

## Health Building Note 09-03: Neonatal units



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## Neonatal units

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# Preface

## About Health Building Notes

Health Building Notes give “best practice” guidance on the design and planning of new healthcare buildings and on the adaptation/extension of existing facilities.

They provide information to support the briefing and design processes for individual projects in the NHS building programme.

## The Health Building Note suite

Healthcare delivery is constantly changing, and so too are the boundaries between primary, secondary and tertiary care. The focus now is on delivering healthcare closer to people’s homes.

The Health Building Note framework (shown below) is based on the patient’s experience across the spectrum of care from home to healthcare setting and back, using the national service frameworks (NSFs) as a model.

## Health Building Note structure

The Health Building Notes have been organised into a suite of 17 core subjects.

**Care-group-based** Health Building Notes provide information about a specific care group or pathway but cross-refer to Health Building Notes on **generic (clinical) activities** or **support systems** as appropriate.

Core subjects are subdivided into specific topics and classified by a two-digit suffix (-01, -02 etc), and may be further subdivided into Supplements A, B etc.

All Health Building Notes are supported by the overarching Health Building Note 00 in which the key areas of design and building are dealt with.

### Example

The Health Building Note on accommodation for adult in-patients is represented as follows:

“Health Building Note 04-01: Adult in-patient facilities”

The supplement to Health Building Note 04-01 on isolation facilities is represented as follows:

“Health Building Note 04-01: Supplement 1 – Isolation facilities for infectious patients in acute settings”

Health Building Note number and series title	Type of Health Building Note
Health Building Note 00 – Core elements	Support-system-based
Health Building Note 01 – Cardiac care	Care-group-based
Health Building Note 02 – Cancer care	Care-group-based
Health Building Note 03 – Mental health	Care-group-based
Health Building Note 04 – In-patient care	Generic-activity-based
Health Building Note 05 – Older people	Care-group-based
Health Building Note 06 – Diagnostics	Generic-activity-based
Health Building Note 07 – Renal care	Care-group-based
Health Building Note 08 – Long-term conditions/long-stay care	Care-group-based
Health Building Note 09 – Children, young people and maternity services	Care-group-based
Health Building Note 10 – Surgery	Generic-activity-based
Health Building Note 11 – Community care	Generic-activity-based
Health Building Note 12 – Out-patient care	Generic-activity-based
Health Building Note 13 – Decontamination	Support-system-based
Health Building Note 14 – Medicines management	Support-system-based
Health Building Note 15 – Emergency care	Care-group-based
Health Building Note 16 – Pathology	Support-system-based

## Other resources in the DH Estates and Facilities knowledge series

### Health Technical Memoranda

Health Technical Memoranda give comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology used in the delivery of healthcare (for example medical gas pipeline systems, and ventilation systems).

They are applicable to new and existing sites, and are for use at various stages during the inception, design, construction, refurbishment and maintenance of a building.

All Health Building Notes should be read in conjunction with the relevant parts of the Health Technical Memorandum series.

### Activity DataBase (ADB)

The Activity DataBase (ADB) data and software assists project teams with the briefing and design of the healthcare environment. Data is based on guidance given in the Health Building Notes, Health Technical Memoranda and Health Technical Memorandum Building Component series.

1. Room data sheets provide an activity-based approach to building design and include data on personnel, planning relationships, environmental considerations, design character, space requirements and graphical layouts.
2. Schedules of equipment/components are included for each room, which may be grouped into ergonomically arranged assemblies.
3. Schedules of equipment can also be obtained at department and project level.
4. Fully loaded drawings may be produced from the database.
5. Reference data is supplied with ADB that may be adapted and modified to suit the users' project-specific needs.

### Note

The sequence of numbering within each subject area does not necessarily indicate the order in which the Health Building Notes were or will be published/printed. However, the overall structure/number format will be maintained as described.

# Executive summary

This Health Building Note covers the policy and service context, and planning and design considerations, for neonatal units.

It covers all types of unit providing care for neonates who require more than the routine care provided in maternity units. This includes cot space provision for special care, high dependency care and intensive care, and the associated clinical and non-clinical support facilities, including facilities for families.

It describes spaces that are unique to a neonatal unit. It also describes any variations to common hospital spaces and clarifies requirements for these spaces, where necessary.

For a full list of space components, see the example schedules of accommodation for a 5000-birth neonatal intensive care unit and a 2500-birth special care unit.

Neonatal units are always co-located with a maternity unit. This guidance should be read in conjunction with Health Building Note 09-02 – ‘Maternity care facilities’, which includes requirements for the routine care of neonates within the maternity unit.

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# 1 Policy context

- 1.1 Most babies are, and remain, healthy and receive routine care at their mother's bedside before going home with their family. However, approximately 10% of babies require some form of specialist support at birth, with 1–3% requiring neonatal intensive care.
- 1.2 Increasing numbers of very small premature babies are being born alive and surviving, owing to the increasing capability of technology and development of healthcare expertise. These babies may require quite prolonged periods of supportive care over several weeks.
- 1.3 Neonatal units provide care for babies in formal, managed “networks”, determined in alignment with the provision of maternity and obstetric care. The ultimate objective is to provide equitable, safe and effective services providing the best possible outcome for babies and their families. This guidance reflects the advice provided in ‘Toolkit for high quality neonatal services’ (DH, 2009) and ‘Service standards for hospitals providing neonatal care’ (BAPM, 2010).
- 1.4 Babies are nursed in cots or incubators in an area or type of unit appropriate to their need for life-support systems, intensive care and treatment, monitoring and observation or isolation. A mixture of multi-cot rooms and single-cot rooms are usually provided.
- 1.5 Family-centred care is a philosophy of care that helps families whose baby is in hospital to cope with the stress, anxiety and altered parenting roles that accompany their baby's condition. It puts the physical, psychological and social needs of both baby and their family at the heart of all care given. Ultimately family-centred care may enhance attachment between a baby and the family and result in improved long-term outcome for both.
- 1.6 Parents are encouraged to visit and stay with, handle and care for their babies. The environment and facilities must be supportive of the needs of the family whatever the type of unit. This is particularly important when a baby is moved for ongoing intensive care.

## 2 Service context

2.1 Neonatal units provide care for babies in formal, managed “networks”, determined in alignment with the provision of maternity and obstetric care. The ‘Toolkit for high quality neonatal services’ (DH, 2009) includes an example of a network structure.

### Levels of neonatal care

2.2 The level of care that a unit provides will be decided according to the overall organisation of the network of care within the region. There are three categories of care above and beyond the routine care provided in a maternity unit, summarised below:

#### Special care

- 2.3 Special care is providing:
- the care of less immature premature babies who no longer need high dependency or intensive care while they grow to a stage of maturity ready for discharge. This includes tube feeding, maintenance of body temperature and monitoring; and the care of babies recovering from illnesses or operations, for example treatment of infections, jaundice and special nutrition.
- 2.4 There will normally be a 1:4 ratio of staff to babies.
- 2.5 Units that provide special care but no higher level of care are referred to as special care units (SCUs).

#### High dependency care

2.6 High dependency care is providing higher levels of clinical care including for those recovering from intensive care. This includes babies receiving oxygen for immature lungs as they breathe on their own, sometimes assisted by higher pressure given via nasal prongs; and babies on intravenous nutrition or treated with chest drains or for convulsions, infections or metabolic problems. There will normally be a 1:2 ratio of staff to babies.

2.7 Units that provide high dependency care also need to be able to provide short-term intensive care (see below) and are referred to as local neonatal units (LNUs). They also provide special care.

#### Intensive care

- 2.8 Neonatal intensive care is needed for:
- babies born prematurely, simply to support organ systems until they have matured; and
  - babies who are ill or who have life-threatening congenital disorders.
- 2.9 The greater the immaturity, the more needs to be done to support a baby’s breathing (often with mechanical ventilation), and to protect it from infection and to achieve growth equivalent to that which occurs in the womb. Thus, even babies who are otherwise well but very premature require intensive care simply to support their life until their organ systems undergo maturity. This includes sophisticated mechanical ventilation with oxygen, intravenous feeding, and the use of incubators to control body temperature and protect from infection. It also involves treatment of illnesses that are more common in such vulnerable babies.
- 2.10 Neonatal intensive care is also required for a small number of larger, more mature babies who become ill from complications of delivery, from infection or metabolic disorders or when surgical or other treatment is required for congenital anomalies such as congenital heart disease, disorders of the lung or gut, or of other organs.
- 2.11 Intensive care, frequently needed for a period of weeks, is then followed by further weeks of high dependency or special care provided in neonatal units as the babies grow to maturity.
- 2.12 Short-term intensive care may be required for less immature babies who need mechanical assistance from a ventilator to breathe, and for some this may only be for one or two days as the effect of artificial substances (surfactant) given through the breathing

tube located in their lungs takes effect and they can move to high dependency care (see above).

2.13 There will normally be a 1:1 ratio of staff to babies.

2.14 Units that provide intensive care are referred to as neonatal intensive care units (NICUs). They also provide high dependency and special care.

Categories of neonatal unit according to the level of care they are able to provide					
Type of unit	Routine care	Special care	High dependency care	Intensive care	
Midwifery (no neonatal unit)	Y				
Special care unit	Y	Y			
Local neonatal unit	Y	Y	Y	Y**	** As agreed within the network
Neonatal intensive care unit	Y	Y	Y	Y***	*** May also provide neonatal surgery

## Note

This definition of a local neonatal unit envisages it providing only short-term intensive care. It is, however, important to recognise that in using the proposed clinical categories a large proportion of high dependency work will be provision of nasal continuous positive airway pressure (CPAP), which under former standards was included with intensive care activity. (From the Neonatal Intensive Care Review; DH, 2003.)

