

**SCHEDULE PART 8**

**Part 3 : Board's Construction Requirements**

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## **1.0 Introduction to Specifications**

Include list of abbreviations – or included elsewhere for whole ITN

### **1.1 Introduction**

The Board's Construction Requirements (including Appendices) detail the specific output requirements of the Board to be met by ProjectCo's Proposals for the design and construction process.

### **1.2 Scope of specifications**

The following standards are referred to in the Board's Construction Requirements and in each case the latest edition at the time of Financial Close and the NHS Scotland versions where published will be applicable. For the avoidance of doubt, it should be noted that any reference to HTM/HBN is deemed to include SHTM/SHBN and that the requirement of the SHTM/SHBN shall take precedence over the HTM/HBN.

- 1.2.1 Building Regulations 1990 (the "Building Regulations")
- 1.2.2 Health & Safety Regulations, Guidance Notes and Associated Regulations  
HBNs, related Design Guides and Health Facilities Notes(HFN)
- 1.2.3 HTMs (including Fire Practice Notes (FPN))
- 1.2.4 Current British Standards, European Standards, Codes of Practice, DIN Standards,  
as appropriate
- 1.2.5 IEE Wiring Regulations v.16 [BS 7671]
- 1.2.6 CIBSE Design Guides and Technical Memoranda
- 1.2.7 All appropriate British Standards and Codes of Practice
- 1.2.8 National Health Service Model Engineering Specifications
- 1.2.9 BISRIA Application Guides
- 1.2.10 HCVA Publications

NHS Design Guidance (NHS Requirements) is addressed at section 3.1, undernoted, with the 'Acknowledgement' column representing comments/derogations agreed with ProjectCo in respect of the relevant NHS Requirement.

## **2.0 Site Rules**

ProjectCo are required to comply with the Site Rules as per sections 2.1.1 and 2.1.6 of Schedule 8 : Part 4.

### 3.0 General Requirements – NHS Requirements

- 3.1 This section relates to advice and guidance provided by Health Building Notes (“HBN”), Health Technical Memoranda (“HTM”), Fire Practice Notes (“FPN”) and NHS Model Engineering Specifications (“MES”) and other National Health Service guidance material (together “NHS Requirements”). Any reference to HTM/HBN is deemed to include SHTM/SHBN. The requirements of SHTM/SHBN shall take precedence over HTM/HBN unless expressly required otherwise by the Board. In the event of any conflict between NHS Requirements and the requirements of building control officers, those of building control shall take precedence.
- 3.2 The NHS Requirements are documents prepared by the Department of Health and the Scottish Executive Health Department and provide advice, guidance, minimum standards and parameters on the design, planning and servicing of hospitals.
- 3.3 Not used.
- 3.4 In respect of the NHS Requirements set out in Section 3.8 below any proposed departures from the said advice, guidance, minimum standards or parameters must be identified by Project Co in writing, and will only be accepted by specific written agreement with the Board.
- 3.5 All references in these Board's Construction Requirements to NHS Requirements, building and engineering standards, Building Regulations, legislation, Statutory Requirements, Codes of Practice, NHS Estates' publications and other published guidance shall be deemed to mean those published, existing and/or in force as at the date of this Agreement, subject to the conditions of Clause 39 (Changes in Law and Variations).
- 3.6 In any event and notwithstanding any other provision of this Agreement ProjectCo shall comply at all times at no additional cost to the Board with the NHS Requirements set out in Section 3.8, making such design choices as are permitted therein provided such choices are notified to the Board in writing in advance and are consistent with the Board's general requirements and objectives as set out in this Agreement.
- 3.7 Without prejudice to the obligations contained in Section 3.6 above, in performing the Works Project Co shall, exercising the degree of skill and care referred to in Clause 17.2 of this Agreement, have regard to and take into consideration all NHS Requirements set out in section 3.9 below. Project Co has exercised the said degree of skill and care to identify by Financial Close any proposed departures from the NHS Requirements set out in section 3.9, which departures have been discussed and agreed by the Board and are accordingly set out in the Acknowledgement boxes below. This is without prejudice to Project Co's general obligation in carrying out the design of the Facilities to exercise the degree of skill and care referred to in Clause 17.2 of this Agreement..

### 3.8 MANDATORY NHS REQUIREMENTS

- 3.8(a) In relation to the **architectural design** of the new buildings comprised in the Facilities

<b>Mandatory NHS Requirements:</b>	<b>Acknowledgement</b>
SHTM 81 - Fire Precautions in New Hospitals	It is required that the new Unit be designed in accordance with SHTM81 "Fire Precautions in New Hospitals". It should be noted that the Unit is designated as a place of lawful detention, the effect of which should be taken cognisance of in regard to SHTM81. In particular this will mean that fire doors can be locked, all fire

	<p>extinguishers must be cabineted, alarm will be key operated as break glass is not permitted, and means of evacuation will be as per the approved fire strategy.</p> <p>In addition to consultation with the local Fire Brigade and Local Authority Building Control Officers it will be necessary for Project Co to consult with the Board's designated Fire Officer to avoid conflict around the interpretation of SHTM81.</p> <p>Project Co will be required to present a preliminary fire precautions strategy to the client's representative early in the design stage for consultation and approval. This provision is in addition and prior to the preparation of the "Fire Safety Strategy".</p>
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3.8(b) In relation to the **structural design** of the new buildings comprised in the Facilities

<b>Mandatory NHS Requirements:</b>	<b>Acknowledgement</b>
SHTM 81 - Fire Precautions in New Hospitals	A fire engineered design is being prepared, for the Unit which may conflict with some SHTM requirements. The engineered solution will take precedence. Refer to comments in Architects section 3.8(a).

3.8(c) In relation to the **services design** of the new buildings comprised in the Facilities

<b>Mandatory NHS Requirements:</b>	<b>Acknowledgement</b>
SHTM 81 - Fire Precautions in New Hospitals	Refer to comments in Architects section 3.8(a).
SHTM 82 – Alarm and Detection Systems	A fire-engineered design is being prepared, for the Unit, which may conflict with some SHTM requirements. The engineered solution will take precedence.
SHTM 83 – Fire Safety in Healthcare Premises – General Precautions	Fire dampers will not be electronically controlled.
SHTM 86 – Fire risk assessment in hospital	Supply ventilation not being installed (to bedrooms). Individual extract systems from en suite accommodation and fire hazard areas will be provided with fusible link dampers. In general, SHTM Version 2, will be the basis of the design. Detection zones will not extend beyond a fire compartment. Ceiling mounted smoke detectors that are anti ligature cannot be sourced.

Scottish Health Guidance Note – “Safe” Hot Water and Surface Temperatures	
SHTM 2007 – Electrical Services: Supply and Distribution	The sections on design and commissioning are relevant and are to be followed although it provides information that is often more relevant to major hospital developments.
SHTM 2011 – Emergency Electrical Services	Where this is relevant, the design is to have regards to, except where there are sections on Lifts, Sewage Disposal, Combined Heat & Power plant and the like that do not figure in the Forensic Unit.
SHTM 2027 – Hot and Cold Water Supply Storage and Mains Services	
SHTM 2040 – The control of legionella in healthcare premises	
SHTN 2 Domestic hot and cold water systems for Scottish Healthcare Premises	Will not be fully achieved in terms of the provision of on site water filtration. This will not be installed in this project.

### 3.9 OTHER NHS REQUIREMENTS

3.9(a) In relation to the **architectural design, structural design, and services design** of the new buildings comprised in the Facilities

The following NHS Estates *Health Technical Memoranda*, (HTM) on the current NHS Estates Publication List), which provide guidance on specification and design for building components for health buildings that, are not adequately covered by current British Standards.

