients should be grouped according to their degree of illness and the extent of their nurse dependency. Advances in medical and nursing practice, including the development of medical technology have, in recent years, led to shorter average lengths of stay in acute wards. As well as the resulting increased turnover, an increase in the proportion of elderly and very elderly patients admitted has meant that the majority of patients at any one time in a typical acute ward could be categorised as being of high dependency. Within this category of high dependency, two levels of care can be identified:

- *Intensive Therapy*

  In acute accommodation, Intensive Therapy is required by a small but significant number of patients who require active care 24 hours per day from both medical and nursing staff and the use of life supporting equipment. This Note does not cover such accommodation.

- *Intensive or concentrated nursing care*

  This care is required by an increasing number of patients in every acute ward. Some Boards claim that 50% or more of patients are in this grouping and require 24 hours per day concentrated nursing care, but not constant medical care. In order to provide continuity of care and to make the best use of equipment and nursing resources, these patients may be grouped in one or more of the wards to form a unit. Alternatively, if nursing management and resources are so structured, these patients may be nursed in single-bed rooms or grouped in multi-

bed rooms. To achieve high occupancy levels and to meet the fluctuations in daily demand for intensive care beds, wards must have a direct relationship one with another. By this means the size of the nursing charge can vary according to patient needs. Nursing management will ensure maximum utilisation of staff and ensure that they are deployed to meet changing requirements throughout the day and night. Clearly the design configuration of the ward must be such as to meet this demand.

Grouping of beds

2.20 The decision to plan accommodation within a range of single and multi-bed rooms requires careful thought. A ward with all single rooms will involve an increase in the size of that ward, along with difficulties in supervision, problems of communication and an increase in staffing resources required. The proportion of beds in any one ward provided as single rooms must be determined by local factors and policy. Single-bed rooms should be used to accommodate patients who are:

- liable to infect others;
- particularly susceptible to infection;
- seriously ill and dying;
- likely to disturb others;
- requiring special attention (needing special apparatus or quiet conditions);
- Patients who need privacy.

The remaining beds should be grouped in twos and fours. The preference is for four bedrooms as each patient has a corner bedspace.

Acute specialities suitable for this type of accommodation

2.21 **General Medicine:**

- Haematology;
- Rheumatology;
- Respiratory Diseases;
- Cardiology;
- Nephrology;
- Rehabilitation Medicine;
- Dermatology.

2.22 **General Surgery:**

- Orthopaedic Surgery;
- Gynaecology;
- ENT;
- Ophthalmology;
- Urology;
- Oral Surgery/Medicine.

2.23 **Supra Area Specialities:**

- Medical Neurology;
- Oncology;
- Plastic Surgery;
- Macillo Facial Surgery.

Control of infection

2.24 Prevention of cross-infection is fundamental to patient care. All wards should comply with the recommendations of the Scottish Infection Manual. The principal ways in which design may help in the control of cross-infection are:

- by the provision of single rooms and multi-bed rooms;
- by the provision of accommodation designed to facilitate safe practice; and
- depending on local needs and policies, some isolation may be needed to minimise the risk of cross-infection. Immuno-compromised patients may require to be nursed in a positive pressure environment, while patients who present a risk of infection to others would normally be nursed in a negative pressure environment. Where necessary up to 4 single-bed rooms in each 24 bed ward should be mechanically ventilated to enable either positive or negative pressurisation. The environmental standards are detailed further in Chapter 5.

Health and safety

2.25 The requirements of relevant sections of the document 'The Control of Substances Hazardous to Health - Guidance for the Initial Assessment in Hospitals' 1994 should be adopted.

Hospital clinical and operational policies

Catering

2.26 Each ward should have facilities for serving meals to patients in accordance with the hospital's catering policy. These facilities should comply with current food hygiene and safety legislation, for example the 'Food Safety Act, 1990' and the 'Food Hygiene Amendment Regulation, 1990'.

2.27 Two common methods of meal delivery service are:

- **central tray service** – meals which have been assembled to the individual patient's requirements and delivered to the ward in a trolley with the food kept hot by a heat retaining base under each plate or in a heated tray trolley. On arrival at the ward, meals are served at the earliest opportunity. Space should be provided to accommodate the delivery trolley without obstructing normal circulation;
- **cook-chill service** – chilled meals which have been assembled to the individual patient's requirements and delivered to the ward in a trolley. This may incorporate a reheating compartment, or a separate reheating unit may be provided at ward level or in a shared trolley holding room. Meals must be stored and heated under controlled conditions before being served to patients. Space, in addition to that needed for the bulky delivery trolleys, must be provided for activities associated with the controlled reheating process – for example temperature monitoring. An electric power supply will be needed.

Domestic services

2.28 The accommodation required for storage and cleaning of domestic equipment at ward level will be determined by the scope and extent of the service as outlined by the Hospital's operational policies.

Supply, storage and disposal

2.29 The concept of Materials Management involves the supply, distribution, storage and disposal or re-cycling of a wide range of goods and equipment essential to the efficient management of wards. The range of items is provided by a number of different hospital departments.

These include:

- Central Store;
- Sterilising and Disinfecting Unit;
- Pharmacy;
- Laundry;

- Kitchen;
- Laboratory;
- Engineering Services.

The methodology adopted by the hospital to provide an effective Materials Management System requires detailed planning and co-ordination.

2.30 The storage space required for supplies is influenced by three principal factors:

- **Type**: medical surgical sundries, sterile supply service items, pharmaceutical supply, etc;
- **Quantity**: proportional to patient throughout;
- **Policy**: the whole hospital policy determines the frequency of delivery of each type of supply.

2.31 The space provided should be sufficient to hold that quantity of each item that will match the expected demand for the longest period of time between consecutive deliveries. In practice this means making space available for holding not less than five days' supply.

2.32 The consequences of supply, storage and disposal policies for capital, revenue and service all interact. Increasing space and stock increases both capital and revenue costs. Reducing space reduces capital outlay but demands an increase in the frequency of delivery, so that running costs also increase. Insufficient stock can adversely affect patient care and nursing service because staff are distracted by the necessity of seeking or collecting the items required. Also, an unreliable supply encourages defensive overstocking.

2.33 Disposal of pressurised containers requires special attention – see SAB(88)79 'LPG Aerosol Containers: Risks arising from storage, use and disposal'. Specifically constructed containers (see Specification No. TSS/S 330, 15 December 1982) should be used for 'SHARPS' particularly needles. This minimises the risk of injury to staff, particularly portering staff, handling goods destined for incineration.

Figure 1

Purpose and siting of departmental stores									
Activity Space	Storage / holding Categories of items to be stored								
	Medical and surgical inc IV fluids	Pharmacy/ lab. reagents	Controlled drugs	Clean linen	Catering supplies	Stationery	House-keeping/ cleaning supplies	Mobile medical equipment	Furniture – bulk items
Staff base						●			
Bed areas	●							●	
Bulk supplies store	●						●		
Furniture store									●
Clean utility	●	●	●						
Linen store				☐					
Dirty utility									
Clinical equip-ment store								●	
Laboratory		●							
Workshop									
Staff changing				●					
Staff rest room/ pantry					●				
Patient pantry					●				
Relatives' pantry					●				
Offices						●			
Seminar room						●		●	
Cleaner's room							●		

Activity spaces not used for storage

Entrance/waiting area

Disposal room

On-call room

Equipment service room

Key

● store

☐ policy option could be linen trolley

Information handling

2.34 Computing expertise is now widely available in the NHS and users should ensure that, at an early stage, they inform themselves of current and projected local computing policies and prepare their proposals accordingly.

Staff changing

2.35 Changing facilities for male and female staff may be provided centrally, zonally, or locally (SHHD/DS(1984)29, Nucleus Study No. 12 'Staff Change (Options)' and Nucleus Study 13 'Decentralised-zonal staff change'). Ward facilities should complement those provided elsewhere.

3. Specific functional and design requirements

Introduction

3.1 The “mix and match” modular approach discussed in paragraphs 2.7 to 2.11 is developed in this Chapter which details individual module and room requirements. There are five modules of accommodation:

- bed and sanitary facilities;
- patient support facilities;
- storage spaces;
- utilities;
- administration areas and staff facilities.

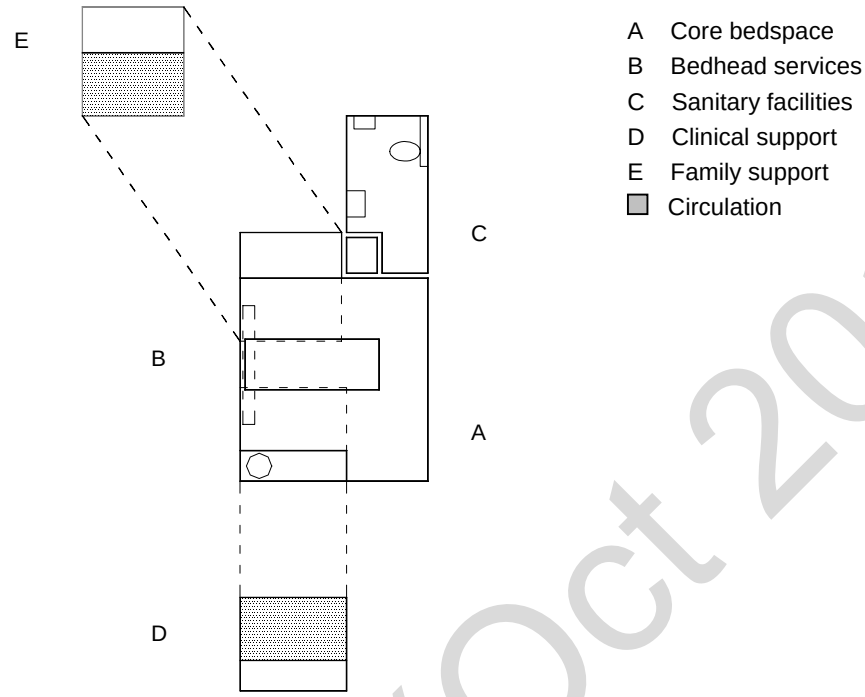
In addition, essential complementary and optional accommodation is offered.

3.2 Modules may be aggregated as packages for the level of provision required.

Bed and sanitary facilities

3.3 This Note provides design guidance for both single-bed and multi-bed rooms. The diagram below shows the zones required to enable the full range of activities to take place around a bedspace in a single-bed room.

Five activity zones within a bedroom



Single-bed rooms

3.4 The single-bed rooms should be sized to enable the range of bedside activities appropriate to the needs of the project. These could include:

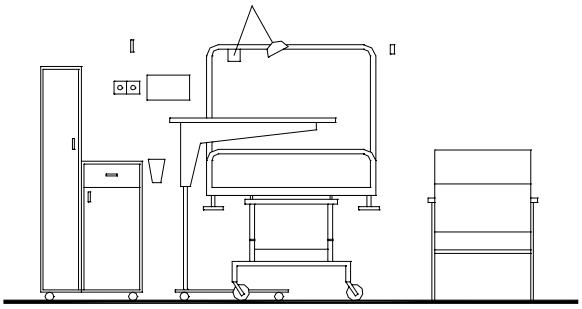
- family involvement in the care team;
- bedside diagnostics and the recording of information;
- local ancillary and support services at the bedside;
- clinical support;
- family support.

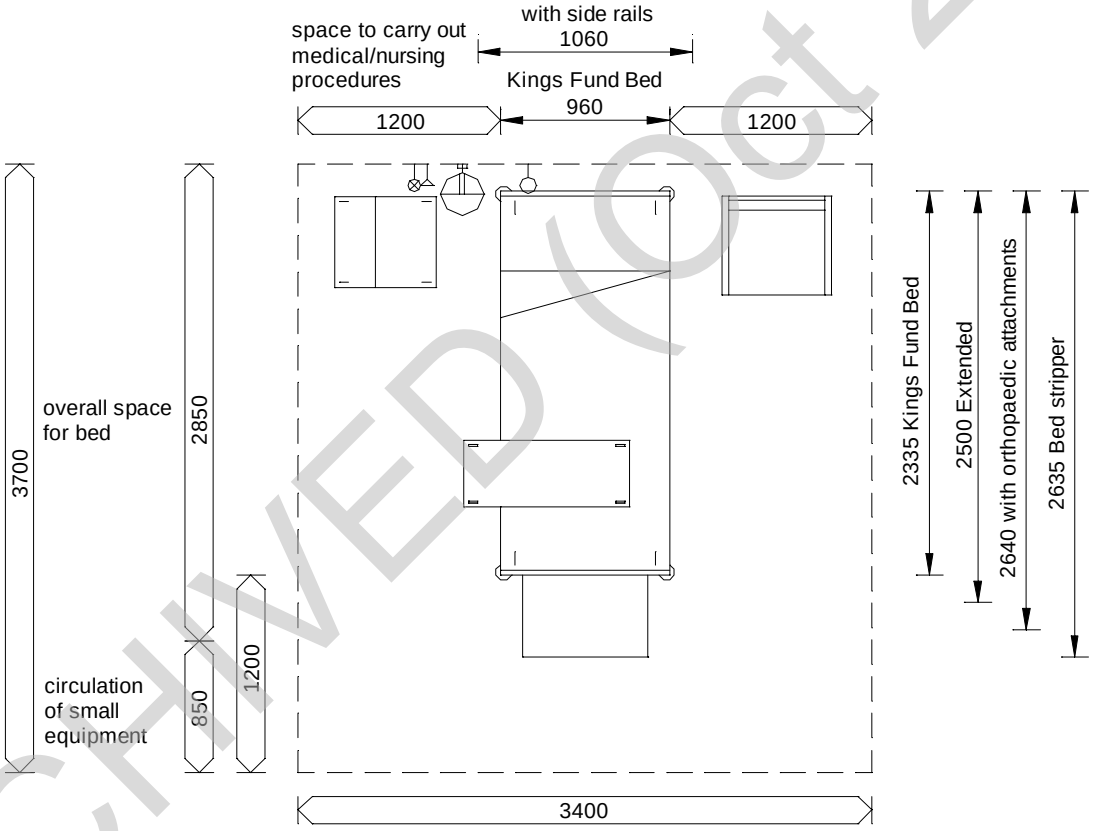
The extent to which these activities are required in individual cases will depend on the nature of the intervention and care involved. In some cases space requirements could be minimal, while in others space more akin to an HDU may be needed. In the interest of economy, it is suggested that Trusts consider adopting a range of room sizes geared to the likely requirements of the project in hand and which will provide flexibility in use. In this regard two bedded rooms are included in the Schedules of Accommodation because they can provide a flexibility of use not always available with single-bed accommodation.

3.5 The single-bed room should allow procedures to be carried out from either side of the bed with adequate circulation space so that medical emergency teams and equipment, including patient lifting aids, can gain access to the patient. There should be adequate space for moveable furniture and unobstructed access for wheelchairs. Space to accommodate overnight visitors should be provided in an appropriate number of rooms to reflect the anticipated requirement. A fold-down bed or bed/seat arrangement may be a suitable way to provide a sleeping facility.

3.6 The need to provide a variety of single-bed room sizes and the likely addition of clinical and family support zones to the bedspace will result in an increase in room size from the previous single-bed room with sanitary facilities area of 15.5m^2 (SHPN 4, 1992). The extent of the increase will be determined by the decisions taken regarding numbers and types of rooms required. The range of room size may vary between 18.0m^2 (no clinical and family support zones) and 30.0m^2, the latter allowing maximum space for all equipment and services including special beds, monitoring equipment, lifting hoists, etc. For planning purposes this Note adopts an average single-bed room area of 21.0m^2.

Core bedspace for single-bed room
(See paragraph 3.9 for multi-bed room dimensions.)





Dimensions are based on a standard Kings Fund bed including all extensions. Easily understood controls for the bed, TV, lights, and nurse call with pressure-sensitive control buttons, accessible with either hand, should be provided.

Minimum clearance of 1200mm should be allowed on both sides of the bed for clinical and support activities. This clearance should be maintained at the end of the bed whilst allowing for bed extensions and for tilting.

Multi-bed rooms

3.7 The alternative to a single-bed room is a multi-bed room, in which the different activity zones move to a greater or lesser degree further away from the bedside, and may be shared to support all the beds in the multi-bed room. To complete the range of room sizes proposed in 3.4 it is suggested that, if appropriate, Trusts use 2 or 4 bed rooms, each with designated sanitary facilities accessed not from within but from just outside the sleeping area. Each patient has a corner to provide a “home base”, the distance to washing and lavatory facilities is still short, but has the advantage of not being under the gaze of one’s immediate fellow patients.

3.8 Whether in a single- or a multi-bed room all bed spaces should be provided with:

- a variable-height bed;
- a bedside locker (or locker wardrobe);
- an overbed table;
- an easy chair and space for an additional stacking chair;
- a bedhead luminaire;
- a bedhead services panel incorporating:
  - electrical socket outlets;
  - shaver socket;
  - luminaire control switch;
  - staff call reset button/indicator lamp;
  - staff/staff emergency pull switch;
  - socket for patient handset;
  - patient handset storage bracket;
  - radio/TV;
  - stethoscope headset outlet (may be on handset control unit);
  - telephone/call monitoring;
  - IT point;
- a patient handset control unit incorporating:
  - staff call button;
  - reassurance light;
  - luminaire switch;
  - radio/TV volume control knob;
  - radio/TV selector switch;
- oxygen, vacuum outlets, etc;

- compressed air outlets (optional);
- personal storage:
  - a wardrobe with clothes hangers, lockable drawer, hooks, space for suitcase, shoes and boots is required. A further lockable drawer for medication should be incorporated.

  Space will be required for storing:
  - toiletries;
  - reading material;
  - writing supplies;
  - radio;
  - flowers;
  - cards;
  - non-perishable food;
- IT point;
- storage for a day's supply of linen and surgical goods/supplies;
- waste disposal (clinical and domestic).

3.9 Where not in a single-bed room each bedspace should not be less than 3.0m x 2.7m and be separable by curtains to provide a degree of privacy. Curtains should be shadow-proof, flame retardant, and if suspended from ceiling track, have a net or scalloped inset heading to ensure ventilation and light when drawn.

3.10 Each multi-bed room should include a wash-hand basin for staff use, a workstation and storage for a day's supply of linen and clinical goods. Each bed should have its own IT point

3.11 All bedrooms, whether single or multi-bed rooms, must be fitted with fire doors to comply with NHS in Scotland Firecode.