## Relationships with other services

2.15 Other related services that need to be taken into account when planning neonatal provision include:

- neonatal surgery: where possible, medical and surgical neonatal services should co-exist;
- obstetrics and fetal medicine services, which should function in parallel with a neonatal network, especially for high-risk pregnancies;
- children's services: SCUs and LNUs can only operate as part of a general paediatric unit, alongside an obstetric unit, because neonatal staffing is shared with the general paediatric service, although in certain circumstances a NICU may be stand-alone;
- other specialised services: in perinatal centres (that is, those providing fetal and maternal medicine), paediatric sub-specialties (cardiology, haematology, endocrinology, gastro-enterology, hepato-biliary, radiology, nephrology, neurology) provide important specialist input when indicated. These and surgical specialties (otolaryngology, neurosurgery, ophthalmology, cleft lip and palate services) are critical to

providing the range of support for the pregnant woman and her newborn baby. Not all these services need to be provided on the same site. Arrangements would need to be made with a perinatal centre associated with, but not necessarily on the same site as, a NICU for support from these services.

## Family-centred care

2.16 Parents are encouraged to visit and stay with, handle and care for their babies, and high priority should be given to the needs of the family. This is especially important when a baby is moved for ongoing intensive care. Accommodation for families should be within easy reach of the neonatal unit, including family rooms (for couples and siblings), bathrooms, basic self-catering facilities and a play area for siblings of infants receiving care. Day facilities should also be included, to provide a space for non-resident families and for other visitors (usually only two people are allowed to be present at one time in the cot area).

2.17 Transitional care and "rooming in" facilities are increasingly being provided, where parents can look

after their baby/babies with supervision from midwives and neonatal professionals for up to two weeks, prior to transfer home. This guidance assumes the following:

- transitional care: the mother requires further care and support, which takes place in multi-bed bays generally associated with post-natal beds;
- rooming in: the focus is on the neonate who has been unwell, and care takes place in single rooms generally associated with the neonatal unit.

## 3 Scope and size of provision

- 3.1 The number and distribution of cots should be decided locally. The following questions should be addressed:
- What is the size of the population served?
  - What are the demographic trends that will influence the number of deliveries in the area served?
  - Will the unit provide care for neonatal surgical patients?
  - Will the unit act as a tertiary referral centre?
  - What are the existing and predicted networks in the region?
  - Does the unit serve predominantly low-risk deliveries?
  - Will the perinatal centre attract many in utero transfers of mothers with high-risk pregnancies?
  - Is it likely that nearby acute general hospitals will close in the coming years, causing the unit to expand its cot numbers?
  - Is it intended to return special care infants to the local acute hospital once intensive care has been completed?
- 3.2 Neonatal care should be planned on a population base of 1 million or more, taking into account demographic trends and changes. In the average population, there is a requirement of 0.75 cots per 1000 birth population for intensive care, 0.7 cots per 1000 birth population for high dependency care and 4.4 cots per 1000 for special care. Not all special care occurs on the neonatal unit and, although the percentage varies, a significant amount of special care occurs next to the mother as transitional care.
- 3.3 It is recommended that considerable flexibility is maintained within a neonatal unit. A baby's care requirements may change between intensive care and high dependency care and it is preferable not to move the baby. High dependency areas should therefore be equipped to enable intensive care to take place. Some designated special care rooms should also be equipped for intensive care, as this allows emergency movement of infants from intensive care in the event of fire. It also allows special care cots to be used for intensive care at a time when an outbreak of infection has occurred in the intensive care rooms ('Designing a neonatal unit'; BAPM, 2004).

## 4 Functional relationships

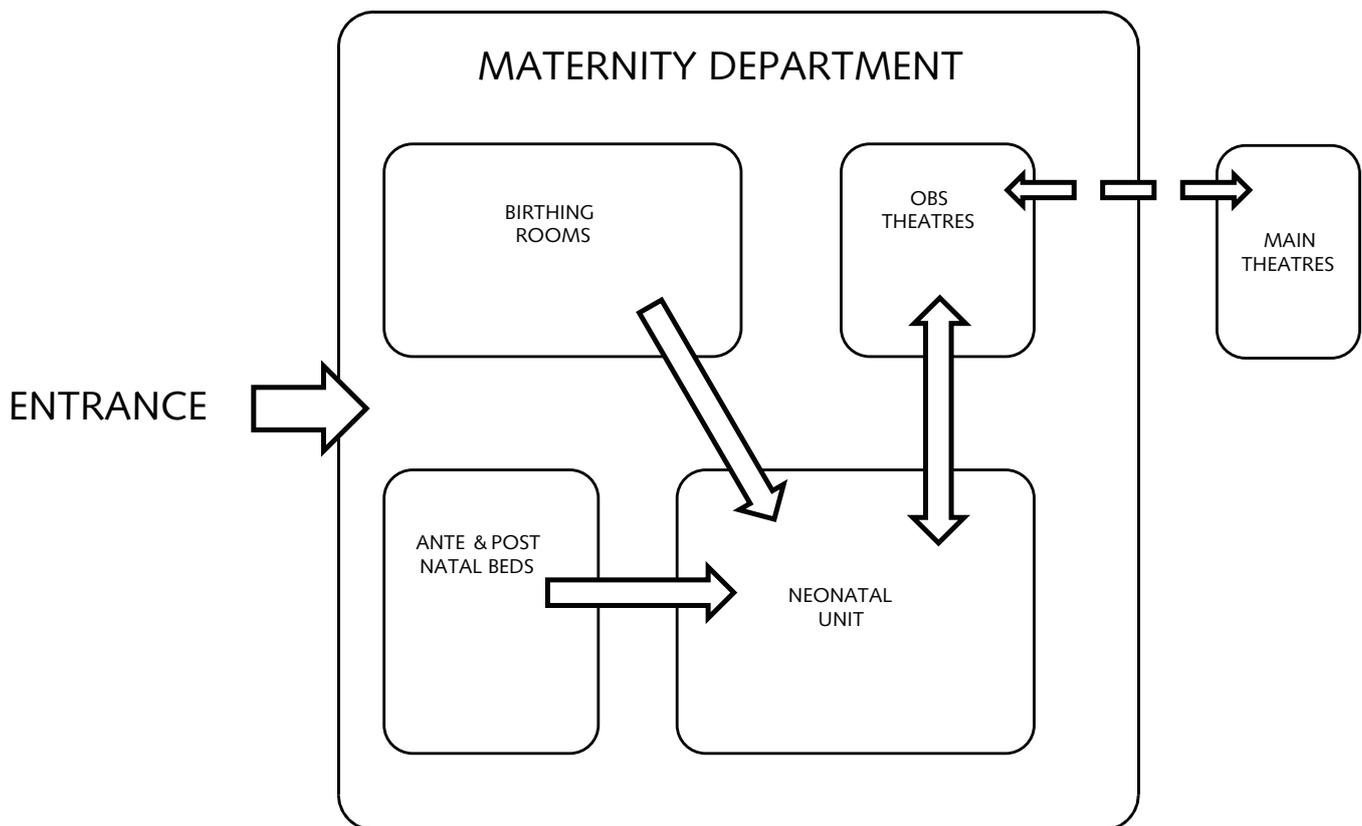
### Relationships with the maternity unit

4.1 The neonatal unit should be as close as possible to the birthing rooms and obstetric theatre(s), ideally immediately adjacent on the same floor, for easy transfer of the baby in case of complications. If the structure of the building precludes the neonatal unit and birthing rooms and theatres being on the

same floor, they should be on adjacent floors and with a dedicated lift for emergency transfers.

4.2 There should be easy access from the postnatal area to the neonatal unit, so that the mother can easily see her baby, bearing in mind that the mother may also require access to see her baby during the night.

Figure 1 Relationships with the maternity department



## Relationships with external facilities

4.3 Where there are paediatric surgical services on site, neonatal units should have direct access to the paediatric operating theatres. Ideally there should be ready access to the mortuary and the viewing area for the bereaved.

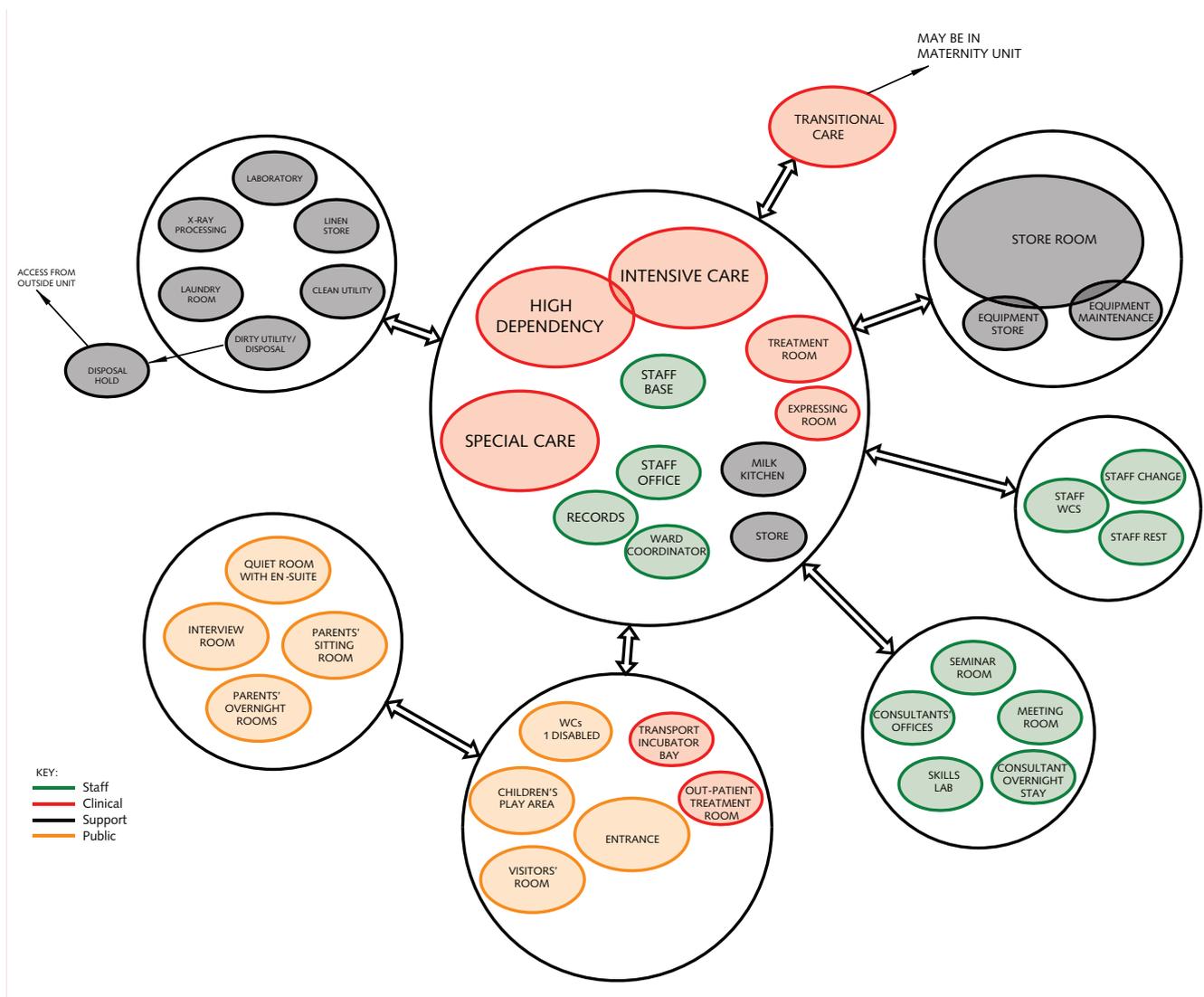
## Internal relationships within the neonatal unit