	<i>Acknowledgment</i>
HTM 54 – User manual	
HTM 57 – Internal Glazing	
HTM 59 – Ironmongery	
HTM 61 – Flooring	
HTM 63 – Fitted storage system	
HTM 64 – Sanitary Assemblies	The specified taps for certain applications are not anti ligature. Wash hand basin taps will be of the pillar types as specified in the room data sheets. These are not seen to be of the anti ligature type but are seen to be a manageable risk.
HTM 66 – Cubicle curtain rack	
HTM 68 – Duct and panel assemblies	
SIITM 69 - Protection	

	<i>Acknowledgment</i>
SHTM 87 Fire code: textiles and furniture	
SHTM 2005 – Building Management System	
SHTM 2014 – Abatement of Electrical Interface	
SHTM 2025 – Ventilation in Healthcare Premises	<p>The internal temperatures being maintained at 23 degrees c, has been waived, Rooms to have no mechanical cooling. A policy of maximising natural ventilation is pursued to reduce energy consumption.</p> <p>This is all embracing and covers every type of system likely to be encountered in a major hospital development. It includes theatres and other air-conditioned areas that do not apply to the Forensic Unit. However, it provides the yardstick on which ventilation design is based. There is an error in the wording of paragraph 3.41, however, and the equivalent paragraph 3.41 in HTM 2025 will be followed.</p>

The following Archived HTM/HBN, may also be referred to:

HTM 60 – Ceilings	
HTM 55 – Windows	
HTM 56 – Partitions	
HTM 58 – Internal doorsets,	
HTM 70 - Fixings	
HBN 45 – External works for health buildings	Details are subject to the general layout as agreed with the Board.

The Health Building Notes listed below may in part have some relevance to certain sections of the Project. Their inclusion within this list does not imply that all aspects of the guidance within these documents may be relevant to the design of the building. The following relevant NHS *Health Building Notes* (HBN) on the current NHS Estates Publication List should be referred to:

HBN 4-	In accordance with the room type and sizes agreed within the Board as reflected in the Schedule of Accommodation.
HBN 8 – Facilities for Rehabilitation Services	Relevant only to the occupational therapy and gymnasium accommodation.

HBN 4-	In accordance with the room type and sizes agreed within the Board as reflected in the Schedule of Accommodation.
HBN 18 – Office Accommodation in Health Buildings	Room sizing to be as agreed with the Board.
HBN 35 – Accommodation for People with Mental Illness. Part 1 – Acute Unit.  Part 2 – Treatment and care in the community, not relevant	Specified taps for certain applications (e.g. lever action pattern) are not anti ligature pattern.  Cameras viewing nurse stations will be viewed by control room staff. They will only be allowed to be viewed when an authorised member of staff keys in a password.  This has yet to be adapted for use in Scotland but "may be used with general caution". This illustrates a variety of approaches in the provision of mental health services. In so doing it examines a range of mental health care models through a series of studies in the UK. So, while it will be read and used to achieving a solution acceptable to the Health Board it is not feasible to comply with the whole document. Indeed the purpose of this publication is stated by PEFEx is to be "an inspiration to planning teams" and the schemes discussed range from small 8-bed support units in the community to 76-bed campus facilities. HBN 35 therefore may have some relevance to, but not mandatory.
HBN 36 Local Healthcare Facilities	This has yet to be adapted for use in Scotland. Same general comments as for HBN 35 therefore apply.
HBN 40 - Common activity spaces Vol 1 Public areas Vol 2 Treatment areas Vol 3 Staff areas Vol 4 Circulation areas	

3.9(b) The Health Facilities Notes listed below may in part have some relevance to certain sections of the Project. Their inclusion within this list does not imply that all aspects of the guidance within these documents may be relevant to the design of the building. The following relevant NHS *Health Facilities Notes* (HFN) on the current NHS Estates Publication List should be referred to:

SHFN 30 – Infection Control in the Built Environment	
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3.9(c) The Hospital Technical Notes listed below may in part have some relevance to certain sections of the Project. Their inclusion within this list does not imply that

all aspects of the guidance within these documents may be relevant to the design of the building. The following relevant NHS *Hospital Technical Notes* (HTN) on the current NHS Estates Publication List should be referred to:

<p>SHTN 5 – The Operation and Management of Emergency Electrical Generators in Scottish Healthcare Premises</p> <p>Boiler plant will not be provided with diesel as the standby fuel to the normal gas firing. The back up will be achieved by creating a ring main around the site perimeter feeding into each external plant room housing the boilers for each building, suitably valved to allow incoming gas to come from either direction round the loop.</p>	<p>SHTN 6 - The Safety Operation and Maintenance of Thermostatic Mixing Valves</p>
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3.9(d) Not used.

3.9(e) Not used.

ProjectCo will be responsible for the design, selection and performance of all building elements, services and finishes to meet any criteria described in the Board's Construction Requirements.

ProjectCo will be responsible for preparing detailed specifications all in accordance with NHS standard design development protocol for PFI schemes for approval by the Board.

The building, structural and civil engineering sections of ProjectCo's specification should be prepared on the basis of the National Building Specification (NBS) and the mechanical and electrical services on the NHS Model Engineering Specifications. Additional sections should be included as appropriate for construction techniques and performance criteria not currently covered by these documents.

ProjectCo will be responsible for all aspects of user briefing, feasibility, production and updating of room data sheets, preliminary design and development of the design.

#### 5.0 Design requirements

#### 5.1 Sustainability & Environmental issues

ProjectCo shall comply with sustainability and environmental issues as per Appendix 2.1.1.A and A2.1.1.B of Schedule 8 : Part 4.

#### 6.0 Statutory requirements

#### 6.1 Building Control

ProjectCo will be responsible for obtaining all necessary consents required under the Building Regulations and paying all associated costs and charges.

ProjectCo must allow in its programme and management arrangements for the access requirements necessary for inspection and testing of the relevant works by the Local Authority and complying with all requisite notices.

ProjectCo shall prepare a Fire Safety Strategy document, including Fire Strategy drawings, decant points etc. to demonstrate compliance with the relevant regulations. Fire Engineering solutions will be considered. The Board will prepare decant points as part of their strategy. This will not form part of the Works.

#### 7.0 Quality Standards Required

#### 7.1 Design Philosophy

The Board requires a design that reflects a secure care environment with the following characteristics:

7.1.1 External works, both hard and soft landscaping must contribute to a therapeutic quality context with clear, efficient and safe patterns of movement;

7.1.2 The use of colour, pattern, texture and light thus contributing to the care, treatment and rehabilitation of patients and providing a pleasant environment for all; and

7.1.3 The ability for the Board to fix art or other decorations to the internal walls. The Board shall inform the ProjectCo the location and extent of the Art Works that have to be accommodated. The scope of the Art Work shall not be detrimental to the Works.

#### 4.0 Responsibilities of ProjectCo

## 7.2 Design for security

The design must ensure the security of patients, staff, property and public safety. It should minimise exposure to crime and facilitate security, reflecting the various risk factors throughout the building. Strict control and access to, and egress from, and within the Unit is critical for the secure and safe operation of the Unit and must be integral to the design solution.

## 8.0 Quality Control Procedures

### 8.1 Quality Plan

ProjectCo shall establish and maintain Quality Control Procedures in accordance with BS EN ISO 9001 or any replacement standard to ensure that the works including the work of all sub-contractors comply with their specified requirements. ProjectCo shall maintain full QA records and audits and make available to the Board for inspection as requested.

3 months after Financial Close, ProjectCo shall submit a Quality Plan for the Design and Construction of the Project in accordance with its Quality Management System.

The Quality Management System will be the responsibility of a Quality Control Manager who will be a designated member of ProjectCo's management team, with overall responsibility for Quality Control during Design and Construction activities.

The Quality Plan shall identify the most significant foreseen areas of quality risk together with the proposed approach to minimise this in each case.

ProjectCo shall ensure a copy of the Quality Plan is maintained on site at the design offices of its professional consultants. These will be updated as appropriate during the course of the works.

### 8.2 Quality Control Audits

Within the Quality Plan ProjectCo will establish a regime for Quality Control Audits throughout the design construction and operational phases.

The Board's representative may also undertake Quality Audits from time to time during the course of the design and construction of the works.

ProjectCo shall require its design professionals and contractors to provide copies of the drawings, specifications, orders and any other documents as may be required to carry out such audits together with any attendance or assistance as may be required.