3.12 Each multi-bed room should include or have easy access to a sitting area, as the majority of patients, although highly dependent, are encouraged out of bed.

Sanitary facilities

3.13 All single-bed rooms and multi-bed rooms should have en suite WC and shower. The increasing acuity of illness of in-patients means that a great proportion of patients may use a wheelchair or require assistance during their hospital stay even when not normally wheelchair users. For greatest flexibility of use all sanitary facilities should be accessible and manageable by people with physical or sensory disabilities with or without assistance.

3.14 Easy access, convenient location and good design of WCs and other sanitary facilities are of great importance to patients. All assist the maintenance of independence and reduce the incidence of side effects from immobilisation. WCs should be clearly identified, and designated for use by people of one gender at a time, as needs fluctuate.

3.15 In each single-bed room there should be a WC and a shower as well as a wash basin for use by patients. Non-tap wash basins with motion sensors may be considered. For economy of space these facilities should be contained in one compartment per bedroom. It must be possible for sani-chairs to be pushed easily and without turning, into WC compartments. The wet shower area of the compartment should be separated by a curtain from the remainder which should serve as the drying area. There should not be a step between the wet and dry areas, but there is a requirement for sufficient slope of the floor to the outlet, so as to ensure proper drainage and prevent spillage of water into the dry areas. A separate wash-hand basin with lever taps for use by staff should be provided within the clinical support area.

3.16 In multi-bed rooms it is convenient to provide a separate WC compartment and a shower compartment both opening off a lobby from the bedroom. Thus two people may use the facility at once and one person showering does not prevent others from using the WC. However privacy and dignity must be ensured with the provision of appropriate security devices, locks, etc but with emergency access. Each compartment should have a wash basin. In the shower compartment there must be no step between wet and dry areas (the latter will contain the wash basin) but there must be sufficient slope to confine the water to the wet area. Both compartments should permit assisted use when required and have sufficient space for drying and dressing.

Shower and bathrooms

3.17 As public experiences widen and attitudes change, there is a greater acceptance of showers. The space economy of showers particularly when compared to assisted bathrooms is considerable. Apart from space, showers are efficient users of water and energy, easier and safer in use for both patients and staff and are said to be less likely to be a source of infection. However, shower compartments must be large enough to allow wheelchair access and it must be possible to shower patients on a suitable chair. A longer shower hose may be required. These factors should be considered by project teams in coming to a decision on the nature of washing facilities to be provided.

3.18 If centrally located, WCs should not be more than about 12m from bed areas or the day room. The following points should also be taken into account:

- all WCs must have provision for handwashing;
- as patients may wish to use the WC before or after bathing or showering, project teams should consider providing a WC and wash basin in each bathroom/shower room;
- at least one assisted WC should be so designed that staff can assist the patient from either or both sides.

3.19 A member of staff must be able to leave the WC without exposing the patient to view, and if privacy cannot be ensured by room design then an internal curtain or screen must be fitted.

3.20 Where a bath or shower is provided en suite to each multi-bed room, a centrally located assisted bathroom will also be required. If no baths are provided in en suite facilities, then at least one standard bath must be provided for general use in addition to the assisted bathroom.

3.21 The cord of the patient staff call system should be easily identifiable, accessible from the wet area, and descend far enough to be within the reach of a patient who has fallen or collapsed. The floor surface should be slip-resistant. The gradient of the floor of the wet area should ensure effective drainage to the waste outlet to prevent ponding. Ventilation should preclude excessive heat, humidity and odours.

Bidet

3.22 Provision of a bidet in the assisted bathroom or assisted shower should be considered; additional bidets may be required in wards serving particular clinical specialities.

Patient records

3.23 As with the single-bed room, the closer the facilities for maintaining records and holding supplies, the less time is spent by staff in travelling to and fro. A work station and storage trolley bay for linen and clinical supplies should be within or closely associated with the multi-bed room. Patients' case notes should be kept in a lockfast compartment or trolley.

Patient support facilities

3.24 The multi-bed room, however, cannot afford privacy for discussion of personal or clinical matters or for clinical treatment. If multi-bed rooms are used there must also be quiet separate rooms for consultation and examination or treatment and for one-to-one discussions, interviews or education.

Consultation/examination/treatment room

3.25 A consultation/examination room may be used for procedures of a clinical nature, as well as for pre-admission assessment, clerking and examination of patients on admission. A computer terminal should be provided at the desk to enable direct input to a patient's record, ordering investigations, etc.

3.26 If a patient who has not been allocated a single-bed room requires treatment, it may take place here. The patients may be ambulant, in a wheelchair, on a trolley, or on a bed; the door width must be sufficient to permit their passage. Door swings should not impede movement or activities within the room. All-round access to the patient on the examination couch is essential (which should be screened to ensure privacy). The examination couch must be mobile so that it can be moved out of the way to allow access to patients who need to be treated on a patient trolley or bed.

3.27 A desk and chairs for consultation are required. A small cupboard with a worktop, for the storage of items of equipment and sterile packs, is desirable.

3.28 This room should be equipped with terminal units for oxygen and for vacuum, an X-ray viewing facility, a mobile lamp, a deep sink and clinical hand washing facilities. Clinical-quality colour rendering light sources should be provided with appropriate dimming/enhancing facilities and walls, ceilings and floors should be of suitable colour and reflection. Natural ventilation will be required unless the department is deep planned where air conditioning may be needed.

Interview/sitting room

3.29 Discussions, assessments and education of patients or relatives with or by staff, therapists, social workers or relatives may be carried out in an interview/sitting room. These should be quiet and distraction-free to enable one-to-one communication. The same rooms may also be used by staff for staff interviews, appraisal and counselling.

3.30 The designer should aim to create an environment which is cheerful, comfortable and warm. Appropriate lighting and decorative textures such as pictures and plants can provide a tasteful domestic atmosphere. Finishes and furniture will have an important influence on the room. Easy chairs, a bookcase and coffee tables should be provided. It is important for rooms in which patients will be sitting to be free from draughts.

Day spaces

3.31 For patients – whether in single-bed rooms or multi-bed bays – open yet intimate areas recognisably intended for casual meeting and talking may be all that is required to enable patients who wish to socialise without the provision of dedicated day rooms which do not always provide an environment that people like to use. However the dedicated day room, in addition to its intended function, can be useful as a multi-purpose area, for example as a smoking area if limited smoking is allowed in the hospital, or as a holding area for patients who cannot go home until later in the day, thus releasing a bed space for more urgent use.

Pantry/beverage making

3.32 The pantry should be equipped with facilities for:

- the preparation of beverages and light snacks;
- the filling of patients' water jugs;
- storage of dry goods, and a limited amount of crockery and cutlery;
- refrigeration of perishable food.

3.33 A mechanical dishwasher and separate facilities for washing-up and hand-washing are required. Crockery and cutlery used for main meals are returned to the central washing-up service. The requirements of paragraphs 3.32 and 3.33 may have to be varied to accord with the Trust's catering policy.

Food trolley bay

3.34 If food is to be served from a trolley on to plates, this trolley should be located within the pantry. If plated meals on trays are delivered ready for distribution the trolley bay may be located off a circulation space.

Resuscitation trolley bay

3.35 Emergency equipment, such as the resuscitation trolley, must be parked where it is accessible from the bedrooms, but should not obstruct circulation areas.

Storage spaces

3.36 Store rooms are a costly means of providing storage as they require internal circulation space. Storage in relatively shallow cupboards or doored alcoves opening directly from circulation areas may be more convenient and cheaper. The latter is particularly useful for goods for which stocks are maintained by an exchange trolley service. If this system is adopted care must be taken in the design of the circulation spaces to ensure their minimum usable width is not restricted. A wheelchair/sani-chair bay will be required, located conveniently to the bedrooms.

Clinical store/Controlled Drugs cupboard

3.37 A back-up lockable clinical store to the clinical supplies trolleys will be required. This store will be the secure storage necessary for controlled drugs, medicines and lotions. A fridge for clinical use may be required in this area.

3.38 A red indicating lamp should be provided on each Controlled Drugs cupboard and, where appropriate, outside the doorway to the room in which the cupboard is located and at the Nurses' Station. The lamps should be interlocked with the cupboard and alarm system to give at the Nurses' Station visual and audible indication of unauthorised entry to the cupboard.

3.39 An indicating lamp denoting that the circuit is energised should also be fitted to each cupboard. The supply circuits for the lamps and alarm system should be derived from essential circuits. BS 2881 provides information on cupboards and their installation.

Large equipment store

3.40 This store is required for bulky items of equipment, bed accessories and therapy aids. Open shelving, hanging rails and hooks as well as free standing space for heavy equipment such as hoists and weighing machines is required. Disposable items delivered in bulk packages to the clinical area will require storage. Storage for beds not in use must also be allowed for unless it is provided elsewhere in the hospital.

Linen trolley bay

3.41 The type of linen store depends on the linen supply policy. This Note assumes an exchange trolley system which requires space to park linen trolleys. The volume of space is determined by the frequency of delivery.

Clinical supplies trolleys

3.42 Clean and sterile goods for daily use may be held on trolleys, at the point of use in the bedrooms under worktops, as determined by the Trust's policy for the storage of clinical supplies.

Administration areas

Reception

3.43 A reception may be required in larger units. It should be in a prominent position at the entrance. The counter needs to be stepped so that a person in a wheelchair can see and speak easily to the receptionist. The desk requires sufficient working space for a receptionist and one other who will welcome patients, relatives and staff, and undertake the local clerical and administrative duties.

3.44 The reception desk will be linked by computer to all areas. Space is required for a computer terminal and associated equipment. It should be wired as the centre for the patient to staff and a staff call system within the area. It should incorporate a facility for transferring a staff to staff emergency call to another manned point.

Office meeting room

3.45 This office is a multi-purpose office, but is likely to be used principally by clinical and therapy staff to complete notes on discharged patients, undertake telephone calls and for staff discussions. It should be sized to accommodate a desk with a computer terminal, a table and up to four people.

Charge nurse/Sister's office

3.46 An office is required from which to organise the work of the ward. This includes writing notes, interviewing staff and planning and recording patient care. The office should be adjacent to the Nurses' Station and General Office/Meeting Room. At least one IT point will be required.

Nurses' Station

3.47 The Nurses' Station is the base at which nurses may receive, read or give instructions and record information in the nursing records held there. It acts as the observation point for bedrooms, especially at night. If a computer terminal is to be provided, the privacy of records and noise implications should be considered and appropriate measures taken. The Nurses' Station should be located near the utilities.

Stationery store/IT room

3.48 A general stationery store room, where a printer may be kept, may be required. It should be shelved and well lit. The IT node cabinet could also be located in this room.

Day space/waiting area

3.49 A seated area should be provided near the reception desk for patients, relatives and ward visitors waiting to be received. The area may also serve as additional informal day space for patients. A public telephone should be located in this area.

Staff lockers

3.50 Staff will require local change facilities to leave outdoor clothes and secure lockers to hold small personal belongings easily accessible while on duty. The staff lockers should be located adjacent to the Type 3 Staff shower/wash-hand basin (Optional accommodation). It is assumed that central changing accommodation will be available for non-resident staff.

Utilities

Utility/sluice/test room

3.51 The room serves as the temporary storage point and testing area for specimens. Bulky items such as bedpans with their carriers are stored here, as is equipment for the destruction of disposable, etc. Such equipment may generate significant noise levels and care should be taken to eliminate this. Colour-coded disposal bags for the bagging of waste materials should be kept here.

Domestic services/cleaners room

3.52 The domestic services/cleaners room is the base from which domestic service staff provide the immediate day-to-day cleaning service. A clinical wash-hand basin should be provided. It should include storage for cleaning materials and equipment in daily use and facilities for the routine servicing and cleaning of equipment. The room should be well lit and ventilated so that equipment can dry quickly; mechanical ventilation may be required. Bulky equipment has to be moved in and out of the room and this should be taken into account in its location. Cleaning materials should be stored in a secure cupboard.

3.53 Space should be sufficient for the storage, washing, drying and manoeuvring of cleaning machines; for loading, parking and unloading trolleys, and for emptying and filling buckets and bowls. Access to the sink should be unrestricted.

Disposal hold/bay

3.54 The disposal room is the temporary storage point for all items of supplies and equipment that have to be removed for cleaning, reprocessing or destruction, e.g. linen and sterile services department items.

3.55 The waste disposal of used items should be consistent with the current hospital policy for the disposal of clinical waste. The bay may have to be divided into separate clean and dirty areas.

Switchgear cupboard

3.56 A departmental switchcupboard housing the main isolators and distribution fuse switchgear should be:

- accessible directly from the circulation area (access space may be part of the circulation area);
- sited away from water services;
- lockable.

3.57 Where possible the cupboard should be sited within the department. There should be clear and safe access for maintenance staff and care should be taken to ensure that safety is not compromised, during maintenance, from passing traffic or the opening of adjacent doors.

Essential complementary accommodation (ECA)

Seminar room

3.58 It is assumed that a designated education centre with conference facilities for multi-disciplinary use will be available on site. If this is not the case, accommodation for teaching, tutorials, etc should be provided in accordance with the Trust's policy (see also paragraph 4.52).

Staff rest room/beverage bay

3.59 Rest room facilities are required where staff can relax and take beverages. Rest rooms should have windows and a pleasant outlook and be comfortably furnished.

3.60 The rest room should include a beverage bay with facilities for preparing beverages for staff, for washing and storing crockery and cutlery, for storing a limited quantity of dry goods, and for the refrigerated storage of milk, etc.

3.61 Equipment should include a stainless steel sink and drainer, a refrigerator, an electric water boiler, and a worktop with cupboards.

Assisted bathroom (Type 2)

3.62 One assisted bathroom should be provided for approximately 24 patients. Patients using an assisted bathroom may arrive in a wheelchair or on a mobile hoist. Staff assist the patient in bathing and associated activities, and may also give treatments. A variable height peninsular bath is essential. Space must be sufficient to accommodate three staff, and permit the manoeuvring of support equipment such as a hoist. The room should also contain a WC, wash-hand basin and possibly a bidet.

Optional accommodation (OA)

Bathroom (Type 1)

3.63 A standard bathroom must be provided if no baths are located in en suite facilities. The bathroom would be for the use of fully ambulant, semi-ambulant and independent wheelchair patients. The bathroom should include a WC and a wash basin and should generally be designed in accordance with Section 6.5 of 'Common Activity Spaces' HBN 40 Volume 2: 'Treatment areas' 4 and HBN/SHPN 40 Volume 5: Scottish Appendix.

Staff shower (Type 3)

3.64 This shower is for fully ambulant staff only and should generally be designed in accordance with Section 6.10 of 'Common Activity Spaces' HBN 40 Volume 3: 'Staff areas' and HBN/SHPN 40 Volume 5: Scottish Appendix.

Cook/chill trolley holding room

3.65 Adjacent wards share this optional space.

3.66 To this space a number of purpose built trolleys are delivered from the Central Food Production Unit and await transfer to the ward at mealtimes. The space must be large enough to permit the easy manoeuvre of the large heavy trolleys. For further information see HBN 10 'Catering department'.

Dedicated day room

3.67 As discussed in paragraph 3.31, a dedicated day room can be a useful multi-purpose room that can be used to contain more disturbing activities such as watching TV or smoking but can also function as a holding area for patients waiting to go home or for other staff or patient activities when space is not available elsewhere. The quality of environment should be similar to that described in paragraph 3.30.

Medical staff office

3.68 Doctors with in-patient responsibilities require office accommodation (at least one office for 24 beds) for administrative and clerical work in connection with their clinical responsibilities and for study, research and discussions with colleagues.

4. General functional and design requirements

Introduction

4.1 This Chapter contains guidance concerning aspects of function and design which are common to health buildings generally and which will need to be borne in mind when designing new buildings or upgrading existing premises. Certain aspects which have particular relevance to wards are discussed in greater detail.

Economy

4.2 The planning of hospital buildings requires design solutions that not only satisfy functional requirements but also ensure maximum economy in respect of both capital and running costs. Due weight must therefore be given to the questions of space provision, maintenance (including cleaning), energy consumption and staffing requirements. Planning should ensure that spaces are used as intensively as possible and are not unnecessarily duplicated. Wherever possible spaces should be designed for flexibility of function, not only in their original use but also in terms of future change of use.

Alterations and extensions to existing buildings

4.3 Guidance for new build is not intended to apply retrospectively to alterations to buildings. Nevertheless, the principles are equally valid and they should be applied wherever practicable when buildings are altered* or extended. Applying the Building Standards (Scotland) Regulations to this type of work sometimes presents difficulties. The basic principle is that the Regulations apply to both alterations and extensions but not to unaffected parts of the building even if these parts do not conform to the Regulations.

4.4 The cost of alterations and/or extensions should be established in accordance with the guidance outlined in the Healthcare Construction Project Price Guide published by NHS in Scotland Property and Environment Forum Executive. The guidance takes into consideration the estimated life of an existing building and the difference in cost between works to an existing building and that of new building.

4.5 Before any decision is made to carry out such a project an option appraisal should be undertaken as described in the Healthcare Construction Project Price Guide. Consideration must be given to the long-term strategy for the

* Alterations include upgradings and adaptations of existing buildings.

service, the space required for the new service and the size of the building. Regard must also be paid to the orientation and aspect of the building and the adequacy and location of all necessary support services.

4.6 If there emerges a prima facie case for upgrading, a thorough analysis of all functional and physical conditions of the existing building should be undertaken.

4.7 When comparing alteration and/or extension of existing buildings with new build, economic considerations will not be the only criteria to be considered. Due account should be taken of matters such as location, accessibility, staffing, etc. The check of physical and other aspects of existing buildings should include:

- availability of space for alterations and additions;
- type of construction;
- insulation;
- age of the buildings, condition of fabric for example external and internal walls, floors, roofs, doors and windows, which can be determined by a condition survey;
- life expectancy and adequacy of engineering services, ease of access and facility for installation of new wiring and pipework, if required;
- the heights of ceilings (high ceilings do not necessarily call for the installation of false ceilings which are costly and often impair natural ventilation);
- changes of floor levels to obviate hazards to disabled people;
- fire precautions;
- physical constraints to adaptation such as load bearing walls and columns.

4.8 Having decided that existing premises are suitable for upgrading or conversion, the main requirement will be to assess how best the accommodation can be planned so as to facilitate the practice of modern care.