4.4 Key relationships within the neonatal unit include:

- Clinical support areas should be as close as possible to clinical care areas. Such support facilities include the near-patient testing laboratory, pharmacy, equipment storage, milk storage, clean and dirty linen store.
- Family access is required to the waiting area, interview rooms, support services (for example social work and community neonatal nursing) and recreational facilities.

- The clinical manager’s office should be located on the same floor as the neonatal unit, easily available to all staff and, by arrangement, to families.
- In LNUs and NICUs, the attending consultant’s office should be located within the neonatal unit.
- On-call accommodation should be located in the neonatal unit or immediately adjacent to it.
- Consultant and research offices can be located further away from the clinical care area.
- In larger units, the milk kitchen should have an associated, separate store (see the guidance on milk kitchens).
- The milk expression room should be located close to the milk kitchen.

Figure 2 Internal relationships within the neonatal unit



## 5 Design considerations

### Security

- 5.1 Security is an issue of importance for staff, mothers and babies: “A robust system must be in place for their protection. Babies born in hospital should be cared for in a secure environment to which access is restricted. An effective system of staff identification is essential. A robust and reliable baby security system should be enforced, such as closed-circuit television, alarmed mattresses. Strict criteria for the labelling and security of the newborn infant are essential” (‘Safer childbirth: Minimum standards for the organisation and delivery of care in labour’; RCAnae, RCM, RCOG and RCPCH, 2007). Security systems should not compromise the ability of staff to carry out their work or to respond to emergencies when required.
- 5.2 For further specific information, see also under ‘Design considerations’ in Health Building Note 09-02 – ‘Maternity care facilities’.

### Access

- 5.3 Balanced with the need for security is the issue of access. All doors between the maternity area and the neonatal unit, and also those within the neonatal unit, should be designed to maximise convenience as well as safety and security. If automatically locking magnetic doors are to be used, consideration should be given to difficulties that may arise in wheeling incubators/cots from room to room in an emergency when the security doors have locked down.
- 5.4 Access must be ensured for mothers on trolleys or in wheelchairs. Widths of doors, corridors and corners should be considered so that mothers have access to all clinical areas.

### Neonatal care environment

- 5.5 There is some evidence (for example Graven et al, 1987–2008; see [paragraph 5.12](#)) that the environment in a neonatal unit can affect a child’s physiology, clinical course of treatment, rate of

recovery and developmental outcome. Leaving a premature baby in a poor environment for even a very short period of time can permanently damage its development.

- 5.6 The neonatal care environment should be designed to be as close as possible to the womb in terms of the following: timing, touch, motion, taste, smell, hearing, memory, vision. The senses come on stream in this order, and the running order should not be interrupted. The environment in every neonatal area therefore needs to be completely controllable in terms of noise, light, smell, view etc.
- 5.7 For example, sound levels should be controlled and kept below 40 db (womb-like level). This means controlling air-conditioning noise, telephone and paging system sounders and all other extraneous background noise. Stainless steel sinks and troughs can be very noisy; where used, care should be taken to avoid high water flow that results in excessive noise. Waste bins should be foot-operated with soft-close tops. Consideration should also be given to noise levels from floor coverings, door closers etc. This needs to be balanced with the need to minimise HCAIs. Sound-monitoring equipment may help to maintain low noise levels.
- 5.8 Similarly, the visual environment should be fully controllable and able to be blacked out. In intensive care cot areas, it should ideally be possible to control lighting to individual babies, possibly within the design of the incubator.
- 5.9 Natural light should be provided to all clinical areas, quiet rooms and parents’ bedrooms. Babies’ cots should be positioned no closer than 600 mm from any external window. Radiant heat gain should be minimised with shading to prevent overheating. Full consideration should also be given to the need for family privacy.
- 5.10 Artificial lighting should be chosen very carefully. All artificial lighting should be indirect, except for lights needed for procedures, and it is preferable that each light should be individually controlled. This is particularly important in special care areas

where a relatively well child can sleep in darkness even when another infant in the same room is being examined. The ability to achieve darkness is very important, not just for the sleeping infant but also for procedures such as echocardiography and chest transillumination. Window shading is essential, and blinds should be provided with privacy glass screen type or vertical cleanable type.

5.11 Detailed guidance is also included in paragraph 5.8.2 of 'SLL Lighting Guide 2: Hospitals and health care buildings' (Society of Light and Lighting, 2009).

5.12 Graven et al references 1987–2008:

- Graven SN and Browne JV. 'Sensory development in the fetus, neonate, and infant: Introduction and overview'. *CNS-BC Newborn & Infant Nursing Reviews*, December 2008 Volume 8, Number 4, [www.nainr.com](http://www.nainr.com)

- Graven SN. 'Impact of the environment on development', in Report of Fourth Annual Ross Planning Associates Symposium, 1987.
  - Graven SN, Bowen Jr FW, Brooten D et al. 'The highrisk infant environment. Part 1. The role of the neonatal intensive care unit in the outcome of highrisk infants'. *J Perinatol.* 12(2):164–172, 1992.
  - Graven SN. 'Clinical research data illuminating the relationship between the physical environment and patient medical outcomes'. *J. Healthc. Des.* 9:1519, 1997.
  - Lister JJ, Graven SN, Hnath Chisolm T and Eaton C. 'Effects of early sensory environment and preterm birth on auditory processing abilities', *Acad., Pediat. Soc.*, 2003.
- 5.13 See also 'Newborn Individualized Developmental Care and Assessment Program'.

## 6 Public spaces

### Entrance and reception

- 6.1 A single access point should be provided for all patients. If there is direct access from the outside of the hospital, an entrance lobby should be provided. It is unlikely that an entrance/reception would be staffed on a full-time basis. The entrance to the unit should have controlled access and be visible from staff bases, either directly or through CCTV links and an intercom link.
- 6.2 There should be a hand-hygiene station just inside the main door and clearly visible on entry. This should comprise:
- a scrub sink, wash-hand basin or antiseptic hand-wash, subject to local policy;
  - a noticeboard;
  - a shelf on which to place items while hand-washing;
  - secure coat hanging and lockers for personal belongings, although these may be located within the parents' sitting room.
- 6.3 An area for the reception of mothers, partners and visitors should be conveniently located near the entrance to the unit. See 'Entrance, reception and waiting' in Health Building Note 00-03 – 'Clinical and clinical support spaces'.

### Parents' quiet room/Interview room

- 6.4 This room will be used for counselling and to provide distressed parents with privacy and quiet. Consideration should be given to furnishings, which should be comfortable and domestic but should meet the requirements of infection control. There should be no telephone or television in this space. Parents may spend time here with a dying baby. The room should be located:
- close to WCs to allow discrete access, or alternatively an en-suite should be provided;
  - to allow distressed parents to leave the unit without passing the cot areas.
- 6.5 This room may also be used for staff activities and confidential discussions.
- 6.6 In addition to a parents' quiet room, a large NICU may require a separate interview room. See 'Consulting, examination and interview spaces' in Health Building Note 00-03 – 'Clinical and clinical support spaces'.

## 7 Intensive care cot areas

- 7.1 Cots will normally be located in several multi-cot rooms. This design has the advantage that observation of infants is unrestricted by walls and curtained windows. Particular attention should be paid to reducing noise levels. Neonatal intensive care cots should be positioned closest to the birthing rooms.
- 7.2 Overall, a six-cot room arrangement is the preferred option to aid observation and create an intimate, personal atmosphere. In intensive care, infants will be nursed on a one-to-one basis, whereas in high dependency a nurse commonly looks after two infants, so there may be an advantage in preserving even numbers to maximise nursing efficiency and flexibility in use. For example, if there are ten intensive care cots, rooms may be designed to accommodate six and four infants rather than having five in each.
- 7.3 Individual bedrooms may be provided for each infant and family. In this case, continuous electronic monitoring is required, with a central console where dedicated staff can respond to any information requiring intervention.
- 7.4 A minimum of one single or a two-cot nursery, equipped to intensive care levels, will be required for cohort nursing and other functions. Note: whether a single/two-cot arrangement is chosen, each cot space must comply with the recommended space and services requirements. NICU/perinatal centres may require two or three rooms. A reclining chair(s) or a pull-down bed(s) should be provided.
- 7.5 A separate viewing room is not considered necessary. Even in units providing the highest level of intensive care, parents should be able to be present in the baby's cot space. Adequate space is required for a sick mother to be brought in on her bed (see [Figure 5 'Intensive care multi-cot room: example layout'](#) under 'Cot area requirements').