### 8.3 Quality Control Mock Ups to be prepared by ProjectCo

During the construction phase of the Project, ProjectCo shall prepare a number of on-site mock-ups at times to be agreed with the Board as part of the Quality Control process. These will establish quality standards for the main areas and require to have Equipment present, or the location and size of Equipment marked/identified, in order that spatial and operational issues can be considered by the Board. The Board may require access to place Equipment or mark the location of such (e.g. beds etc).

The following areas are to be completed and offered up for Board observation and comment before the contractor commences final finishing and decorating:-

- A. Typical single bedroom and en-suite bathroom
- B. Typical Office

The following areas are to be identified so that during the Construction of the Works a sample room type can be offered up to the Board for viewing, prior to similar room types being completed. Such rooms will be prepared in accordance with the Programme:

1. Typical Group/Day Room
2. Typical length of inter-departmental corridor
3. Typical Interview Room
4. Typical Shower Room
5. Typical Servery
6. Typical Dining Area

**9.0 Building Standards**

**9.1 Building Design**

Internal grounds should be exploited as much as possible to provide attractive views from bedroom and day areas and pleasant, sheltered environments where patients can take air.

The Board expects the highest standards to be brought to this Project and believes that good health care design has the following characteristics:

- 9.1.1 pleasing to the eye and contributing successfully to the local environment;
  - 9.1.2 well landscaped, taking into consideration maintenance and security;
  - 9.1.3 easily comprehensible as a building and well sign posted internally and externally;
  - 9.1.4 easy and convenient to enter and welcoming for all patients and visitors;
  - 9.1.5 finished to high standards but in styles which are non-institutional;
  - 9.1.6 able to offer all in-patients, and staff, natural light and ventilation;
  - 9.1.7 readily and economically adaptable to meet changing clinical needs;
  - 9.1.8 efficient and convenient for the staff to provide high quality professional care;
  - 9.1.9 'human' both organisationally and physically;
  - 9.1.10 able to provide adequate privacy and confidentiality everywhere for patients and their relatives;
  - 9.1.11 designed to allow patients to control their own environments in relation to noise, TV and radio broadcast;
  - 9.1.12 facilitating for patients ordinary social, intellectual and personal lifestyles, for instance by providing adequate space, storage, telephones and facilities for personal dietary requirements; and
  - 9.1.13 complies with all relevant access regulations including Disability Discrimination Act 1995.
- The building envelope should be considered, with the aspects of visual appearance, security and requirements of the Schedule Part 14 Part 1 in mind. These should be achievable without affecting the provision of clinical care within the accommodation.
- The design of the internal divisions and environmental servicing strategy for the building should represent a co-ordinated and consistent approach throughout and readily accept change with the minimum disruption to the building structure and main mechanical and electrical plant installations.

## 9.2 Building Form and Security Enclosure

The following design principles must be adhered to:

9.2.1 the whole unit to be accommodated within single storey buildings. The local authority Planning Department and the Board have prohibited the use of high perimeter security fences enclosing the whole site. Consequently, the designed building form and mass must be used as the security barrier to internal courtyards;

9.2.2 the Medium Secure accommodation must be separated from the remaining accommodation by centrally controlled "airlock" lobby approach doors. The Medium Secure internal courtyards must be kept separated from the Low Secure and public areas by either other buildings or fences with a minimum height of 5.8m. The access route from the centrally controlled Reception to the Medium Secure areas must not pass through any open Low Secure or public area;

9.2.3 where it is not possible to enclose totally internal courtyards with un-broken building mass, perimeter security must be maintained with walls, not fences, of a minimum height of 5.8m for all areas. This height should relate to all walls forming the boundary to any internal courtyard; thereafter roofs can pitch down to a minimum outer perimeter wall height of 3.5m throughout the development;

9.2.4 No windows from patient areas will open, nor view directly to the outside of the secure perimeter. If patient areas are unavoidably located on the external perimeter walls of the Unit and daylight is required to these rooms, this shall only be provided by either high level glass blocks, high level fixed obscured glazed security windows, or by obscured glazed security rooflights. Within the design, any aspect of the building opening directly to the outside of the secure perimeter shall only be a non-escorted patient area, such as offices, storerooms, staff toilet or kitchen facilities;

9.2.5 It is not permissible to have any enclosed patient courtyard for either the Low or the Medium Secure accommodation on the "external" face of this part of the development; all patient courtyards for both areas must be enclosed by buildings and or walls of a minimum height of 5.8m.

9.2.6 All pipework is to be protected to prevent access by patients.

## 9.3 Control of Access

### 9.3.1 Access to Reception and other areas of the Unit

All access by all forms (i.e. pedestrian and vehicular; staff, patient and public) including all deliveries to all parts of the development, with the exception of the Administration Building, shall be solely by way of a centralised, security staff controlled entrance / egress route. This will necessitate the use of electronically controlled interlocked "airlocks" for both pedestrian and vehicular access. At all times one of the doors or gates require to be able to be locked to maintain the integrity of the secured area. The airlock area will be under close circuit television surveillance and each door or gate will be separately alarmed and monitored by the central control room.

The Reception will be shared between both the medium and low secure services. All individuals and services entering the secure perimeter of the Centre require in the first instance to be able to report to reception. This includes the airlock vehicle entrance.

The design will require to support the following roles and function of the reception / control room:

9.3.1.1 welcoming patient and professional visitors to the unit (Reception);

9.3.1.2 providing information for staff and visitors as appropriate (Reception);

9.3.1.3 central telephone switchboard (it is hoped that most areas will have dedicated telephone numbers to reduce pressure on this switchboard)(Reception);

9.3.1.4 dispensing and receiving staff locking systems and personal alarms(Reception);

9.3.1.5 registering and monitoring visits (including FM staff) (Reception and Control Room);

9.3.1.6 monitoring of CCTV recording systems(Control Room);

9.3.1.7 fire control(Control Room);

9.3.1.8 emergency alarm control (Control Room);

9.3.1.9 ensuring compliance with visitor procedures(Reception and Control Room);

9.3.1.10 registering and managing patient external movement (such as in the use of pass-time or external patient visits or hospital appointments)(Reception and Control Room);

9.3.1.11 monitoring the access and egress of workers providing services outside of the unit such as forensic community psychiatric nurses, medical, occupational therapy, psychology or social work staff (Reception and Control Room).

Access between the low and the medium secure areas shall only be by way of security interlocked airlocks controlled by the Reception Control Room. No direct access will be allowed from the Administration Building into either the low or medium secure areas without passing through the Reception security interlocked airlocks.

Direct access to the Administration Building will be permissible for both staff and staff visitors, but will be by way of a security interlocked airlock, controlled and observed by CCTV, from the Reception Control Room.

For patients' visitors there should be an area for children to play and also baby-changing facilities accessible to both male and female visitors. Children under 16 will not be allowed onto wards and therefore an area will be available within the secure perimeter for children to visit under observation. This area will have a play area.

Facilities for visitor access will include the provision of lockers for visitors to place items that are barred from the unit. This will include alcohol, incendiaries such as matches or lighters, sharps etc.

### 9.3.2 Vehicle Airlock Entrance

The vehicle airlock entrance will be used to allow access to the secure area for specific reasons. This may include the rapid access of emergency vehicles such as fire service, ambulance or police, or access to the area to allow the dignified admission of a disturbed patient. The entrance would also be used in the delivery of supplies or access for maintenance services such as gardening, etc.

The vehicle airlock entrance must be located next to the reception building so that it is easily observable by the centralised control room staff.

### 9.3.3 Access to Wards

Each Ward will have a defined entrance which will be well signposted. All ward entrances and fire exits will be locked and controlled by staff cards and keys respectively. The entrances and exits shall be secure and robust but as domestic in style as possible and well maintained to ensure that doors do not slam or are especially noisy. Each entrance area will be well lit and observable through CCTV from the Control Room. All fire exits must lead into the secure internal courtyards. Video access and card proximity readers externally and internally at the ward entrance door shall be provided.