4.9 This summary of the main aspects of upgrading is general in character and it is recognised that each upgrading project will present its own problems. In many instances compromises may have to be made between Planning Note standards and what it is possible to achieve. Alterations should be functionally sound not merely cosmetic - and appropriate for the projected needs of patients and staff for a number of years to come. Extensions should be regarded as new build wherever practicable.

Statutory and other requirements

4.10 NHS Circular No 1991 (GEN)1 issued in January 1991 advised Health Boards of the requirement to comply with all relevant legislation following the removal of Crown immunity under Section 60 of the NHS and Community Care Act 1990. Health Boards and NHS Trusts are reminded of their responsibility for ensuring compliance with all statutes, regulations, codes and standards.

Smoking

4.11 Following NHS Management Executive letter MEL(1992)24 issued 30 July 1992, which set a target date of 31 May 1993, all health boards and NHS Trusts have introduced and implemented written no-smoking policies. No smoking is now the standard in all NHS premises. Although the policies may allow for provision for designated smoking areas for staff and patients, increasingly, boards and Trusts are adopting a total restriction on smoking. MEL(1992)24 refers to a fuller set of guidance available for those boards and Trusts who might find it a helpful resource. This guidance includes a statement that consideration should be given on how to adequately ventilate smoking rooms.

Fire safety

4.12 The project team members should familiarise themselves with NHS in Scotland Firecode which contains technical guidance on fire safety in hospitals and other National Health Service premises.

4.13 It is important to establish during the design stage those aspects of fire safety strategy which affect the design, configuration and structure of a ward. At appropriate stages of the design process the architect and engineer will be required to discuss their proposals with the local fire brigade, and ensure that the project team and all other NHS staff are fully acquainted with the fire safety strategy for the design in operational terms (staff responsibilities, etc) equipment provision, and engineering layouts. Health Technical Memoranda 57, 58, 59, 60 and ‘Wayfinding’ give detailed information on the selection of fire resisting components and fire signs.

4.14 The principles of fire safety apply to both new projects and to alterations and upgrading of existing buildings.

Telephones

4.15 Central telephone facilities for internal and external calls should be extended to serve the ward in accordance with the requirements shown on the Activity Data Sheets. Wiring should terminate at each extension point in a standard line jack unit. When telephones are fitted with an audible bell or buzzer this should be fitted with a muting facility for night-time operation. All telephones should be fitted with visual indicators.

4.16 Outlets should be provided for fixed payphones for the use of staff and visitors only. Payphones for use by visitors should be located near to the visitors' accommodation and the waiting area, and should be fitted with an inductive coupler to assist people using a hearing aid. Guidance concerning the provision of telephone services, including the telephone internal cabling distribution and telephone handsets, is given in HBN 48 -' Telephone services'. Refer also to paragraphs 5.80 to 5.83.

Security/control of access

4.17 Assaults on hospital staff and theft of NHS property are recognised problems. The project team should discuss security with the officer in charge of the local Police Crime Prevention Department and the hospital or district security officer or adviser at an early stage in the design of the building. Fire and Security Officers should be consulted concurrently because the demands of security and fire safety may sometimes conflict. The attention of planners is drawn to circular NHS No 1984 (Gen)7 and the updated NHS Security Manual issued with Management Executive Letter MEL(1992)35 on 21 July 1992.

4.18 Security needs to be considered from both the point of view of security from outside intruders and the safety and security of patients and staff. The building should be designed, fitted and equipped to a standard which reduces the risk of injury to users. The creation of a homely, domestic environment will be of equal importance. Refer also to paragraphs 5.74 to 5.76.

Valuables

4.19 Facilities should be provided for the temporary security of patients' valuables in a staff office. Valuables requiring longer-term storage should be kept in accordance with the hospital operational policy.

Drugs

4.20 Secure storage for Controlled Drugs will be required. Because of their potential for abuse, normal control procedures over all drugs may need to be strengthened. Refer also to paragraphs 5.62 to 5.64.

Damage in health buildings

4.21 When designing and equipping health buildings, the likely occurrence and effects of accidental damage should be considered. Damage in health buildings has increased over the years, to some extent as a result of lightweight, often less robust, building materials. Measures to minimise damage should be taken in the form of protective corners, buffers and plates where necessary, and to proper continuation of floor surfacing, i.e. strong screeds and fully bonded floor coverings. Protective devices, if used, should be capable of being renewed as need arises and should be designed as part of the decoration to retain the relaxed domestic character.

Building Component data

4.22 The Building Component Database consists of a series of Health Technical Memoranda (HTMs), 54–71 which provide specification and design guidance on building components for health buildings which are not adequately covered by current British Standards. No firms or products are listed. The numbers and titles of the various SHTMs and HTMs in the series are listed in ‘References’.

Environmental considerations

4.23 The effect of operations and actions on the environment is of significant importance and is an integral part of the responsibility for the health and well-being of the community. Care must be taken to contain the environmental impact of activities to a practical minimum consistent with maintaining responsibilities of providing high quality patient care. Commitment to the requirements of the Environmental Protection Act and all other relevant statutory legislation is essential. It is of particular importance to seek to:

- continue to promote the efficient use of energy in an economical and environmentally sound manner by promoting energy conservation and where economically viable, investing in energy saving technology and management;
- provide environmental training to appropriate staff, ensure that all staff are aware of the environmental policy and how they can contribute to the overall environmental performance;

- promote waste minimisation and reduce the environmental impact of waste through beneficial use, where practicable, or safe disposal where not;
- reduce, where practicable, pollution to air, land and water.

Internal environmental conditions

Noise and sound attenuation

4.24 In order for the environment to be relaxing and non-institutional in character, the building will have to cater for both noisy and quiet activities and this should be borne in mind during the early stages of planning. It is important that quiet areas are not adjacent to noisy areas. Utility rooms and pantries likely to be used at night should not be too close to bedrooms.

4.25 In addition to appropriate planning measures, noise can be lessened by isolating sound sources with sound containing partitions and doors, by attenuating sound with acoustic materials and generally using soft floor coverings, curtains and other such materials. There will be a need to ensure oral privacy, i.e. that confidential conversation is unintelligible in adjoining rooms or spaces. This will be typically required in consulting/examination rooms and interview/discussion rooms.

Floors

4.26 It is important to select a floor covering which contributes towards the creation of an attractive environment, but one which does not present a hazard to disabled people or the movement of wheeled equipment.

4.27 Carpets are suitable for use in the offices, staff rest room, overnight stay accommodation and visitors' waiting areas. For further information on soft floor coverings, see HTM 61.

4.28 It is also important that whatever floor covering is chosen it can be effectively cleaned, maintained and repaired. Rapid developments in soft floor covering technology have produced a wide variety of new materials. (See Health Technical Memorandum 61 - 'Flooring'.) Floors should not present or appear to present a slip hazard and the patterning should not induce disorientation. Surface drag, static electricity, flammability and infection hazards are other factors which need to be considered - see also 'Maintenance and Cleaning' – paragraph 4.48.

Doors and frames

4.29 Doors should be wide enough to allow easy passage. Lever handles should be 900mm above the floor level. Rails across the sight-line of seated people should be avoided in the design of glazed doors. If magnetic door closers are required to meet fire regulations, they should be carefully selected to minimise interference with day-to-day activities. Any locked fire exit doors must have the capability of release on the activation of the fire alarm or a local release facility of a type not likely to tempt patients to misuse it.

Ventilation

4.30 Natural ventilation is usually caused by the effect of wind pressure. It will also occur to some extent if there is a temperature difference between inside and outside the building. This thermo-convective effect frequently predominates when the wind speed is low and will be enhanced if there is a difference in height between inlet and outlet openings. Ventilation induced by wind pressure can promote high air change rates through a building if air is able to move freely within the space from windward to the leeward side of the building.

4.31 Internal partitions, fire compartment walls and closed doorways can, however, often impede the flow path and when this happens the process will be more dependent on single-sided ventilation. Nevertheless, even with this degree of obstruction to air movement, acceptable ventilation may still be obtained without excessive window openings which could prejudice safety, security and comfort. Some types of windows, e.g. vertical sliding, can enhance single - sided air exchange by temperature difference and these will improve the overall rate of natural ventilation in protected or sheltered areas where the effect of wind pressure is likely to be minimal. Section 2.3 of HTM 55 and BS 5925 provide further guidance on this subject.

Heating

4.32 Space heating should be designed for continuous operation and should be available during the summer months for use on cold days and nights. Heat emitters should be free of sharp edges and should be easy to clean. Emitters should not create an obstruction and should not be located behind beds. Exposed hot water pipework, accessible to touch, should be insulated.

Furnishings and finishes

4.33 Designers should aim to create an interior which is comfortable and pleasant to look at. The choice of fittings and furniture should form an integral part of the design process and should be co-ordinated within the overall design scheme. Finishes should be functional and be compatible with the need for comfort, cleanliness and safety. The quality of finishes should, in general, conform with the standard of finishes specified for the rest of the hospital.

Cleaning regimes should be considered when materials are selected. For further information see HTM 87 – 'Textiles and furniture'.

Natural and artificial lighting

4.34 The design of windows must reconcile different needs as well as providing natural daylight and outside views. In addition to the various statutory requirements, the following aspects also require consideration:

- illumination and ventilation;
- insulation against noise;
- thermal loss or solar gain;
- the prevention of glare;
- the provision of a visual link with the outside world.

4.35 Design should ensure that it is possible for cleaners to have easy access to the inside and outside of windows. Guidance on types of window and on the safety aspects is available in HTM 55 - 'Windows'.

4.36 Where windows are located in the wall behind the bedheads, it is necessary to ensure that the space requirements for beds, lockers, bedhead services, etc are not compromised to the disadvantage of either patients or staff.

4.37 Décor should be light and pleasant. Natural lighting is essential to the well-being of patients. The provision of a comprehensive artificial lighting installation is also essential; it makes an important contribution to the aesthetic appeal of the ward. It should be possible to vary the level of illumination to suit functional activities. Task lighting of the required intensity with low-contrast glare-free background illumination should be provided. All lighting in the ward should have suitable colour rendering characteristics.

4.38 Orientation is an important consideration in any site development scheme. Sunlight enhances colour and shape and helps to make a room bright and cheerful. Glare can be reduced by attention to the detail of window design, and can be controlled by curtains or blinds. The harmful effects of undesired solar gain can be mitigated by external screens – a costly solution – or by architectural detail of the shape of windows and depth of reveals. Properly controlled solar gain contributes to energy efficiency.

Internal rooms

4.39 Internal rooms may contribute to economy in planning but the resulting continuous need for artificial lighting and mechanical ventilation will add to both capital and running costs. Such rooms do not provide good working conditions hence should be used only for activities of infrequent or intermittent occurrence or which demand a controlled environment. Rooms that are likely to be occupied for any length of time by staff or patients should have windows.

Art in hospitals

4.40 Works of art and craft can make a significant contribution towards the desired standard of the interior of wards and day hospitals. This need not be limited to the conventional hanging of pictures on a wall. Every opportunity should be taken to include works by local artists and craftspeople. These may include paintings, murals, prints, photographs, sculptures, decorative tiles, ceramics and textile hangings.

4.41 Often it is works of art and craft which lend special identity and which help give a sense of locality.

4.42 Advice should be sought from experts on:

- obtaining funding;
- ensuring quality in all art and craft works;
- appropriately locating art and craft works;
- selecting artists and craftspeople.

4.43 Colour can be used to good effect for decorative and other purposes. Colour schemes can be devised to aid in the identification of particular rooms or parts of the department. Drab colours should be avoided.

People with a disability

4.44 It is essential to ensure that suitable access and facilities are provided for people who have problems of mobility or orientation or other special needs. This category includes, besides people who are wheelchair-bound, those who for any reason have difficulty in walking, those with a sensory handicap such as visual or hearing impairment, and those whose first language is not English.

Readers should refer to SHFN 14 – Disability access. Project teams are reminded of the need to comply with the provisions of:

- The Chronically Sick and Disabled Persons Act 1970 and The Chronically Sick and Disabled Persons (Scotland) Act 1972;
- The Chronically Sick and Disabled Persons (Amendment) Act 1976;
- The Disabled Persons Act 1981;
- The Disabled Persons (Services, Consultation and Representation) Act 1986;
- The Disability Discrimination Act 1995.

Attention is drawn to BS 5810: 1979 Code of Practice for Access for the Disabled to Buildings (under review). One of the effects of the 1981 Act is to apply this British Standard to premises covered by the 1970 Act, which includes those open to the public.

Wayfinding

4.45 To encourage patients and visitors to look after themselves, to use their initiative and to have freedom of movement about the unit, particular attention should be paid to wayfinding. The form of signposting used and the method of displaying notices should not detract from the desired environment but should be sufficiently explicit to be understood by patients who may be either confused or are from a different culture. Only certain doors require conventional labelling, e.g. fire exit doors, bathrooms, WCs and offices. Further guidance is available from NHS Estates publication ‘Wayfinding: Guidance for healthcare facilities’.

Waste disposal

4.46 The segregation, storage and the safe disposal of waste should comply with the guidance given in the Health and Safety Commission - Health Service Advisory Committee 'Safe Disposal of Clinical Waste', TSO 1992, issued with letter reference NHS MEL(1993)21 and the guidance on Clinical Waste Management issued with NHS MEL(1994)88.

4.47 The waste disposal provision of used items should be consistent with the current policy of the health body for the disposal of clinical waste. A room for the temporary holding of waste should be provided at the entrance to the department.

Maintenance and cleaning

4.48 Materials and finishes should minimise maintenance and be compatible with their intended function. Building elements that require frequent redecoration or are difficult to service or clean should be avoided. Special consideration should be given to elements such as door sets, corners, partitions, and counters which may be subject to heavy use. Floor finishes should be restricted in variety and, where soft floor coverings are specified and spillage likely, should have a backing impervious to fluids and a non-absorbent pile. Wall coverings should be chosen with cleaning in mind. Advice on these topics is published in HTMs 56 - ‘Partitions’, 58 - ‘Internal doorsets’ and 61 - ‘Flooring’.

Provision for Automatic Data Processing (ADP)

4.49 Information technology has a central role in health management. The use of computers and telecommunications - and, indeed the rate of technological innovation - continues to increase. The implications for project teams are threefold: firstly, a requirement for the housing of the computers; secondly, a requirement for the provision of ducts for transmission cabling; and thirdly, sufficient space and adequate power supplies for modems, visual display terminals (VDTs) and printers, and associated software and stationery. Even if the introduction of automatic data processing (ADP) is not proposed at the time that the project team completes its brief it will be advisable to design in such a way that equipment can be introduced easily and quickly at some later date.

4.50 There are two principal matters of concern: visibility and noise. VDTs are now a familiar sight, and it will easily be appreciated that they cannot be reduced beyond a certain size. Consequently, sufficient and convenient space must be provided for them. Since the brightness of the letters displayed on the screen cannot exceed a certain limit, special attention must be given to the ambient lighting to ensure that the contents of the screen are legible. Additional space will be required in front of the screen for a keyboard. Printers are often noisy. Noise may not be too noticeable in bed areas during normal working hours but during quiet hours it will probably not be acceptable. If it is not possible to position a printer at a site remote from patient areas, expenditure on a quieter printer or on means of quietening a noisy printer can be justified.

4.51 Computer expertise is now widely available in the NHS and project teams should ensure that, at an early stage, they inform themselves concerning current and projected local computing policies, and that their proposals conform with them.

Clinical teaching and overnight accommodation

4.52 If it has been agreed that the teaching of undergraduate and postgraduate medical students will take place in the accommodation and their numbers necessitate additional space, reference should be made to the document 'Teaching Hospital Space Requirements'

5. Engineering services

Introduction

5.1 This Chapter describes the engineering services contained within the in-patient accommodation and how they integrate with the engineering systems serving a whole site. The guidance should not inhibit the design solution, but will acquaint the engineering members of the multidisciplinary design team with the design criteria and material specification needed to meet the functional requirements.

5.2 An acute hospital requires a most complex range of engineering services. These services contribute about one third of the total capital outlay and are a significant feature of an operational budget. Most of these services are required within the in-patient area. Attempts have been made in the recent past to be selective in the distribution and outlets for services in the in-patient areas in the interest of economy. This has proved a false economy – flexibility in bed utilisation is lost and the increased acuity of patient illnesses requires all bed spaces to have the full range of services.

5.3 Engineering and mechanical services have been constantly researched, studied and the findings promulgated through an extensive range of guidance – notably the Scottish Health Technical Memoranda series. This provides the specialist advice that covers the areas beyond those met in normal building and design practice. The following paragraphs summarise the relevant guidance for in-patient areas.

Model specifications

5.4 A series of model specifications including Scottish Supplements, for the specialised engineering services in healthcare buildings, has been issued nationally and is sufficiently flexible to meet local needs. The NHS in Scotland cost guidance for the engineering services in each functional unit of this accommodation is based on the qualities of material and workmanship described in the relevant parts of the model specifications.

Economy

5.5 Engineering services are a significant proportion of the capital cost and thereafter remain a continuing charge on revenue budgets. Therefore the project design engineer should ensure not only the utmost economy in initial provision, consistent with meeting the functional requirements and maintaining clinical standards, but also the optimum benefit from the total financial resources these services are likely to absorb during their lifetime.

5.6 Where various design solutions are available the consequential capital and running costs should be compared using the procedures outlined in the Scottish Capital Investment Manual.

5.7 The economic appraisal of design solutions should include heat conversion and distribution losses at the point of use. Where buildings are located remote from the development's load centre, these losses can often be significant.

5.8 The energy management and accounting system should be part of the hospital building management system (BMS) and should include metering of all services where practicable. If a hospital BMS is not available, the energy and accounting system for the unit should stand alone. It should be suitable for integration with a future BMS. Further detailed guidance is available in SHTM 2005 - 'Building management systems'.

5.9 After satisfying the Building Standards (Scotland) Regulations (and subsequent amendments) on standards of thermal insulation, consideration should be given to the economics of additional insulation to the ground floor slab and the roof particularly, where accommodation is located in a 'low-rise' building. Where there is a solidly constructed ground floor, the inclusion of floor insulation will have the additional benefit of contributing to patient and staff comfort.

5.10 In view of the increasing costs of generating heat energy, consideration should be given to the economics of recovering some of the energy which would otherwise be discharged by mechanical ventilation systems and to turning off or reducing heating and ventilation in those spaces which are used only for part of the day.