### Cot space requirements

#### General cot space requirements

- 7.6 Each cot space should be able to accommodate the following:
  - a. all-round access to the incubator;
  - b. space to enable staff to manoeuvre the incubator, themselves and equipment safely;
  - c. clinical equipment permanently located around the incubator;
  - d. any mobile equipment that may be required;
  - e. a minimum of five members of staff (to attend the baby in an emergency situation);
  - f. space for the mother to express discreetly at the cot-side;
  - g. at least two chairs to accommodate visitors.

#### Specific equipment/service requirements

- 7.7 Each cot space requires within the space itself:
  - a. an incubator;
  - b. space for a supplies trolley and dressing trolley;
  - c. a dripstand (although this may be mounted on the medical supply unit);
  - d. four computer ports;
  - e. a staff/staff call system;
  - f. WiFi capability (based on local decision);
  - g. a whiteboard.
- 7.8 Equipment used intermittently at the cot space includes:
  - EEG machine;
  - ECG machine;
  - mobile imaging equipment.
- 7.9 Babies' lives will depend on the environmental conditions and life-support systems in each nursery,

and adequate provision of engineering services is essential. For maximum flexibility, this guidance assumes the following equipment and services are provided at each cot space:

- a. 24 single switched socket-outlets to be supplied by no fewer than two separate isolated power supply (IPS) systems;
- b. where a risk exists to patient safety as a consequence of power loss, each IPS should be further connected to an uninterruptible power supply (UPS);
- c. multi-parameter monitoring;
- d. ventilation and humidification equipment;
- e. two infusion pumps;
- f. six to eight syringe pumps;
- g. two medical vacuum terminal units;
- h. an examination luminaire (Note: mobile lights are not generally recommended);
- j. three medical oxygen terminal units;
- k. three 4-bar medical compressed air terminal units;
- m. a suitable number of equipotential earth bonding points for the connection of external medical equipment.

### Medical supply units

- 7.10 Each cot space requires a ceiling-, wall- or floor-mounted medical supply unit to provide medical gases and socket-outlets (for the wide range of equipment required). Care should be taken in the selection and mounting of medical supply units to ensure relatively unimpeded access to the neonate by staff and to meet infection control requirements.
- 7.11 A ceiling-mounted system provides unobstructed access and uncluttered floor space around the cot. This guidance is based on the provision of a pendant-style medical supply unit, but beam system solutions are also possible. Project teams may wish to specify shelving as part of the medical supply unit; staff should be discouraged from placing items on top of incubators, which can create noise inside them.
- 7.12 Cabinetry systems are not recommended because of the potential limitations in the flexibility of the use of space.

7.13 See the BAPM's '[Designing a neonatal unit](#)' (2004) for detailed comment on each type of medical supply unit.

7.14 An early decision should be taken because of the structural support required for overhead medical supply units. All medical supply units should be manufactured and installed in accordance with BS EN 11197: 2004.

### Intensive care cot space: Activity envelope and critical dimensions

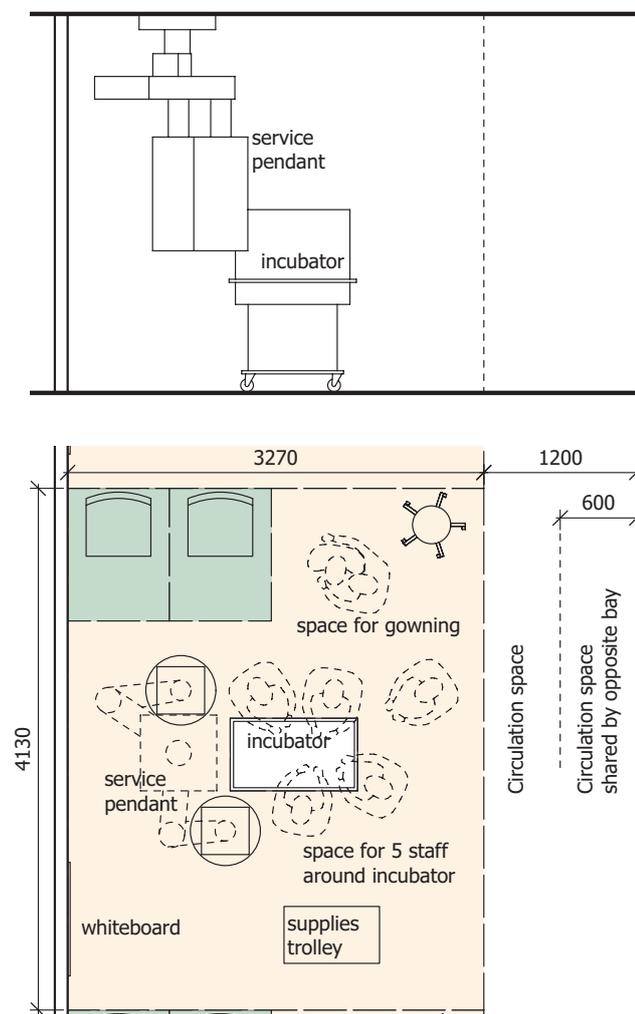
7.15 Based on a detailed space study of activities within an intensive care cot area, the recommended core clinical space envelope within a multi-cot environment is 13.5 sq m. The critical dimensions are 4.13 m × 3.27 m, plus 600 mm access space (4.13 m × 3.87 m = 16 sq m). For further information, see 'Two case studies using mock-ups for planning adult and neonatal intensive care facilities' (Sue Hignett, Jun Lu, Mike Fray, Loughborough University).

7.16 When evaluating an existing facility, cot space provisions that are equivalent to approximately 90% of the recommended length (which equates to 80% of the recommended area) should be considered acceptable.

### Space allowance given in SoA

- 7.17 The recommended allowance of 20 sq m per cot space given in the schedule of accommodation includes the core cot space, access space and an allowance for the following core support space:
- a. pharmacy preparation, including controlled drugs;
  - b. refrigerated storage of milk and feeds; and
  - c. clinical hand-washing/scrub sinks and local disposal.
- 7.18 Project teams will need to consider optimal configurations of cot areas to accommodate the above, plus the relationship with a staff communication base. NB the staff communication base is not included in the 20 sq m allowance.

Figure 3 Intensive care cot space: Activity envelope and critical dimensions



Intensive care cot space:  
Courtesy: Royal Devon and Exeter NHS Foundation Trust.  
Photographer: Lisa Payne

### Intensive care single-cot room: example layout

7.19 The single-cot room is based upon the same space study as for the core clinical cot space in a multi-cot bay, except that with the indicative room layout/area allowance, consideration has been given to:

- the positioning and impact of the door position on the room;
- the provision of clinical wash facilities within each room;
- the provision of dedicated small pharmacy preparation area with each room.

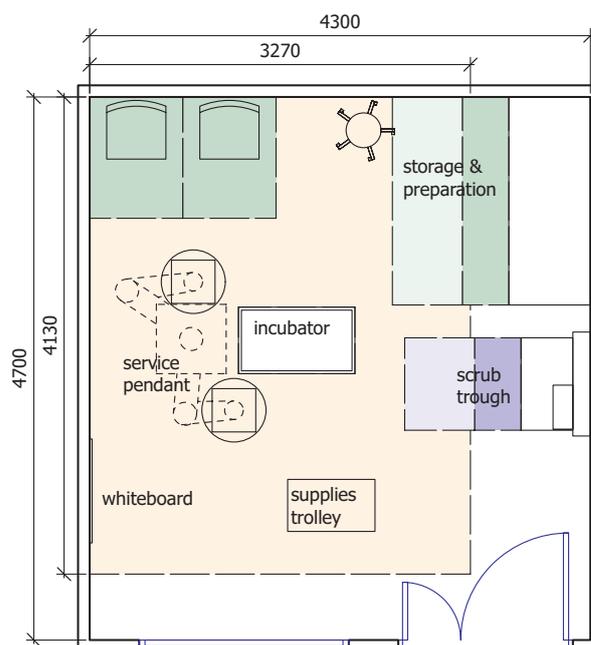
### Space allowance given in SoA

7.20 The recommended allowance of 20 sq m per cot space given in the schedule of accommodation includes the core cot space, access space and an allowance for the following core support space:

- pharmacy preparation, excluding controlled drugs;
- refrigerated storage of milk and feeds; and
- clinical hand-washing/scrub sinks and local disposal.

7.21 For single-cot rooms, while the allowance is identical to a multi-cot bay, the detailed content and space requirements are different; there is a greater requirement for access space, with space to

Figure 4 Intensive care single-cot room: example layout





*Intensive care single-cot room*

*Courtesy: Royal Devon and Exeter NHS Foundation Trust*

*Photographer: Lisa Payne*

allow for the door and walls, and there is a smaller space requirement for pharmacy preparation.