### 9.3.4 Access to the Recreation Building

The facilities in the Recreation Building will be used by both the Low Secure and the Medium Secure Patients. Access to this building for medium secure patients must be directly from within the medium secure courtyard and must not pass through any lower security area. If patients from the Low Secure Wards have to pass through the medium secure courtyard this access must be only via Reception.

Entrance to the Recreation Building will be by way of access control doors, able to be controlled and observed by CCTV, from the Control Room. All fire exits will be locked and alarmed and controlled by staff keys. All fire exits must lead into the secure internal courtyards.

### 9.3.5 Access to the Administration Building

Direct access to the Administration Building will be permissible following presentation at the Reception Desk to be issued with an access card unique to the Administration Building. All fire exits will be alarmed and controlled by staff keys. Fire exits from this building will be located in the external perimeter walls and must not lead into the secure courtyards.

### 9.3.6 Observation

A clear, unobstructed, view of the building perimeter by CCTV is required.

All rooms with patient access will have security glass observation panels as per the Room Data Sheets. For areas where a window exists, there must be specific precautions in the use of blinds which could reduce observation. Doors where staff exit into patient areas such as staff toilets, offices or communicating doors between wards, will have observation panels in order for staff to identify any hazards or concerns that may be beyond the door. Such doors are identified on the Room Data Sheets.

The height of the enclosing buildings, walls and fences is important only in deterring individuals from attempting to escape or to delay their escape whilst assistance is sought. In order to reduce the risk posed, it is important to ensure that observation within courtyards and around the external perimeter of the building is of a high standard. Observation can be increased by providing a clear security observation zone around the perimeter of the building, by avoiding the planting of shrubs etc. Furniture within a security enclosed area should be fixed to prevent individuals from using it as a means of escape. In addition closed circuit television can be used to view internal and external open areas.

Both low and medium secure courtyards, as well as the external perimeter of the building, require to be lit for wayfinding and security purposes.

CCTV will be sited as unobtrusively as possible, and will be protected from tampering or vandalism. CCTV should have the capacity to operate effectively both day and night, utilising infrared, or suitable colour/mono chrome cameras (at night time), capability for high quality images even in low light conditions. There should be capacity for recording all CCTV operations. All CCTV cameras will be capable of being monitored in the Control Room.

## 9.3.7 Fire

To reduce the risk of false alarms within the Unit, there will be a system of key operated alarms rather than using "break glass" types. The fire alarm system must be audible in all areas of the Unit and also must be clearly distinguishable from the personal alarm system.

Fire escape routes from all secure patient areas must lead into internal enclosed controlled courtyards with a minimum enclosing height for all perimeter buildings and walls of 5.8m.

Heat detectors in bathrooms and Smoke Detectors in Bedroom Areas are required, as per the requirements of FireCode.

## 9.3.8 Service Zone Escape Hatches

Service zone escape hatches proposed by ProjectCo on the gable ends of the ward buildings, inboard to the courtyard, require to be substantially flush with the building line, outward opening only, have no external ironmongery or other protrusions and be of a similar colouring to the surrounding building fabric.

Such hatches shall not be able to be accessed from the external area of the building (i.e. the courtyard) and must not provide any opportunity to gain or assist access to the roof void area or the roof of the building from the courtyard.

The hatches are subject to the Review Procedure, where the specific requirements, above, require to be demonstrated, as well as the locking and opening mechanisms and arrangements as well as the mode of egress from such in order that this does not then provide an access back into the roof void area from the courtyard (i.e. a self closing or other arrangement is necessary).

## 10.0 General Construction Principles:

### 10.1 Secure Construction

Secure and robust construction is required for all walls, floors and ceilings of all the secure accommodation. Timber kit solutions will be acceptable in this respect. All floors of all patient areas to be of reinforced concrete construction; all external skin of perimeter walls of secure areas to be of solid masonry construction; all ceilings of all patient areas to be secure and robust and to be reinforced/backed with metal mesh. Walls should be resilient to damage from kicking, so that patients would be unable to damage a wall to the extent of entering another area. The finish of the wall is important both for the appearance and also the function of the area. Patient areas should have protection to vulnerable areas such as corners.

All design should follow an anti-ligature policy, to be applied to all areas out with the Administration Area, with care being taken to ensure that all projections, shelves, etc are either designed out or are incorporated in such a manner to ensure that there are not any substantial projections which could be used as ligature points for self-harm by patients.

### 10.2 Building Materials and Workmanship for Construction

ProjectCo must ensure that all works are carried out by appropriately skilled operatives, suitably experienced for the type and quality of the work to be undertaken. All trades people, where applicable, must be members of the "Construction Skills Certification Scheme".

General workmanship will be in accordance with BS 8000, which covers typical building construction activities. Where specialist design proposals require construction activities outside of the scope of this document, ProjectCo will propose specific quality procedures relating to these, which will be based on the Industry standard current at the time of Financial Close.

## 10.3 Doors

The following criteria should be incorporated in the design:

- 10.3.1 all internal door leaves (excluding administration blocks) to be of solid laminated timber core construction, reinforced where necessary with sheet metal plates in high risk areas. They must be able to withstand high levels of force applied from kicks or objects being thrown against them;
- 10.3.2 all door frames must be of solid or metal construction, and must be very securely fixed in to the adjoining construction;
- 10.3.3 wherever possible, single doors will be used. These will be wider than normal doors due to the need to transport patients and items through. Patients involved in restraint will be managed by an individual on either side of them and a further member of staff in front. The doors would have to be wide enough to accommodate two large people walking side by side as a minimum. A minimum corridor width of 1.6m will be required between departments and along main communications corridors;
- 10.3.4 Door closers should not be standing proud of the door, in order that the risk of injury when transferring a patient is reduced.
- 10.3.5 some doors to incorporate vision panels to permit staff observation, as per Room Data Sheets; of these some will require a controlled method to obscure the panel for privacy reasons, operational from outside the room, by knob control only;
- 10.3.6 All doors to all patient areas require the ability to be opened outwards from the room in an emergency (anti-barricade) to allow staff to enter rapidly. Some patient area doors, e.g. bedroom, bathroom and toilets, will be fitted with a thumb-turn style lock so that patients can have a level of privacy. This lock, however, must have a clutch mechanism which will allow any force applied by a patient to the thumb-turn on the inside of the door to be easily overridden and opened by staff who require immediate access to an area. This system will also be fitted to some doors in joint staff and patient areas, as per the Room Data Sheets;
- 10.3.7 all interview and consulting room doors require acoustic sealant strips. All interview Room doors to open out from the room;
- 10.3.8 the entrance to the Reception area requires a controlled access lobby whose outer and inner doors are to have electronically released locks operated from the reception. Similarly the vehicular entrance will also have an electronically controlled "air-lock" with locks to the external and internal gates operated from the reception;
- 10.3.9 doors must be fire resistant in line with Fire Regulations but, where connected to the fire and security alarm systems, must fail closed (subject to the agreement of the Fire Brigade and Building Control). Any alarm system linked to doors must not be compromised by even a short term power loss or surge. An (non UPS) uninterruptible back-up power source must be available to protect the alarm systems;
- 10.3.10 doors in non-patient areas such as the administration block may have a lesser specification but again should be of good appearance. Specific doors such as medical records require to be of a similar security specification to patient area doors and will also be alarmed and linked to a burglar alarm system monitored by the control room;
- 10.3.11 Secure external doors (which may have a metal overplate) rated to suit a medium secure environment are required and will be fitted with an alarm system to identify to staff at ward level or at the control room the specific door which has been opened or is being tampered with. The system is monitored by staff to inform the control area that the door has been opened legitimately. The control room may prevent access via access control

doors to external areas in the case of the use of machinery, maintenance or another occasions when the recreation areas may be out of use;

10.3.12 external access control doors to the ward will be closely monitored by the control room and will be under close circuit television surveillance. The external access control doors to the unit will be controlled only through the central control room, although there will need to be a protected back-up or override system in the event of a fire or incident within the control room area. These doors will also be under surveillance;

10.3.13 All doors throughout the complex to have the same lock to allow a single key to be used by all staff. It is envisaged that an electronic pass key system be used within the facility. One example of the electronic key system consists of staff entering the unit and offering their pass to the control room. The control room issues the member of staff with their allocated key and "arms" the key for use. This is recorded on the central computer system which then tracks the use of the key throughout the time that the member of staff is in the unit. In the event of a loss of an electronic key, the system can easily determine which doors were used and the key can be disarmed at any time by the control room;

10.3.14 an electronic card monitoring system linked to a central computer shall be incorporated which allows the control room staff to identify movement through access control doors by each member of staff throughout the unit. This ensures that at all times staff movement is monitored and whilst in the patient area, this improves the safety of staff. Defined access can be given to specific members of staff to reduce the risk of compromising security. An example of this could be that certain staff have access throughout the unit, whilst others have no access to external doors in ward areas.