Maximum demands

5.11 User demand on engineering services is often difficult to predict, but experience indicates that services designed for simultaneous peak conditions are seldom fully utilised in practice. The estimated maximum demand and storage requirement (where appropriate) for each engineering service in this accommodation will need to be assessed individually to take account of the range, size and shape of the functional units, geographical location, operational policies and intensity of use. The Property and Environment Forum may provide estimates of the maximum demands and storage requirements for a specific project if required by the project team.

Space for plant and services

5.12 The satisfactory performance of plant in healthcare buildings is particularly important and the building design should allow for:

- easy and safe means of access protected as far as possible from unauthorised entry;
- frequent inspection and maintenance with sufficient access panels being provided for this purpose;
- eventual removal and replacement of plant with particular attention being paid to the requirements of the Manual Handling Operations Regulations (1992) and succeeding legislation.

5.13 Recommended spatial requirements for mechanical, electrical and public health engineering services in health buildings are given in SHTM 2023 – 'Access and accommodation for engineering services'. The information in this publication is specifically intended for use during the initial planning stages when precise dimensional details of plant are not available and it makes reference to the Construction (Design and Management) Regulations.

5.14 The distribution of mechanical and electrical services to final points of use should, wherever possible, be concealed in walls and above ceilings. Heat emitters should be contained within a 200mm wide perimeter zone under window sills and critical dimensions should be taken from the boundary of this zone. The 200mm zone includes the floor area occupied by minor vertical engineering ducts and is included in the building circulation allowance.

5.15 Services contained in the space above the false ceiling, with the exception of drainage should be confined to those required for the accommodation immediately below the false ceiling. Provision of satisfactory access should be provided to pipework, fittings and valves concealed in partitions, walls and ceilings.

Activity data

5.16 Environmental and engineering technical data and equipment details are described in the Activity Data Base sheets (see Chapter 7). They should be referred to for space temperatures, lighting levels, outlets for power, telephones, equipment details, etc, and when positioning equipment and outlets. Any item that involves patient operation should be of a simple pattern and designed to inhibit interference.

Safety

5.17 The Health and Safety at Work etc Act (1974) as partly amended by the Consumer Protection Act 1987, together with the Workplace Regulations, the Work Equipment Regulations and the Construction (Design and Management) Regulations 1994 impose statutory duties on employers and designers to ensure, so far as is reasonably practical, that design and construction is such that articles and equipment will be safe and without risk to health at all times when being set, used, cleaned or maintained by a person at work. Engineering components, e.g. pipework, terminals, etc, are covered by the term 'articles' and thus these duties apply to the designers of engineering services for non-domestic buildings.

Fire safety

5.18 Fire safety measures should not only meet the requirements of the Building Standards (Scotland) Regulations and be to the satisfaction of the local fire brigade but should also conform with NHS in Scotland Firecode. Firecode gives design guidance and requirements for fire safety in healthcare buildings through a series of Scottish Health Technical Memoranda and Scottish Fire Practice Notes. Project team members should familiarise themselves with NHS in Scotland Firecode.

5.19 The design engineers should verify the design proposals are in accordance with the procedures described in paragraphs 4.12 to 4.14 of this Note.

Noise

5.20 Excessive noise and vibration from engineering services, whether generated internally or externally and transmitted to internal areas, or noise from other sources e.g. speech which can be transmitted by the ventilation system, can adversely affect the operational efficiency of the department and cause discomfort to patients and staff. However, in addition to designing for control of noise levels, there may also be a need to ensure speech privacy so that confidential conversations are unintelligible in adjoining rooms or spaces. This will be important in consulting/examination and treatment rooms, particularly where these are located adjacent to waiting areas. The noise limits and means of control advocated in SHTM 2045 – 'Acoustics' should provide an acceptable acoustic environment.

Control access

5.21 Devices for control and safe isolation of engineering services should be:

- located in circulation rather than working areas to avoid disruption of clinical work;
- protected against unauthorised operation, for example switchgear and fuseboards should be housed in secure cupboards and, where appropriate, water stopcocks and drain down valves should be designed/positioned to thwart deliberate flooding;
- clearly visible to and accessible where intended for operation by the department's staff;
- easily accessible and visible to commissioning and maintenance personnel.

Engineering commissioning

5.22 It is essential that engineering services should be fully commissioned and adequate test facilities and devices should be included in the design to facilitate flow measurement and regulation of all water, ventilation and gaseous services. The services should be commissioned in accordance with the methods identified in relevant Health Technical Memoranda. Engineering services for which a specific SHTM or HTM is not available should be commissioned in accordance with the following as appropriate:

- Engineering commissioning published by The Institute of Healthcare Engineering and Estate Management (IHEEM).
- Engineering Services commissioning codes published by the Chartered Institute of Building Services Engineers (CIBSE).
- Trade associations' commissioning codes.

Commissioning should also be carried out and documented in accordance with the requirements of Scottish Hospital Technical Note 1 – 'Post commissioning documentation for health buildings in Scotland'. It is essential that full information regarding commissioning codes and test methods to be used are included in the specification for engineering services.

Mechanical services

General scope

5.23 The mechanical services include the provision of heating, ventilation/air conditioning, hot and cold water services and medical gas supplies. For cost guidance purposes the distribution of all piped systems is deemed to commence at their point of entry into the accommodation and includes pipework, fittings, controls and connections to equipment and outlets. The cost guidance includes for air handling and treatment plants, ductwork and fittings, together with associated ventilation system controls.

5.24 For environmental requirements in individual spaces reference should be made to the Activity Data Base sheets. Recommended room temperatures, air change rates, hot water service temperatures, etc are grouped under 'Technical Design Data' on each A - Sheet.

Heating

5.25 General space heating requirements can usually be met by low pressure hot water radiators. They should be of the low surface temperature type and the system should be designed to ensure that the surface temperature does not exceed 43°C. Where multi finned radiators enclosed in a metal casing are used to achieve this low surface temperature, the casing should be easily accessible/removable/openable to allow rapid access for cleaning. Consideration should also be given to the use of ceiling heating as this releases space within the room. Exposed pipework, accessible to touch, serving heat emitters should be insulated in accordance with the guidance in Scottish Health Guidance Note '"Safe" hot water and surface temperatures'.

5.26 Radiators should normally be located under windows or against exposed walls with sufficient clear space between the top of the radiator and the window sill to prevent curtains reducing the output. There should be adequate space underneath 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.

5.27 Radiators may also be used to offset building fabric heat loss in mechanically ventilated spaces. Where, for example, a number of spaces are supplied from a common ventilation system, individual room temperature control may be achieved by using thermostatically controlled radiators.

5.28 All radiators should be fitted with thermostatic radiator valves. These should be of robust construction and selected to match the temperature and pressure characteristics of the heating system. The thermostatic head, incorporating a tamper-proof facility for pre-setting the maximum room temperature, should be controlled via a sensor located integrally or remotely

as appropriate. To provide frost protection at its minimum setting, the valve should not remain closed below a fixed temperature.

5.29 Flow temperatures to heating appliances should be controlled by the BMS in accordance with space requirements and external temperatures. The system should be zoned to suit the building.

Ventilation

5.30 Single and multi-bed areas will normally be naturally ventilated, but other areas, including multi-bed areas with a depth greater than 6 metres from the external wall, may require mechanical supply and/or extract to meet clinical or functional requirements,

5.31 Wherever possible, individual spaces should be naturally ventilated in order to limit the level of mechanical ventilation. The high capital and revenue consequences of air conditioning in ward areas will rarely be justified. Cooling, however, may be required in rooms having high heat gains such as kitchens if they are located adjacent to bed areas. Cooling shall commence at 25^{o}C and shall be capable of maintaining an internal air temperature of 3^{o}C below the external air temperature.

5.32 Deep planned spaces may need mechanical ventilation. Internal planning of the ward should, therefore, seek to minimise the need for mechanical ventilation by ensuring that, wherever practicable, core areas are reserved for:

- rooms that require mechanical ventilation, for clinical or functional reasons, irrespective of whether their location is internal or peripheral, for example, sanitary facilities, preparation, disposal and sluice rooms and pantries;
- spaces which have only transient occupation and, therefore, require little or no mechanical ventilation, for example, circulation and some storage areas.

5.33 Where nursing needs and policies require a degree of physical isolation (in accordance with the Scottish Infection Manual guidance, a minimum of 4 single-bed rooms in each ward should be mechanically ventilated to meet the following requirements:

- each room should be capable of being held at a positive pressure relative to adjacent communications spaces and at a slight positive pressure relative to the room's associated sanitary facility;
- additionally, each room should also be capable of being held at a negative pressure relative to adjacent communications spaces and to that room's associated sanitary facility;
- a local control and status indication panel for these single rooms will be required showing the pressurisation status of each room and allowing

local control to alter the pressurisation of each room from positive to negative.

Where these environmental conditions are to be provided, the design engineer must ensure that a positive/negative pressure nursing environment is possible. This may be most effectively achieved by providing a separate ventilation system to satisfy the range of demands that will arise from these rooms. This arrangement will allow a flexible control regime to be adopted for other central ventilation systems in a hospital.

5.34 Air movement induced by mechanical ventilation should be from clean to dirty areas, where these can be defined. The design should allow for an adequate flow of air into any space having only mechanical extract ventilation via transfer grilles in doors or walls. Such arrangements, however, should avoid the introduction of untempered air and should not prejudice the requirements of fire safety or privacy.

5.35 Fresh air should be introduced via a low velocity system and should be tempered and filtered before being distributed via high level outlets. Diffusers and grilles should be located to achieve uniform air distribution within the space, without causing discomfort to patients and staff.

5.36 Ventilation supply plant should include air filters having a minimum arrestance of 85% when tested in accordance with BS EN 779:1993. In urban or other areas of high atmospheric pollution, a higher standard of filtration may be economically justified to reduce the level of staining to internal finishes. Filters must be readily accessible for replacement and should be provided with a pressure-differential indicator. Supply diffusers transfer and extract grilles should be chosen to facilitate easy cleaning.

5.37 A separate extract system will be required for “dirty” areas, for example, sluice and disposal and sanitary facilities. It should operate continuously throughout the day and night. A dual motor fan unit with an automatic changeover facility should be provided.

5.38 External discharge arrangements for extract systems should be protected against back pressure from adverse wind effects and should be located to avoid reintroduction of exhausted air into the building through air intakes and windows.

5.39 Further detailed guidance is contained in SHTM 2025 – ‘Ventilation in healthcare premises’.

Controls

5.40 Supply and extract ventilation systems should include controls and indicator lamps in the plant room to confirm the operational status of each system. Alarms should be repeated in the Estates department. Their selection should take account of the extent to which they can be linked to, or provided

by, a building management system serving the whole hospital. Further guidance is contained in SHTM 2005 – 'Building management systems'.

Hot, cold and drinking water services

5.41 Guidance concerning the design and installation of cold water supply pipework and distribution systems is given in SHTM 2027 – 'Hot and cold water supply, storage and mains services'. For frost protection and to prevent condensation staining decorative finishes all cold water pipework, valves and flanges should be insulated and vapour sealed. For additional information see Scottish Hospital Technical Note 2 - 'Domestic Hot and Cold Water Systems for Scottish Health Care Premises', TSO 1994.

5.42 To limit the risk of Legionnaires disease, the water services should be designed, installed and commissioned in accordance with the recommendations in Scottish Health Technical Memorandum 2040 - The Control of Legionellae in Health Care Premises - A Code of Practice, TSO, 1993.

5.43 The domestic hot water supply should be taken from the general hospital calorifier installation at a minimum outflow temperature of 60°C ± 2.5°C, and distributed to all outlets so that the return temperature at the calorifier is not less than 50°C. Outlet temperatures and fittings for sanitary equipment are shown in the Activity Data Base sheets. (See also Scottish Health Guidance Note - "Safe" hot water and surface temperatures.) The general principle being unless a higher temperature is required for functional reasons, the outlet temperature for domestic hot water should not exceed 43°C, and the water temperature at all outlets accessible to patients should not exceed 43°C or lower in certain circumstances. Thermostatic mixing valves should be of a type that has limited variation in temperature control with water pressure variation and that automatically closes the hot water supply if the cold water supply fails. The provision of one thermostatic mixing valve to serve a group of baths or showers is not acceptable. Guidance on thermostatic mixing valves is available in Scottish Health Guidance Note - '"Safe" hot water and surface temperatures'.

5.44 Where fully potable cold water systems are not provided, drinking water outlets should be provided in the preparation room and servery/pantry. The supply should be direct from the mains.

5.45 The requirements for the control of legionellae bacteria in hot and cold water systems are set out in SHTM 2040 – 'The control of legionellae in healthcare premises – a code of practice'.

Piped medical gases

5.46 Guidance on piped medical gas systems, anaesthetic gas scavenging and gas storage is contained in SHTM 2022 – 'Medical gas pipeline systems'.

Electrical services

General scope

5.47 The electrical installation includes:

- The main intake switchgear;
- Lighting;
- Power (including supplies to ventilation plant);
- Earth bonding of extraneous metal work;
- Telephone wiring;
- Wireways for data links;
- Clocks;
- Fire alarms;
- Staff location;
- Staff call.

The installation shall conform in all respects with BS 7671 – Requirements for electrical installations (current edition) and SHTM 2007 'Electrical Services – supply and distribution' and SHTM 2020 – 'Electrical safety code for low voltage systems'. Emergency electrical supplies shall be provided in accordance with SHTM 2011 – 'Emergency electrical services'.

5.48 Reference should be made to the Activity Data Base sheets for the recommended levels of internal illumination, disposition of outlets for power, telephones, call systems and clocks, etc in individual spaces.

5.49 The point of entry for the electrical supply will be a departmental switchroom housing the main isolators, the main distribution equipment and metering. The switchroom will also be the distribution centre of subsidiary electrical services and, wherever possible, all equipment should be mounted at a height to give easy access from a standing position. The switchroom should be positioned so as to minimise the cost of cabling required to serve the accommodation. All distribution boards and main switches should be contained in secure cupboards, preferably in areas where there is normally a continuous staff presence.

Electrical installation

5.50 The electrical installation in occupied areas should be concealed in screwed steel conduit and steel trunking using appropriately insulated copper conductors – see SHTM 2007. In certain circumstances however metal sheathed or steel wired armoured (SWA) cables may be used. External installations should use screwed galvanised steel conduit with waterproof fittings. Plant areas should use screwed galvanised steel conduits and galvanised steel trunking. Steel conduits and trunking wireways for

communications and data systems should also be concealed wherever possible.

Electrical interference

5.51 Care should be taken to avoid mains borne interference, electrical radio frequency and telephone interference affecting physiological monitoring equipment, computers and other electronic equipment used here and elsewhere. Guidance on the avoidance and abatement of electrical interference is contained in HTM 2014 – 'Abatement of electrical interference'. Fluorescent luminaires should comply with BS EN 55015: 1993.

5.52 Electrical products systems and installations should not cause or be unduly affected by electromagnetic interference. This requirement is in the form of an EC Directive on Electro-Magnetic Compatibility (89/336/EEC as amended by 97/263/EEC and 92/31/EEC). This Directive has been implemented in UK law by the Electromagnetic Compatibility Regulations 1992 (SI No. 2372).

Lighting

5.53 Practical methods of lighting the various functional spaces are contained in CIBSE Lighting Guide LG 02 - 'Hospital and Health Care Buildings'. The choice of luminaire should take account not only of the requirements for light distribution and visual comfort appropriate to the space, but also the operational efficiency of the light source used. Luminaires should be of a type which are easily cleaned and maintained, as well as being manufactured and tested in accordance with the requirements specified in the relevant sections of BS 4533. Generally, energy efficient luminaires should be used. Infrequently used luminaires may be fitted with compact fluorescent or incandescent lamps.

5.54 In reception and circulation areas, colour graphics and lighting should be co-ordinated to create a calm and welcoming atmosphere whilst also contributing to the safe movement of patients in the department.

5.55 It is essential that fluorescent lighting in clinical areas is derived from one of the recommended types of lamps having suitable colour rendering characteristics. In such areas the colours chosen for walls, floors and ceilings should be carefully selected. Architects and engineers should collaborate to ensure that the decorative finishes are compatible with the colour rendering properties of the lamp and that spectral distribution of the light source is not unduly altered. Consideration should be given to using the same lamp characteristics in clinical and non-clinical areas in order to simplify maintenance and stock replacement lamps.

5.56 Each bed should be illuminated by luminaires located above or behind the bedhead. Dimmer switches capable of providing appropriate illuminance at all times should control the luminaires.

5.57 Additional luminaires should be provided within the general circulation space of the multi-bed area and dimmer switches should also control these.

5.58 Local luminaires, controlled by dimmer switches, should be provided at the staff base.

5.59 Dimmer controlled localised night lighting of the Nurses' Station should provide 300 lux on the table. This will meet the needs of staff and act as a focal point for patients at night. Where visual display terminals are to be used, the lighting should be designed to avoid bright reflections on the screen and to ensure that the contents of the screen are legible and meet the Health and Safety (Display Screen Equipment) Regulations 1992 implementing EU Directive No. 90/270/EEC 1990 – Further guidance is contained in CIBSE Lighting Guide LG3. Emergency lighting should be provided on primary escape routes in accordance with SHTM 2011 – 'Emergency electrical services' and BS 5266 and should comply with the relevant sections of Firecode.

5.60 The lighting of corridors and other circulation areas, which generally are areas not covered by the Activity Data Base sheets, should be in accordance with the guidance contained in HBN 40 - 'Common activity spaces, Volume 4 – Circulation areas' and HBN/SHPN 40 Volume 5: Scottish Appendix.

5.61 Mobile examination luminaires, where provided, should operate at extra low voltage (normally fed from an in-built step-down transformer), be totally enclosed and be equipped with a heat filter. The temperature of external surfaces should be such as to avoid injury to patients and staff.

Controlled Drugs cupboard

5.62 A red indicating lamp should be provided on each Controlled Drugs cupboard and, where appropriate, outside the doorway to the room in which the cupboard is located and at a continuously staffed location. The lamps should be interlocked with the cupboard and alarm system to give visual and audible indication at the continuously staffed location of unauthorised entry to the cupboard.

5.63 An indicating lamp denoting that the circuit is energised should also be fitted to each cupboard. The supply circuits for the lamps and alarm system should be derived from essential circuits. The electrical supply to the cupboard should be via an interference proof connection unit to avoid unauthorised disconnection. The cupboards should comply with BS 2881. Further information is contained in HTM 63 – 'Fitted storage systems'. More general information is contained in 'Guidelines for the Safe and Secure Handling of Medicines' (1988).