## Cot area requirements

- 7.22 In an intensive care cot area, there should be a scrub-up trough accessible from each cot space. A minimum quantity of one scrub facility should be provided per two cot spaces. They should ideally have heat-sensitive automatic sensors that activate the flow of warm water appropriately.
- 7.23 A clock with a sweep seconds hand should be clearly visible from each cot space. There should be one telephone point per four to six cots, for staff use; this may be located at a staff communication base if included within the cot area.
- 7.24 Each nursery will require mechanical ventilation with cooling, humidification and controlled air movement. It should be possible to independently vary room temperatures in the range 21°C to 30°C. Temperature and humidity control may be enhanced internally to the incubator to avoid conflict with the needs of staff and babies. Windows on external elevations should be designed to avoid condensation and to prevent excessive solar gain. The general lighting should be constant throughout the clinical areas and have good colour-rendering, and the intensity should be variable, through provision of a dimmer switch. The design of the windows should ensure that cot spaces are not subject to direct sunlight.
- 7.25 See also [paragraph 5.5, 'Neonatal care environment'](#).

## Circulation and storage

- 7.26 In addition to the cot spaces there should be space in the centre of the room to allow large pieces of equipment for radiography and ultrasonography to pass to the furthest cot without intruding on the space allocated to another family. Other items in transit may include incubators, ventilators, multiparameter monitors, infusion stands and phototherapy machines.
- 7.27 Space is required within the care areas for storage of the neonate's personal effects and some clinical supplies. Much of the baby's personal items can be accommodated in the incubator shelves. All regularly used facilities and supplies should be accommodated in a supplies trolley in each bay. Top-up storage clean utility etc should be located nearby.

## Pharmacy/working area

- 7.28 To minimise the need for staff to leave the neonatal care area, each intensive care room should include within the room itself sufficient work space to enable the safe preparation of medicines and feeds for more than one baby at a time.
- 7.29 The space for the preparation of medicines should consist of:
- a Controlled Drugs cupboard (not single-cot rooms);
  - a drugs fridge;
  - a drugs cupboard for those medicines used frequently;
  - sufficient work surface for drug preparation (one person in a single-cot room, two people in a multi-cot room).

### Note

Agreement should be reached at the earliest opportunity with the main pharmacy regarding the implications of providing multiple numbers of Controlled Drugs cupboards.

- 7.30 In addition, but separately, each intensive care room requires a milk or feeds fridge.

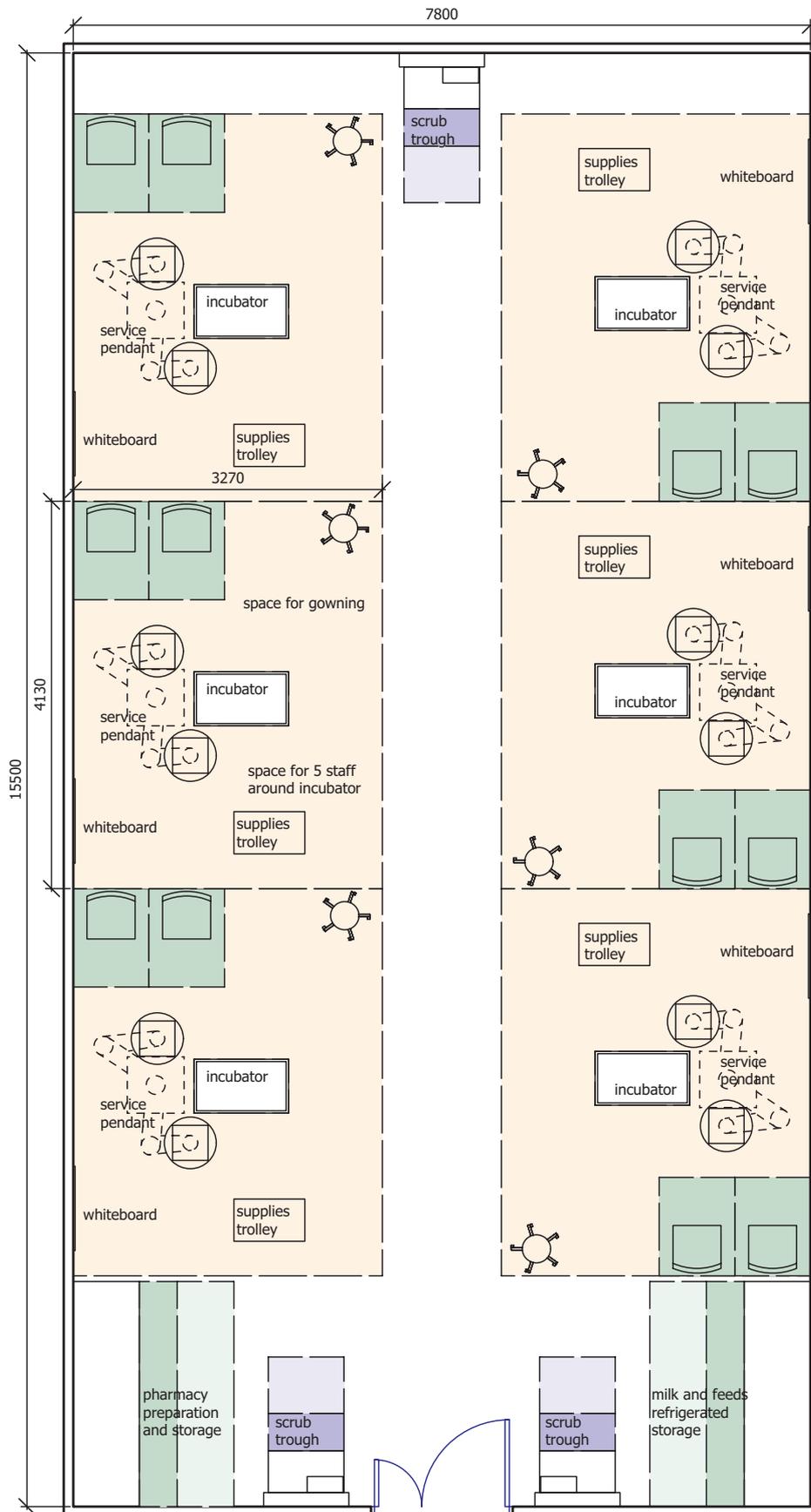


Figure 5 Intensive care multi-cot room: example layout



*Intensive care multi-cot area: Courtesy: Royal Devon and Exeter NHS Foundation Trust. Photographer: Lisa Payne*

## 8 High dependency care cot areas

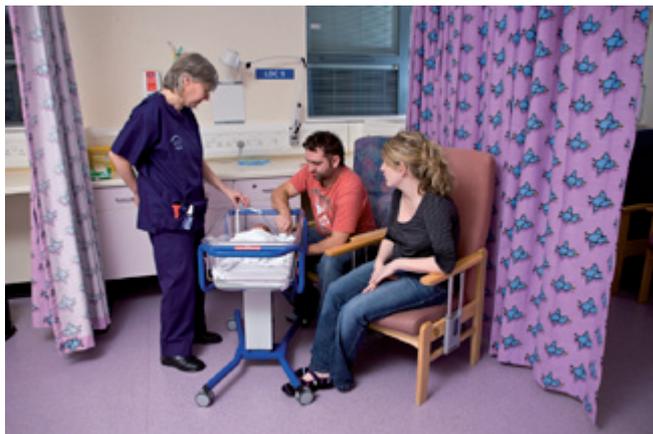
- 8.1 To allow flexibility of use of space, the high dependency care cot areas should be designed and equipped to allow intensive care to occur if necessary. Therefore, the guidance in [Chapter 7](#), 'Intensive care cot areas' should be applied to high dependency care cot areas.

## 9 Special care cot areas

- 9.1 The guidance in **Chapter 7, ‘Intensive care cot areas’** should also be applied to special care areas designated for emergency intensive care (during fire or infection; see **Chapter 3, ‘Scope and size of provision’**).
- 9.2 Rooms that are allocated to special care and that are not to be used at any time for intensive care functions should be designed carefully with the safety of the infant and the relaxation of families in mind. In most instances, major clinical interventions are not likely to be undertaken in special care areas. The whole atmosphere should be more domestic and supportive of parents taking responsibility for their infant’s care.
- 9.3 A minimum of one clinical wash-hand basin should be provided per three cots.
- 9.4 Staff should give careful thought to storage of all items of care, including the infant’s own clothes. Ideally, a small wardrobe should be provided at each cotside.
- 9.5 There should be facilities for filling, emptying and storing a baby bath(s), bathing the infant and changing nappies.
- 9.6 Cot spaces should not include medical supply units or cabinetry bays. However, each cot space will require two medical oxygen outlets, two medical air outlets and one suction outlet, along with eight single socket-outlets.
- 9.7 Two lockable, temperature-controlled fridges should also be provided, one for milk and one for feeds. Consideration may be given to the provision of individual lockable lockers for the use of parent-administered medicines (one per cot space).