#### 10.4 Windows

The following criteria should be incorporated in the design:

10.4.1 windows must combine security with good natural light and ventilation but should not appear custodial;

10.4.2 secure windows will form part of the design;

10.4.3 windows to be metal frame construction. Frames of windows and openings will be designed to be secure and will limit any points of ligature.

10.4.4 all frames will be secured with security screws which will include those screws hidden under panels.

10.4.5 all windows to have robustly controlled, limited, openings with a robust, secure method of restricting the extent of opening, and are to have security mesh, or equivalent, to prevent the passage of any form of contraband, tools and/or weapons;

10.4.6 there may be a reduced airflow within the building as, for security reasons, windows are unlikely to open extensively. With this in mind, it is essential that the ventilation and temperature control systems are of a high standard;

10.4.7 all windows must be very securely fixed in to the adjoining construction;

#### 10.5 Glass and Glazing

10.5.1 The following criteria should be incorporated in the design:

10.5.2 The glass fitted into the windows will be double glazed, laminated outside and toughened inside;

10.5.3 glazing beads should be fixed from outside with tamper-proof fixings and should be at least 25mm wide to prevent the risk of any glass being sprung out;

10.5.4 solar control glasses should be considered for all fixed windows which have a southerly aspect;

All windows to patient areas which are required to have blinds or curtain tracks will, at the minimum require these to be easily pulled off if any excessive force or load is applied to them.

#### **10.6 Ceilings and Roof Voids**

In patient areas, ceilings should be designed to prevent access to the roof-space. Light fittings to be designed with anti-ligature requirements in all areas except the Administration Area.

Ceiling and roof voids must be capable of ensuring appropriate space for maintenance and must allow provision for future expansion of services.

Roof-spaces should be alarmed with infra-red systems and secured, service access points unavailable in patient areas.

#### **10.7 Miscellaneous Ironmongery, Fixtures and Fittings**

The following criteria should be incorporated in the design in all areas except the Administration Area:

- 10.7.1 all fixings to ironmongery, fixtures and fittings must be either securely concealed or be of a tamper-proof form (e.g. non-return screws);
- 10.7.2 curtain tracks and rails to be lightly fixed to prevent them being used as any form of support;
- 10.7.3 hooks in all patient areas to be plastic and fixed to walls and doors with adhesive pads;
- 10.7.4 mirrors to be plastic and securely fixed to prevent access behind the surface or concealment,
- 10.7.5 all joints between flush fitting components and adjoining surfaces to be as concealed within any voids;
- 10.7.6 where practicable all lockable cupboards and drawers to be operated by the same key throughout the Facilities; and
- 10.7.7 all fire fighting equipment to be located within recessed secure lockable containers where possible and operated by the same key throughout the development. Proposed locations to be provided by the Board and approved by the Fire Brigade.

#### **10.8 Floor to Ceiling Heights**

The floor to ceiling heights should be as required by the nature and use of the accommodation, provided that this shall not be less than 2.4m in any area. Principle patient spaces and other large rooms should have a minimum floor to ceiling height of 2.7m irrespective of location. Major public communication spaces should have a minimum floor to ceiling height of 2.7m. Circulation spaces within departments should have a minimum floor to ceiling height of 2.4m.

Certain special rooms may have to exceed 2.7m, but it shall be the ProjectCo responsibility to determine the actual height required. e.g. Sports Hall – this will have a minimum floor to ceiling height of 7600mm.

#### **10.9 Acoustic Performance**

Consideration must be given to the sound insulation between adjacent spaces and the sound absorption of the ceiling. Rooms will be tested to ensure compliance with appropriate standards

of performance as determined by Good Industry Practice with gaskets or equivalent to be utilised to reduce 'drumming' noise on the walls. – PCPs to identify dB levels per room type/location.

Each ceiling will provide a decibel reduction, which is no less than HTM 56 (Partitions) as identified in Section 3.9 of the Board's Construction Requirements. The partitions, which make up ceilings and adjoin the walls shall also provide no less a decibel reduction.

#### **10.10 Finishes and Interior Design**

These will be determined by the Review Procedure.

#### **10.11 Storage and Distribution of Resources**

The Board requires a design solution that embodies the principles of logical efficiency in the arrangements for the distribution and storage of the materials and resources necessary to support its core clinical activity.

#### **11.00 External Work**

##### **11.1 Design**

Clear, routes are required for those approaching the building. Car parks should be convenient. Drop off point(s) should be immediate to the building's controlled secure entrance. Access and egress for both pedestrian and vehicular traffic to and from the Unit must be designed to be through the centralised, secure controlled Reception.

Access routes to services entrances will be safe and services entrances will be as discrete as possible. Services access should be located so that they are not seen by patients or visitors, and only by staff that have a necessity to see them.

The design must provide an external environment which will provide for the following:

- 11.1.1 Access and circulation for people and vehicles (incorporating disabled access);
- 11.1.2 Parking for vehicles. Staff parking should be screened from the main entrance and public parking areas. The numbers of car parking spaces shall be derived from the relevant Planning Consent;
- 11.1.3 The staff parking entrance to this will be protected by a barrier, with staff utilising a key card that could be linked to their identification tag;
- 11.1.4 Planting, beyond the limited requirements of the Local Authority is welcomed;
- 11.1.5 shelter against adverse weather conditions at the main entrance is required;
- 11.1.6 all external areas require extensive landscaping to provide visual screening from adjacent developments. There is a requirement, however, to provide a clear security zone of a depth of 10m, devoid of any shrub or tree planting, adjoining the external perimeter wall of all Medium Secure Areas. This will provide a clear zone for observation and alarm systems;
- 11.1.7 gardening will be used as an integral part of occupational therapy and, consequently, dedicated area(s) must be made available for this activity. Secure provision will be required for the controlled storage of all associated gardening equipment. Provision for maintenance access and watering must be made to all internal courtyards;
- 11.1.8 other aspects such as services areas, plant rooms, access for building maintenance, security and lighting, and any requirements laid down by the Local Authority (such as

boundary tree planting) and Local Fire Department (such as emergency access) must form a part of the design;

11.1.9 a service vehicle turning area, separated from the pedestrian access route and not a common surface, is to be located adjacent to the controlled point of entrance; its size sufficient to accommodate the size and numbers of delivery vehicles likely to be waiting to gain entry to the development at any one time;

11.1.10 external lighting should be designed to facilitate the use after dark and to satisfy safety and security conditions.

## **11.2 Resistance to ground water and dampness**

All building elements and retaining structures will incorporate appropriate means to resist the passage of dampness both into the building structure and fabric and into the accommodation, including resistance to any hydrostatic pressure.

All such construction will be in accordance with the requirements of the Building Regulations, BS 8192 Code of Practice for protection of structures against water from the ground and CP 102 Code of Practice for protection of buildings against water from the ground.

## **11.3 Civil and Structural Requirements**

### **11.3.1 Loadings**

All loadings including dead, live and wind shall be in accordance with the relevant British Standards and Codes of Practice. Allowance shall be made for actual loads of plant items, suspended ceilings or special requirements and fixtures, when these impose higher loads.