5.64 Guidance is also contained in the Scottish Home and Health Department publication 'Guidelines for the Safe and Secure Handling of Medicines', issued with NHS Circular No. 1988 (GEN) 33.

Socket-outlets and power connections

5.65 Socket-outlets in each bed space should be supplied from at least two separately fused circuits of common phase. A total of 24 13A socket-outlets should be provided at each bed.

5.66 Sufficient 13 amp switched, shuttered socket-outlets, connected to ring or radial circuits, and should be provided to supply all portable appliances likely to be used simultaneously. The installation of twin outlets should be considered where activities occur in juxtaposition.

5.67 To enable domestic cleaning appliances, with flexible leads nine metres long, to operate over the whole of the department, switched socket-outlets should be provided in corridors and in individual rooms where considered necessary.

5.68 Appliances requiring a three-phase supply or those rated in excess of 13 amp single phase should be permanently connected to separate final subcircuits fed from the distribution board and independently switched at a local isolator of appropriate fused rating. Fixed appliances of less than 13 amp rating should be permanently connected to a double pole switched 13 amp spur outlet with indicating light and suitably fused for the appliance rating. These spur outlets may form part of a ring circuit. Isolation switches should be provided adjacent to all engineering plant and equipment for use by maintenance staff. Where appropriate provide lockable switches or separate means of disconnection.

5.69 All electrical appliances, equipment and plant items whether automatically operated or not shall be provided with indicator lamps to show when the equipment is energised. Such indicators should be incorporated in the control unit of the apparatus, in the control switch of the apparatus, in the plug top of the apparatus or in the socket outlet from which the apparatus derives its supply.

5.70 The electrical supply connections to electro-medical equipment should comply with BS EN 60601-2 1993. Advice on the power supply requirements for radiodiagnostic equipment is contained in SHTM 2007 – ‘Electrical services supply and distribution’.

Emergency electrical supplies

5.71 Guidance on emergency electrical supplies is given in SHTM 2011 – ‘Emergency electrical services’.

5.72 Socket outlets connected to essential circuits will include those at the bedheads, reception areas and any rooms where treatment may be carried out. The supplies to the controlled drugs cupboards, bedpan disposal units and refrigerators will also be derived from essential circuits.

5.73 All communication systems, alarm systems and intruder alarm systems should be supplied from essential circuits.

Door security inter-communication system

5.74 The main entrance to the in-patient accommodation should be controlled by a door security system, which may operate in conjunction with a closed circuit television system, and a verbal communication system with an electromagnetically operated door lock to be controlled from the main reception desk. Similar arrangements may be appropriate at sub-divisions of the in-patient accommodation. Lock overrides should be provided for staff use. Locks should open automatically upon the initiation of a fire alarm. Consideration should be given to the provision of an electronic/mechanical keypad door locking system. A security alarm actuating switch or button is required at the reception desk. It should be connected to a continuously occupied part of the hospital such as the telephone switchboard, the porters' room or the security room.

5.75 The requirements of Scottish Office PAN 46 Planning for crime prevention, and NAHAT Security Manual, together with supplements shall be adhered to.

5.76 If personal alarm transmitters are to be used by staff, and if they are not self contained, conduits and transmitting/receiving equipment and propagating devices such as induction loops and/or aerials will be required to suit the selected system.

Staff location system

5.77 The hospital staff location system should cover all in-patient areas.

Patient/staff call system

5.78 Call points shall be as indicated on Activity Data Base sheets and each unit will normally comprise a push button, reassurance lamp and reset switch. Visual and audible indication of operation should be provided at the Nurses' Station to give responding staff unambiguous identification of the call. The audible signal initiated by the patient should operate for one second every ten seconds until cancelled.

5.79 Further guidance is given in SHTM 2015 – 'Bedhead services'.

Telephones

5.80 The hospital telephone system should be extended to serve this unit in accordance with the requirements shown in the Activity Data Base sheets. Wiring should terminate at each extension point in a standard line jack unit. Consideration should be given, however, to a cordless telephone system that can be integrated with the staff alarm and security systems, and the staff location system. Because of the rapid developments in the communications/ security industry, project teams should evaluate the options available to them at the time of planning.

5.81 Coin and/or card operated pay phones, which may be fixed or mobile depending upon local policy, should be provided to enable visitors and patients to make phone calls (if necessary in private). Consideration should be given to providing a free phone service for taxis in public areas as appropriate. The handsets of public telephones should be provided with inductive couplers to assist people wearing hearing aids.

5.82 Self-contained intercommunication systems are relatively inflexible and limited in the extent of their economic application. Any subsequent modifications to them usually involve disproportionate cost. Only in very rare instances can such systems be justified for functional or clinical reasons. Consequently, reasons for providing a separate intercommunication system should be clearly shown. Option appraisals should be undertaken in considering the systems to be selected.

5.83 Guidance concerning the provision of telephone services, including the internal cabling distribution and telephone handsets, is contained in SHPN 48 – 'Telephone services'. Refer also to paragraphs 4.15 and 4.16.

Patient communication systems

5.84 Patients (including those with visual and auditory handicaps) may need to be kept informed of waiting times and/or called for treatments, etc. Options include announcements:

- by a member of staff personally;
- over a loudspeaker system;
- using VDTs.

Wireways for data links

5.85 Conduits and/or trunking will be required for cables to interconnect electronic equipment. The extent to which these conduits and/or trunking should link all workstations in this department and the main hospital system or elsewhere will depend on the local policy for automatic data processing. If a structured cable system is to be installed within the hospital, then the department should be provided with all outlets wired and connected. Conduits and/or

trunking may also be required to link closed-circuit television between the seminar room and treatment areas.

Wireways for physiological monitoring equipment

5.86 Since automated physiological monitoring at the bedhead may be required in the future, it may be advisable to consider installing wireways during construction. The installation of wireways after the hospital has been completed will be disruptive.

Electric clocks

5.87 Battery quartz type clocks, with sweep second hands if required, should be provided where indicated on the Activity Data Base sheets.

Radio and television

5.88 The radio/television relay system should be supplied via the hospital communal aerial installation and central amplification equipment.

5.89 Radio and TV sound should be available at each bed position with a handset having a selector switch and volume control serving an earphone unit.

5.90 TV outlet sockets should be provided in day spaces.

5.91 Details of the requirements for radio and TV are shown in the Activity DataBase. Further guidance is contained in SHTM 2015 – 'Bedhead services'.

Lightning protection

5.92 Protection of the building against lightning should be provided in accordance with SHTM 2007 – 'Electrical services supply and distribution', HSE Data Sheet DB 2 and BS 6651.

Internal drainage

General scope

5.93 The primary objective is to provide an internal drainage system which:

- uses the minimum of pipework;
- remains water- and air-tight at joints and connectors; and
- is sufficiently ventilated to retain the integrity of water seals.

Design parameters

5.94 The design should comply with the relevant British Standards and Codes of Practice, including BS 5572, BS 6367 and BS 8301 and the current building regulations. Recommendations for spatial and access requirements for public health engineering services are contained in HSE Data Sheet EA5.

5.95 The gradient of branch drains should be uniform and adequate to convey the maximum discharge to the stack without blockage. Practical considerations, such as available angles of bends, junctions and their assembly, as well as space considerations, usually limit the minimum gradient to about 1:50 (20 mm/m). For larger pipes, for example 100mm diameter, the gradient may be less, but this will require workmanship of a high standard if an adequate self-cleaning flow is to be maintained. It is not envisaged that pipes larger than 100mm diameter will be required within interfloor or ground floor systems serving this department.

5.96 Provisions for inspection, rodding and maintenance should ensure “full bore” access and are located to minimise disruption or possible contamination. Manholes should not be located within this department.

Materials specification

5.97 The materials specified for the drainage system in this department will depend upon their location and the nature of the effluent being discharged. Waste pipework should as far as practicable be concealed. Although adequate for drainage requirements, UPVC may not always be acceptable to the fire officer and should not be installed above 'sensitive' areas, e.g. operating theatres, intensive therapy, radio-diagnostic, catering departments, electrical switch-cupboards.

6. Cost information

Introduction

6.1 For all types of health buildings it is clearly of vital importance that building costs and revenue expenditure should be kept as low as possible consistent with acceptable standards. Within this general context Scottish Health Planning Notes provide a synopsis of accommodation for health buildings which the NHS in Scotland recommends for the provision of a given service.

Scottish Capital Investment Manual

6.2 The Scottish Capital Investment Manual (SCIM), published by the National Health Service in Scotland Management Executive, provides detailed guidance for each of the main stages of capital schemes including those that may ultimately be delivered using private finance. It gives practical guidance on the technical considerations of the full capital appraisal process and also provides a framework for establishing management arrangements to ensure that the benefits of every capital investment are identified, evaluated and realised. Projects will not get Scottish Executive approval unless adequate project management arrangements can be demonstrated to be in place.

6.3 The Management of Construction Projects section of the Manual provides guidance on mandatory procedures and best practice for the planning and implementation of construction projects. It covers the stages of a project from the full business case through to technical commissioning and handover. The procedures are divided into six stages:

1. full Business Case, leading to approval;
2. design;
3. tender and contract;
4. construction and equipment supply;
5. technical commissioning and handover;
6. post-completion.

Cost guidance

6.4 The Departmental Cost Guides which reflect the building and engineering requirements of new-build accommodation associated with this SHPN are promulgated by the NHS in Scotland Property and Environment Forum Executive in their annual publication Healthcare Construction Project Price Guide.

Equipment

6.5 Group 1 items are provided for in the Departmental Cost Guides associated with this SHPN. Specific guidance on Group 2 and 3 equipment is available from the Common Services Agency's Scottish Healthcare Supplies.

Equipment is categorised into four groups:

Group 1:

Items (including engineering terminal outlets) supplied and fixed within the terms of the building contract;

Group 2:

Items which have space and/or building construction and/or engineering service requirements and are fixed within the terms of the building contract but supplied under arrangements separate from the building contract;

Group 3:

As Group 2 but supplied and fixed (or placed in position) under arrangements separate from the building contract;

Group 4:

Items supplied under arrangements separate from the building contract, possibly with storage implications but otherwise having no effect on space or engineering service requirements.

Functional unit

6.6 The functional unit for this Note is the "bed unit". Six sizes of "bed units" have been costed; 16, 24, 32, 40, 48 and 56 beds, allowing the project team to choose a "bed unit" appropriate for its particular needs. The activity spaces and areas used for costing the functional units are listed in the Schedules of Accommodation at the end of this Chapter. Where a ward contains fewer or more beds than the nearest appropriate "bed unit", the costs should be adjusted to allow for the actual accommodation planned.

Essential complementary accommodation (ECA)

6.7 This comprises activity spaces which are essential to the running of a ward, but which in certain circumstances may be available in a convenient location elsewhere in the hospital. The ECA costed in this Note is listed in the Schedules of Accommodation at the end of this Chapter and detailed in Chapter 3.

Optional accommodation and services (OAS)

6.8 Where appropriate this Note draws attention to other ways of providing services or facilities, including the likely cost implications. This information will allow project teams to select the solution which is most suitable to their needs. The Optional Accommodation and Services costed in this Note are listed in the schedules and detailed in Chapter 3.

Dimensions and areas

6.9 At the early stages of a project, designers should use the brief to make an approximate assessment of the total area of accommodation involved. Schedules of areas are given at the end of this Chapter. It is emphasised that these areas are for guidance in assessing options and planning schemes only.

6.10 In determining spatial requirements, the essential factors are the critical dimensions, i.e. the minimum linear dimensions within which activities may be performed with reasonable efficiency. The area required for an activity space is the product of the critical dimensions. Reference should also be made to the ergonomic diagrams in 'Common Activity Spaces' HBN 40 Volumes 1-4 and HBN/SHPN 40 Volume 5: Scottish Appendix.

6.11 The schedules of areas were prepared for the purpose of establishing the cost guidance. It is emphasised that the areas published do not represent recommended room sizes, maximum or minimum costs, nor are they to be regarded in any way as specific individual entitlements.

Circulation space

6.12 The circulation space comprises space for all corridors, a heating and ventilation zone adjacent to external walls, small vertical ducts and spaces occupied by partitions, walls and planning flexibility. This space is included in the cost guidance.

Communications space

6.13 Staircases, lifts and plant rooms, with the exception of electrical switch cupboards, are not included in the cost guidance. The cost of communications space is covered in the 'on-costs' defined in paragraph 1.11 of Healthcare Construction Project Price Guide.

Engineering space

6.14 The cost guidance provides for space taken by mechanical and electrical service routes and for small vertical ducts. The space is included in the Schedules of Accommodation as part of the circulation provision.

Engineering services

6.15 The engineering services as described in Chapter 5, and exemplified in the Activity Data Base, are included in the cost guidance. Primary engineering services are assumed to be conveniently available at the boundary of the department but the cost guidance does include a share of the central refrigeration plant and distribution system. The cost guidance also includes for the ventilation plant and distribution system.

Mechanical services:

- Heating;
- Ventilation;
- Mechanical cooling;
- Hot and cold water (including supply and drainage for dialysis);
- Fire main;
- Medical gases.

Electrical services:

- Main intake switchgear, local isolators and distribution boards;
- Lighting;
- Power (including supplies to ventilation plant);
- Earth bonding of extraneous metal work;
- Telephone wiring (excluding handsets);
- Wireways for data links;
- Wireways for physiological monitoring equipment;
- Clocks;
- Fire and alarm systems;
- Staff/staff call systems;
- Staff location and emergency system.

Equipment Group 1:

- Controlled Drugs cupboard.

Modules

6.16 The description of the activity spaces makes it evident that a range of different organisational arrangements may be encompassed.

6.17 The principle of devolved clinical care management to the patient bedside with services and supplies located as close as possible within a cluster is enabled by the modular approach.

6.18 Clusters may be aggregated to:

- provide a greater clinical grouping, flexed use, clinical overview and variable staffing cover over the 24-hour period;
- provide shared back-up services and facilities;
- enable facilities and bed management over a group of clusters for an economy of scale.

6.19 The content of different modules and the levels of aggregation attempt to balance the conflicting demands for a clinically suitable environment, a people-centred one and for efficient use of staff and capital resources. A bed module requires to be complemented by four supplementary modules.

6.20 There is a choice of three eight-bed cluster modules which enable beds to be provided in an arrangement of 50, 75 or 100% single-bed rooms.

Module 1 is an eight-bed cluster:

- eight single-bed rooms each with an en suite facility and mini workstation;

Module 1a is an eight-bed cluster:

- four single-bed rooms each with an en suite facility and mini workstation;
- two two-bedded or one four-bedded rooms with associated en suite facilities and mini workstation;
- an assisted (type 5) WC;
- associated day space.

Module 1b is an eight-bed cluster:

- two single-bed rooms each with an en suite facility and mini workstation;
- three two-bedded rooms with associated en suite facilities and mini workstation;
- an assisted (type 5) WC;
- associated day space.

Complementary modules

Module 2 is the initial complementary module for direct patient care activities and includes:

- consultation/examination/treatment room;
- interview/sitting room;
- Nurses' Stations as required;
- resuscitation trolley bay;
- pantry;
- food trolley bay;
- wheelchair bay.

Module 3 backup storage. Storage for goods and supplies in day-to-day use will be accommodated within the workstation:

- linen trolley bay;
- clinical supplies trolley bay;
- clinical store/controlled drug cupboard;
- equipment store.

Module 4 is a utilities module including:

- utility/sluice/test room;
- small disposal/hold bay;
- domestic services/cleaner's room;
- a standard (Type 1) WC;
- switch cupboard.

Module 5 provides the essential office and administrative facilities:

- reception desk;
- general office/meeting room;
- charge nurse/sister's office;
- printer/IT/administration store room;
- waiting/social area;
- staff locker bay.

6.21 In addition, a staff rest room, a separate seminar room and an assisted bathroom (Type 2) should be provided as essential complementary accommodation. Optional accommodation includes a bathroom, staff shower (Type 3), a cook-chill holding room, resuscitation trolley bay, an office/meeting room and dedicated day room.

6.22 In this SHPN the assumption has been made that direct clinical administration will be carried out at the point of activity, at the bedside or in the consultation/examination room using a terminal linked to a local area network. Pre-admission and post-discharge correspondence, private telephone calls and small clinical team meetings may take place in the office/meeting room. However, general organisation of the work of the facility and the observation and care of patients cannot be undertaken from either a general reception desk or a shared office/meeting room. Both functions require specific spaces and a charge nurse/sister's office and Nurses' Stations have been included.

6.23 Patients likely to require treatments should, if possible**,** be accommodated in single-bed rooms both for the containment of infection and for privacy. However, if this is not possible and for patients in multi-bed rooms, the Consultation/examination room can also be used as a treatment room. It is the assumption that clinical goods and materials for use will be delivered on a daily basis to the point of use with a small back-up store.

6.24 An independent eight-bed cluster is unlikely to be required except for specialist areas.

6.25 Modules may be aggregated in a variety of ways to suit local patterns of care delivery. Once more than three bed modules are associated together some but not all support modules are replicated. The table below identifies the aggregation of modules for different bed numbers from 16 to 56 beds.

Bed unit	% Single rooms *	Module 1	Module 1a	Module 1b	Module 2	Module 3	Module 4	Module 5	Plus	Less	Total area m²
16 beds	50%	-	2	-	1	1	1	1			625
	60%	1	-	1	1	1	1	1			641
	75%	1	1	-	1	1	1	1			635
	100%	2	-	-	1	1	1	1			640
24 beds	50%	-	3	-	1	1	1	1			845
	75%	2	-	1	1	1	1	1			866
	80%	2	1	-	1	1	1	1			860
	100%	3	-	-	1	1	1	1			865
32 beds	50%	-	4	-	2	1	1	1			1136
	70%	2	1	1	1	1	1	1			1086
	75%	2	2	-	1	1	1	1			1080
	100%	4	-	-	1	1	1	1			1095
40 beds	50%	-	5	-	2	1	1	1			1355
	75%	3	1	1	2	1	1	1			1382
	80%	3	2	-	2	1	1	1			1375
	100%	5	-	-	1	1	1	1	1 resus trolley bay		1320
48 beds	50%	-	6	-	2	2	1	1			1590
	66%	3	1	2	2	2	1	1			1628
	80%	4	2	-	2	2	1	1			1620
	100%	6	-	-	1	2	1	1	1 resus trolley		1565
56 beds	50%	-	7	-	2	2	2	1	1 office meeting room	1 disposal	1860
	70%	4	1	2	2	2	2	1	1 office meeting room	1 disposal	1888
	80%	4	3	-	2	2	2	1	1 office meeting room	1 disposal	1895
	100%	7	-	-	1	2	2	1	1 office meeting room	1 disposal	1830

Aggregation of modules from 16 to 56 beds

***** Note: areas allow for family support in all single rooms**.**

Essential complementary accommodation	**Optional accommodation**
Seminar room	Bathroom
Staff rest room	Staff shower
Assisted bathroom	Cook/chill trolley holding room
	Dedicated day room
	Medical staff office

Table to show aggregation of bed and support modules and the associated area to provide facilities for up to 56 beds.