### Special care: activity envelope

- 9.8 No specific space studies have been carried out for activities within the special care cot space. However, based on the BAPM’s recommendation in ‘Designing a neonatal unit’ (BAPM, 2004), and a review of recent projects and existing spaces, the



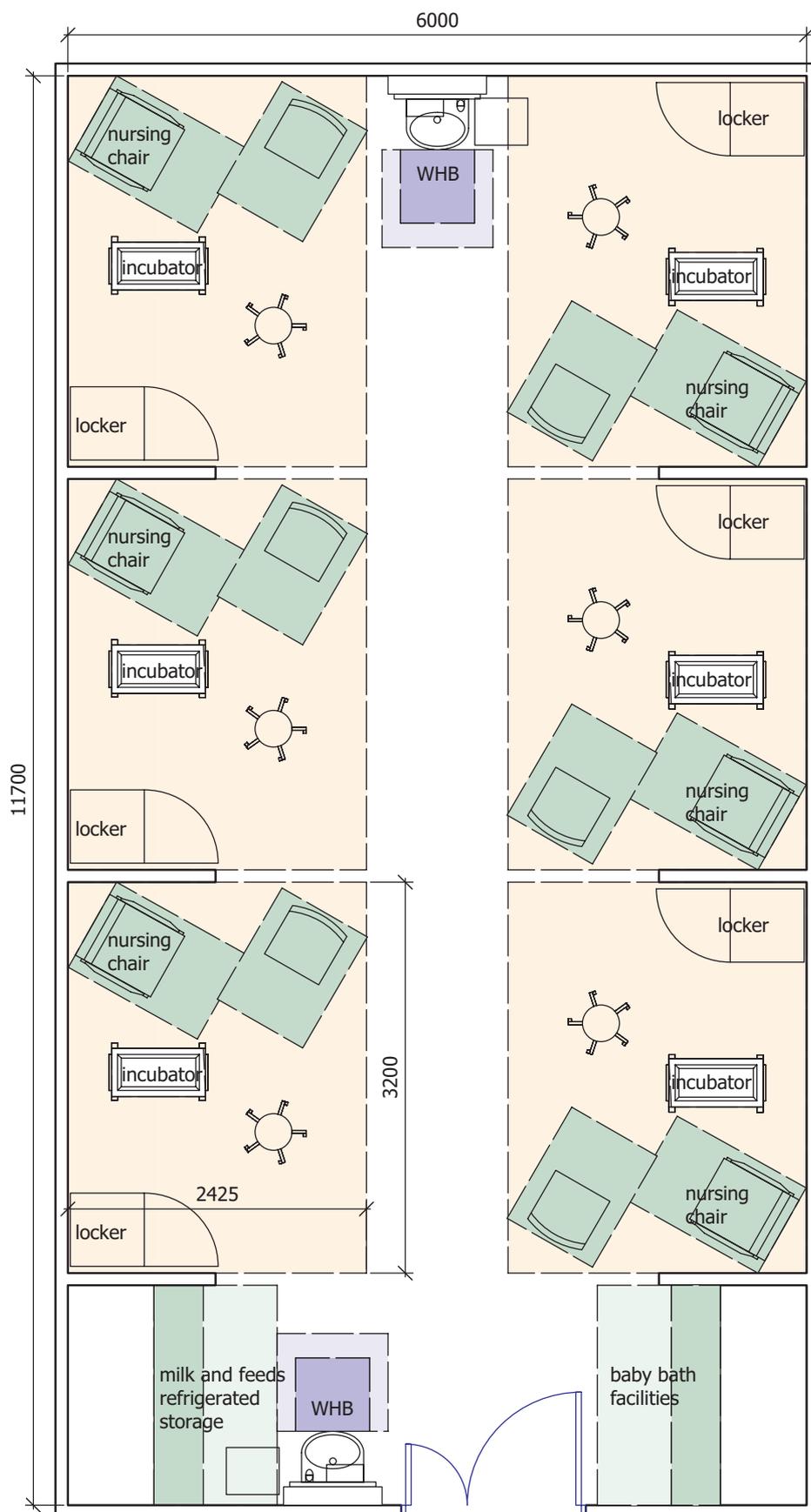
*Special care cot space: Courtesy: Royal Devon and Exeter NHS Foundation Trust. Photographer: Lisa Payne*

- recommended core clinical space envelope within a multi-cot environment is 9 sq m, including access space.
- 9.9 This assumes that resuscitation is not undertaken in the special care cot space but that babies are instead transferred to an adjacent intensive/high dependency care cot space.

### Space allowance given in SoA

- 9.10 The recommended allowance of 11.5 sq m per cot space given in the schedule of accommodation incorporates the cot space, access space and an allowance for the following core support space:
- space for filling, emptying and storing baby baths and for baby changing;
  - space for the refrigerated storage of milk/feeds.
- 9.11 Project teams will need to consider optimal configurations of cot areas to accommodate the above, plus the relationship with a staff communication base. Note: the staff communication base is not included in the 11.5 sq m allowance.

Figure 6 Special care multi-cot room: example layout



## 10 Other clinical spaces

### Staff communication base

- 10.1 The staff communication base is the organisational centre of the unit. It should consist of an open-plan area located close to the geographical centre of the area it serves with sufficient access to cot areas. It may be located adjacent to the general office.
- 10.2 Observation of babies will take place directly within the cot areas. In a small SCU, a single communication base should be sufficient, which could be combined with reception. A large NICU may provide multiple communication bases serving groups of cots.
- 10.3 The specific considerations are as follows:
- There should be space for storing neonatal records; records can be stored off site following discharge from follow-up.
  - Nurse-to-nurse calls, monitoring display units and alarms should all be located within the base.
  - In addition to the general space for a computer terminal and associated equipment, digital X-ray viewing facilities are required, which should include diagnostic quality imaging screens; NICUs may require more than one screen.
- 10.4 See 'Staff communication base' in Health Building Note 00-03 – 'Clinical and clinical support spaces'.

### General office/clinical administration room

- 10.5 The general office is the administrative centre of the neonatal unit. The room consists of shared workstations with associated power and data points. Facilities are required for storing any paper sheets required for the efficient running of the unit. See 'Offices' in Health Building Note 00-03 – 'Clinical and clinical support spaces'.

### Transfer/reception area

- 10.6 There must be space for preparing a baby for transfer out and for receiving and stabilising a baby when the transfer team arrives, including space for a mobile intensive care unit (in the form of a trolley). Typically a transfer team may include two or three staff and the handover team a further one or two staff, as well as trolley attendants. In SCUs and LNUs, a multi-purpose single-cot room or intensive care/high dependency care cot space may be used; NICUs normally include a separate dedicated room. If a separate dedicated room is provided, this should be located near the entrance to the unit and be equipped to the same level as an intensive care cot space.
- 10.7 See [Chapter 7, 'Intensive care cot areas'](#).

### Resuscitation facilities

- 10.8 Facilities for neonatal resuscitation should be carefully thought out for each area in which babies are cared for. In intensive care and high dependency areas, resuscitation is commonly carried out in the incubator itself.
- 10.9 In special care areas, it is very difficult to resuscitate infants in open-topped cots with fixed walls. A stand-alone special care unit should provide a space equipped to intensive care standard, containing an open radiant-heated cot or resuscitaire, with appropriate facilities including piped gases and vacuum suction, electric sockets, laryngoscopes, equipment for assisted ventilation and a secure store for drugs. This may be provided in a single-cot room or in a bay within the special care area. In a special care unit combined with intensive/high dependency care, consideration may be given to using intensive or critical care spaces for resuscitation. The schedule of accommodation is based on the use of a single-cot room.

## In-patient treatment room

- 10.10** The majority of procedures can be undertaken within the neonatal care area at the cot or incubator side. However, a dedicated space is required for babies coming into the unit from maternity for ultrasound examination etc.
- 10.11** This guidance assumes that in a SCU/LNU a generic treatment room will be sufficient (omitting the couch), whereas in a tertiary referral unit a single-cot room equipped for intensive care should be provided. If laser therapy is to be carried out, the room should be protected by screens that are proof against argon lasers, and fitted with a warning system to prevent staff from entering inadvertently while laser therapy is being carried out. See ‘Treatment rooms’ in Health Building Note 00-03 – ‘Clinical and clinical support spaces’ regarding the design of a generic treatment room, and [Chapter 7, ‘Intensive care cot areas’](#) regarding cot space requirements.

## Transitional care

- 10.12** Regarding transitional care provision, see [paragraph 2.16, ‘Family-centred care’](#), and also ‘Multi-bed spaces’ under ‘Birthing facilities (and associated in-patient facilities)’ in Health Building Note 09-02 – ‘Maternity care facilities’. Consideration may be given to the provision of individual lockable lockers for the use of parent-administered medicines (one per cot space).

## Parents’ overnight/rooming-in room(s)

- 10.13** Access to overnight accommodation should be available for parents of very sick babies within a 10-minute walk of the cot areas. This is particularly important for units that are tertiary referral centres, where parents may live many miles from the unit. The overall provision should be based on the average number of babies requiring intensive care, with an allocation of one overnight room per intensive care cot. These rooms may be provided in a number of different ways subject to local policy and requirements, including an apartment block, B&B etc.
- 10.14** A minimum of two domestic-type en-suite bedrooms (one a double bedroom) should be provided within or adjacent to the neonatal unit itself for “rooming in”; these may also be used as overnight rooms (see [paragraph 2.16, ‘Family-centred care’](#)). The location should allow families

to exit the unit without having to pass through cot or visitor areas. These rooms should include space for cots and be equipped with nurse call, oxygen and suction. The furnishings and decor should be chosen with great care but should meet infection control requirements.

- 10.15** There should also be easy access to beverage-making facilities and a microwave. Radio sound, a TV outlet, a telephone point, a desk and an over-bed light may also be provided.
- 10.16** Consideration may be given to the provision of individual lockable lockers for parental administration of medicines and for local cleaning and storage facilities. Rooming-in families will have access to the day/support facilities in the neonatal unit.



Rooming in: Courtesy: Royal Devon and Exeter NHS Foundation Trust. Photographer: Lisa Payne

## Out-patient examination room (optional)

- 10.17** Many units offer a daily “drop-in” clinic for unscheduled patients. These infants are commonly those who are diagnosed in the community to be jaundiced or to have lost more than 12% of their birth weight. An examination room may be provided close to the unit entrance. It should be equipped with two chairs, an examination surface, an examination lamp, and facilities for weighing a neonate and for phlebotomy. A standard single-sided consulting room is considered sufficient in size and function, although the reclining treatment chair should be replaced by a smaller examination surface with the inclusion of baby scales. See ‘Examination/physical therapy room’ in Health Building Note 00-03 – ‘Clinical and clinical support spaces’.