### **11.3.2 Fire Resistance**

All civil and structural elements shall have a fire resistance in accordance with the Building Regulations and to meet the specific requirements of the Firecode and Building Control.

Any externally applied fire protection must be durable and in accordance with the design life of the members in question. All such surfaces must be capable of decoration and compatible with any other materials with which they will be in contact.

### **11.3.3 Foundations**

Differential settlement shall be limited to ensure no re-distribution of load resulting in the over-stressing of the structure or foundations. Settlement shall be restricted to ensure no visible distress is caused to the structure and that no damage is caused to internal finishes or services;

Building settlement shall not affect the continued operation or serviceability of the facility;

### **11.3.4 Superstructure**

Structure should be fully integrated with building services and shall retain flexibility for future changes in services and service routes, including provision for knock out areas adjacent to all columns;

Roof construction shall be fully weatherproof and designed for minimum maintenance. All penetrations through the roof membrane should be suitably sealed to prevent the ingress of water. Suitable drainage shall be provided in order to avoid standing water and minimise maintenance.

### 11.3.5 Below Ground Drainage

A separate foul water and storm water drainage system shall be designed fully in accordance with Local Authority adoptable standards;

Provision shall be made for the diversion of any existing below ground drainage which may be necessary;

Inspection chambers and maintenance access will be provided as required;

Any manhole/inspection chamber covers within the courtyard area must be secured to prevent access by patients.

### 11.3.6 Services Co-ordination

Co-ordination with electrical, fire alarm, security, IT, telephone, access control and mechanical services is an inherent part of the ceiling design.

Within each ceiling area the installation of the lights, fire alarm smoke/heat detectors, access control and mechanical service shall be co-ordinated with the ceiling layout and allow simple relocation if required.

## 12.00 Disabled Requirements

### 12.1 General

The requirements detailed in the, Building Regulation and Building Standards must be adhered to in the design of the Project in addition to the Disability Discrimination Act 1995 requirements. The following must be taken into account.

### 12.2 Approaches must:

- 12.2.1 Accommodate safe set down points for disabled people from minibuses and taxis;
- 12.2.2 Design routes to prevent cars from parking on pavements and obstructing circulation routes for visually impaired people;
- 12.2.3 Use contrasting colour/texture paviors at dropped kerb crossing points. Blister type paving is only recommended at controlled crossings on main highways;
- 12.2.4 Ensure adequate disabled persons parking is provided as close as possible to principal entrances to buildings;
- 12.2.5 Allow for sizing at least one accessible parking bay to accommodate a people carrier van with electrically operated side hoist;
- 12.2.6 Disabled person parking bays to be of 1 ½ bay width; and
- 12.2.7 Provide clear orientation clues for visually impaired people at changes in direction on entrance routes, at all main entrances;

### 12.3 Reception Area

- 12.3.1 Reception desks to have a dropped section for wheelchair users;
- 12.3.2 Reception desk to have adequate provision to enable a wheelchair user to complete or in-fill documentation whilst adjacent to reception desk (consider knee position);

- 12.3.3 Matwell to entrance/exit doors to be solid alternating strip and pile suitable for wheelchair use. Barrier matting to equate to 4/5 paces from entrance. Coconut matting is not acceptable;
- 12.3.4 Provide colour contrasted or tactile variation flooring clues to main reception area to guide visually impaired people to reception desk point at 90 degrees from circulation route;
- 12.3.5 Provide VDU display visual appointment call system for hearing impaired clients;
- 12.3.6 Text telephone for hearing impaired clients on enquiries desk with separately publicised telephone number;
- 12.3.7 Induction loop system to be installed for hearing impaired clients ([section 1311.5] also refers);
- 12.3.8 Panic button underneath desk which will alert security if depressed;
- 12.3.9 Glazed security screen;
- 12.3.10 Door entry system; and
- 12.3.11 Security in the event of escape.

#### **12.4 Internal circulation areas**

- 12.4.1 Wherever possible reduce lengths of circulation routes and provide open areas and stopping/resting points along length of travel;
- 12.4.2 Avoid isolated columns in open plan areas or on circulation routes;
- 12.4.3 All stairs to comply with the Building Regulations (Part M refers to English Building Regulations) and have contrasting colour nosings for visual identification and tactile warning surfaces at top and bottom landings;
- 12.4.4 Bump rail to be used as handrails where appropriate; and
- 12.4.5 All signage to be installed in accordance with the requirements set out in relevant Guidelines and/or Regulations.

#### **12.5 Hearing Enhancement Systems**

- 12.5.1 All public telephones fitted with inductive couplers;
- 12.5.2 Public text payphone;
- 12.5.3 Loop systems to waiting areas if PA announcements are to be made or if TV entertainment is provided for clients while waiting. Ensure management provide Teletext/Ceefax TV facility for subtitles;
- 12.5.4 Loop systems to training/therapy/interview rooms as appropriate;
- 12.5.5 Avoid over spill from loop systems in adjacent rooms and on floors above and below (confidentiality) and avoid electrical interference from other equipment; and
- 12.5.6 Visual fire alerts to all spaces where hearing-impaired people are likely to be unaccompanied and out of sight.

## **12.6 Surfaces and Finishes**

- 12.6.1 Slip resistant non reflecting surfaces that meet with the Board's Infection Control policy should be used;
- 12.6.2 Avoid echo and reverberation;
- 12.6.3 Colour contrasting to doorways relative to wall finishes;
- 12.6.4 Avoid confusing patterns and background colours; and
- 12.6.5 Avoid glare from natural and artificial lighting.

## **12.7 Generally**

- 12.7.1 Where appropriate, provide a 300mm return to side of doors as required by the Building Regulations and ensure that this is not obstructed by fittings, fire extinguishers etc;
- 12.7.2 Check that arrangement of reception, consulting/treatment and interview room layouts do not cause problems of glare for occupants;
- 12.7.3 Check that consulting/treatment/interview rooms are arranged to permit min 1500mm turning circle for wheelchair users;
- 12.7.4 Ensure that all shower and changing areas are accessible; and
- 12.7.5 Ensure that staff areas are accessible and able to be monitored by staff.

## **12.8 Doors**

Consideration should be given to the following:-

- 12.8.1 Ensure that door edges do not present hazard to visually impaired people when in hold open position. Provide planter boxes or contrasted texture flooring to guide people into line of doors;
- 12.8.2 Anti-ligature, light pressure delay check door closers should be provided to self-closing doors;
- 12.8.3 Vision panels as referred to in the Building Regulations;
- 12.8.4 Colour contrasted easy grip lever furniture and ironmongery;
- 12.8.5 Fully glazed doors to have additional visual identification;
- 12.8.6 Level access to all doors including escape doors;
- 12.8.7 800mm clear width preferred including single leaf or double doors. 800 mm clear needed for double buggies. Door and half sets may be used in preference to double doors; and
- 12.8.8 Generally intermediate doors across main circulation routes should be held open on electro-magnetic devices linked to the fire and security alarm systems and designed to fail closed in an emergency or power failure.

## **12.9 Accessible WC's**

Consideration should be given to the following:-

- 12.9.1 Accessible WC's to comply with the Building Regulations;
- 12.9.2 Unisex WC's accessible directly off corridor preferred. Accessible WC's located within Male or Female WC blocks do not permit a disabled person to be assisted by a member of the opposite sex where necessary;
- 12.9.3 If providing more than one accessible WC, endeavour to provide a choice of left and right hand transfer layouts;
- 12.9.4 Ensure that walling to WCs is constructed to provide adequate solid fixing options for grab rails and sanitary ware which will be fixed so as to prevent ligature risk;
- 12.9.5 WC alarm linked to reception or nearest nurse station and capable of being manually reset. The alarm should not present a ligature risk;
- 12.9.6 Visual fire alert for hearing impaired users;
- 12.9.7 Very light pressure self-closing devices to accessible WC doors;
- 12.9.8 Avoid lobbies to WC areas where possible and provide visual screening instead. If providing lobbies ensure these are large enough for wheelchair users or guide dogs to pass and that door have light pressure self closers;
- 12.9.9 Provide accessible WC's and showers to staff areas as well as public areas; and
- 12.9.10 Cubicle doors should have the facility in an emergency to open outwards.