Schedules of accommodation

Planning single-bed rooms

6.26 By analysing typical examples of single-bed rooms with en suite facilities and clinical and family support areas, a mean area allowance for bed spaces in a single-bed room can be established at 21.0m^2. This value is used in generating the area modules in the schedules of accommodation.

6.27 Details of the activity spaces contained in each module follow.

Schedules of Accommodation - 8 Bed Cluster - Module 1

Activity Spaces	Space Area m²	Module 1 100% Singles No	Module 1 100% Singles Area
Bed and Sanitary Facilities			
Single Room	13.5	8	108.0
En suite assisted shower/wc/whb	4.5	8	36.0
Family and clinical support	3.0	8	24.0
	Sub-Total		**168.0**
	Planning	5%	8.4
	Sub-Total		**176.4**
	Engineering	3%	5.3
	Circulation	25%	44.1
		Total	**225.8**
		Departmental Total	**225**
		Area/bed	**28.1**

Activity Spaces	Space Area m²	Module 1a 50% Singles No	Module 1a 50% Singles Area
Bed and Sanitary Facilities			
Single Room	13.5	4	54.0
En suite assisted shower/wc/whb	4.5	6	27.0
Family and clinical support	3.0	5	15.0
Multi-bed (4 bays)	48.0	1	48.0
Day Space	20.0	1	20.0
	Sub-Total		**164.0**
	Planning	5%	8.2
	Sub-Total		**172.2**
	Engineering	3%	5.2
	Circulation	25%	43.0
		Total	**220.4**
		Departmental Total	**220**
		Area/bed	**27.5**

Activity Spaces	Space Area m²	Module 1b 25% Singles No	Area
Bed and Sanitary Facilities			
Single Room	13.5	2	27.0
En suite assisted shower/wc/whb	4.5	5	22.5
Family and clinical support	3.0	5	15.0
Multi-bed (2 bays)	28.0	3	84.0
Day Space	20.0	1	20.0
	Sub-Total		**168.5**
	Planning	5%	8.4
	Sub-Total		**176.9**
	Engineering	3%	5.3
	Circulation	25%	44.2
		Total	**226.4**
		Departmental Total	**226**
		Area/bed	**28.2**

Patient Support Facilities - Module 2

Activity Spaces	Space m²	Module 2 No	Area
Consultation/Examination/Treatment Room	16.5	1	16.5
Interview/Sitting Room	9.0	1	9.0
Nurses' Station	8.0	1	8.0
Resuscitation Trolley Bay – 1 trolley	2.0	1	2.0
Pantry/Beverage making	12.0	1	12.0
Food Trolley Bay	1.5	1	1.5
Wheelchair Bay	4.0	1	4.0
	Sub-Total		**53.0**
	Planning	5%	2.6
	Sub-Total		**55.6**
	Engineering	3%	1.7
	Circulation	25%	13.9
		Total	**71.2**

Backup Storage - Module 3

Activity Spaces	Space m²	Module 3 No	Area
Linen Trolley Bay	1.5	1	1.5
Clinical Supplies Trolley	1.5	1	1.5
Clinical Store/Controlled Drug Cupboard	1.5	1	1.5
Store – Equipment - large	10.0	0.75	7.5
	Sub-Total		**12.0**
	Planning	5%	0.6
	Sub-Total		**12.6**
	Engineering	3%	0.4
	Circulation	25%	3.1
		Total	**16.1**

Utilities - Module 4

	Space	Module 4	
Activity Spaces	**m²**	**No**	**Area**
Dirty Utility/Sluice/Test Room – small	6.5	1	6.5
Disposal hold/bay – large	8.0	1	8.0
Cleaners Room	7.0	1	7.0
WC/whb – type 1	2.0	1	2.0
Switchgear Cupboard	1.0	1	1.0

Sub-Total		**24.5**
Planning	5%	1.2
Sub-Total		**25.7**
Engineering	3%	0.8
Circulation	25%	6.4
	Total	**32.9**

Office and Administrative Services - Module 5

	Space	Module 5	
Activity Spaces	**m²**	**No**	**Area**
Reception – 2 position – open*	8.0	1	8.0
Office – 1 position + meeting area	12.0	1	12.0
Charge Nurse/Sister's Office	9.0	1	9.0
Printer/IT/administration store room*	6.0	1	6.0
Waiting Area – 5-10 persons	16.0	1	16.0
Staff locker bay	1.5	1	1.5

Sub-Total		**52.5**
Planning	5%	2.6
Sub-Total		**55.1**
Engineering	3%	1.6
Circulation	25%	13.8
	Total	**70.5**

* if required.

Essential Complementary Accommodation

	Space	Planning	Sub-Total	Engineering	Circulation	Total
Activity Spaces	**m²**	5%		3%	25%	
Staff Rest Room/Beverage Bay – 20 pers	20.0	1.00	21.0	0.6	5.3	**27.0**
Staff Rest Room/Beverage Bay – 10 pers	16.0	0.80	16.8	0.5	4.2	**21.5**
Seminar Room – 10 persons	10.0	1.00	21.0	0.6	5.3	**27.0**
Seminar Room – 20 persons	30.0	1.50	31.5	0.9	7.9	**40.5**
Seminar Room – 25 persons	45.0	2.25	47.3	1.4	11.8	**60.5**
Assisted Bathroom/wc/whb – Type 2	16.0	0.80	16.8	0.5	4.2	**21.5**

Optional Accommodation and Services

	Space	Planning	Sub-Total	Engineering	Circulation	**Total**
Activity Spaces	m²	5%		3%	25%	
Bathroom	9.0	0.45	9.5	0.3	2.4	**12.2**
Staff Shower/whb – Type 3	6.5	0.33	6.8	0.2	1.7	**8.5**
Cookchill/Hot Trolley Holding Room	26.0	1.30	27.3	0.8	6.8	**35.0**
Office/meeting room	16.0	0.80	16.8	0.5	4.2	**21.5**
Dedicated Day Room	24.0	1.20	25.2	0.8	6.3	**32.3**
Medical Staff Office	10.0	0.50	10.5	0.3	2.6	**13.4**

7. Activity data, critical dimensions and ergonomic drawings

Activity data

7.1 The Activity Data Base is a computerised information system developed by NHS Estates to help project and design teams by defining the users' needs more precisely.

7.2 The Activity Data Base is not designed for Scottish application and therefore, if used by a NHSiS Trust, should be adapted with caution.

7.3 In particular, a number of Activity Spaces in common use in Scottish Hospitals may not be included in the Activity Data Base and the individual room activities, technical data and components may well be different in a Scottish context.

7.4 Further information about the use and preparation of activity data can be obtained from:

NHS Estates,
Department of Health,
1 Trevelyan Square,
Boar Lane,
Leeds LS1 6AE.

7.5 It is unlikely that the NHS in Scotland Property and Environment Forum Executive will be publishing a Scottish version of the Activity Data Base.

Critical dimensions

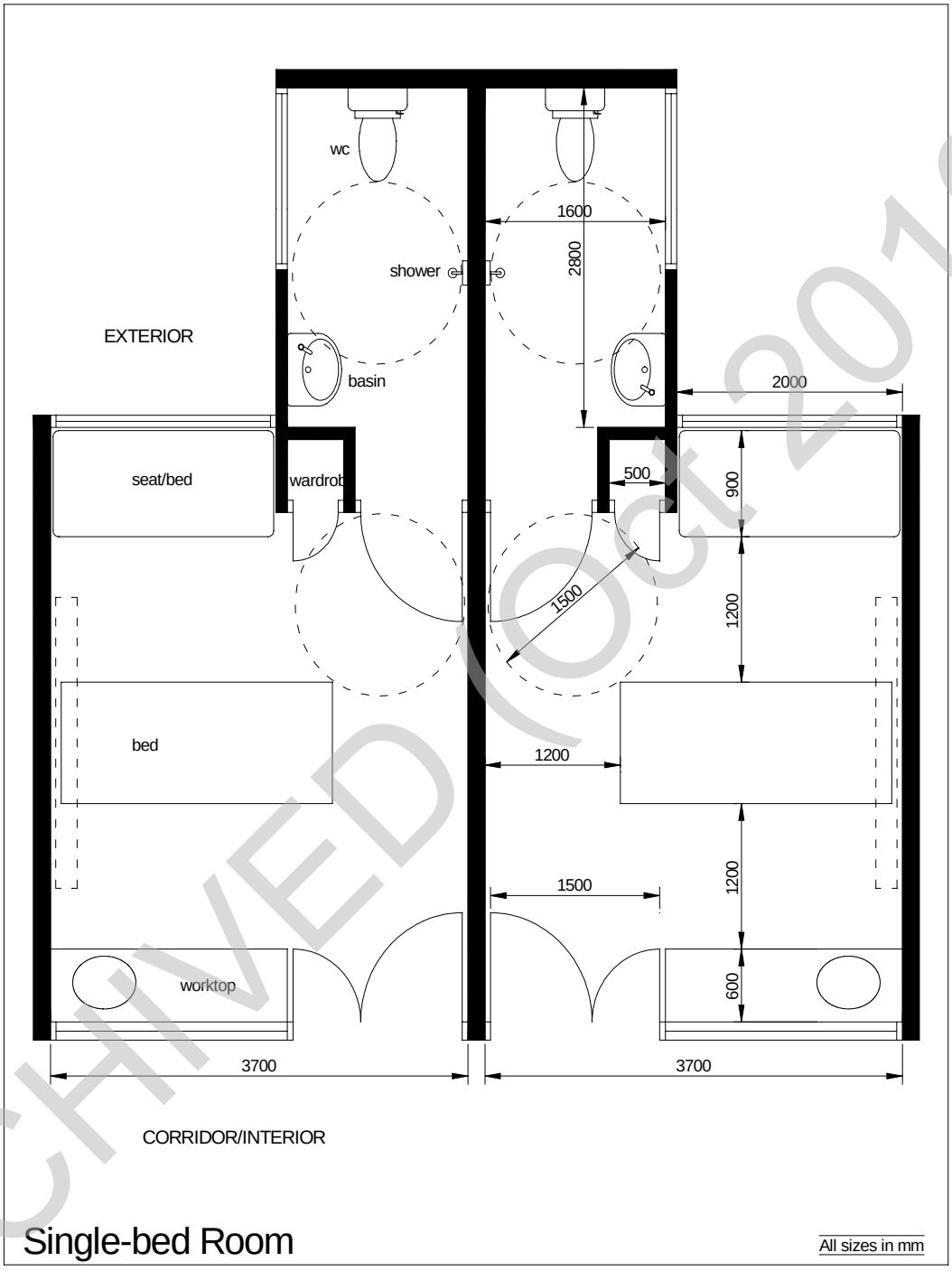
7.6 Critical dimensions are those dimensions that are critical to the efficient functioning of an activity; thus the size of components, their position and the space around them may all be critical to the task being performed. Guidance on these dimensions for a particular activity is provided in the form of ergonomic drawings**.** These illustrate components, that is equipment, furniture and fittings, and provide ergonomic data on the space required for users to move, operate or otherwise use the component; information about the component, for example fixing heights, and the users, for example reach, is also provided.

7.7 This Chapter contains ergonomic drawings relevant to this Note. In addition, ergonomic data common to the design of a number of departments is contained in NHS Estates publication 'Common Activity Spaces' HBN 40 Volumes 1-4 and HBN/SHPN 40 Volume 5: Scottish Appendix, to which reference should also be made.

7.8 List of ergonomic drawings relevant to SHPN 04

1. Single-bed room
2. Two-bed room
3. Four-bed room
4. Nurses' Station
5. Treatment room

Single-bed room



Notes:

1350 (1300)

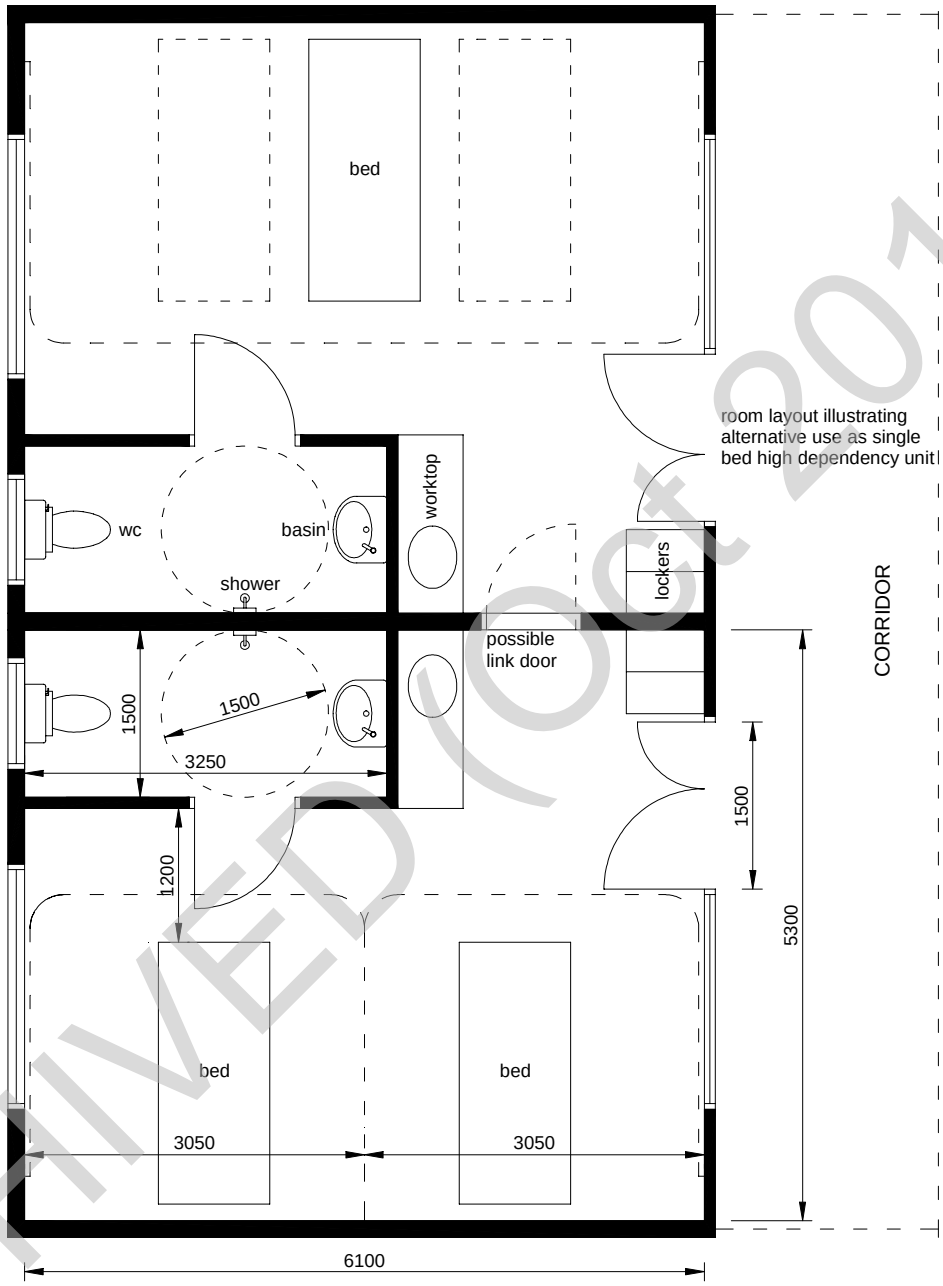
Preferred minimum: (Restricted minimum, not recommended for general use.)

Drawing not to scale

This layout shows a pair of single-bed rooms configured with external ensuite facilities. It illustrates the most efficient layout in terms of activity space, observation and circulation.