## 11 Clinical support spaces

### Parents' sitting room

- 11.1 Each unit should have a designated family area where parents can relax. The room should appear welcoming and should include beverage-making facilities and a microwave. It may be an advantage to keep the parents' sitting room as an open-plan area, to ensure that use of the area is not abused.
- 11.2 Coat hanging and lockers may be provided in this area. Provision should be made for television, radio etc; telephone and television jack points should also be included. Computer links with internet access should be provided.
- 11.3 Adjacent to or contained within the parents' sitting room there should be a family education area. This area should contain a guide to the unit, leaflets on common neonatal conditions, information on help available to families, Internet access and audiovisual resources for educational purposes.
- 11.4 As part of the parents' sitting room a secure play area should be provided for children accompanying adults. Young children should be able to play or read in safety without disturbing adult attendees. The location of the play or reading area should facilitate easy and constant observation. If possible, there should be access to a suitable outside play area. Playground equipment and surfacing should comply with [BS EN 1176-3](#) and [1176-4:1998](#) and [BS EN 1177: 1998](#).

### Laundry room

- 11.5 A laundry room is required, located in the parents' communal area, for washing and drying baby clothes. Equipment should be to industrial standard and should include washing machine and dryer. A stainless steel sink and drainer, and a work-top with cupboards, should be provided, all to industrial standard.

### Milk expression room

- 11.6 Comfortable private rooms with lockable doors should be provided for mothers to express breast

milk, using an electric pump provided by the unit. Sterilizing facilities are required close by. The rooms should include facilities for hand-washing, a chair and access to a fridge for the exclusive use of expressed breast milk. (See also [Chapter 7, 'Intensive care cot areas'](#) and [Chapter 9, 'Special care cot areas'](#) regarding the provision of fridges in these areas.)

### Milk kitchen

- 11.7 A milk kitchen is required for:
  - a. the preparation of formula feeds;
  - b. the separate sterilization of bottles for each neonate (if not carried out at the cot side, that is, in special care);
  - c. refrigerated storage of milk etc if not in a separate store;
  - d. storage of pre-packed baby foods (identified by neonate);
  - e. storage of baby bottles, teats, equipment and disposable items;
  - f. in large units, pasteurisation of donor milk;
  - g. in small units (where only a single fridge is required), frozen storage of milk/feeds.
- 11.8 Parents and staff should have ready access to this area. Subject to local policy, there should be a separate, identified storage facility for each baby as well as sufficient preparation area where tuition can take place.
- 11.9 Project teams should refer to the NICE guidelines on donor breast milk banks.

### Milk kitchen store

- 11.10 In larger units (NICUs), a separate room should be provided for the refrigerated storage of special formula baby feeds and breast milk banks and the refrigerated/ frozen storage of human milk feeds. The quantity of refrigerated/frozen storage

required will depend upon the size of unit and use of local refrigeration within the cot rooms.

## Bereavement suite

- 11.11 A bereavement suite generally consists of two interview rooms that are interconnected, one with space for a cot/crib to contain the deceased infant.
- 11.12 The first room should be for the counselling of relatives.
- 11.13 The second room should be for relatives to quietly sit with their deceased infant.
- 11.14 The quality of the environment and atmosphere within the suite is of great importance.
- 11.15 The suite should:
  - a. be located away from any parents' overnight-stay accommodation: it may be provided within the neonatal unit or could be co-located with maternity if easily accessible and separate access points are provided;
  - b. have decor that is domestic, informal and relaxing;
  - c. be close to WCs to allow discrete access, or alternatively an en-suite should be provided;
  - d. allow distressed parents to leave the unit without passing the cot areas.

## Near-patient testing room

- 11.16 Near-patient testing is essential, located close to the intensive care cot areas. It is a standard requirement to be able to test blood gas tensions within the confines of the unit and a major advantage to be able to measure concentrations of electrolytes, sugar, lactate, bilirubin and

coagulation. A room should therefore be available where blood gas analysis and other frequently required tests can be performed. See 'Near patient testing room' in Health Building Note 00-03 – 'Clinical and clinical support spaces'.

## Equipment store

- 11.17 A store is required for cots/incubators, ventilators, monitors, infusion stands, imaging and phototherapy equipment; its size will be dependent on whether used items of equipment will be cleaned and recycled within the unit or centrally in the hospital. The room should be equipped with extensive shelving. At least 20 electrical sockets are required for charging battery-operated equipment.

## Maintenance area

- 11.18 Facilities are required for cleaning, decontaminating and maintenance of incubators and other equipment. The location of such facilities will depend upon local hospital operational policies, but they may be provided in the sterile services department or within the neonatal unit. This guidance assumes that facilities are provided within the neonatal unit, in which case they should be arranged so that there is a progression from "dirty" to "clean" areas for cleaned equipment before maintenance.

## Transport incubator bay

- 11.19 An area should be provided in the unit to store all the equipment that needs to be readily available to staff involved in transferring babies out of the unit. This may be a separate space within the main store, but should as close as possible to the unit entrance.

## 12 Staff spaces

### Skills lab

- 12.1 A skills lab can be invaluable for learning and practising simulated procedures; this will be a project option. The use of a generic seminar room is appropriate, as long as there is access to storage for a resuscitaire, incubator, ventilator, mannequin, and to several chairs for when the room is used for general seminar functions.

### Staff on-call room(s)

- 12.2 Two doctors' on-call rooms should be provided within the neonatal unit or within very easy access of the unit, sufficiently distanced from busy corridors and extraneous noises to allow adequate rest opportunities. They should have a reclining

chair, wash-basin, desk, chair and wardrobe; at least one room should have a single bed. They should have en-suite WC/shower facilities. There should be a telephone in each room. Sound attenuation is desirable. Staff may also use the room during the day as a place to study.

### Offices

- 12.3 Office accommodation (including photocopying facilities) should be provided according to local need, including an office to comply with Royal College (RCPCH) requirements. See 'Offices' in Health Building Note 00-03 – 'Clinical and clinical support spaces'.

## 13 Specific engineering considerations

### Piped medical gases

- 13.1 Where nitric oxide is administered, the associated anaesthetising equipment should be provided with integral scavenging, discharging to a safe outside location. See Health Technical Memorandum 02-01 – ‘Medical gas pipeline systems’.

### Ventilation

- 13.2 High dependency/intensive care areas will require a controlled environment using mechanical ventilation with comfort cooling to achieve appropriate ventilation and temperature control.
- 13.3 In high dependency/intensive care areas there are conflicting requirements, since staff require comfortable working conditions whereas babies need to be maintained at a higher temperature and humidity to mitigate body heat loss and dehydration. To overcome this, it is recommended that the ventilation system is designed to maintain a space temperature in the range 23–25°C, and that the required microclimate for each baby is achieved by the heating and humidification provided by the incubator. It is not always possible to keep the neonate within the incubator for procedures and therefore it is vital that the locations of any ventilation grilles are carefully considered in relation to the incubators.
- 13.4 Conventional incubators may not allow the required conditions to be maintained when access is required to the baby. It is therefore strongly recommended that consideration is given to the selection of incubators that are designed to “ramp up” heating and humidification to maintain the required conditions when the incubator cover is removed.
- 13.5 The design of the ventilation and cooling system should ensure that stable temperatures are maintained and that air movement in the vicinity of the cots/ incubators is controlled. See Health Technical Memorandum 03-01 – ‘Specialised ventilation for healthcare premises’.

### Fire detection and alarm systems

- 13.6 In cot areas, beacons should be used in place of alarm sounders to avoid unnecessary disturbance to babies. See ‘Firecode’.

### Resilience of electrical supplies

- 13.7 Certain life-supporting equipment such as infusion pumps should include battery back-up.
- 13.8 Where equipment is permanently installed or where there is the possibility of equipment theft, switched double pole 13-amp spur-outlets should be used in preference to socket-outlets. See Health Technical Memorandum 06-01 – ‘Electrical services supply and distribution’.

### Lighting systems

- 13.9 See paragraph 5.82 in the SLL Lighting Guide 02: ‘Hospitals and health care buildings’ for recommended luminance levels for cot and incubator locations.
- 13.10 In cot areas the luminaires should be positioned to avoid glare onto the cots. Additional separately switched luminaires may be required over or near to the cots to provide the required levels of luminance for medical procedures.
- 13.11 In incubator areas, higher levels of luminance are required for the care and examination of the babies. This should be achieved by a combination of low-glare general lighting and high-luminance luminaires integral or attached to the associated medical equipment.
- 13.12 In this unit it is essential that clinical standard colour rendering is specified to ensure accurate determination of skin tone. To simplify supply and storage of replacement lamps and maintenance of the lighting systems, consideration should be given to the use of clinical standard colour rendering throughout the department.
- 13.13 It is important in neonatal facilities to achieve a relaxed, informal atmosphere in areas where

lighting does not have a clinical function. This may be achieved by indirect sources including wall lighting and uplighting.

### **Entertainment systems**

- 13.14 Entertainment facilities, such as television and radio/music systems, may be provided in parent rooms. See Health Technical Memorandum 08-03 – ‘Bedhead services’.

### **Lifts**

- 13.15 It would not be practical to plan a neonatal unit on more than one level. Consequently, lifts would need to embrace the overall passenger and goods lift strategy for the building.

# 14 Schedule and cost information

## Example schedules of accommodation

14.1 The schedules of accommodation include the following example units:

- Example 1: Neonatal intensive care unit serving 5000 local births, but also including 11 intensive care/high dependency cots for transfers from a network of 19,500 births. It excludes neonatal surgery.
- Example 2: Special care unit serving 2500 local births.