## **13.0 EXTERNAL WORKS, LANDSCAPING AND EXTERNAL SIGNS**

### **13.1 Design Principles**

The design of the external work should give consideration to the following:

- 13.1.1 Access and circulation for people and vehicles;
- 13.1.2 Traffic calming;
- 13.1.3 Fire paths;
- 13.1.4 Road Marking;
- 13.1.5 Access control;
- 13.1.6 Parking for vehicles;
- 13.1.7 Robust covered racking for storage of bicycles;
- 13.1.8 Service areas;
- 13.1.9 Accommodation for building services plant, waste and materials management and protection against noise and environmental pollution; and
- 13.1.10 Access for building maintenance.

### **13.2 Hard Landscaping**

The design and construction of the external hard landscape surfaces except for main access roads and loading dock areas should be completed using materials which create durable and attractive areas with integrated soft landscaping but with due regard to the patient categories which will use the Unit.

Consideration should be given to how illegal and inappropriate parking can be controlled using, but not limited to, landscaping and architectural ironmongery.

Pedestrian walkways should be clearly defined and segregated from vehicle routes.

Car parking to be provided suitably proximate to building entrances, number of spaces to be calculated in line with local planning authority and local roads department requirements as a minimum provision.

Dedicated "disabled spaces" to be as close as practicable to the nearest entrance.

Provision for secure parking for bicycles in a covered bicycle shelter which is secured to the ground, as per the Planning Conditions.

Hardstanding for SAS ambulances and other vehicles shall be provided.

Separate dedicated area for deliveries/uplifts as well as mortuary services to be provided.

Access for emergency vehicles to the external perimeter of the building via fire paths to be included;

Traffic signage, white lining of surfaces and Board corporate signage to be provided within the site boundary;

Temporary signage for the currency of the Works are required to identify access and egress points, emergency muster areas and for vehicle management.

Permanent external signage identifying the Facilities to be provided by the Board and fixed by ProjectCo.

Location and security of Local Authority bins to be agreed with the Local Authority.

### **13.3 Soft Landscaping**

The soft landscaping should be designed with particular emphasis on the security and safety of staff, patients and visitors and the requirements of the Planning Authority.

Areas of soft landscaping should complement both buildings and hard landscaped areas of the site.

Specified plants and materials shall be non-poisonous and non-injurious (e.g. berries, spikes and the like).

#### **External Furniture**

Amenity areas shall have suitable external furniture provided.

Planters may be incorporated, and shall require drainage and irrigation provisions.

Litter bins require to be robust and secured to the ground, cigarette extinguishing feature at all public/staff entrances.

## **13.4 Other Requirements**

Temporary Site Accommodation

A meeting room will be made available to the Board on site, on a bookable basis.

## **14.0 Mechanical & Electrical standards**

### **14.1 General**

ProjectCo shall prepare a realistic assessment of the energy efficiency of their building design taking into consideration the capital cost and cost in use. As part of the tender submission, ProjectCo shall provide an energy target along with summer and winter consumption profiles for gas and electricity for their proposed scheme. Assessment and energy target will comply with the hospital energy codes, ProjectCo thereby being required to demonstrate during the design process and at completion of the design that the NHS energy targets of 35-55 GJ/M3 per year are met.

The following are given as design considerations:

- 14.1.1 Adequate and safe access to be provided to all plant, equipment and roof areas;
- 14.1.2 Secure and lockable access hatches to be located, where possible, in non-critical/operational areas to prevent disruption to users;
- 14.1.3 Adequate space to be provided in plant areas to facilitate removal of equipment for maintenance and renewal;
- 14.1.4 Consideration should be given to allowing adequate space in plant rooms and service voids to allow for future expansion.
- 14.1.5 Large plant rooms should contain work benches, power supplies and lockable storage.

### **14.2 Heating (spatial temperatures)**

Spacial temperature requirements are contained in the Room Data Sheets.

Some areas may require to be maintained at normal operating conditions on a 24 hours per day basis. Others may be controlled by the Building Management System (BMS) to reflect anticipated occupancy levels and their duration. ProjectCo require to use a suitable BMS.

### **14.3 Domestic cold water requirements**

- 14.3.1 All drinking water to be mains fed or from a potable supply.
- 14.3.2 Size and number of storage tanks to be limited to ensure adequate turnover and chlorination requirements.
- 14.3.3 Control of Infection policy to be considered in any decision on water temperatures or storage.
- 14.3.4 Adequate pumps to be included when high rise buildings cannot be fed by mains pressure.
- 14.3.5 Bore holes only to be considered when economically feasible.
- 14.3.6 The requirements of 'L8 The Control of Legionella bacteria in Water Systems' must be achieved in water systems (hot and cold).

#### **14.4 Domestic hot water requirements**

Domestic hot water will be required in sufficient quantity and flow rate to satisfy demand. The pressure of both cold and hot water supplies is to be appropriate for use in the particular area. Specific requirements to be met in respect of delivered temperature, avoidance of dead legs, control valves, legionella and concealment of pipework.

Schematic details should be included within ProjectCo's submission.

It is the responsibility of ProjectCo to ensure, where total bodily immersion is anticipated, e.g. showers and baths, or where lower maximum temperatures are necessary, fail safe thermostatic devices are used in accordance with BS1415 Part 2 and NHS TMV3 scheme.

#### **14.5 Drains & Sewers**

14.5.1 Separate systems to be installed to meet Local Authority requirements.

14.5.2 Above ground horizontal drain runs to be limited where practicable.

14.5.3 Adequate rodding eyes to be installed.

14.5.4 Consideration to be given to use of plastic pipes rather than cast iron.

#### **14.6 Ventilation requirements**

##### General Principles

14.6.1 Maximum use shall be made of natural ventilation, subject to local heat gains, security requirements and space temperatures.

14.6.2 Where design requirements cannot be met reliably by natural ventilation systems, mechanical ventilation should be employed e.g. kitchen area.

14.6.3 Bidders should note that windows in certain areas are likely to be incapable of providing adequate natural ventilation.

14.6.4 Specific areas requiring mechanical ventilation include toilets, bathrooms and shower rooms. In accordance with Building Regulations and Local Authority requirements and good practice.

##### Kitchens and Serveries

14.6.5 Supply and extract to dissipate the load generated by heat producing equipment.

##### Ward areas and patient accommodation

14.6.6 All areas identified as ward or patient areas shall be provided with supply and extract ventilation to meet the standard and requirements of the relevant HBN/HTM

##### Negative pressure

Areas indicated on Room Data Sheets shall be maintained under a negative pressure with respect of adjacent rooms or circulation spaces, e.g.

14.6.7 Disposal areas.

14.6.8 All linen and waste stores.

## **14.7 Air Conditioning requirements**

Only in unit 2.02 (Conference Room) a DX unit or similar to be provided.

## **14.8 Electrical requirements**

### **14.8.1 Distribution Of Electrical Services**

The main building switchboard shall be located within a dedicated switchroom/plantroom area and shall be form 4 type in accordance with BS EN 60439. The main switchboard shall interface with the new standby generator and shall be essential sections. An electrical/mechanical interlock shall be paralleled and that the generator will only operate on mains failure.

The switchboard shall incorporate multi-function mains metering and shall supply final distribution boards, control panels etc., which shall be located throughout the project to support the various power requirements. All the multi-function mains metering shall be interfaced with the BMS.

Mains and sub-mains distribution cabling shall be of single and multi – core XLPE SWA LSEZH type and shall run to and from respective 400v distribution centres, strategically located throughout the project ,to minimise final circuit cabling. These distribution points shall contain essential boards, to serve general lighting, power, ancillary services and small mechanical services power, as required.

Final distribution boards shall be provided with integral isolators, lockable enclosures and shall utilise MCB protection devices for final circuit distribution. All distribution boards shall have spare capacity for future expansion and future flexibility of 25%.