NORMAN RAITT ARCHITECTS

Two-bed room



Two-bed Room

All sizes in mm

Notes:

1350 (1300)

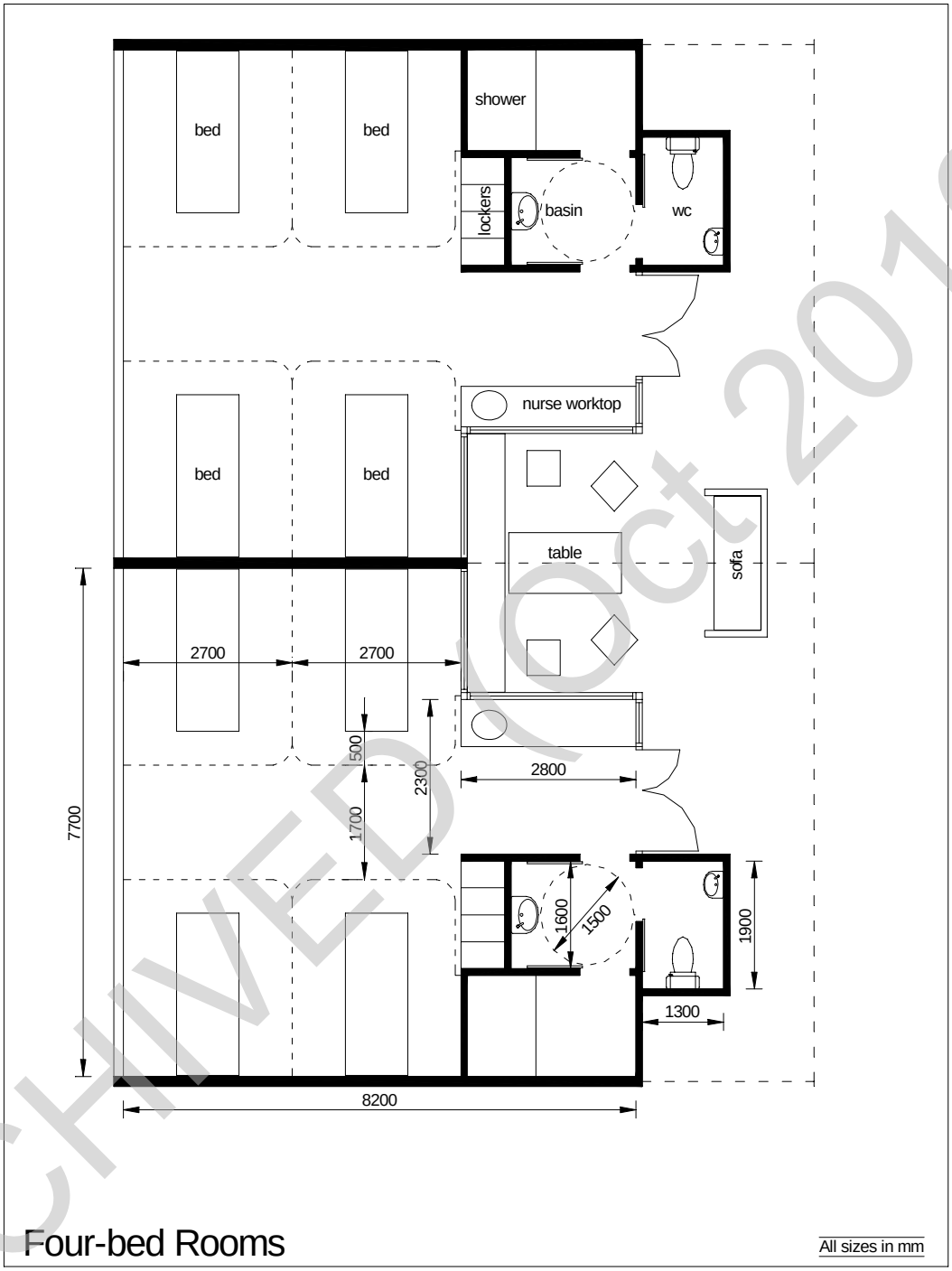
Preferred minimum: (Restricted minimum, not recommended for general use.)
Drawing not to scale

This layout shows a pair of two-bed rooms configured with ensuite facilities.
It illustrates the flexibility of room use discussed in paragraph 3.6 demonstrating alternative possible use as:

- two single-bed rooms
- two two-bed rooms
- one single-bed and one two-bed room
- one three-bed room (linked)
- one four-bed room (linked)

NORMAN RAITT ARCHITECTS

Four-bed room



Notes:

1350 (1300)

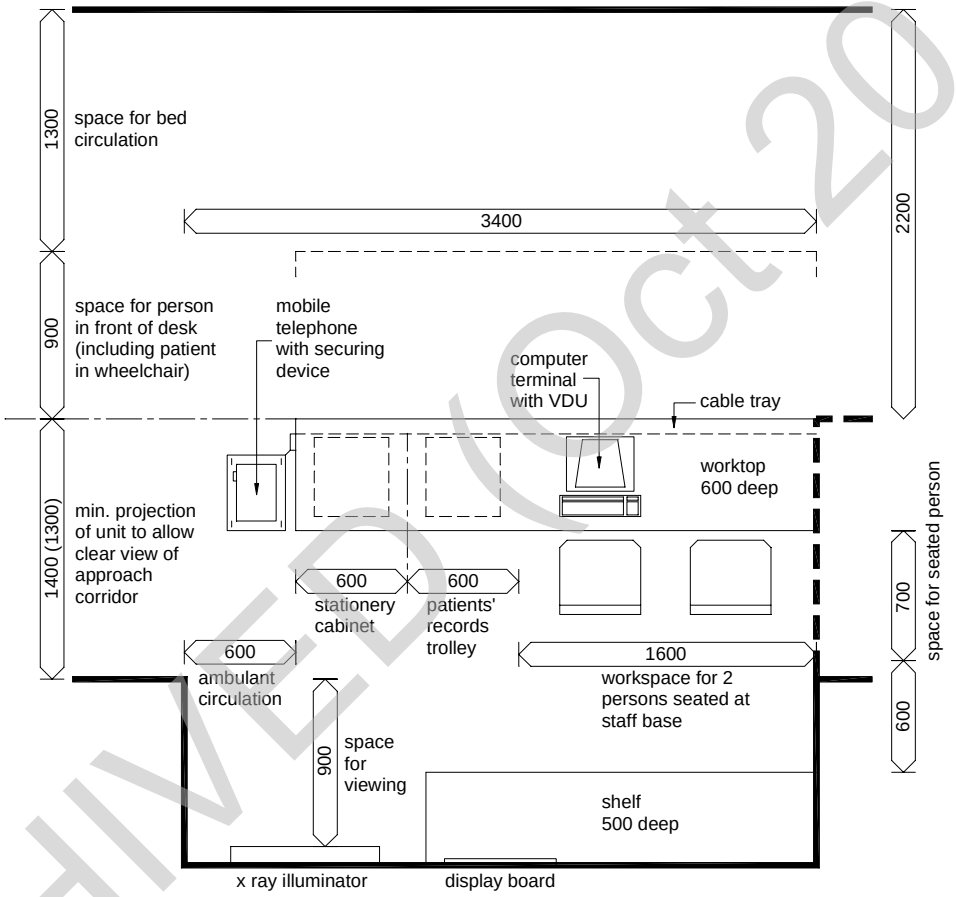
Preferred minimum: (Restricted minimum, not recommended for general use.)

Drawing not to scale

The four-bed rooms are planned with ensuite facilities to maximise views from all bed positions. Overnight stay facilities would be provided elsewhere. This arangement includes a multi-purpose day/social space integrated with the circulation and promoting more social interaction between patients, staff and visitors.

NORMAN RAITT ARCHITECTS

Nurses station



Nurses Station

All sizes in mm

Notes:

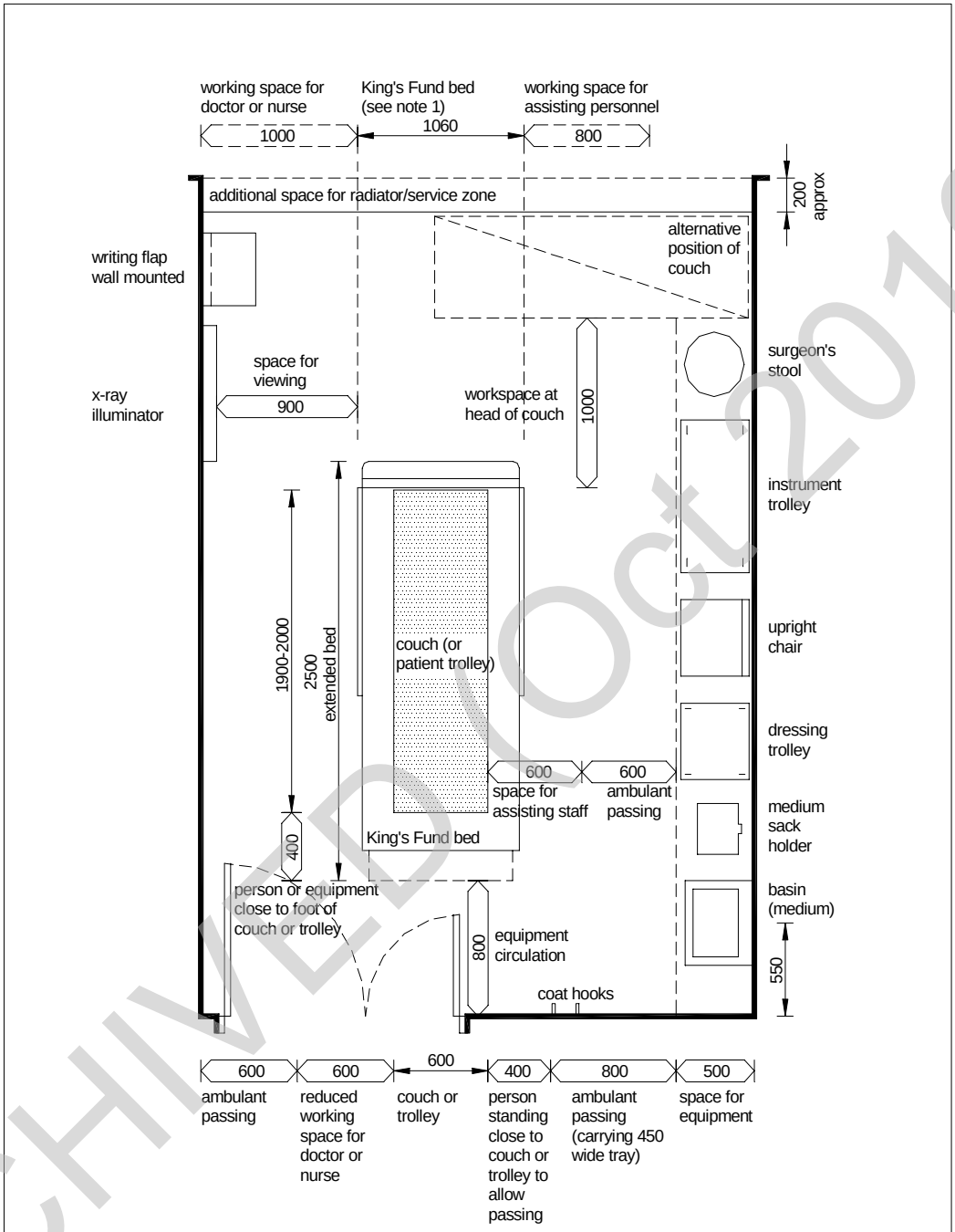
1350 (1300)

Preferred minimum: (Restricted minimum, not recommended for general use.)

Drawing not to scale

NORMAN RAITT ARCHITECTS

Treatment room: X-ray viewer



Treatment Room: X-ray viewer

All sizes in mm

Notes:

1350 (1300)

Preferred minimum: (Restricted minimum, not recommended for general use.)
Drawing not to scale

1. Treatment may be performed on a patient trolley or bed as well as on a couch When this occurs the couch must be moved to the side, away from the room centre.

2. To accommodate a King's Fund bed with orthopaedic attachments, both the room dimensions and the clear door opening should be increased.

3. When not in use, the patient couch may be situated outwith the room. In such a circumstance, the room may be of lesser dimensions.

NORMAN RAITT ARCHITECTS

Bedroom dimensions

7.9 The minimum widths of two and four-bedded rooms are 3.7m and 7.2m respectively. Single-bed rooms require, per bed, a greater length of external wall and corridor wall than do two or four-bedded rooms, so are not viewed as efficient in space terms. The minimum acceptable width is 3.4m, which allows 1.2m on either side of the bed. However, this carries the penalty of an unsatisfactory arrangement of activity zones, and the placing of the window behind the patient with limited options for locating en suite facilities.

7.10 The position of the bed influences the extent to which a patient can see out and be seen. The ability to see the daily activities within an in-patient area may provide a stimulating alternative to the views through the external window, offering the patient the opportunity to “participate” in the life of the nursing unit without needing to leave the bed. However privacy is also a factor in the planning of in-patient areas and designs need to balance these factors.

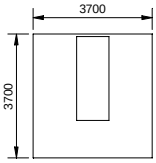
7.11 In the past in the UK room sizes have been finely tuned in relation to the proposed activities of the various spaces. A “tight” fit has been sought as a means to an overall space economy and through this an economic initial capital outlay.

7.12 Planning precisely, however, can lead to an inflexible space that cannot be used in any way other than that originally intended.

7.13 This section demonstrates the impact of different room layouts on working areas and observation and the implications of different configurations on the building envelope.

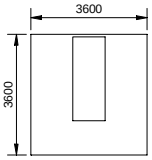
7.14 Working areas around a bed

area 12.58 sq.m.



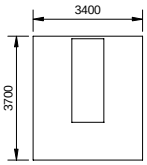
Dimensions and proportions for room with maximum bed positions

area 12.96 sq.m.

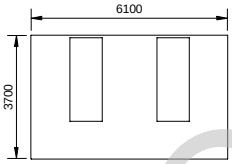


Optimum dimensions and proportions for room with bed positions commonly found in Europe

area 13.69 sq.m. Single

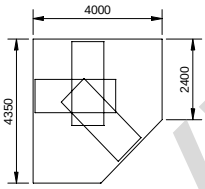


area 22.57 sq.m. Double room

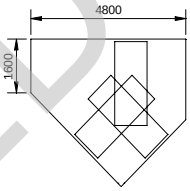


Dimensions around bed/beds with fixed orientation

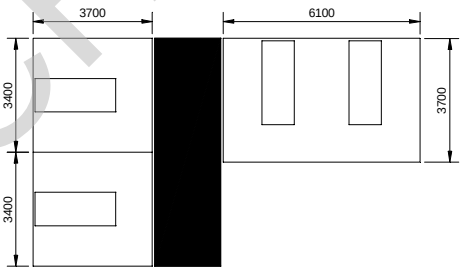
area 15.60 sq.m.

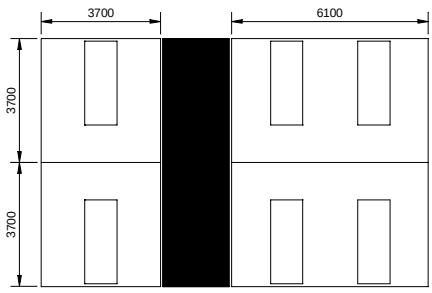


area 14.83 sq.m.



Flexibility in the position of the bed is shown above in two room shapes which meet minimum working areas. These types of room plans have been used in close packing cluster designs





En suite bathroom options for single-bed rooms

7.15 The combination and integration of en suite facilities affects not only the gross/net floor area per bed, but also the proportion of circulation, external wall area and wall-to-floor ratio, which together have a bearing on capital costs as well as operational concerns.

7.16 A comparison of bathroom options in linear arrangements of bedrooms shows the effect of bathroom location on total floor area, circulation and floor-to-wall ratios. These, together with the engineering requirements, will affect the overall building costs. The benefits are outlined for each of the illustrated layouts. (See page 87.)

7.17 Figures (a) and (d) contain the lowest floor area but include the highest proportion of circulation space.

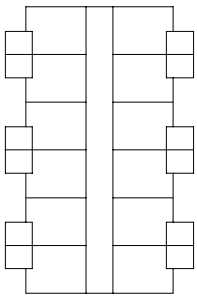
7.18 Figure (a) has the highest floor-to-wall ratio at 1:0.76, compared to (b) and (c) that have 1:0.52. Figures (b) and (c) contain the greatest floor area and (c) uses space least effectively and permits the poorest observation into the room.

7.19 Linear layouts may appear to be more economical, but are less efficient in their use of space than centric clustering arrangements.

7.20 Minimising gross floor area increases the floor-to-wall ratio and vice versa. A high floor-to-wall ratio may well be generated despite efficient and functional space planning. Economic solutions aim to optimise both the gross floor area and external wall area for any given layout.

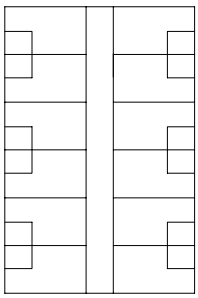
a **b** **c** **d**

En suite bathroom options for single rooms



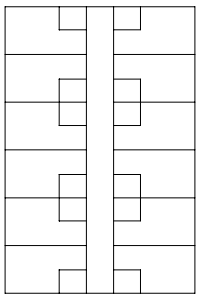
External bathroom 1

Total area = 331.0 m^2
@ 27.64 m^2 per bed
Circulation = 63.3 m^2
(inc walls and ducts @ 10 m^2)
Bedrooms = 267.7 m^2
External wall = 84.0 lin. m
% circulation = 23.0
External wall area = 252 m^2
Ration floor/wall = 1:0.76



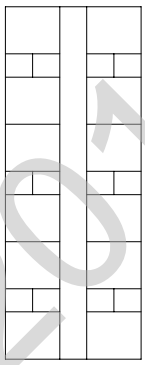
External bathroom 2

Total area = 351.0 m^2
@ 29.24 m^2 per bed
Circulation = 63.3 m^2
(inc walls and ducts @ 10 m^2)
Bedrooms = 287.7 m^2
External wall = 62.0 lin. m
% circulation = 22.0
External wall area = 186 m^2
Ratio floor/wall = 1:0.52



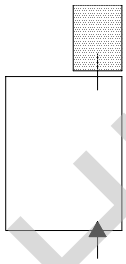
Internal bathroom

Total area = 351.0 m^2
@ 2924 m^2 per bed
Circulation = 63.3 m^2
(inc walls and ducts @ 10 m^2)
Bedrooms = 287.7 m^2
External wall = 62.0 lin. m
% circulation = 22.0
External wall area = 186 m^2
Ration floor/wall = 1:0.52



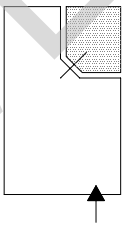
Interlocking bathroom

Total area = 330.0 m^2
@ 27.50 m^2
Circulation = 87.0 m^2
(inc walls and ducts 20 m^2) @ 10m^2)
Bedrooms = 243.0 m^2
External wall = 68.0 lin. m
% circulation = 35.0
External wall area = 204 m^2
Ration floor/wall = 1:0.61



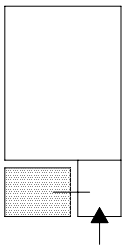
External bathroom 1
(outside envelope)

- good observation to and from room
- efficient circulation
- minimum room width
- natural light and ventilation to bathroom
- reduces window area in bedroom
- bathroom service duct could be accessed externally
- can be bolted on to an existing building



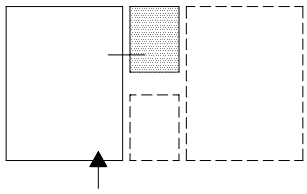
External bathroom 2
(within envelope)

- good observation to and from room
- efficient circulation
- minimum room width
- natural light and ventilation to bathroom
- reduces window area in bedroom
- bathroom service duct could be accessed externally
- increases floor area



Internal bathroom

- reduces observation to and from bedroom
- creates dead area behind doors
- increases area of unusable floor space
- maximises window area in bedroom
- bathroom service duct can be maintained from corridor



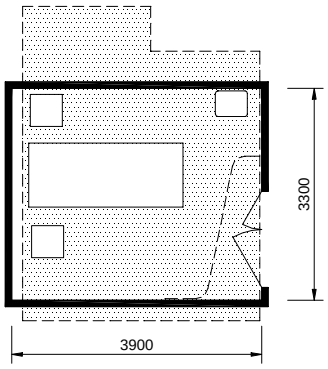
Interlocking bathrooms

- good observation to and from room
- one internal bathroom per two bedrooms
- increases overall width of room
- maximises window area in bedroom
- one service duct has to be accessed from room

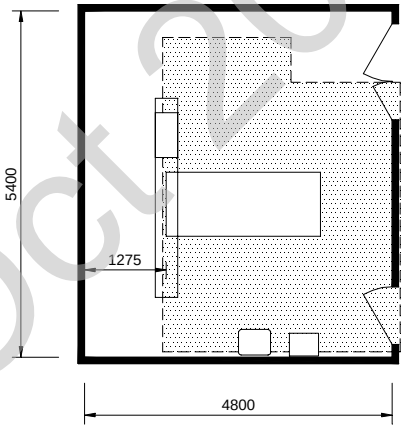
Single-bed room designs in NHS guidance

7.21 Previous planning guidance for single-bed rooms (HBN 04 1990 and HBN 40 1995) is compared to a single-bed room with en suite and integral support facilities. The single-bed room is larger to accommodate the additional bedside activity and equipment. The increase in area over HBN 04 (1990) and HBN 40 is between 32% and 50%.

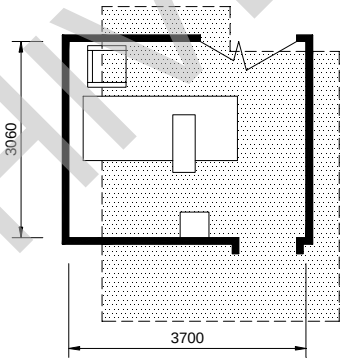
Single room
HBN 04 1990
area 12.87 sq.m.



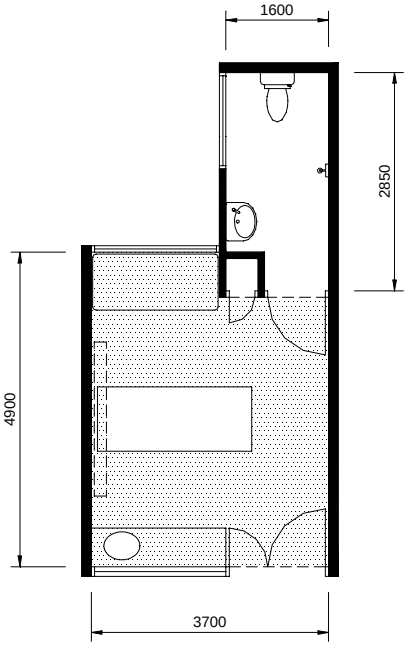
ITU/Isolation room
Nucleus data pack 1992
area 25.92 sq.m.



Single room
HBN 40 1995
area 11.32 sq.m.



Single room
HBN 04 1997
area (excl ensuite) 16.88 sq.m.



References

References are identified by paragraph number.

1.9 **NHS in Scotland Patient's Charter - Charter for Health**.

2.24 **Scottish Infection Manual**. The Scottish Office, Department of Health Public Health Policy Unit 1998.

2.25 **SI 3246: 1994 The Control of Substances Hazardous to Health Regulations (COSHH) - Guidance for the Initial Assessment in Hospitals**. TSO 1994.

2.26 **Food Safety Act 1990.** TSO 1990.

Food Hygiene Amendment Regulations 1990. TSO 1990.

2.33 **LPG aerosol containers: risks arising from storage, use and disposal**. Safety Action Bulletin SAB(88)79, Department of Health 1988.

Specification No. TSS/S 330. 1982

2.35 **Nucleus Study No. 12 'Staff Change (Options)' and Nucleus Study 13 'Decentralised-zonal staff change'**. SHHD/DS(1984)29.

3.11 **NHS in Scotland Firecode**. NHS in Scotland Property and Environment Forum Executive 1998.

3.39 **BS 2881:1989 Specifications for Cupboards for the Storage of Medicines in Healthcare Premises**. BSI 1989.

3.63 **HBN 40 – Common activity spaces, Volume 2: Treatment areas.** NHS Estates, TSO 1995.

SHPN 40 – Common Activity Spaces, Volume 5: Scottish Appendix. NHS Estates, TSO 1996.

3.64 **HBN 40 – Common activity spaces, Volume 3: Staff areas.** NHS Estates, TSO 1995.

SHPN 40 – Common Activity Spaces, Volume 5: Scottish Appendix. NHS Estates, TSO 1996.

3.66 **HBN 10 – Catering Department**. NHS Estates, TSO 1997.

4.3 **SI 2179:1990(S187) The Building Standards (Scotland) Regulations (with subsequent amendments)**. TSO 1990.

4.4 **Healthcare Construction Project Price Guide**. NHS in Scotland Property and Environment Forum Executive (annual publication).

4.5 **Healthcare Construction Project Price Guide**. NHS in Scotland Property and Environment Forum Executive (annual publication).

4.10 **Removal of Crown immunity under Section 60 of the NHS and Community Care Act 1990**. NHS Circular No 1991(GEN) 1 January 1991.

4.11 The Scottish Office NHS in Scotland Management Executive letter MEL(1992)24, 30 July 1992.

4.12 **NHS in Scotland Firecode**. NHS in Scotland Property and Environment Forum Executive 1998.

4.13 **HTMs 57- 60**. See 4.22 below.

Wayfinding. NHS Estates 1999.

4.16 **HBN 48 – Telephone services**. NHS Estates, TSO 1997.

4.17 NHS Circular No 1984(Gen)7.

NHS Security Manual (issued with Management Executive Letter MEL(1992)35). National Association of Health Authorities and Trusts (NAHAT) 1992.

4.22 **HTM 54 – User manual**. NHS Estates, TSO 1989.

HTM 54.1 – User manual update. NHS Estates, TSO 1993.

HTM 55 – Windows. NHS Estates, TSO 1998.

HTM 56 – Partitions. NHS Estates, TSO 1998.

HTM 57 – Internal glazing. NHS Estates, TSO 1995.

HTM 58 – Internal doorsets. NHS Estates, TSO 1998.

HTM 59 – Ironmongery. NHS Estates, TSO 1998.

HTM 60 – Ceilings. NHS Estates, TSO 1989.

HTM 61 – Flooring. NHS Estates, TSO 1995.

HTM 62 – Demountable storage systems. NHS Estates, TSO 1989.

HTM 63 – Fitted storage systems. NHS Estates, TSO 1989.

HTM 64 – Sanitary assemblies. NHS Estates, TSO 1995.

HTM 66 – Cubicle curtain track. NHS Estates, TSO 1989.

HTM 67 – Laboratory fitting out systems. NHS Estates, TSO 1993.

HTM 68 – Duct panel assemblies. NHS Estates, TSO 1993.

HTM 69 – Protection. NHS Estates, TSO 1993.

HTM 70 – Fixings. NHS Estates, TSO 1993.

HTM 71 – Materials management modular storage. NHS Estates, TSO 1998.

4.23 **Environmental Protection Act**.

4.27 **HTM 61**. See 4.22 above.

4.28 **HTM 61**. See 4.22 above.

4.31 **HTM 55**. See 4.22 above.

BS 5925:1991 Code of practice for ventilation principles and designing for natural ventilation. BSI 1991.

4.33 **HTM 87 – Textiles and furniture**. NHS Estates, TSO 1993.

4.35 **HTM 55**. See 4.22 above.

4.44 **SHFN 14 - Disability access**. NHS in Scotland Property and Environment Forum Executive, 1999.

Chronically Sick and Disabled Persons Act 1970. TSO 1970.

Chronically Sick and Disabled Persons (Scotland) Act 1972. TSO 1972.

Chronically Sick and Disabled Persons (Amendment) Act 1976. TSO 1976.

Disabled Persons Act 1981. TSO 1981 (print on demand).

Disabled Persons (Services, Consultation and Representation) Act 1986. TSO 1986.

Disability Discrimination Act 1995. TSO 1995.

4.45 **Wayfinding**. NHS Estates 1999.

4.46 **Safe Disposal of Clinical Waste 1992** (issued with letter reference NHS MEL(1993)21). Health Services Advisory Committee, Health and Safety Executive 1992.

4.48 **HTMs 56, 58 and 61**. See 4.22 above.

4.52 **Teaching Hospital Space Requirements**.

5.6 **Scottish Capital Investment Manual**. The Scottish Office NHS in Scotland Management Executive, TSO.

5.8 **SHTM 2005 – Building management systems**. NHS in Scotland Property and Environment Forum Executive 1999.

5.9 **SI 2179:1990(S187) The Building Standards (Scotland) Regulations (with subsequent amendments)**. TSO 1990.

5.12 **SI 2793:1992 The Manual Handling Operations Regulations**. TSO 1992.

5.13 **SHTM 2023 – Access and accommodation for engineering services**. NHS in Scotland Property and Environment Forum Executive 1999.

SI 3140:1994 Construction (Design and Management) Regulations. TSO 1994.

5.17 **Health and Safety at Work etc Act 1974**. TSO 1974.

Consumer Protection Act 1987. TSO 1987.

SI 3004 1992 The Workplace (Health Safety and Welfare) Regulations. TSO 1992.

SI 2306: 1998 Provision and Use of Work Equipment Regulations. TSO 1998.

SI 3140: 1994 Construction (Design and Management) Regulations. TSO 1994.

5.18 **SI 2179: 1990(S187) The Building Standards (Scotland) Regulations (with subsequent amendments)**. TSO 1990.

NHS in Scotland Firecode. NHS in Scotland Property and Environment Forum Executive 1998.

5.20 **SHTM 2045 – Acoustics**. NHS in Scotland Property and Environment Forum Executive 1999.

5.22 **Engineering Commissioning**. The Institute of Healthcare Engineering and Estate Management (IHEEM).

Engineering services commissioning codes. Chartered Institute of Building Services Engineers (CIBSE).

Scottish Hospital Technical Note 1 – Post commissioning documentation for health buildings in Scotland. The Scottish Office NHS in Scotland Management Executive.

5.25 **Scottish Health Guidance Note: "Safe" hot water and surface temperatures**. NHS in Scotland Property and Environment Forum Executive 1999.

5.33 **Scottish Infection Manual**. The Scottish Office Department of Health Public Health Policy Unit 1998.

5.36 **BS EN 779:1993 Particulate air filters for general ventilation. Requirements, testing, marking**. BSI 1993.

5.39 **SHTM 2025 – Ventilation in healthcare premises**. NHS in Scotland Property and Environment Forum Executive 1999.

5.40 **SHTM 2005 – Building management systems**. NHS in Scotland Property and Environment Forum Executive 1999.

5.41 **SHTM 2027 – Hot and cold water supply, storage and mains services**. NHS in Scotland Property and Environment Forum Executive 1999.

Scottish Hospital Technical Note 2 – Domestic hot and cold water systems for Scottish healthcare premises. NHS in Scotland Property and Environment Forum Executive 1999

5.42 **SHTM 2040 – The control of Legionellae in healthcare premises – A code of practice**. NHS in Scotland Property and Environment Forum Executive 1999.

5.43 **Scottish Health Guidance Note: "Safe" hot water and surface temperatures**. NHS in Scotland Property and Environment Forum Executive 1999.

5.45 **SHTM 2040 – The control of Legionellae in healthcare premises – A code of practice**. NHS in Scotland Property and Environment Forum Executive 1999.

5.46 **SHTM 2022 – Medical gas pipeline systems**. NHS in Scotland Property and Environment Forum Executive 1999.

5.47 **BS 7671:1992 Requirements for electrical installations IEE wiring regulations (current edition with amendments)**. BSI 1992.

SHTM 2007 – Electrical services supply and distribution. NHS in Scotland Property and Environment Forum Executive 1999.

SHTM 2020 – Electrical safety code for low voltage systems. NHS in Scotland Property and Environment Forum Executive 1999.

SHTM 2011 – Emergency electrical services. NHS in Scotland Property and Environment Forum Executive 1999.

5.50 **SHTM 2007 – Electrical services supply and distribution**. NHS in Scotland Property and Environment Forum Executive 1999.

5.51 **HTM 2014 – Abatement of electrical interference**. NHS Estates, TSO 1993.

BS EN 55015: 1993

5.52 **Electro-Magnetic Compatibility (89/336/EEC)** (as amended by 91/263/EEC and 92/31/EEC) TSO 1989.

SI 2372:1992 Electro-Magnetic Compatibility Regulations. TSO 1992.

5.53 **Lighting Guide : Hospitals & Healthcare Buildings (LG2)**. Chartered Institute of Building Services Engineers (CIBSE) 1989.

5.59 **SI 2792:1992 The Health and Safety (Display Screen Equipment) Regulations**. TSO, 1992.

Lighting Guide: Hospital and healthcare premises No. LG3. Chartered Institute of Building Services Engineers (CIBSE) 1989.

SHTM 2011 – Emergency electrical services. NHS in Scotland Property and Environment Forum Executive 1999.

BS 5266:1988 Emergency Lighting. BSI 1988.

NHS in Scotland Firecode. NHS in Scotland Property and Environment Forum Executive 1998.

5.60 **HBN 40 – Common activity spaces, Volume 4: Circulation areas**. NHS Estates, TSO 1995.

SHPN 40 – Common Activity Spaces, Volume 5: Scottish Appendix. NHS Estates, TSO 1996.

5.63 **BS 2881:1989 Specifications for Cupboards for the Storage of Medicines in Healthcare Premises**. BSI 1989.

Guidelines for the Safe and Secure Handling of Medicines (issued with General Letter GEN(1988)33). Department of Health, R. Duthie TSO 1988 (out of print).

5.64 **Guidelines for the Safe and Secure Handling of Medicines** (issued with General Letter GEN(1988)33). Department of Health, R. Duthie TSO 1988 (out of print).

5.70 **SHTM 2007 – Electrical services supply and distribution** NHS in Scotland Property and Environment Forum Executive 1999.

BS EN 60601-2:1993: Medical electrical equipment particular requirements for safety. BSI 1993.

5.71 **SHTM 2011 – Emergency electrical services**. NHS in Scotland Property and Environment Forum Executive 1999.

5.75 **Planning for crime prevention (Planning Advice Note 46)**. The Scottish Office 1994.

NHS Security Manual (issued with Management Executive Letter MEL(1992)35). National Association of Health Authorities and Trusts (NAHAT) 1992.

5.79 **SHTM 2015 – Bedhead services**. NHS in Scotland Property and Environment Forum Executive 1999.

5.83 **HBN 48 – Telephone services**. NHS Estates, TSO 1997.

5.91 **SHTM 2015 – Bedhead services**. NHS in Scotland Property and Environment Forum Executive 1999.

5.92 **SHTM 2007 – Electrical services supply and distribution**. NHS in Scotland Property and Environment Forum Executive 1999.

HSE Data Sheet DB 2. Health & Safety Executive.

BS 6651:1992 Code of practice for protection of structures against lightning. BSI 1992.

5.93 **BS 5572:1978 Code of practice for sanitary pipework**. BSI 1978.

BS 6367:1983 Code of practice for drainage of roofs and paved areas. BSI 1983.

BS 8301:1985 Code of practice for building drainage. BSI 1985.

HSE Data sheet EA5. Health and Safety Executive.

6.2 **Scottish Capital Investment Manual**. The Scottish Office NHS in Scotland Management Executive, TSO.

6.4 **Healthcare Construction Project Price Guide**. NHS in Scotland Property and Environment Forum Executive (annual publication).

6.10 **HBN 40 – Common Activity Spaces, Volumes 1- 4**. NHS Estates, TSO 1995.

SHPN 40 – Common Activity Spaces, Volume 5: Scottish Appendix. NHS Estates, TSO 1996.

6.13 **Healthcare Construction Project Price Guide**. NHS in Scotland Property and Environment Forum Executive (annual publication).

7.7 **HBN 40 – Common Activity Spaces, Volumes 1- 4**. NHS Estates, TSO 1995.

SHPN 40 – Common Activity Spaces, Volume 5: Scottish Appendix. NHS Estates, TSO 1996.

7.21 **HBN 04 – Adult Acute Wards**. 1990 (out of print).

HBN 40 – Common Activity Spaces, Volumes 1-4. NHS Estates, TSO 1995.

Publications in SHPN series

Given below is a list of all Scottish Hospital Planning Notes. Those Notes which have to be read along with their counterpart Health Building Note (HBN) are marked with an *. This list is correct at time of publication of this Note, but refer also to the Health Building Notes and Scottish Health Planning Note Reference Guide published by the NHS in Scotland Property and Environment Forum Executive.

1 Health Service building in Scotland 1991 TSO

2 Hospital briefing and operational policy 1993 TSO

4 Adult acute wards (with DBS) 1992 TSO

4 Adult acute wards Supplement 1 - Activity space data sheets 1992 TSO

6 Radiology department 1995 TSO

12 Out-patients department (with DBS) 1993 TSO

12 Out-patients department Supplement A – Activity space data sheets 1993 TSO

12 Out-patients department Supplement 1 – Genito-urinary medicine clinics 1993 TSO

12 Out-patients department Supplement 2 – Oral surgery, orthodontics, restorative dentistry 1996 TSO

13 Sterile services department 1994 TSO

15 Accommodation for pathology services 1994 TSO

20 Mortuary and post-mortem rooms 1993 TSO

20 Mortuary and post-mortem rooms Supplement 1 – Activity space data sheets 1994 TSO

21 Maternity department 1996 TSO

22 Accident and emergency department in an acute general hospital 1995 TSO

22 Accident and emergency department in an acute general hospital Supplement 1 – Trauma care and minor injury 1996 TSO

26 Operating department* 1992 TSO

26 Operating department Supplement 1 – Activity space data sheets 1993 TSO

34 Estate maintenance and works operations* 1992 TSO

34 Estate maintenance and works operations Supplement I – Activity space data sheets 1993 TSO

35 Accommodation for people with acute mental illness 1994 TSO

40 Common activity spaces Volume 5 – Scottish appendix* 1996 TSO

45 External works for health buildings* 1994 TSO

47 Health records department 1995 TSO

48 Telephone services 1997 TSO

51 Accommodation at the main entrance of a District General Hospital 1992 TSO

51 Accommodation at the main entrance of a District General Hospital Supplement A – Activity space data sheets 1993 TSO

51 Accommodation at the main entrance of a District General Hospital Supplement 1 – Miscellaneous spaces in a District General Hospital 1992 TSO

51 Accommodation at the main entrance of a District General Hospital Supplement 1A – Miscellaneous spaces in a District General Hospital - Activity space data sheets 1993 TSO