<b>Clinical support</b>								
	Room for expressing milk	6.0	2	12.0	4.2	20.4	2 required for a large unit.	
	Kitchen: milk feeds preparation	12.0	1	12.0	4.2	20.4	Large units (with 36 cots plus) will require separate refrigerated store.	
	Refrigerated supplies store	8.0	2.8	2.8	2.8	13.6	For refrigerated and frozen milk/feeds.	
L1308	Near patient testing room	8.0	1	8.0	2.8	13.6		
T0535	Clean utility room	16.0	1	16.0	5.6	27.2		
Y0431	Dirty utility room	8.0	2	16.0	5.6	27.2		
Y0646	Disposal hold: 3000 litres	12.0	1	12.0	4.2	20.4	Separate dirty linen store has not been included. If local policy requires dirty linen disposal it is assumed that it could be dealt with in this area.	
W1584-04	Storage: clinical equipment	1.0	40	40.0	14.0	68.0	Allowance of 1 sqm per cot based on project evaluations. Bulky equipment eg ventilators, incubators etc. Assumed to include 1 spare cot for every 4 cots. Actual requirements subject to local policy.	
	Storage: ready to use medical gas cylinders	4.0	1	4.0	1.4	6.8		
	Storage: linen	6.0	1	6.0	2.1	10.2	Local policy permitting.	
	Equipment servicing/decontamination suite	40.0	1	40.0	14.0	68.0	Allowance included in a large unit for receiving, cleaning and repairing incubators. Local policy may vary.	
G0180-01	Parking bay for large equipment	4.0	4	16.0	5.6	27.2	1 per 12 cots. Minimum 2. Includes mobile X-ray and transport incubator.	
	Parking bay for resuscitation equipment	2.0	1	2.0	0.7	3.4		
Y1510	Cleaners' room	8.0	1	8.0	2.8	13.6	1 per unit (excluding cleaners' room for relatives' overnight stay).	
<b>Staff spaces</b>								
<b>Staff support</b>								
	Changing area: staff (size based on number of lockers)	1.4	60	84.0	29.4	131.0	1 locker per cot for ITU, 0.5 per cot HDU and 0.25 per cot SC, plus between 2 and 5 to allow for all staff. Multiply by 2 to allow for shift changeover. Multiply by 1.1 to allow for variation in male/female split. Includes uniform exchange, showers and a number of individual changing rooms.	
	Shower room: ambulant	2.5	2	5.0	1.8	1.1	7.8	Additional shower rooms to allow for male and female segregation.
	Changing room: semi-ambulant	2.0	4	8.0	2.8	1.7	12.5	Additional individual changing rooms to allow for male and female segregation.
V1010	WC: ambulant	2.0	2	4.0	1.4	0.8	6.2	1 WC per 25 staff including wheelchair accessible. Minimum 2 scheduled to allow for separate male and female provision.
	Admin area: shared use	6.6	10	66.0	23.1	13.9	103.0	2 desk spaces for every 1000 births.
H1304-02	Seminar room: 15 places (incl. 1 wheelchair place)	25.0	1	25.0	8.8	5.3	39.0	Also used as a skills lab.
W1585-02	Storage: general	8.0	1	8.0	2.8	1.7	12.5	En-suite to seminar room for flexibility in use of room.
D0434-03	Rest room with mini kitchen (size based on number of seats)	1.8	20	36.0	12.6	7.6	56.2	Overall staff requirements will vary by cot allocation and quantity of other staff. Total staff numbers have been estimated at twice the number of staff directly required for the number and type of cots.
M0251	Office: 1-person	8.0	2	16.0	5.6	3.4	25.0	Attending consultant and ward manager within unit only.
D1311	On-call overnight stay room	13.0	1	13.0	4.6	2.7	20.3	
V1323	Shower room: semi-ambulant: standing use	5.0	1	5.0	1.8	1.1	7.8	
	<b>Total allowance</b>			<b>1421.5</b>	<b>497.5</b>	<b>450.5</b>	<b>2369.5</b>	
<b>Optional accommodation</b>								
	Play area: outside							Area subject to local decision.
P0808	Vending machine	3.0	1	3.0				
J1414	Children's play area	4.5	1	4.5				
	Information/resource centre: 3-person	12.0	1	12.0				Shared facility that could be co-located with maternity.
	Examination room	12.0	1	12.0				May be located near the entrance for out-patient examination.
	Parking bay	2.0	1	2.0				
H1304-02	Skills lab	25.0	1	25.0				For flexibility this is assumed to be a generic seminar room.
W1585-02	Storage: general	8.0	1	8.0				En-suite to skills lab, for flexibility in use of room.
M0251	Office: 1-person	8.0	1	8.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
M0252	Office: 2-person	12.0	1	12.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
M0254	Office: 4-person	24.0	1	24.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
<b>Relationship of schedule to ADB room names</b>								
The ADB room codes listed may not carry a title, in ADB, identical to the room function in the schedules. Use of the appropriate ADB room code will, however, result in the correct room being accessed.								
<b>Relationship of schedule to ADB for scalable rooms (ie those for which a recommended room size does not exist)</b>								
ADB room code relates to one example size of this space and does not reflect space requirements of these schedules. Projects will scale up/down according to schedule.								
<b>Rounding of scalable rooms</b>								
The number of waiting spaces and lockers (in the communal changing areas) have been rounded to the nearest multiple of 5. The number of seats in the staff rest rooms have been rounded to the nearest multiple of 10. The number of workstations in the open plan offices have been rounded to the nearest even number.								
<b>Optional accommodation</b>								
Accommodation which is not expected in all departments, but, dependent on local policy, may be needed in addition to or instead of rooms listed in the schedule.								
<b>Circulation, communication and engineering services allowances</b>								
Allowances are based on the Health Premises Cost Guide allowances for critical care.								



V1510	Cleaners' room	8.0	1	8.0	2.8	2.8	13.6	1 per unit (excluding cleaners' room for relatives' overnight stay).
	<b>Staff spaces</b>							
	<b>Staff support</b>							
	Changing area: staff (size based on number of lockers)	1.4	15	21.0	7.4	4.4	32.8	1 locker per cot for ITU, 0.5 per cot HDU and 0.25 per cot SC, plus between 2 and 5 to allow for all staff. Multiply by 2 to allow for shift changeover. Multiply by 1.1 to allow for variation in male/female split. Includes uniform exchange, showers and a number of individual changing rooms.
	Shower room: ambulant	2.5	1	2.5	0.9	0.5	3.9	Additional shower rooms to allow for male and female segregation.
	Changing room: semi-ambulant	2.0	1	2.0	0.7	0.4	3.1	Additional individual changing rooms to allow for male and female segregation.
V1010	WC: ambulant	2.0	2	4.0	1.4	0.8	6.2	1 WC per 25 staff including wheelchair accessible. Minimum 2 scheduled to allow for separate male and female provision.
	Admin area: shared use	6.6	5	33.0	11.6	6.9	51.5	2 desk spaces for every 1000 births.
	Seminar room: 2 places (incl. 1 wheelchair place)	10.0	1	10.0	3.5	2.1	15.6	To be sized up and shared with other department(s)
W1585-02	Storage: general	8.0	0.1	0.8	0.3	0.2	1.2	En-suite to seminar room, for flexibility in use of room. Part-time access required in small unit.
D0434-03	Rest room with mini kitchen (size based on number of seats)	1.8	10	18.0	6.3	3.8	28.1	Provision for 50% of staff on duty at any one time, with a minimum of 6. Overall staff requirements will vary by cot allocation and quantity of other staff. Total staff numbers have been estimated at twice the number of staff directly required for the number and type of cots.
M0251	Office: 1-person	8.0	1	8.0	2.8	1.7	12.5	Attending consultant and ward manager within unit only.
	<b>Total allowance</b>			<b>526.8</b>	<b>184.4</b>	<b>162.8</b>	<b>874.0</b>	
	<b>Optional accommodation</b>							
F0808	Play area: outside							Area subject to local decision.
J1414	Vending machine	3.0	1	3.0				
	Children's play area	4.5	1	4.5				
	Information/resource centre: 3 persons	12.0	1	12.0				Shared facility that could be co-located with maternity.
	Examination room	12.0	1	12.0				May be located near the entrance for outpatient examination.
	Parking bay	2.0	1	2.0				
H1304-02	Skills lab	28.0	1	28.0				For flexibility this is assumed to be a generic seminar room.
D1311	On-call overnight stay room	13.0	1	13.0				
V1323	Shower room: semi-ambulant: standing use	5.0	1	5.0				En-suite to skills lab, for flexibility in use of room.
W1585-02	Storage: general	8.0	1	8.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
M0251	Office: 1-person	8.0	1	8.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
M0252	Office: 2-person	12.0	1	12.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
M0254	Office: 4-person	24.0	1	24.0				Option provision to replace area allowance for open plan office space, but not generally recommended.
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	<b>Rounding of scalable rooms</b>							The number of waiting spaces and lockers (in the communal changing areas) have been rounded to the nearest multiple of 5. The number of seats in the staff rest rooms have been rounded to the nearest multiple of 10. The number of workstations in the open plan offices have been rounded to the nearest even number.
	<b>Optional accommodation</b>							Accommodation which is not expected in all departments, but, dependent on local policy, may be needed in addition to or instead of rooms listed in the schedule.
	<b>Circulation, communication and engineering services allowances</b>							Allowances are based on the Health Premises Cost Guide allowances for critical care.

## 15 References

### Department of Health

Health Building Note 09-02 – Maternity care facilities.

Health Building Note 00-03 – Clinical and clinical support spaces.

Health Technical Memorandum 02-01 – Medical gas pipeline systems.

Health Technical Memorandum 03-01 – Specialised ventilation for healthcare premises.

Health Technical Memorandum 06-01 – Electrical services supply and distribution.

Health Technical Memorandum 08-03 – Bedhead services.

DH Toolkit for high quality neonatal services.

BAPM service standards for hospitals providing neonatal care (3rd edition).

Neonatal Intensive Care Review 2003.

Designing a neonatal unit.

Safer childbirth: Minimum standards for the organisation and delivery of care in labour.

Newborn Individualized Developmental Care and Assessment Program.

SLL LIGHTING GUIDE 2: Hospitals and health care buildings.

NICE guidelines on donor breast milk banks.

‘Two case studies using mock-ups for planning adult and neonatal intensive care facilities’ (Sue Hignett, Jun Lu, Mike Fray, Loughborough University).