Distribution boards shall be complete with MCB protection devices with the appropriate short circuit ratings. Combined MCB/RCD units shall protect sockets circuits in high risk.

Distribution boards shall be located in lockable cupboards and/or plant spaces.

### **14.8.2 Cabling and Containment**

Sub-circuit cabling shall be carried out in suitable LSF insulated cables enclosed in a network of basket, cable trunking and conduit.

Containment shall comprise trunking, or basket, or conduit and tray .The containment shall primarily house the 230 volt supplies together with nurse call wiring installation which will be in a segregated compartment.

Containment systems shall be provided for mains cables, fire alarm and emergency lighting, security, radio and television and data and voice systems. Each of these systems shall also involve separate conduit work to various outlets. Types and grades of containment shall be appropriate to the particular service.

### **14.8.3 Illumination Levels**

See Room Data Sheets for specific illumination requirements.

### **14.8.4 Lighting Generally**

The lighting installation will be designed to comply with the following publications including all amendments: -

14.8.4.1 CIBSE Lighting Guide for Interior Lighting;

14.8.4.2 CIBSE Lighting Guide for Hospital and Health Care Buildings;

14.8.4.3 CIBSE Lighting Guide 3 "Lighting for Visual Display Terminals";

14.8.4.4 IES Technical Report on the Daytime Lighting of Buildings; and

14.8.4.5 Designing for the disabled

14.8.5 Interior Lighting Design

The light environment is crucial to the overall design strategy of the Unit. It is essential that both patients and staff have a pleasant and visually effective environment, all of which will be affected by the way the Unit is illuminated, both by daylight and electric light.

To facilitate this, an approach to the lighting design will be adopted, taking cognisance of elements such as:

14.8.5.1 Visual Function;

14.8.5.2 Visual Amenity;

14.8.5.3 Architectural Integration;

14.8.5.4 Energy Efficiency;

14.8.5.5 Whole Life Costs;

14.8.5.6 Whole Life Performance; and

14.8.5.7 Secure and safe fittings.

Together these elements cover lighting the task, the lit appearance of the unit and the energy and economics of the installation. They shall be integrated with the overall design and strategy to provide a total lighting solution for the Unit offering a bespoke approach to the requirement of its various departments.

The designs shall recognise and employ the guidance given in the CIBSE Code for Interior Lighting LG2 (Hospitals and Health Care Buildings) by adopting, and enhancing the recommendations therein to suit the needs of a modern hospital and its users.

The selection of luminaries shall be considered against the following Criteria:

14.8.5.8 The general colour temperature of the lamp shall be at or about 4000k;

14.8.5.9 The general efficiency of the lighting source, which shall offer good light output ratio and utilise efficient control gear;

14.8.5.10 Compact source fluorescent luminaries where indirect lighting is to be considered;

14.8.5.11 All luminaries shall be complete with power factor correction;

14.8.5.12 All luminaries used within patient areas shall be sufficiently robust and also inherently safe for the user groups. Diffusers shall be secured in place with tamperproof screws to prevent patients gaining access to live terminals and controls. These luminaries shall imply dual lamp technology which shall afford a night light / observation facility for staff;

14.8.5.13 All luminaries shall be simple to clean and be able to withstand frequent applications of cleaning agents;

14.8.5.14 Cost and availability of replacement lamps;

14.8.5.15 Environmental conditions, ie.outdoors/indoors;

14.8.5.16 Tamperproof lighting is to be provided in appropriate areas; and

14.8.5.17 Corridor lighting shall be multi-circuited to facilitate use of 100% or 50 % of the luminaries.

#### 14.8.6 Emergency Lighting

A complete installation of non-maintained emergency lighting and maintained illuminated emergency exit signs complying with BS 5266 will be provided to ensure the escape routes are lit in the event of a failure of the incoming supply.

The lighting will employ the use of self-contained luminaires or by the use of conversion packs fitted within the main luminaires. The installation will provide three hours duration of escape lighting.

#### 14.8.7 Exterior Lighting

Roadways, paths, car parks and cycle racks will be illuminated in accordance with the various British Standards and Lighting Guides. In addition special attention will be given in respect of adequate lighting levels associated with security of staff and patients. Special attention should also be given to the external illumination of the building.

All external areas, including car parks shall have mercury lighting to a minimum level of BS5489.

### 14.9 Standby generation strategy

Standby provision is to be provided with consideration to be given to and in accordance with the requirements of HTM 2007 and HTM 2011:

14.9.1 Siting of generators with regards noise & exhaust emissions.

14.9.2 An LV standby generator shall be provided adjacent to the buildings substation and interface to the primary LV switchboard.

14.9.3 Standby generation shall provide 100% back up at the buildings load centre to ensure continuation of supply on load substation mains failure.

14.9.4 Standby generation shall be housed in suitable acoustic enclosures with minimal breakout attenuation of 65dBA @ 3m Local day tank(s) or immediate fuel consumption will also be provided at the load centre.

14.9.5 An automatic changeover system shall be provided at the main switchboard.

External isolation of electrical services back to the nurses station on a room by room will be required for patient bedroom areas.

### 14.10 Thermal Performance Requirements

The buildings require to be designed for the conservation of fuel and power, appropriate to the building type, in accordance with the Scottish Building Standards Technical Handbook 2004 Non Domestic, Section 6: Energy and in particular paragraphs 6.2.4 "Limiting the effect of thermal bridging at junctions and around openings 2and paragraph 6.2.5 "Limiting air infiltration".

The principles indicated in BRE Report 262 "Thermal Insulation, "avoiding risks", 2002 edition and BRE report 448 "Air Tightness in Commercial and Public Buildings", 2002 edition should also be followed in respect of design, construction and site inspection (during construction).

#### **14.11 X-Ray Provision**

In order to facilitate the installation of 'airport style' security provisions ('rapidscan' x-ray or similar) by the Board, ProjectCo shall install a 25 mm conduit, back box and cover adjacent to both machines on the wall for control gear and two switched spur units single phase adjacent to both machines in the same area. This provision will be re-appraised between the Board and ProjectCo at the detailed design stage in order that exact requirements are met.

#### **14.12 Automatic Doors**

14.12.1 Automatic door retaining devices to be incorporated on appropriate internal doors linked to the fire alarm system.

14.12.2 Conflict between security and fire escape requirements to be considered at design stage.

#### **14.13 BMS strategy**

An integrated Building Management System (BMS) shall be provided to monitor and control all aspects of the Engineering Services within the building. The Board at present use a BMS system.

The BMS is to utilise localised; intelligent, stand-alone microprocessor based outstations that incorporate the latest technological advances in distributive intelligence and direct digital control methodology.

The BMS and associated devices are to be fully networked and are to integrate with all other Board buildings on the specific site. The network shall also incorporate the latest developments in technology, which shall serve all field devices, file servers, printers and front-end requirements. The completed network shall be engineered such that it forms an overall integrated knowledge based management system.

The BMS is to perform comprehensive control functions via specific control algorithms together with all other necessary monitoring functions of mechanical, electrical and other major plant and equipment items including interrogation of all the following systems:

- 14.13.1 Fire Alarm and Fire Protection System;
- 14.13.2 Access Control and Security Systems;
- 14.13.3 Closed Circuit Television (CCTV) Systems;
- 14.13.4 Electrical Supply Systems; and
- 14.13.5 Standby Power.

The BMS is to incorporate Direct Digital Control (DDC) networked field devices. These DDC devices are to perform the necessary control logical functions and provide all necessary interface links associated with plant items, equipment, machines, detectors, sensors, monitoring points, actuators, limit switches and all other associated proprietary control systems.

The network communication link and BMS are to be designed to have sufficient versatility, diversity and UPS back-up such that in the event of a mains power failure, or the loss of a particular section of the network installation it continues to operate and communicate with no adverse affects whatsoever.

The BMS shall be designed to operate and control the engineering services within the building to ensure optimum usage of energy resources. The following facilities as a minimum shall be considered: